Cross-cultural aspects of reading practices: A longitudinal study of Thai and Indian/Bangladeshi postgraduate students’ metacognitive and framing abilities when reading at an Australian university

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2002
Declaration

I declare that this dissertation is my own account of my research and contains, as its main content, findings which have not previously been submitted for a degree at any tertiary institution.

Signed

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Cross-cultural aspects of reading practices: A longitudinal study of Thai and Indian/Bangladeshi postgraduate students’ reading practices at an Australian university.

Abstract

This research aimed at understanding the reading practices of two groups of international postgraduate students across three semesters. The research was underpinned by a conceptual framework incorporating metacognitive concepts with framing theory. The methodology involved individual interviews using academic text and pair think-alouds followed by retrospective interviews using general-interest texts. The interviews and pair think-alouds took place at an Australian university with Thai and Indian/Bangladeshi postgraduate students and at university campuses in Thailand and India.

The data selected from the interviews and pair think-alouds revealed significant changes in reading practices between first and third semester at an Australian university and the participants’ awareness of these changes. The participants’ reflections also provided some explanation for the differences in their cognitive and metacognitive strategy use.

The research study was important because, at the postgraduate level, students are faced with complex text interpretation processes. International students, in addition, have to make a significant cultural/study shift; not only do they have to become
accustomed to the reading of academic texts using discipline-specific patterns but often have to adjust to different conventions used by authors from cultural backgrounds other than their own. Little is known, in particular, about Thai and Indian/Bangladeshi postgraduate students’ reading experiences in their own countries or how their reading practices change during study at an Australian university.

The research findings suggest a dynamic, multi-dimensional, developmental framework for conceptualising international postgraduate students’ reading practices in first semester at an Australian university, and the changes in reading practices and the educational and socio-cultural influences on these changes by third semester; the findings, in addition, can inform the debate on literacy levels in the cross-cultural academic environment and can contribute to discussions on such pedagogical issues as reforming of curricular structure, the internationalisation of curricula and the development of more culturally sensitive supervisory frameworks.
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Chapter One

Introduction and background

Over the last decades, many universities in Australia, as elsewhere, have seen a significant increase in the number of international students from a non-English speaking background (NESB). According to the Australian Department of Immigration and Multicultural Affairs, approximately 110,900 student visas were granted between 1998 and 1999. Education is Australia’s fifth largest export earner and yet despite the importance of international students, both financial and cultural, there are gaps in expectations between academic staff and students which still need addressing. There is concern, too, about the lack of research and development in the field of postgraduate education of international students (Zuber-Skerritt and Ryan, 1998) and, specifically, about the teaching styles used with international postgraduate students given the different teaching/learning styles to which they have been accustomed (Zuber-Skerritt, 1994). In particular, reading problems and the expected outcomes have been cited as one of the most neglected problems facing international postgraduate students (Smith, 1998). The importance of reading for academic study cannot be overemphasised. However, it has been shown that university students’ reading is not strategic or well regulated (Guthrie, 1988). While academic staff often express concerns regarding the learning/study approaches of international students (Ninnes 1999; Zuber-Skerritt, 1994), and the English as a second language (ESL) literacy (Fitzgerald, 1995), few of these students have themselves been asked for their
views on their learning, or specifically, their reading approaches. Indeed, there is a lack of research on postgraduate research practices and supervision (Zuber-Skerritt, 1994). As a result, international ESL postgraduate students often find themselves working with supervisors or in classes with lecturers with little knowledge of their international postgraduate students’ learning styles, in particular, their reading practices or, if they do have some knowledge of their students’ cultural-educational backgrounds they ‘may lack specialist skills to help improve outcomes’ (Cargill, 1996:177).

This dissertation focuses on the reading practices of international postgraduate students. Reading is of particular importance to postgraduate students’ study; much subject-specific academic reading is required to give the students a grounding in their field; it is also required for the writing of literature reviews and to draw on when presenting arguments in a postgraduate student’s thesis, whether it be a Masters or PhD study. Many mismatches in expectations can occur, however. These mismatches may concern important factors such as the purpose of reading, the extent of criticality expected in the reading for a particular discipline, the amount of background knowledge and experience available for specialised academic reading.

Reading is a complex skill influenced by background knowledge, educational upbringings, cultural attitudes to reading, expectations regarding the purpose of reading. While international students from a non-English speaking background may read adequately in their own country to fulfil the educational expectations of their country, they may find that these same reading practices do not fulfil the requirements of a Western university. This is not to imply that their skills are deficient, rather to suggest that these students may encounter a system which rewards study approaches
which are Western rather than international (Ninnes, 1999). Moreover, while many local students may experience difficulties at higher academic levels, international students from non-English speaking backgrounds may experience more serious difficulties as they are also operating with a type of English language which may not be completely appropriate for the Australian English speaking environment.

The present study aims to provide insights into the reading practices of international ESL postgraduate students so that they can be factored into the design of postgraduate programmes. It should be noted here that the term ‘international ESL students’ is used throughout this thesis to refer to students whose first language is not English and whose permanent home is overseas. The term ‘international’ only is used to refer to students from an overseas country who may or may not have English as their first language. The study attempted to avoid stereotyping of ‘Asian’ students by focussing on two particular groups of students, Thai and Indian/Bangladeshi. The study focussed on these two particular groups of international students as little research has been carried out with these groups and yet enrolments of these particular groups at Australian universities are increasing.

In order to place this study in context, this chapter provides the objectives of the study and a discussion of the different cultural, social and educational complexities which may influence the approaches to the reading of text by international postgraduate students, in general, and from India/Bangladesh and Thailand, in particular. The chapter concludes with a summary of the issues related to reading. The focus of the study is then presented, the research questions and an overview of the chapters of the thesis.
Objectives of the study

This research explored the reading practices of two particular cohorts of international ESL students, postgraduate Thai and postgraduate Indian/Bangladeshi students over a period of three semesters.

Specifically, the study was designed to:

- Investigate the reading practices of Thai and Indian/Bangladeshi postgraduate students while studying at an Australian university during their first semester;

- Identify the socio-cultural and educational influences on these reading practices, some of which would be derived from practices and experiences in their home countries;

- Investigate the reading practices of Thai and Indian/Bangladeshi postgraduate students while studying at an Australian university during their third semester and the changes that may have occurred since first semester; and

- Identify the changing socio-cultural and educational influences which may have produced changes in their reading practices between first and third semester.

The fourth objective is reiterated in more detail under Purpose of study on page 107.
Cultural, social and educational complexities

Many postgraduate students from a non-English speaking background have experienced difficulties with their studies at Australian universities. In a study by Burke and Wyatt-Smith (1996) with Australian ESL students (i.e. migrant students whose first language is not English), fewer than half perceived that their previous academic studies had prepared them for their study at an Australian university. The difficulties reported were: different teaching/learning styles, especially the requirement for more independent learning; less reliance on examinations for assessment; and much reading, incorporating unfamiliar discipline-specific terminology requiring reliance on dictionaries which led to surface level reading for assignments. While these results may not be generalised to every cohort of postgraduate international students, they are an indication that many postgraduate students experience difficulties, certainly in their first semester at an Australian university.

Reading comprises much of the postgraduate student’s time and effort yet a review of the literature indicates that, while there have been several studies on the difficulties which undergraduate and postgraduate students experience (Burns, 1991; Burke and Wyatt-Smith, 1996; Castleton, Flemming and Harvey, 1993; Kiley, 1999; Samuelowicz, 1987), the reading practices of postgraduate international students have not received much attention. In particular, little is known about Thai and Indian/Bangladeshi postgraduate students’ reading experiences in their own countries or how their reading practices change during study at an Australian university. This piece of research explored the changes and self awareness of the changes in reading practices by these two groups of students when reading in English. The methodology
involved an ethnographic approach, grounded in a theory of framing and metacognitive theory, and incorporating a socio-cultural perspective; in addition, data were collected in Thailand and India using interviews and observations to provide insights into the nature and magnitude of the students’ cultural/study shift. The conceptual and methodological framework of the study is explained in detail in chapter three.

A better understanding of the reading processes should benefit both lecturers and students, particularly as, for some years now, there have been concerns among Australian academics about academic literacy standards with international ESL students (Bradley, 1984) and Australian postgraduate ESL students (Burke and Wyatt-Smith, 1996). The latter may have had a number of years of undergraduate study in Australia but even these students, according to Burke and Wyatt-Smith’s study, still experience considerable difficulty. In addition, the appropriateness of the teaching styles used with international postgraduate students has been questioned (Zuber-Skerritt, 1994). According to Moses (1985), supervisory guidance and amount of direction to students is based on teachers’ own experiences and as such may not be appropriate for their current diverse populations of students.

Some consideration needs, at this stage, to be given to these issues as well as to the attributes generally thought by academic staff to be necessary for the successful postgraduate student, regardless of language background: ability to read critically, an understanding of academic language, knowledge of discipline-specific discourse patterns and knowledge of reading strategies and the ability to apply them appropriately. While these are issues which affect all postgraduate students, both
local and international ESL students, the international ESL students arrive at Australian universities with diverse cultural, linguistic, religious and educational backgrounds (Ninnes et al., 1999) sometimes far removed from those of their host country. These differing backgrounds may lead to differing expectations and hence differing approaches to their learning and, in particular, their reading.

**Effective reading attributes**

Effective reading relies on appropriate matching of expectations and skills on the part of students with the requirements of curriculum and expectations of lecturers and supervisors. Furthermore, the reading process involves complex and multifaceted factors which interact in various combinations at various times as a dynamic, multidimensional process (Brown, 1980; Finkbeiner, 1998). Some of the cultural, social and educational complexities influencing the reading process are now discussed: lexico-grammatical competence, English language use in the home countries, cultural characteristics, Western academic subcultures, differences in text structures, expected reading criticality, educational background, purpose for reading, and knowledge of effective reading strategies.

**Lexico-grammatical competence**

Lexico-grammatical competence while encompassing the notion of grammatical and structural competence also relates to the type of English learnt in the home country. Moreover, ‘different cultures may promote different levels of metalinguistic awareness’ (Hall and Guthrie, 1982: 133) thus influencing a student’s interpretation of a text. For example, at the purely linguistic level, students may miss cohesive markers
and other signposts in texts and, if reading is slow, may not have the time to relate a
text to other related texts to gain further understanding.

Students may, of course, have a high level of English language but of a variety more
appropriate for intranational use in their own country than in the host country (Pride,
1982). A study by Bell (1994) set up to investigate the variety of Englishes and
cultural assumptions learnt by Singaporeans in their home country and the
implications when these students studied at an Australian university, found these
students were not aware of the linguistic differences they may meet in Australia.
Based on students’ accounts, it appeared that Singapore English had been learnt in the
context of an Asian nation with its own cultural meanings and there had been little or
no exposure to Australian English either in the form of teaching by Australians,
exchanges with Australian schools or time given to the study of Australian culture in
the Singapore English Syllabus. In addition, while studying in Australia, they found
that the Australian students and even some staff, made no allowances for the fact that
Australian English was not their native language.

Pride (1982) explains the situation non-English speaking background students often
find themselves in when studying in a Western environment. He says ‘…the language
learner cannot help but transfer into his use of English certain of the more deep-seated
culture-bound communicative competencies which he has acquired and developed in
his native language or languages, while at the same time having to learn new
communicative competencies appropriate to the target, non-native language’ (p. 5).
He cites Akere’s study of Nigerian English as an example. Akere posits that the
English language, ‘transplanted from its native cultural domain, is now being used to
convey the cultural norms and concepts of the various ethnic groups in the Nigerian society (p. 90). His analysis of the emerging forms and functions of the English language shows many variations from the original meanings. For example, English kinship terms in Nigerian English have wider semantic features. The term 'family' refers to several different categories encompassing children with several wives and extended family including brothers and their families. International students come from a diverse range of language situations in their home country. It is important to understand to what language situations the Thai and Indian/Bangladeshi students belong in order to understand the 'culture-bound communicative competencies' they may have brought with them and how these may relate to their reading practices. A brief look at different language situations as categorized by Moag (1982) will help provide some understanding of the impact these situations may have on students studying in a different cultural environment.

Moag (1982), in attempting to look at the full range of language situations within which English operates around the World, organized these language situations into four classes: EFL (English as a foreign language), ESL (English as a Second language), ENL (English as a native language) and EBL (English as a basal language, referring to a small group of societies where English is the mother tongue of a minority group only). India is listed as an EFL society in transition to becoming an ESL society. One could presume that this transition towards being an ESL society is continuing in 2002. Thailand is not listed but one could judge that, according to Moag's taxonomy below, it would be designated also as an EFL society. It can be seen from Table 1 that Moag categorises 'the use factor of English' in EFL societies as slight, as are factors favourable to English acquisition. Moving along the
continuum from EFL to ESL, it can be seen that ESL societies have policies favouring English language use, the use of English factor is designated ‘extensive’ as are the factors favourable to English acquisition.

Table 1. Composite features of English-using societies

<table>
<thead>
<tr>
<th>Feature</th>
<th>EFL</th>
<th>ESL</th>
<th>ENL</th>
<th>EBL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree to which policies favour English</td>
<td>slight</td>
<td>extensive</td>
<td>full</td>
<td>slight</td>
</tr>
<tr>
<td>Use factor of English</td>
<td>slight</td>
<td>extensive</td>
<td>full</td>
<td>extensive</td>
</tr>
<tr>
<td>Index of factors favourable to English acquisition</td>
<td>slight</td>
<td>extensive</td>
<td>full</td>
<td>extensive</td>
</tr>
<tr>
<td>Favourable attitudes toward English measures</td>
<td>uncertain</td>
<td>certain</td>
<td>certain</td>
<td>uncertain</td>
</tr>
<tr>
<td>Models</td>
<td>conflicting</td>
<td>Non-native</td>
<td>native</td>
<td>native</td>
</tr>
<tr>
<td>Language variation within English</td>
<td>slight</td>
<td>considerable</td>
<td>full</td>
<td>considerable</td>
</tr>
<tr>
<td>Interlanguage features</td>
<td>extensive</td>
<td>extensive</td>
<td>slight</td>
<td>extensive</td>
</tr>
</tbody>
</table>

Reproduced from Moag in Pride (1982:16)
Note: EFL = English as a foreign language; ESL = English as a second language; ENL = English as a native language; EBL = English as a basal language.

Moag states that language use within governmental activities, as with education, shows a clear division between EFL and ESL societies. In the EFL society a local language serves all the functions and English is used only for communication with foreigners. It can therefore be seen that students from India and Thailand do not necessarily have the advantages of students coming from an ESL designated country.
If, however, we consider that India is approaching being an ESL society, their students may well have certain linguistic advantages over Thai students. It should be noted, though, from the table that the models for the English language are non-native speakers which could cause some difficulty when studying in an ENL environment. This could impact, for example, on the level of vocabulary knowledge. According to Grabe (1988) there is a need for advanced ESL students to have 'a massive receptive vocabulary that is rapidly, accurately, and automatically accessed' (p. 63).

There is, of course, much diversity among students from these two countries. In practical terms, the researcher noted from field trips to India and Thailand that much discussion of text with postgraduate students was conducted or at least explained in a local language, although their studies may have been purported to be conducted in English. Even from the general categories devised by Moag, it can be seen that there could be certain differences in language background between Thai and Indian students which could influence their ability to cope with the amount of reading in English expected at an Australian university and could also affect their interpretations of general and academic text. Language in general is often cited as one of the major difficulties for international students (Ballard and Clanchy, 1984). Further insights may be gained from a specific look at English language use in India and Thailand.
English language use in home countries

English language use in India

In India, English is used as a lingua franca and between 36 and 40 million people find
English a necessary part of their lives. India has arguably the world’s largest number
of speakers of a modern indigenised variety of English. Bernstein (cited in Kachru,
1978a) classifies Indian English into the following functions:

- Instrumentative function: English is used as an instrument of learning,
especially in higher education. Nevertheless, much explanation is still in
Hindi. There is mother tongue interference and other interlanguage features
(Pride, 1982).

- Regulative function: used for legislation.

- Interpersonal function: external use only; for communication with foreigners
rather than as an interethnic form of communication.

- Imaginative function: 1.3 million people read English newspapers. This figure
has climbed substantially to the present day. According to research in the
1980s one third of Indians study in schools which have English as the medium
of instruction and would be expected to read English newspapers.

Despite the use of English in a variety of functions, including education, students from
India certainly do not have the background of a student from an ENL society. Even
when education is stated to be in English, there is significant explanation in Hindi, as
noted earlier. As a result, as a transplanted English, the ability to put language to use in appropriate ways in culturally defined contexts, may become problematic because the cultural contexts that defined ‘appropriateness’ in the parent situation are not necessarily the same in the new situation (Kachru, 1976b, 1992).

While the English language is used in government, education and for communication with foreigners, the variety of English used may be less appropriate for the Australian academic environment than for the Indian environment. As Malcolm (1995) has expressed it, ‘Indian English identifies on the one hand with English and the wider community of its speakers, but on the other hand it identifies with what is Indian in contradistinction to what is English’ (p. 4). Kachru (1981) states, moreover, that the ‘transported’ varieties of English, such as Australian English or American English, although they differ, are still intelligible and acceptable between the speakers of these Englishes; he adds that the same cannot be said of other varieties of English including Indian English.

As enrolments of Indian students at Australian universities are increasing, it is clearly important to investigate as precisely as possible the ways Indian English is different from other Englishes and what influence that may have on reading practices in the Australian academic environment. At the same time, it is accepted that this study cannot hope to find out about Indian English in its entirety as there are several categories of Indian English, according to Das (1982); for example, English used by students varies from region to region and the English used by teachers in different educational institutions in India also varies. Das noted, in particular, with regard to reading, that many Indians prefer ‘poetic prose’ and the teaching of English has
always involved the teaching of English literature (p.143). As a result, Indians tend to use more literary vocabulary in everyday speech. For example, they tend to use words such as ‘ancient’ rather than ‘old’, ‘demise’ rather than ‘death’, ‘resplendent’ rather than ‘dazzling’, ‘blithe’ rather than ‘happy’ to quote a few of Das’ examples (p.144).

Overall, it can be seen how the linguistic background of Indian students could influence their reading at an Australian university. Their use of the English language, a consequence of the different teaching styles and the incongruous use of vocabulary, the result of the use of literary texts, may lead to misunderstandings related to the reading requirements of an Australian university.

A brief look now at the English language use in Thailand reveals that there are many similarities with Bernstein’s classification for India.

English Language Use in Thailand

In Thailand, as in India, English is used in all the public domains but little used in the private domains, e.g. in the home. Pornpimol (1984 cited in Cheshire, 1991) has listed six domains in which English is currently used in Thailand; the first three can be related to Bernstein’s instrumentative function, regulative function and interpersonal function. The imaginative function can be related to publications and the media.
Pompimol’s classifications are:

- The educational system
- Government agencies
- The private sector
- The élite community in Thailand
- The media
- Publications.

The élite community in Thailand is a domain not taken into account in Bernstein’s classifications. The élite English speaking Thais are often those who have studied in English speaking countries overseas and have been given the name of ‘nag-rîan-noog’ by other Thais.

As in India, there are newspapers published in English such as the Bangkok Post and the educational system uses English. It was noted by the researcher while staying at a Thai university, however, that, as in India, in postgraduate classes, there were frequent explanations in their native language.

Again, as in India, in addition to the varying uses of English in Thailand, there are also differences in the form of English used. Pornpimol, according to Cheshire (1991), believes there is a unique Thai variety of English and the Thainess in Thai English can be seen in the use of pretentious words, wordiness and modes of address, examples of which can be seen in novels, short stories and newspaper articles. The Thai English to which the Thai student has been exposed may have implications for the English authored text structures which they will have to negotiate when reading
for postgraduate study. Similarly the Indian variety of English may influence the processes and, indeed, interpretation of English authored texts while studying at a Western university.

While English language usage in students’ home countries is an important factor to consider when investigating the influences on reading at an Australian university, it is difficult to separate language from culture (an underlying assumption of intercultural theory is that language and culture are inextricably intertwined (Milhouse, 1996). It follows that students do not only have to contend with linguistic aspects of texts but also cultural aspects deriving from their educational and socio-cultural upbringings.

**Cultural characteristics**

Despite the culturally diverse student populations at Australian universities, little is known about how Indian/Bangladeshi and Thai students adapt to the specific academic expectations of their host country. Ballard and Clanchy (1991) and Cargill (1996) argue that international students are faced with a double cultural shift as they are required to accommodate to a Western lifestyle and culture, and to the culture of the classroom, that is, the different teaching and learning styles (e.g. patterns of discourse and ways of relating to lecturers) used in an Australian university. Volet and Renshaw (1995) found in a study with international (South East Asian students) and local (Australian) students that there was evidence of cultural/educational differences between their conceptualisations of goals in first semester but the differences disappeared after one semester. In addition, they found that South-East Asian students differentiated the usefulness of typical study settings according to the need to achieve high or low goals while the local students viewed individual study to
be the most useful form of study for all purposes. Differences in preferred styles of learning and the adaptations made to accommodate to a new academic environment may, of course, vary from culture to culture. Thai and Indian/Bangladeshi students will encounter to some extent a shift which will include the way they approach their study and their reading of texts. This approach will take account of, not only their linguistic knowledge, but their knowledge of cultural connotations. An example of different connotative knowledge is taken from Singapore.

In Singapore, many people speak both Singapore English and Singapore Hokkien. Kuiper and Lin (1989) argue that ‘although bilingual, these people are often not bicultural because their two languages code essentially the same culture, that of Singapore Chinese culture’. They cite the example:

“He is old enough to be your father” (p. 282).

In Western culture it would be understood when to use this sentence, in what setting and to whom. Also understood in Western culture would be the deeper cultural messages of a young girl being involved with an older man and older female relatives being responsible for the behaviour of young women.

Similarly, Indian sayings such as ‘Rats were running around his belly’ or ‘Whosoever has the staff, has the buffalo’ (cited in Mehrotra 1982: 154) could be incomprehensible to the English native speaker although the second saying could be guessed. As Mehrotra explains, variation in speech and the written mode is not only regional but also socio-cultural. Awareness of cultural connotations is, therefore, an
essential ingredient to understanding written text. Makchuchit (1993) when investigating, specifically, reading comprehension of Thai students of English as a second language, found that connotative acculturation was indeed an essential component for the understanding of reading.

Instructional time is often not given to connotative awareness in international students’ home countries. A study by Yamamoto and Swan (1989) illustrates this. They conducted a survey and a test with 76 Japanese teachers of English and 28 native English-speaking teachers and found that teachers immersed in one cultural background may ‘pass along images that do not necessarily correspond to the connotations held in other societies’ (p. 244). It seems likely then, due to the differing connotations held by students from differing cultural backgrounds that they may, as a result, misunderstand texts embedded in a different cultural context from their own.

It is one thing, though, to acknowledge that connotative acculturation is an important element in reading; it is quite another to expect readers to accept unfamiliar cultural connotations. Moreover, lecturers at Western universities may not even be aware of students’ lack of cultural connotative knowledge or their difficulty in accepting certain connotations. To illustrate, we can look at examples from Makchuchit’s (1993) study in which he set out to investigate the importance of connotative acculturation in reading comprehension of Thai students of English as a second language. These students performed especially poorly on Makchuchit’s connotative acculturation test with words such as ‘sexually explicit’, ‘indecent’. Makchuchit explained that Thai students needed to understand these words in the cultural context.
Makchuchit's study demonstrates that lecturers on a Western campus cannot expect students from various cultures to interpret texts in the same way as they do themselves. Newly arrived ESL international students, in particular, may need time to become accustomed to unfamiliar connotations in order to be able to accommodate these new elements when engaging in reading texts which may be embedded in Australian or, as is often the case, American contexts.

While misinterpretation may occur through lack of knowledge of different cultural connotations, another aspect of cross-cultural communication, which may influence interpretation, is readers' own cultural characteristics. In other words, students from different cultural backgrounds and with certain characteristics may have differing expectations about the way they approach text. Those approaches may not be in line with those expected by Australian university lecturers/supervisors. Framing theory which is used in this study and explained in chapter two, helps us to identify and connect the cultural knowledge and expectations which influence readers' practices.

A brief look at Hofstede's 1986 study in which he devised a 4-Dimensional model of cultural differences based on research carried out in 40 different countries, gives insights into some cultural characteristics which may impact on reading practices. Although the study took place some years ago and travel and overseas education may have blurred some of the characteristics, the insights are still useful in drawing our attention to the cultural components which may be embedded in reading. The four dimensions highlighted by Hofstede are Individualism versus Collectivism, large versus small Power Distance, strong versus weak Uncertainty Avoidance, and
Masculinity versus Femininity. Table 1.1 presents the abbreviations used by Geert Hofstede in the following figures.

**Table 1.1 Country abbreviations**

<table>
<thead>
<tr>
<th>ARA</th>
<th>Arab Countries (Egypt, Lebanon, Libya, Kuwait, Iraq, Saudi Arabia, U.A.E.)</th>
<th>FRA</th>
<th>France</th>
<th>PER</th>
<th>Peru</th>
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<tbody>
<tr>
<td>ARG</td>
<td>Argentina</td>
<td>IDO</td>
<td>Indonesia</td>
<td>PHI</td>
<td>Philippines</td>
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<td>Columbia</td>
<td>JPN</td>
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<td>USA</td>
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<td>COS</td>
<td>Costa Rica</td>
<td>JOR</td>
<td>South Korea</td>
<td>VEN</td>
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<td>DEN</td>
<td>Denmark</td>
<td>MAL</td>
<td>Malaysia</td>
<td>WAF</td>
<td>West Africa (Nigeria, Ghana, Sierra Leone)</td>
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<td>EAF</td>
<td>East Africa (Kenya, Ethiopia, Zambia)</td>
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</table>
Individualism/Collectivism

Figure 1 Reproduced from Hofstede (1986, p. 309)

According to Hofstede, an individualistic culture is one in which a person looks after his/her own and his/her own immediate family interests. The collectivistic culture is one where a person belongs to an ‘in-group’ and the interests of the members are protected foremost. In contrast, a collectivistic society is assumed to be tightly integrated. In Figure 1, Australia is shown as an individualistic society while India is shown in the low individualism segment as intermediate, between low and high. In Smith’s 1996 study of academic and non-academic difficulties experienced by postgraduate Australian non-native speaking students, an Indian student reported his difficulty in coming to terms with the more independent learning environment of
Australia and specifically with the volume of reading. Ninnes et al. (1999) reported, too, that evidence from a small cohort of Indian postgraduate students showed that, in Indian universities or colleges affiliated to Indian universities, emphasis was placed on listening to the teacher rather than on participating in discussion. On the other hand, the Ninnes et al. study also showed that some students had to engage in self directed learning, i.e. seeking advice and support from other sources, as they could not understand their lecturers. Indians are shown on Hofstede's model as having low individualism but higher individualism than Thais. Although individual students may not 'fit' the model exactly, students from these countries may display a propensity for reading and discussing in groups rather than approaching reading as an individual, independent activity. The Volet and Renshaw (1996) study, mentioned earlier, showed that South-East Asians preferred group work for certain purposes. The preference for group discussion in Thai classes was observed by this researcher while teaching on a Thai campus. This preference for group discussion of text may, in fact, be a worthwhile strategy to extend the meanings of a text and one that should be retained while studying at an Australian university if the situation allows.

**Power Distance**

The second dimension of Hofstede's four dimensional model is Power Distance. Hofstede defines Power distance as the extent to which the less powerful persons in a society accept inequality in power and feel it is normal. Figure 1 indicates small power distance in Australia but large power distance for both the Thais and Indians. This would explain cultures where there is respect for teachers/lecturers, where teachers are considered 'experts' and ought not to be questioned. This traditional respect for authority could lead to a non critical approach to reading i.e. an
unwillingness to debate or argue with issues raised in their readings by authority figures such as the authors of their texts, as found in Flowerdew’s (1998) study of textual analysis by Hong Kong undergraduate students. Hong Kong students are shown in the Hofstede model as belonging to a society embodying large power distance and low individualism. This aspect is further discussed under the section on ‘Expected reading criticality’ in this chapter.

Masculinity/Femininity

Figure 1.1 Reproduced from Hofstede (1986, p. 310)
The other two dimensions of the 4 dimensional model are Masculinity/ Femininity versus Uncertainty Avoidance as shown in Figure 1.1. Masculine societies, according to Hofstede, expect men to be ‘assertive’, ambitious and competitive and to strive for material success, and to respect whatever is big, strong, and fast (Hofstede 1986: 308). In a Feminine society men need not be ambitious and competitive and may care for the weak. Both Australia and India are shown on the model as being masculine cultures. Thailand is shown as being a Feminine culture. Masculinity and Femininity in this context may affect approaches to reading as a masculine or feminine perspective could influence the reactions readers have when reading texts. This aspect of a culture is discussed in the Results chapters in terms of the reading practices of Thai and Indian postgraduate students.

**Uncertainty Avoidance**

Uncertainty Avoidance, the fourth dimension, is defined by Hofstede as the extent to which people within a culture are made nervous by situations which they perceive as unstructured, unclear, or unpredictable. They avoid these situations by maintaining strict codes of behaviour. Cultures with a strong uncertainty avoidance, according to Hofstede, are active, aggressive, emotional, compulsive, security-seeking, and intolerant; cultures with a weak uncertainty avoidance are contemplative, less aggressive, unemotional, relaxed, accepting of personal risks, and relatively tolerant. From the model it can be seen that Indians are placed as having weak uncertainty avoidance, therefore contemplative, less aggressive, unemotional, relaxed, and relatively tolerant whereas the Thais are shown as having strong uncertainty avoidance. The degree of uncertainty avoidance inherent in their cultures may affect the emotional state and level of confidence experienced by postgraduate students in
their first semester at a university in a Western environment. These self concept aspects may affect their ability to adapt to the expectations of the Western university, at least in the short term. This aspect, related to our Indian/Bangladeshi and Thai participants, is discussed in the Results chapters.

As difficult as linguistic differences may be when reading, so too are the cultural characteristics which influence the expectations regarding reading. ESL readers, for example, may not see as relevant, aspects of a text which their supervisor sees as relevant. In addition, their reaction to a text or level of criticality may also be affected by a cultural background which discourages argument and a critical approach to reading.

Important as the language/culture difficulties may be in relation to reading, it has been argued by Williams (1989) and Barker (1990) that language difficulties do not account for all the students’ experiences and that apparent difficulties with language are really problems relating to understanding of the knowledge presented. Other difficulties which may need to be considered relate to discipline-specific discourse, unfamiliar text structures and reading/learning strategies learned in another cultural context.

In light of the above discussion, it is clear that language and cultural background are intertwined and are likely to influence the approaches to, and meaning making of, texts. The four dimensions on the Hofstede model are indicators of some areas of difference between readers from different cultures. Those rated as low in individualism may prefer group readings and discussions; those from high power distance may not be inclined to critically evaluate text to the extent expected at an
Australian university (although whether it is indeed expected in every discipline at an Australian university is discussed in the section ‘Expected reading criticality’ in this chapter). The Masculinity/Femininity factors may influence readers’ reactions to, and interpretations of, text; the Uncertainty Avoidance factor could relate to the degree of confidence and comfort with which readers approach their reading. At the same time, it should be noted that readers are individuals and while it is important to be mindful of various cultural characteristics, it is also important to be aware that readers may not conform to the generalised categories discussed above. Nevertheless, many international postgraduate students do experience a mismatch of expectations when studying at an Australian university; for example their perceptions regarding the purpose of academic reading may be different from their supervisors’ expectations. To compound their difficulties each discipline has its own language – jargon and technical terms – as well as its own culture.

**Western academic subcultures**

When students move from their undergraduate study undertaken at a university in their home country, to an Australian university, they then face a shift from their own cultural-educational traditions to those of the Australian university as the specific cultures of universities are not ‘universal’ but are strongly influenced by the broader socio-cultural influences of the society in which they are located (Ballard and Clanchy, 1991). Furthermore, each discipline has its own sub-culture termed ‘tribes and territories’ by Becher (1989), different teaching and learning styles (such as patterns of discourse and ways of relating to lectures) used at an Australian university (Ballard and Clanchy, 1991; Cargill, 1996). Even in the humanities areas, students from other cultures can feel excluded, according to Becher (1989), ‘since the
communication here none the less creates what linguists would call its own register - a particular set of favoured terms, sentence structures and logical syntax - which it is not easy for an outsider to imitate' (p. 24).

Kline (1993) provides an example of mismatch of expectations in a culture unfamiliar to a group of students. Using a social practices model of literacy, she investigated the reading behaviours of eight American undergraduate participants in a study exchange programme in France. She found that a subculture arose, partly in response to perceptions of French literacies as alienating and college literacies as inappropriate to the foreign setting.

Thus academic disciplines have their own set of cultural meanings and expectations. Students may not always be aware of these cultural meanings and expectations, especially ESL students in their first semester at an Australian university and therefore cannot draw on these contextual factors when reading their texts. The changes which take place in ESL postgraduate students' reading practices as they become more aware of these factors are investigated in this study. Yet another important aspect of reading is being aware of, and understanding, different rhetorical text structures.

**Differences in text structures**

Knowledge of text structure is critical for reading to learn, according to Collins (1994). The reading research shows that awareness of text structure is related to comprehension and recall of text (Carrell, 1990). The research has shown, for example, that good readers seem to use the text structure to facilitate recall of the main ideas in the text as well as an aid to interpreting the whole piece of text (Leon and
Carretero, 1995). Hinds (1990), when investigating expository writing in Japanese, Korean, Chinese and Thai, discovered that, in all these languages, there is a common style which is characterized by 'delayed introduction of purpose'. This delayed introduction of purpose, he claims, has the undesirable effect of making the essay appear incoherent to the English speaking reader. Hence students accustomed to reading, for example, German or Chinese texts, may be confused by the different conventions used in English texts. Research has shown that training in text structures with adult students in academic ESL programmes can lead to significant advancement in text comprehension (Carrell, Pharis and Liberto, 1989).

Another example of differing text interpretations is provided by Hinkel (1994) in a study in which native and ESL (Japanese, Chinese, Korean and Vietnamese) undergraduate students were asked to compare and evaluate two English texts, one written by a native English speaking student and the other by an ESL student. Each group of ESL students evaluated both texts very differently from the native English speaking students. The native English speaking students showed that they seemed to know the conventions of writing in English and recognized the signposts and other textual devices indicative of these conventions. The ESL students, however, even after many years of English language training did not seem to have the same common background knowledge and contextual assumptions associated with the conventions of English writing and their interpretations were, hence, quite different. This study was important for highlighting the differing interpretations. For this reason, Urquhart and Weir (1998) caution that conventional tests of reading cannot accommodate individual interpretations and so one must not extrapolate too much from them. They suggest minimising the effect of background knowledge when testing, as it is one of the main
causes of differing interpretations, through using a range of short texts or using texts which are unfamiliar to all candidates. Hinkel’s study, while raising awareness of differing interpretations related to differing rhetorical structures, and hence the need for care in administering comprehension tests, did not allow in the questionnaire design for insights to be uncovered relating to the reasons behind the differing interpretations.

International students at Australian universities may not have used texts written by English authors in their undergraduate study. The difficulty of reading academic texts in the disciplines is hence often compounded by the fact that the structure of academic texts varies according to the cultural background of the writer (Bhatia 1993; Clyne, 1981, 1987; Hinkel, 1994; Holm and Dodd, 1996; Swales, 1990; Taylor and Tingguang, 1991).

**Differing orthographies**

Another issue for ESL international students are the orthographies they have been accustomed to. Reading comprehension and interpretation can be affected by the use of scripts other than the roman script. Because orthographies differ with respect to the basic representational unit, the strategies most useful for processing the first language orthography may be less useful in processing the second language (Wade-Woolley, 1999). For example, Koda’s (1995) study showed that students from four different cultural backgrounds where written texts used different orthographic structures (Arabic, English, Japanese and Spanish) used different information processing procedures for reading English text. Taylor and Olson (1995), too, found from cross
linguistic studies that students used different information processing procedures when reading different orthographies.

Text structure is clearly an important element in the comprehension of text. Students may be used to rhetorical structures which differ from those used at an Australian university. They may also be used to different orthographies which can compound difficulties in understanding texts. Unfamiliar text structures and orthographies may also influence the extent to which they can critically analyse a text.

**Expected reading criticality**

Academics around the world claim that critical thinking is an integral part of scholarship at university. The current situation in universities may, in reality, be somewhat different. Recently, Reid et al. (1998) challenged this view that students at Western universities are assumed to read with 'an attitude of reflective scepticism, questioning what they read in the light of other readings, other findings, other values' (Ballard, 1995). Based on Spires, Huntley-Johnston and Huffman's (1993) proposal that 'a critical stance means that students are able to question the authority of texts and generate and use their own ideas as they construct meaning' (p. 114), Reid et al. investigated the extent that criticality is required at an Australian university. Using a whole range of methodological approaches (e.g. observations in lectures, interviews with staff and students, analysis of methods of assessment), Reid et al. found that, across the disciplines, 'the assumption that success at an Australian university depends upon the need to think critically appears to be false in many instances' (p. 57). Handbooks and course outlines, which they examined, generally seemed to encourage
the demonstration of critical analysis of texts and case studies but the educational practices did not always match the rhetoric.

Another study by Gonzalez-Cbos, Rios-Hernandez and Landeros-Morales (2001) showed similar findings. They explored the critical reading ability of 34 medical students from two hospitals in Mexico and found the critical reading of the participants to be very low and suggested that the curriculum, particularly a bibliography session involving reading of research papers, was oriented to absorption of information rather than evaluation and critical examination of research papers. Not only does this study highlight the lack of critical reading taking place in some universities but, like Reid et al’s study also demonstrates the lack of expectation of criticality in reading in relation to curricula goals.

Critical reading, then, is far from being a universal attribute between or even within universities, both international and Australian. According to Ballard and Clanchy (1991) universities are ‘strongly influenced by the cultures which nurture them’ and thus our attitude to knowledge is also culturally shaped. An important area of cultural difference and hence of expectations regarding critical reading is in the area of assessment.

Forms of assessment are the clearest indicators of attitudes to knowledge which underpin an educational system (Ramsden, 1994; Ballard and Clanchy, 1991). It has been found that, if instructional conditions do not require their use, higher level cognitive skills when learning to read will not be activated (Yopp and Singer, 1994). Assessment methods in undergraduate courses, therefore, which place a great
emphasis on examination, may not encourage the development of critical thinking skills. For example, research with students from Hong Kong (Biggs 1991; Kember and Gow, 1990) and Singapore (Volet and Kee, 1993; Volet, Renshaw and Tietzel, 1994) and India (Ninnes et al., 1999), where tests and examinations dominate the formal assessment, has shown that students tend to use memorization strategies when reading texts. Yet there is strong empirical evidence that students from these countries read, learn and memorize with the intention of understanding the material, even more so than students from Western backgrounds (Biggs, 1996; Volet and Renshaw, 1996).

Reticence to critically analyse was discovered also by Flowerdew (1998) among Hong Kong students, when analysing a text by the then Hong Kong Governor, Patten. He concluded that the reticence to critically analyse may have been due to a) students’ colonial education, b) their Confucian heritage, traditional respect for authority and unwillingness to challenge or c) their respect for, and fear of possibly threatening the face of their teacher who, like the governor, was British. The Power dimension of the Hofstede model of cultural characteristics, mentioned above, helps to explain why there may be ‘intellectual and behavioural disjunctions’ (Ballard, 1995: 4) with regard to the expected reading approaches to text.

There is clearly a difference between expectations regarding critical reading, on the part of lecturers of differing disciplines and the expectations and, indeed, willingness to critically analyse on the part of students, local or international. As Ballard (1995) argued, while all students have the ability to think critically, ‘its appropriateness and its mode of expression are strongly influenced by the specific culture and context in which it takes place’ (p. 1). The degree to which critical thinking in relation to
reading is expected in a particular discipline at an Australian university needs to be understood by the international student in order that he/she may fit into his/her new cultural environment.

**Educational background**

Not only do students’ linguistic and cultural backgrounds influence their approaches to text and their degree of criticality in reading but so, too, do their specific educational backgrounds. Different education systems may focus on oral as opposed to written modes of learning, for example. Usually it is a question of degree; different systems place a different emphasis on different modes of learning. Coupled with the modes are the culturally acceptable methods of utilising these modes; for example, based on Hofstede’s claim that Thais and Indians come from a more collectivistic society (see Hofstede’s study mentioned earlier) than Australians, it could be expected that Thai and Indian students may well use reading as their main learning mode but may, rather than work individually, form groups and share their understandings before communicating with academic staff. Evidence of this was seen by the researcher at a Thai university. When conducting a class on textual analysis with a group of postgraduate education students, it was observed that, when asked to discuss an aspect of the text or their own experiences related to the text, there would be much excited chatter in groups but individuals were extremely reticent to discuss the text with the researcher, presumably not wishing to lose face if their answers were ‘wrong’ or if their English was not grammatically correct (as they expressed considerable concern regarding their English language competence).
Loss of face was an aspect which was observed by Sakaguchi (1993) when he observed teaching practices in Japanese universities. He found that, generally, Japanese reading instructors tended to be critical of students' efforts. The reading courses, in addition, were very structured consisting mainly of a teacher lecture, giving little time for active participation by the students, even if they wished to participate and risk losing face.

Students who have completed their undergraduate study in such educational environments, then, are likely to follow these familiar modes of learning by seeking comfort in groups and may, certainly at first, not feel comfortable with teaching modes other than those they have experienced. These styles of teaching and learning, moreover, may influence their ability to carry out independent reading and to critically analyse text on their own.

Coupled with the different styles of learning are the different styles and competence of teachers. Watkins and Babu (1991) contend that the quality of education in India has suffered due to the increasing numbers of higher education establishments with one of the lowest levels of funding in the world. Specifically, it has been revealed that native and non-native teachers around the world reveal considerable differences in their teaching behaviour and discrepancies which are language-related (Medgyes, 1992). On the other hand, Medgyes acknowledges that a deficient command of English may even have hidden advantages. Non-native teachers, he suggests, are more able to anticipate language difficulties and may be more empathetic to the needs and problems of their learners. He found, however, from a survey conducted in ten countries with non-native speaking teachers of English that their most frequently
encountered difficulties covered virtually all areas of language use, including reading. The researcher noted from observing a secondary school class on reading in Thailand, that the teacher, although enthusiastic and committed, often displayed grammatical and semantic errors when speaking and also when writing on the board.

It is clear that our postgraduate Thai and Indian students may come from diverse educational backgrounds. They may have come from oral cultures with little reading even at undergraduate level or they may have been used to different modes of teaching, e.g. teacher centred, with little encouragement given to individual expression of opinions. In addition, English language classes may have been taught by non-native teachers who, while displaying sound teaching techniques, may have had varying degrees of English language competence themselves.

Ballard and Clanchy (1984) argue that students from different cultural backgrounds bring different purposes to their thinking and learning. It seems likely that the teaching learning differences mentioned above as well as other aspects of students' cultural backgrounds will also influence, specifically, the purpose of reading perceived by international students when they first arrive at an Australian university.

The purpose of reading

All readers have differing purposes for reading and to fulfil these purposes may read in different ways. For example, a different kind of reading is required to read in order to summarise key issues than to read in order to provide oneself with background information. For the former, students would need to attend to specific textual features such as signposts indicating the major topics in a passage. Reading for background
knowledge, on the other hand, may only require the use of skim reading strategies and perhaps some highlighting or note taking to assist memorising key points.

Educational systems encourage different approaches to reading. A study by Anderson (1991) highlighted these different approaches. He investigated the reading strategies of ESL readers in two different reading situations: a test situation where readers had to answer multiple choice comprehension questions and a general academic reading for content. He concluded that there was considerable similarity between the types of strategies used for both situations but this may have been because, after reading in both situations, multiple choice questions had to be answered and hence reading strategies were chosen to fit the purpose of the task rather than for the type of text.

Educational systems themselves, moreover, have specific purposes. Yee (1989) compared the purposes of two educational systems and the relationship to reading. He argued that the educational systems in the U.S.A. and East Asia have a different focus. In East Asia the system aims to develop literate, skilled citizenry ready to serve society's needs. The U.S.A., on the other hand, he stated, focuses upon the individual and development of the individual to his/her fullest potential. Yee (1989) suggests that reading in East Asia is used for rote memorisation as performance on university exams is based on factual details, i.e. subject matter knowledge involving much extensive cramming and coaching for the exams. As mentioned in the 'Expected reading criticality' section, there are varying views about the purpose of memorisation.
Memorisation may be used as a technique to reach a deeper, fuller understanding (Biggs, 1996; Chalmers and Volet, 1997). Nevertheless, different purposes can affect reading practices which, in turn, can affect writing practices (Ninnes et al., 1999).

An example of writing being affected by reading purpose is given by Ballard and Clanchy (1984). They investigated the writing of a Japanese student in Australia and found a profound mismatch of expectations. The Japanese student wrote according to the Japanese style and summarised information rather than analysing and comparing. As the student had problems reading the assigned English texts, he had read instead Japanese texts. Thus both his perceived purpose and the style of texts he was reading, would both have influenced his structuring of his written response. As Ballard and Clanchy pointed out, the Japanese student’s purpose was at odds with the Australian purpose of the assignment. Ninnes et al. (1999) also showed, in relation to a small, diverse group of Indian postgraduate students studying at an Australian university, that that ‘there may well be some difference between the Indian experience and the Australian requirements of analysis and argument in extended writing’ (p. 335).

Kachru (1992) viewing reading from the perspective of a native speaker of English when reading a text in his second language, states that he/she ‘may have to extend his linguistic, literary, historical, cultural awareness to meet the new demands’ [of the non-native English text]. Therefore, one would surmise the reverse to be true for the non-native speaker of English. Only when a student has a clear sense of purpose, can he/she then choose/adapt appropriate reading strategies which will enable him/her to fulfil that purpose, whether it be, for example, for examination purposes or for the purposes of writing a literature review.
Learning strategies

All students need to adopt effective learning strategies in order to be successful in the academic environment. Learning strategy studies within and without the language field have shown that effective learners actively associate new information with existing information in long-term memory; they often use metacognitive strategies such as organizing, evaluating and planning their learning. Research has shown that some of the best learners use affective and social strategies to control their emotional state, to keep themselves motivated and on-task, and to get help when they need it (McCombs, 1982, 1988). Cultural background affects strategy choice, according to Oxford (1996). As much learning is derived from reading, we can relate many of the learning strategies to reading. For example, it has been found that students from Korea and some Arabic-speaking countries often use rote memorization strategies when reading to learn; compensation or guessing strategies have been shown to rank high amongst Japanese (Watanabe, 1990), Chinese (Chang, S-J, 1990), and Thai students (Wen and Johnson, 1991).

These strategies are usually linked with reproductive or surface learning as opposed to deep learning. The term 'surface' learning is used here to mean the memorization of details or key terms in order to answer questions and the term 'deep' learning is used here to mean the attempt to understand the message that a text has (Biggs, 1996). Ballard and Clanchy (1991) have attempted to relate the learning strategies of students to their cultural attitudes. (see Figure 1.2).
Influence of cultural attitudes to knowledge on teaching and learning strategies

ATTITUDES TO KNOWLEDGE

conserving ← reproductive ← analytical ← speculative → extending

LEARNING APPROACHES

<table>
<thead>
<tr>
<th>Type</th>
<th>Activities</th>
<th>Characteristic Questions</th>
<th>Aim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memorization and imitation</td>
<td>Summarizing, describing, identifying and applying formulae and information</td>
<td>What?</td>
<td>'correctness'</td>
</tr>
<tr>
<td>Critical thinking</td>
<td>Questioning, judging and recombining ideas and information into an argument</td>
<td>Why? How? How valid? How important?</td>
<td>'simple' originality, reshaping material into a different pattern</td>
</tr>
<tr>
<td>Deliberate search for new possibilities and explanations</td>
<td>Speculating hypothesizing</td>
<td>What if?</td>
<td>'creative' originality, totally new knowledge</td>
</tr>
</tbody>
</table>

Figure 1.2 Reproduced from Ballard and Clanchy (1991: 12).
Ballard and Clanchy view learning as a continuum and show the differing strategies that students use as they progress from a reproductive style to a more speculative style of learning. According to Ballard and Clanchy’s diagram, it would seem that students who use memorisation techniques are reproductive learners. Large-scale international comparisons of attainment between students of a Confucian heritage cultural background and Western students have shown, however, that the students from the Confucian heritage cultural background rate higher than Australian students on deep learning (Biggs, 1996; Salili, 1996) despite using memorisation strategies.

On the one hand, then, those studying in the Confucian tradition seem to use memorization techniques; on the other hand, Chinese students also have been shown to perform at high cognitive levels in academic tasks. Wing On (1996) addresses this issue by arguing that, although memorization is certainly a significant component of learning in the Confucian tradition, it should not be equated to rote learning. Marton, Dall’Alba and Lai Kun (1996) discuss this ambiguity. They showed, through interviews with teacher-educators and by making comparisons with an earlier study carried out in 1993, that memorization has different purposes. Memorization can be associated with rote learning but can also be used to deepen and further understanding. The different approaches to learning, derived from different educational systems, may lead students from Eastern educational traditions, to different results than those from Western educational systems (Cheng, 1995, cited in Volet, 1999). It is thus clear that ‘...the culturally-shaped mental baggage of guest students and their host educators is not always congruent and can lead to ambivalent or difficult transfer of knowledge’ (Volet, 1999). For example, students who are unfamiliar with the English speaking study environment, are presented with linguistic and cultural challenges; they must
ascertain, not only to what degree critical analysis is required in a discipline, but also how to interpret possibly unfamiliar texts and express their criticality in the discourse appropriate for that discipline.

The extent to which the Australian environment requires, for example, Thai and Indian/Bangladeshi postgraduate students to evaluate the efficiency of their reading/learning strategies in their second language and make adjustments, is not well known. Furthermore, Ballard (1989) argues that postgraduate students often experience greater difficulties than their undergraduate counterparts due to their previous schooling and undergraduate training. She states, ‘although it is comfortably assumed that graduate students are already “naturalised” within their disciplines, in the case of international students this naturalisation may have taken place not only in another language but also within another set of broader cultural determinants’ (p. 5) that are not applicable in the Australian setting.

Reading problems have been cited as one of the most neglected areas facing international postgraduate students (Smith, 1998). While Urquhart and Weir (1998) mention that there is a considerable data base on reading behaviour by cognitive psychologists, little reading research has been carried out with postgraduate students of a non-English speaking background. A study, however, by Burke and Wyatt-Smith (1996) who investigated postgraduate ESL Australian students’ perceptions of their difficulties with postgraduate study, highlighted some of their problems with reading. Through a questionnaire survey and follow-up individual interviews, the participants in the study indicated that, among other difficulties, new discipline-specific terminology was a major cause of difficulty causing them to read considerably more
slowly than their Australian (English as a first language) counterparts, to heavily rely on dictionaries and to re-read a text several times. This research is important in that it highlights the fact that, even postgraduate students, who have lived in Australia for some time as migrants, still experience reading difficulties when undertaking postgraduate study. It is likely then to expect that international ESL students will also experience difficulties with reading, although the difficulties may be somewhat different.

In summary, what has been presented is a view of reading as a complex, multidimensional, dynamic process. This process is influenced by many factors which can be categorised into linguistic, cultural and educational factors. From the brief examination of these factors we can form certain conclusions.

Firstly, the English language has many varieties and is learnt in many different contexts for differing purposes. This has implications for the way readers note, for example, signposts and other textual features or for the way they interpret vocabulary items.

Secondly, cultural characteristics vary among and between different cultures. In addition, different cultural contexts affect the way we view the world. Different life experiences and educational background may affect also the way we approach and react to reading material.

Thirdly, educational systems vary within and between cultures. These systems embody differing expectations which impact on the styles of learning, strategies and
goals of students. These learning styles, strategies and goals are developed according to the needs of the students and the requirements of tasks. Texts themselves vary not only in their usage e.g. for examination purposes, but also in the way they are organized which may be dictated by the background of an author and/or the discipline for which he/she is writing.

Postgraduate ESL students, who have completed their undergraduate studies in their home countries, may have considerable adaptations to make. By studying the factors which may influence the reading of texts, we gain a more complete understanding of their reading practices. We also gain a more positive view of postgraduate ESL students’ capabilities when faced with a change in linguistic, cultural and educational environment.

In order to avoid ‘blurring of cultural distinctiveness’ (Burke and Wyatt-Smith, 1996: 4), Thai and Indian/Bangladeshi groups of postgraduate students were investigated in this study as discrete groups in order to explore the education/cultural diversity of these two cohorts in relation to their reading practices.

A full understanding is required of international students’ reading approaches and the adaptations they make to their reading approaches in order to develop more appropriate curriculum and support programmes. In addition, supervisors and lecturers would benefit from a greater understanding of their international students’ reading practices in order that time and support may be allocated to assisting students in developing the attributes mentioned above as being important for their reading and understanding: lexico-grammatical competence, awareness of Western academic
subcultures, awareness of the extent of criticality required for their discipline, awareness of discipline-specific academic discourse patterns.

**Focus of the present study**

Reading is a critical skill for postgraduate students. Effective reading, in particular, reading comprehension and awareness of varying interpretations, will contribute to their greater progress in their academic fields (Anderson, 1999). Many students arrive at their Australian university, however, with a mismatch of expectations and skills. While study support exists at most universities, much of it has so far emphasised the development of writing skills. Moreover, few longitudinal studies have been carried out on changes in reading practices over the duration of students’ postgraduate study. The present study attempted to examine the reading practices as an holistic, multi-dimensional phenomenon and examined the students’ reading practices across three semesters. Moreover, as Asia comprises many cultures with varying approaches to study and reading, the study attempted to gain insights into two cultures, Thai and Indian/Bangladeshi, rather than look at Asian readers as a group.

The overall aim of this research, then, was to develop a better understanding of the reading practices and the socio-cultural and educational influences both in the home country and in the host country on the reading practices of Thai and Indian/Bangladeshi postgraduate students. In addition, the research aimed to not only understand the reading practices in first and third semester, but to understand the changes in reading practices which had taken place between those two semesters.
Specifically, the research questions which were addressed were:

What are the reading practices of Thai and Indian/Bangladeshi postgraduate students when studying in first semester at an Australian university?

How do the home country and Australian influences shape their reading practices?

What are the reading practices of Thai and Indian/Bangladeshi postgraduate students in third semester at an Australian university?

What are the influences which may have led to change in their reading practices by third semester at an Australian university?

**Overview of chapters**

This chapter provided the objectives of the present study and a discussion of the different linguistic, cultural and educational complexities which may influence the reading practices of international students.

Chapter Two describes the four main theories used to frame reading research and reviews the reading research literature.

Chapter Three describes the overall research design. It then discusses the methodology chosen for the study and the rationale behind that choice.
Chapters Four to Seven present the results and interpretation from the data gathered to investigate the reading practices of the Thai and Indian/Bangladeshi postgraduate students. Chapter Four focuses on the reading practices of the Thai postgraduate students during their first semester at an Australian university and the influences impacting on their reading practices. Chapter Five presents the results and interpretation of the data gathered to examine the reading practices of the Thai postgraduate students during third semester. Chapters Six and Seven present the results and interpretation of the data collected to examine the reading practices of the Indian/Bangladeshi postgraduate students in first semester and in third semester respectively, while studying at an Australian university. Moreover, the data were analysed to discover the influences impacting on the changing reading practices.

Chapter Eight discusses the conceptual framework, some of the similarities and differences in reading practices by the Thai and Indian/Bangladeshi participants, and their implications for postgraduate supervision, curriculum development and for future research.
Chapter Two

Literature review

This chapter reviews the literature relevant to ESL reading. The first section presents and discusses the main theories underpinning this research with some illustrations of empirical work. The second section reviews the empirical work, firstly with an examination of some studies on reading research in general, followed by a review of ESL reading research in particular. The chapter ends with an outline of the rationale for the present research and an overview of the theoretical framework underlying the empirical work.

Section one

Much of the ESL reading research to date has used theories from native language reading research. Fitzgerald (1995) found, when investigating ESL reading research in the United States of America that four theories or views, in particular, from native language reading research, seem to have been relied upon to study cognitive reading processes in ESL reading research. These were: a psycholinguistic view of reading; schema theory; an interactive view of reading; and metacognitive theory. These four main theories are now discussed. Metacognitive theory is discussed in detail to highlight its usefulness for the present study. In particular, it is shown how the use of metacognitive theory enables identification of the interaction of reading processes and how socio-cultural influences impact on reading practices. In addition to these four
theories, frame theory, not generally used in reading research but of relevance to this study, is added to this chapter and also discussed in detail as it has been found useful to highlight how readers approach text and the reasons for their approaches.

Psycholinguistic theory

Psycholinguistic theory views reading as conceptually driven processing or, according to Goodman (1967, cited in Singer and Ruddell, 1970), as a ‘guessing’ game. Readers sample texts, make and test hypotheses and predictions, relying on their own background knowledge of the text’s content as well as background knowledge about how language works. According to the psycholinguistic view of reading, a reader need not use all the textual cues (Carrell, 1988) ... and ‘reconstructs meaning from written language by using graphophonic, syntactic, and semantic systems of the language, but he/she merely uses cues from these three levels of language to predict meaning, and most important, confirms those predictions by relating them to his or her past experiences and knowledge of the language’ (p. 3). In fact psycholinguistic views of reading show a ‘procedural preference for reliance on language factors instead of graphic information’ (Samuels and Kamil, 1988: 24). This is a ‘top-down’, primarily concept-driven process. While psycholinguistic theory has led to substantial research on how conceptual knowledge, inferencing and background knowledge all affect reading, there are questions which remain unanswered. The psycholinguistic view of reading may not account for the reading practices of ESL readers who are less than fluent readers and have to rely on bottom-up processing. Grabe (1988) argues specifically that the psycholinguistic approach does not help us to find out how and to what extent second language readers use bottom-up processing strategies and how these strategies interact with top-down strategies. As Grabe points
out, the second language reader works with a different set of constraints from the native language reader. For example, we do not know, he argues, how second language readers approach reading in their first language as a social phenomenon; also we do not know that first language reading skills are necessarily transferable to second language reading. We cannot also assume that second language readers have a large vocabulary or the availability of sound basic syntactic structures necessary for fluent reading. The psycholinguistic view of reading may, therefore, not be appropriate for ESL readers.

Psycholinguistic studies have tended to use miscue analysis, comparing observed with expected responses as readers read a text orally. While the error detection paradigm shows deficiencies when readers are poor at comprehension monitoring it may not be useful for normal text that is relatively error-free (Maki, 1998: 117). Results have been varied. For example, Haynes (1984) showed that adult ESL readers used graphonic, syntactic and semantic cueing systems to guess word meanings, showing a balance in use of psycholinguistic strategies. Participants (beginning and advanced ESL readers), on the other hand, in McLeod and McLaughlin’s (1986) study tended to rely more on graphonics and made many semantically unacceptable miscues. These results may reflect the degree of vocabulary and grammatical structures available to the readers.

Another study investigated whether language patterns found in English, different from those in Spanish, would have significant effect on ESL learners’ comprehension of English text (Stone, 1985). It was found that oral reading errors increased as language pattern similarity decreased. However, on literal comprehension questions, students
attained the highest scores on dissimilar passages. Similar patterns to miscue analysis in oral reading have been found through the use of cloze activities where words are deleted from the text; while the cloze procedure distorts the text it can examine comprehension through silent reading (Goodman, 1994).

Daneman (1991) found that poor readers make more use of context for word recognition than good readers – they were better at playing the guessing game. He contends that poor readers are assisted more by context only because they take longer to recognise vocabulary. Paran (1996) believes, moreover, that while guessing occurs, it does not necessarily occur at lower levels of processing; he states, if readers are to make informed decisions ‘they have to be based on a close reading of those parts of the text that are being read’ (p. 30).

While useful for investigating oral reading processes, Goodman’s theory may not be useful for the study of silent reading as it has been shown that there are significant discrepancies between silent and oral reading (Bernhardt, 1983, cited in Weber, 1991). Furthermore, Goodman’s theory is also ‘not a theory of comprehension, cognition, or perception’ (Goodman, 1988: 11). Finally, his theory does not accommodate all situations where the reader has little knowledge of the topic and cannot generate predictions. In such a case, it may be more time efficient for a skilled reader to use word recognition strategies than try to make predictions. As argued by Samuels and Kamil (1988) the psycholinguistic view of reading then, while it may be able to describe beginning reading, with slow rates of word recognition, does not accurately describe skilled reading. Moreover, although the psycholinguistic model of reading is seen as an interaction of factors, for example, word recognition abilities
and language background, it has generally failed to account for background
knowledge. In 1979, Coady developed a model which accounts for interaction of
background knowledge with conceptual abilities and process strategies in order to
attain comprehension (Carrell, 1988). This involvement with background knowledge
came to be known as Schema theory.

**Schema theory**

Bartlett is generally acknowledged as the first psychologist to use the term schema
(Anderson and Pearson, 1988). In 1932, Bartlett argued that a reader’s schema, or
organized knowledge of the world, provides the necessary information for
comprehending, learning and remembering the ideas in texts (Anderson, 1994).
Anderson and Pearson (1988) further define schema as an abstract knowledge
structure in the sense that it 'summarizes what is known about a variety of cases that
differ in many particulars' (p. 42). According to Grow (1996), a schema is a
generalized mental model which is used to organize memory, to focus attention, to
interpret experience, and to codify actions. A schema is similar to a prototype or
template, except that schemas are active, self-activating, self-revising processes.
Grow adds that, to a large degree, the activation of readers' prior knowledge is what
makes reading possible. Schema theory thus makes use of top-down processing,
'making of predictions about the text based on prior experience or background
knowledge, and then checking the text for confirmation or refutation of those
predictions' (Carrell, 1988: 101).

Carrell (1984a) has differentiated between formal schemata (knowledge of rhetorical
organizational structures of a text) and content schemata (knowledge of content of a
text). Readers activate the appropriate schema to produce comprehension. These schema relate to two modes of information processing inherent in schema theory: bottom-up processing or data driven processing and top-down processing or conceptually-driven processing and failure to activate the appropriate schema may be due to insufficient clues being provided in the text to enable bottom-up processing or a reader's lack of appropriate schema (Carrell and Eisterhold, 1988).

A number of ESL reading studies have been carried out using schema theory utilizing recall protocols (Anderson and Pearson, 1984; Anderson, Spiro and Anderson, 1978; Bransford and Johnson, 1970; Carrell, 1987; Garcia, 1991; Steffensen, Joag-Dev and Anderson, 1979). Much of the research grounded in schema theory has illustrated recall of information from a text. It has been shown, moreover, that recall of information from a text increases significantly if the reader has the appropriate background knowledge. The Steffensen, Joag-Dev and Anderson (1979) study illustrates the relationship between recall and background knowledge. They investigated the influence specifically of cultural background knowledge on recall using recall protocols.

They asked American and Indian participants to read descriptions of weddings from their own culture and from the other culture and found that the Americans recalled more of the American text and the Indians recalled more of the Indian text because they had culturally appropriate schema. When the participants did not have the schemata, recall protocols were vague.
The study, however, did not examine the extent to which the Indians had background knowledge of American weddings nor the extent to which the Americans had background knowledge of Indian weddings prior to the readings. In addition, as Alderson and Urquhart (1984) point out, the Steffensen et al. (1979) study showed the effect of cultural knowledge on the product of comprehension rather than the process. This recall of fact rather than engagement with the text, moreover, is generally considered characteristic of a surface approach to reading (Hallam and Francis, 1998). In addition, it has been suggested by Johnson (1982) and Ono (1992) that cultural background knowledge is difficult to measure. Another point they make is that it is, in fact, participants' cultural experiences rather than cultural background knowledge which affect readers' interpretation of a text. Bransford (1994) argues that readers who are asked to recall information after several days may have to rely on their own knowledge of an event rather than on what was recorded in a text. He also points out that the way questions are phrased concerning a text, may lead to 'certain decrements in memory performance' (p. 485). Another aspect pointed out by Johnson (1982) and Ono (1992) is that non-native speakers may not be able to write their recalls well in their second language to show their understanding.

Another criticism of the schema theoretical approach is that it fails to recognise the significance of social and cultural context (Luke, 1992). In contrast, Framing theory, discussed later in this chapter, takes account of social and cultural aspects of reading.

Another important point with regard to the present study is that schema theory does not take account of how novel events are interpreted and new schemata acquired (Bransford, 1994). A major part of a supervisor's work with an international student,
unfamiliar with certain text structures and content, may be to help that student acquire sufficient, appropriate background knowledge and reading strategies and, possibly, more importantly, to help readers to 'learn about themselves as learners' (Bransford, 1994: 494). This aspect will be followed up in the segment on metacognition.

While Schema theory has provided a useful conceptual framework to explain the procedural/sequential kind of knowledge and has highlighted the importance of background content knowledge on recall and comprehension, it does not help to explain reading processes. Background knowledge alone does not create comprehension. Researchers use the term ‘comprehension’ to explain what takes place when a reader connects new information with prior knowledge. To make that connection, however, comprehension depends on a reader's prior knowledge and reading strategies (Grow, 1994). Information alone does not create comprehension. Spiro (1980) points out, too, that there are differences in the component skills of individual readers which affect their reading performance. Another point he makes is that 'schema-theoretic tradition has focussed on the structure of knowledge that must be analysed, rather than on the texture that must be felt' (p. 273). Words have been shown to have psychological meaning very different from that studied analytically. This point is illustrated later in the results chapter of this thesis. In addition, according to Urquhart and Weir (1998), 'studies of the effect of background knowledge, when they find a positive effect, provide evidence that such knowledge can legitimately be considered a component of reading. They tell us nothing of the process i.e. what is going on to produce this effect' (p. 70). In other words, according to schema theory: readers are able to learn how to understand the literal meaning of the text by using their background knowledge and applying such reading comprehension skills as understanding vocabulary, grammatical rules and the literal
meaning of each word, sentence and paragraph. Schema theory, according to Urquhart and Weir (1998), does not account for how readers might experience and react to the content of the text, express opinions and develop their own perspectives.

Another aspect which schema theory does not take account of, according to MacLachan and Reid (1994), is change. Using the term ‘frame’ which is a closely related concept to schemata, MacLachan and Reid (1994) note that cognitive frames (schemata) do not help to explain ‘how new experiences interact with, and modify existing frames and how changes in frames affect interpretation’ (p. 75). For example, Kitao’s (1989) study, using schema theory, investigated how East Asian non-native English speakers make use of schemata when they read English. Kitao used graduates from Taiwan, Japan, Korea and China because their native languages are not related to English. The study showed correlations between reading and comprehension for reading passages that required background knowledge for comprehension. There was indication that readers of low proficiency, in particular, compensated for their lack of proficiency by using their prior knowledge.

The results, then, were derived from data on the relationships among the variables of reading and vocabulary proficiency, comprehension, and length of time in English-speaking countries at one point in time. What could not be shown were the changes in use of background knowledge over a period of time. The main contributions from schema theory have been the move to incorporating background knowledge and its interaction with top-down processing strategies. Although the higher level processes are of importance in reading, there has been a recognition that the gap in knowledge
about lower level processes and their interaction with higher level processes needed to be addressed (Carlo and Sylvester, 1996; Grabe, 1988).

**Interactive theories**

Schema theory accounted for sequential processing and took account of the interaction of background knowledge with conceptual abilities and knowledge of language and, as such, is a mainly top-down, conceptually-driven process. An interactive view of reading, on the other hand, is both a ‘top-down’ and a ‘bottom-up’ process (Rumelhart, 1994), a simultaneous perceptual and cognitive process (Rumelhart, 1977) which focuses on the interaction between levels of the reading process (Carlo and Sylvester, 1996). Therefore readers interpret data from the page (bottom up) and use knowledge already present in the mind (top-down) to understand text. It is argued that readers need bottom-up and top-down processing skills to be effective readers (Eskey, 1988). According to Grabe (1988: 60) interactive models include any model that ‘tries to account for more than serial processing and that does so assuming that any parallel or array processing will interact’. The models also take account of bottom-up skills which are important to successful reading (Eskey and Grabe, 1988). Studies following the view that reading is interactive, have included investigations with high and low proficient readers of decoding, exploiting prior knowledge and linguistic content (Devine, 1988; Lesgold and Perfetti, 1981b; Perfetti and Lesgold, 1977; Singhal, 1998; Steffenson, 1988; Upton, 1993; van Dijk and Kintsch, 1983).

Interactive models of reading, however, while taking into account that meaning and syntactic context influence the perception and recognition of letters and words – what
was missing in Goodman’s model - still lack a socio-cultural perspective where different social groups are seen as practising reading differently (Purcell-Gates, 1999). Although social contexts are an important consideration, Green (1990) has pointed out that the social dimension does not change the conceptualisation of reading. Reading, she explained, was still ‘a process in which individuals engage with text to interpret (respond, or decode depending on the theoretical orientation) meaning’ (p. 105).

Overall, interactive views of reading, psycholinguistic theory and schema theory have all contributed substantially to the field of reading research. Psycholinguistic theory and schema theory involve top-down processing of text. Schema theory also takes account of background knowledge and how it interacts with conceptual abilities to interpret text. Psycholinguistic theory and schema theory do not take into account the interaction of bottom-up strategies with top-down processing strategies. Interactive theories acknowledge the usefulness of bottom-up processing especially in relation to ESL readers who may not have sufficient background knowledge to interpret the text without using text related clues.

**Metacognitive theory and reading**

The above three theories, psycholinguistic theory, schema theory and interactive theories, while providing much useful data on reading product, remembering, and the mental processes involved in reading, what a reader does (Beck, 1993), have not directly addressed and examined the significance of how the reading processes interlink with each other (Trollope, 1996) or how socio-cultural influences may affect the approach to reading. A number of investigations of reading strategies as used by ESL students have documented and highlighted the significance of the interactions
taking place in the reading process. Of particular relevance are studies carried out from a metacognitive perspective. Although much reading research in the 1980s focussed on metacognition and reading, several researchers, as pointed out by Flavell (1985) and Baker and Brown (1984), have been aware since the turn of the century that reading incorporates the ‘planning, checking, and evaluating activities now considered as metacognition’ (p. 354).

Metacognitive theory as such emerged in the 1970s with the work of Flavell who defined metacognition as knowledge which focuses on or regulates any part of cognitive activity. He identified two general dimensions of metacognition: knowledge and experience. Knowledge, Flavell (1985) further defined as the knowledge and beliefs, ‘accumulated through experience and stored in long-term memory that concern … the human mind and its doings’ (p. 105). Metacognitive experiences, according to Flavell, are ‘cognitive or affective experiences that pertain to a cognitive enterprise’ (p. 107). These metacognitive experiences serve many useful functions. An example given by Flavell is when a reader realises that he/she has not understood a text and this realization will instigate several adaptive strategies, such as re-reading or reading ahead. Flavell stated, moreover, that there is ‘a mutually facilitative, reciprocally mediative developmental relationship between cognitive (perceptual and conceptual) processes and social behaviour’ (p. 131). Flavell’s model has been considered a useful theoretical foundation for those interested in metacognitive aspects of human thinking (Hacker, 1998). With regard to reading, the study of metacognition – what readers know about themselves, the task of reading, and various reading strategies – has proven to be a fruitful area of investigation (Flavell, 1985; Jimenez et al., 1996).
According to Brown (1980), metacognition in reading refers to awareness of one’s own reading processes and also refers to one’s own understanding and non-understanding of reading strategies, and of monitoring comprehension during reading. Metacognition also involves ‘conscious deliberate attempts to understand and orchestrate one’s own efforts at being strategic’ (p. 456).

Another aspect of metacognition, the notion of self-efficacy, embodying the elements of self-appraisal and self-management, is generally accepted as part of any definition of metacognition (Paris and Winograd, 1990). ‘Focusing on self-appraisal and self-management helps in the conceptualisation of learners as individuals who need to be actively involved in the orchestration of their knowledge construction’ (Hacker, 1990: 11).

Armbruster et al. (1982) and other researchers discuss reading to learn from a metacognitive perspective as it relates to four specific variables: Knowledge of tasks, Knowledge of text structures, Knowledge of strategies and their applications, and Knowledge of own learner characteristics as shown in Table 2:
Table 2. Reading from a metacognitive perspective: four variables

<table>
<thead>
<tr>
<th>Task</th>
<th>Textual features/structures, purpose, meaning from text, accurate prediction of own performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texts</td>
<td>Knowledge of textual features – researchers suggest that knowledge of the effect of text structures on learning is prerequisite to conscious control of strategies; adjustments can be made to accommodate ambiguous words or other confusions</td>
</tr>
<tr>
<td>Strategies</td>
<td>'fix up' strategies</td>
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<tr>
<td></td>
<td>Forming a mental image</td>
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<td></td>
<td>Re-reading</td>
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<td></td>
<td>Adjusting reading rate</td>
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<tr>
<td></td>
<td>Searching to identify unknown words</td>
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<tr>
<td></td>
<td>Predicting meaning that lies ahead</td>
</tr>
<tr>
<td>Study strategies</td>
<td>Underlining</td>
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<td></td>
<td>Outlining</td>
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<tr>
<td></td>
<td>Note taking</td>
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<td>Skills- deficiencies and their effect on learning</td>
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Adapted from Armbruster et al. (1982) and Collins (1994)

The four components of metacognition described in Table 2 were used to categorize data in the present study with slight variation, i.e. the categories that were used in the present study are: Knowledge of self, Knowledge of task, Knowledge of text and Knowledge of strategies and their applications. It was considered that data relating to these four components of the reading process helped to give an holistic picture of the thinking processes involved in reading. Discussed later in this chapter are the categories related to Framing theory which were also incorporated in the study.

Around the world there has been an extensive amount of research related to metacognition and reading, much of it with second language readers throughout the 80s and early 90s (Anderson, 1991; Block, 1986a; Block, 1992; Carrell, 1989;

Research investigating the use of metacognitive strategies in reading has been shown to be particularly significant because it has demonstrated two important aspects, a) that readers' metacognitive awareness of their reading processes and strategies enhances proficiency (Auerbach and Paxton, 1997) and b) that training in strategy use can have positive effects: raised awareness of reading problems and efforts for reading improvement (Park-Oh, 1994).

Leon and Carretero (1995), for example, assessed the outcomes of an instructional programme designed to improve knowledge and use of expository text structure as a comprehension strategy with good and poor first language (L1) readers. The results showed improvements in the proficient readers in text comprehension with expository texts as well as the ability to transfer the strategies to texts whose organizational structures had not previously been taught. The programme, however, did not have the same effect on less proficient readers. Carrell (1992) pointed out, too, that teaching of top-level rhetorical organization of texts could facilitate second language (L2) readers' reading comprehension measured by quantity of information recalled rather than by quality.

Other research, however, has shown less than positive effects. Booth (1997) has shown that there is little to be gained from interventions or study skill or reading skill teaching. She explains, 'separating the what from the how of learning and attempting
to train the how without reference to the what appears to be doomed to failure’ (p.146).

Therefore, further research investigating the what as well as the how (as the present study does) could have positive implications for instruction and curriculum development.

In summary, current conceptions of reading comprehension portray readers as active learners who direct their own cognitive resources to learn from text (Forrest-Pressley and Waller, 1984; Garner, 1994). Moreover, most researchers agree that metacognition, with specific regard to reading, includes two components: knowledge and self-regulation (otherwise known as executive control), with motivation often considered a third component. The knowledge and self-regulation components are closely intertwined. Brown (1987) argued that to consider separating the components may lead to ‘oversimplification’ of a complex process. For example, knowledge that a task is difficult should lead to monitoring cognitive process very carefully.

Conversely, successful cognitive monitoring can lead to knowledge of which tasks are easy and which difficult (Moses and Baird, 2000). Brown (1980) has suggested that a reader’s metacognitive skills (which she breaks down further into predicting; checking; monitoring; reality testing and coordination and control of deliberate attempts to study, learn or solve problems) are not only the basic characteristics of thinking efficiently in a wide range of situations but of effective reading.

Grounding the present study in metacognitive theory made it possible to explore the extent to which readers activated and applied the four variables related to
metacognition in reading espoused by Armbruster et al. (1982), Collins (1994) and others: Knowledge of task, Knowledge of text structure, Knowledge of strategies and Knowledge of own characteristics; and how changing expectations can lead to changes in readers’ metacognitive abilities. The analysis was carried out using these reading-related categories of metacognition in order to investigate their importance to ESL readers from different cultural and educational backgrounds.

As discussed in chapter one of this study, there are many factors which interact with each other when reading in a second language (L2) making second language reading ‘a phenomenon unto itself’ (Singhal, 1998: 1). Although it has been shown that the four theories referred to above, used for native speaker reading research, are a ‘good fit’ for ESL reader research, Fitzgerald (1995) suggests that the ‘specialness’ of ESL reading could be better explained through some modification of these theories. As the present study was designed to investigate the reading practices of Thai and Indian/Bangladeshi postgraduate students at two points in time – first semester and third semester – and the changes which had taken place between these two semesters, a framework incorporating two theories, metacognitive theory and framing theory, was incorporated. Metacognitive theory enabled the researcher to examine readers’ metacognitive processes, their knowledge of, and thinking about, these processes and their selection of processes to aid interpretation. Framing theory enabled the researcher to identify the types of framing used by readers. For example, the use of extratextual framing (explained in the next segment) highlights the cultural and educational backgrounds which readers invoke to help them interpret text. In addition, framing theory helps identify any mismatches in expectations of readers studying in a
different educational setting. Framing theory and its relevance to reading will now be discussed.

**Framing theory**

Framing theory, while not widely used for reading research, has been used in the sociolinguistic research of Tannen (1993). Sociologists of education, such as Bernstein (1971) have also used framing theory, as have linguists such as Lakoff and Johnson (1980) and Gumperz (1982a, 1982b). More recently Reid et al. (1998) carried out a study ‘Framing Student Literacy’, specifically ‘Framing Reading’ which was shaped by a theory of framing (this study will be discussed later in the chapter).

Reid et al. (1998) argue that construction of meaning always involves framing. The basic premise of frame analysis, according to Reid (1996: 92) ‘is that appropriate interpretation presupposes an ability to recognise the framing devices (mainly linguistic) which convey metamessages’ - that is, messages about the messages. The term ‘frame’ refers to the notion of a frame as developed by Bateson (1972) and Goffman (1974) and used extensively by Tannen (1984) who defines ‘frames’ as ‘expectations’. Students have specific expectations about, for example, text structures, length of sentences, content of introductions, pictures/tables with links to text, subheadings. Their reactions to the text reflect their frames or knowledge of the world, their interest in the text. While schema theory deals with recall and the product of reading, comprehension, framing theory takes account of the reactions to, and interpretations of, text. The expectations that students bring to text, however, may hinder interpretation. Tannen suggests that close analysis of linguistic evidence can reveal the expectations or frames which create them. International students, in
particular, may experience a mismatch of frames as they come from differing cultural and educational systems with, for example, differing expectations of text structures and content.

By closely examining the data from case studies, linguistic cues signalling frames in a given culture can be identified. An example of interpretation is given from Goffman (1981) and suggests that sharing a language is not sufficient.

A. Are you going to be here for ten minutes?
B. Go ahead and take your break.

Gumperz (1981) points out that, although A’s first utterance is a yes-no question, B does not give a yes-no answer, but an imperative one. This is because B interprets A’s utterance as requesting B to stay while A takes a break. How does this interpretation come to be shared? According to Goffman (1986: 10-11) people within a society share frames, defined as ‘principles of organization which govern events – at least social ones – and our subjective involvement in them’. Frames, then, guide interactants to appropriate interpretations of what is going on in situations at each moment. So, too, interaction is taking place between writer and reader.

Extratextual, intertextual, circumtextual and intratextual framing are all involved in, and influence the interpretative process. MacLachlan and Reid (1994) describe the four types of framing as follows:
• Extratextual framing occurs when a reader uses his background knowledge and experience to assist in interpreting the text;

• Intratextual framing is when a reader uses cues, such as headings and subheadings, cohesive devices etc. within a passage to interpret;

• Circumtextual framing occurs when a reader takes into account the cover of a book or journal, and peripheral features such as title and abstract to build a picture of the text; and

• Intertextual framing is when a reader links other readings with his present reading to help make sense of the present reading.

Intratextual framing, attending to features in the text, and extratextual framing, using background knowledge to assist with interpretation are taken into account in schema theory. Circumtextual and intertextual frames – both of which play a significant role in directing and constraining interpretation, MacLachan and Reid claim, however, have yet to be taken into account in the work of researchers who work with cognitive theories. According to MacLachan and Reid (1994) Artificial Intelligence researchers, in particular, regard issues like cognitive frame content and specification as more relevant to their research than the broader societal and institutional frameworks within which meanings are normally negotiated. Circumtextual and intertextual frames relate to both the spatial and temporal aspects of the reading process. Since reading is an activity that takes place in time, the point that is reached in a given text at a particular moment affects how the information offered at that
stage is interpreted. New information causes reframing of what has gone before and affects expectations of what lies ahead. Since reading is also an activity with spatial dimensions, other factors which affect interpretation include how words are represented typographically on the page (Reid et al., 1998).

In their study of international students’ reading practices, Reid et al. found, through the use of framing theory, that students from cultures other than the host culture often experienced a mismatch of frames. They stated that while both native speakers of English and non-native speakers of English will experience ‘interpretive “gaps” in the knowledge, experiences and assumptions’ they apply to reading, non-native speakers of English are likely to be less ‘culturally in tune’ (p. 71).

Frame theory, while highlighting mismatches in expectations, can also help identify ‘the causes of miscommunication of those from different cultures’ (Watanabe, 1993: 205). Watanabe (1993) applied frame theory to an investigation of discussions by three groups of Japanese university students and four groups of American university students. She identified two types of framing: (1) bracketing (delineating the event at its beginning and end), and (2) specific conversational moves such as requesting or joking and how they differed between the Japanese and American groups. Watanabe, therefore, showed that ‘some elements of frames are specific to a culture’ (p. 205); for example, she showed that when Japanese and Americans are faced with discussing a controversial matter, the Japanese may experience frustration because they feel the style of arguing by Americans is too fast and does not allow for ‘personalized stories’ (p. 205). The Americans may feel the Japanese are too cautious in coming to the main point in the discussion immediately. Watanabe contends that her study shows that
'Frame analysis provides a strong foundation for explicating the mechanism of cross-cultural communication' (p. 205).

The use of framing theory, then, in the present study enabled the identification of readers' expectations which guided their approaches to reading. Framing theory identifies how readers approach text and the reasons for their approaches. Moreover, as the present study is concerned with changes in reading practices over a period of time, framing theory was useful as it can help highlight the changes.

As mentioned earlier, the present study used metacognitive theory in conjunction with framing theory. The main reason for using metacognitive theory in combination with framing theory is that metacognitive theory enables the identification of participants' knowledge of such metacognitive reading features as knowledge of self, knowledge of task, knowledge of text structure and knowledge of strategies and their applications. It identifies the extent of executive control being utilised by the participants to effect efficient reading to fulfil their purposes. For example, it was envisaged that, as participants became more aware of academic text structures, they would adapt their current range of text-related strategies or develop new strategies to suit the new reading requirements. Urquhart and Weir (1998) argue that, while we have theories of careful reading, we have little information on how readers process text quickly and efficiently, extracting important information in line with their intended purposes.

Section two of this chapter presents a literature review of the reading research in general to date, followed by a review of ESL reading research in particular. The
research is grouped firstly according to three of the four main elements of 
metacognition: Knowledge of text structures, Knowledge of task, Knowledge and 
application of strategies. Then it reviews reading research using framing theory. The 
review of research focussing on metacognitive and framing aspects of reading 
demonstrates how the combining of those two theories in the present study can 
provide an holistic view of the reading practices of two discrete cultural groups, Thai 
and Indian/Bangladeshi postgraduate students.

Section two

Reading research review

Much of the reading research to date has tended to focus on what a reader 
comprehends, the product of reading, or on particular individual components of the 
reading process. Moreover, much of the research has focussed on reading activities 
which, while not named as such, are metacognitive in nature. Therefore, this section 
presents research which, either explicitly or implicitly, reflects metacognitive 
elements in the study of reading. Firstly, the research focussing on three of the four 
elements of metacognition: Knowledge of text structure, Knowledge of task and 
Knowledge and application of strategies, will be discussed. The Knowledge and 
application of strategies section will incorporate research investigating the effects of 
bilingualism and, specifically, the use of translation. Next, research focussing on 
interpretations of text and reflections on reading practices, incorporating the 
metacognitive component, Knowledge of self, will be discussed.

Following the discussion of research on metacognitive aspects of reading, knowledge 
of text structures, knowledge of task, knowledge of strategies and their applications,
will be a brief review of research on the framing used by readers and speakers in cross-cultural situations.

**Knowledge of text structures**

There have been a variety of studies incorporating the examination of the influence of text structure on reading. Some researchers, for example, have investigated the influence of text structure on ESL readers in conjunction with the good/pair variable (e.g. Anderson, 1991; Block, 1992; Carrell, 1989; Devine, 1988; Langer et al., 1990). Research with good and poor readers with regard to text structure has demonstrated that good readers seem to use the text structure to aid recall of the main ideas in the text as well as a means of facilitating comprehension (Leon and Carretero, 1995).

Another area of research has focused on the difficulties experienced by readers related to the structures of academic texts (Bhatia, 1993; Clyne, 1981, 1987; Hinkel, 1994; Holm and Dodd, 1996; Swales, 1990; Taylor and Tingguang, 1991). Contrastive studies of discourse have demonstrated, for example, variations in text structures in different languages. A comparison of introductions to scientific papers by Taylor and Tingguang (1991) with Anglo-Americans writing in English, Chinese writing in English, and Chinese writing in Chinese, showed that there was an underlying rhetorical structure common to all language groups but that there were systematic variations, some of which related to the discipline rather than the language or nationality of the writers. Other variations, however, showed substantial differences between Western and Chinese writers, irrespective of language. The Chinese writers, for example, avoided elaboration, did not write at length and cited fewer references. Their overall conclusion was that, while there was ‘an internationalization of
scientific discourse, there were yet significant variations in both regional and
disciplinary cultures' (p. 332).

The influence of different text structures on reading has been investigated in other
studies. Using schema theory, some researchers have focused on the effects of
different text structures solely on recall (Bean et al., 1980; Carrell, 1984a; 1984b;
Carrell, 1990). Carrell's 1984a study showed that different text structures affected
temporal sequence of recall and the type of information recalled. Bean et al. found
that different types of text structure differentially affected recall. Carrell's 1992
study, however, found that different text structures (comparison/contrast and
description type texts) did not differentially affect comprehension and recall. It did
find, however, that there were differences in the quality of information recalled
between the text structures. Significantly more top-level idea units were recalled
from the comparison/contrast text than from the collections of descriptions text. The
study highlights the fact that different types of text structures and different groups of
students (with differing language backgrounds) can lead to different results.

While much research has focussed on the effect of different rhetorical structures on
recall of English narrative and expository text, hardly any had been carried out on
differences in readers' awareness of particular text structures and their recall of those
text structures until the Carrell (1990) study. Carrell's (1990) study showed there
were no significant differences between the two types of text structure
(comparison/contrast and collections of descriptions) in the quantity of information
recalled by high-intermediate ESL readers. There were differences, however, in the
quality of information recalled. Significantly more top-level idea units were recalled from the comparison/contrast text than from the collection of descriptions.

Other researchers have investigated the relationship between text characteristics and other variables. Wade et al. (1999), for example, studied the relationship between text characteristics, interest and recall. They found that importance/value was the most frequently mentioned characteristic that created interest. Associated with importance/value were unexpectedness, readers’ connections and author’s connections as well as imagery/descriptive language. Characteristics which interfered with interest were inadequate explanation/background information, unfamiliar vocabulary and lack of coherence. These findings have implications for text choices when planning curriculum. Otherwise, curriculum planners may be disadvantaging international students.

To compound the problem of becoming familiar with different genre employing differing text structures, is the problem of finding well-constructed texts in any discipline. Educational reading researchers have found, when applying criteria for well-structured texts, that many texts at the school level did not meet these criteria (Beck, 1993). The type and quality of students’ background reading, both at school level and university level, could be expected to influence their reading at postgraduate level.

While language backgrounds and previous reading may influence the familiarity with the use of certain rhetorical structures specific to certain language backgrounds and approaches to differing reading tasks, cultural background is closely related. Some
research has focused on cultural and/or linguistic background knowledge and the influences on meaning making of text.

**Cultural aspects of reading**

A difficulty for ESL students reading in a language other than their own is that ‘L2 texts are usually written within the cultural assumptions of the speakers of that language, not within those of the readers’ first language’ (McDonough, 1995: 42). Steffensen, Joag-Dev and Anderson (1979), mentioned earlier, using schema theory, found that American students reading a text about an American wedding remembered more facts than the Indian students did and the Indian students recalled more facts from a text about an Indian wedding than the American students did. This study, however, only shows the product of reading, the recall of text, related to cultural background.

Various researchers (e.g. Block, 1986; Olshtain and Cohen, 1998) have shown the importance of recognizing text structure along with other strategies. Some researchers, too, have examined the construction of meaning process of academic texts in relation to the cultural context of a text. In an attempt to investigate the connection between appropriate strategy use and comprehension of science texts McLoughlin (1995), for example, specifically designed a study to explore how cultural background knowledge and linguistic variables influence students’ reconstruction of scientific texts. No differences emerged between the Australian and the Singaporean students with regard to recall of main ideas or awareness of text structures. The Malaysian students, in the study, however, recalled fewer main ideas and showed less awareness of argument structure. Also problem-solution type texts
seemed to produce greater difficulties than texts organized as comparison/contrast. The Carrell (1990) study, mentioned earlier, also showed that students vary in their awareness of text structures and fewer students were able to recognize the problem/solution texts and this related to the amount of recall of main ideas from the text. The McLoughlin study did not assess quality of information recalled.

Using short stories instead of science texts, Ono (1992) explored Japanese readers’ strategies while reading stories in English at different degrees of cultural proximity to students’ backgrounds. The study showed not only that more advanced students used less comprehension-based strategies and more interpretation-based strategies than beginning level readers but also that, no matter how close the readers’ knowledge was to the text, they interpreted it on the basis of their personal experience, knowledge, perceptions and beliefs acquired throughout their lives.

The experiences and world knowledge that a reader brings to text are clearly another important aspect of the reading process and can produce markedly different interpretations of the same text. Alderson and Urquhart’s (1988) studies, while highlighting the effects of differing backgrounds on reading, i.e. what the readers from differing backgrounds did, again could not illustrate the process of reading or why the readers approached texts the way they did.

Overall, the results from the various studies, relating to text structure, highlight several issues. Good readers seem to use text structure to aid recall but the rhetorical structures readers from other countries are accustomed to may be different from those used in academic texts they may read while studying in a different cultural-
educational context. The differing text structures they encounter can affect the type of information that is recalled and the temporal sequence of recall. As a result of these studies, it has been suggested by Carrell and Eisterhold (1988) that ESL students be exposed to readings on a single topic or by a single author so that they can become familiar with the specialized vocabulary and context.

It is well established that international students must make many adaptations to their reading approaches as they seek to learn from complex academic texts written in their second language in such a way that they meet the expectations of their disciplines. As differing frames of expectations with regard to previously learnt text structures may be a source of difficulty for international students these should be considered in the overall study of reading processes. Frame theory was considered useful to examine the expectations international students may have with regard to reading. Metacognitive theory helped to highlight their realization that there could be a mismatch between their own expectations and those of the host country; it also could highlight the selection of strategies to cope with the different cultural-educational situation.

Engagement with a text, however, does not orly depend on the familiarity of text structures and their use as techniques for recall but on purposes for reading, the task, which may or may not include recall. The reader has to learn how to adapt reading behaviour to specific tasks (Collins, 1994) and this aspect of reading will be discussed next.
Knowledge of task

Both mature and immature learners differ with respect to their knowledge of, and ability to control, task variables. For example, locating a specific detail in a text requires a different process than that needed to write a critical analysis of the text. Another important aspect is deciding how much reading for study purposes is required; in other words when is the material known (Maki, 1998).

Several variables in relation to the reading task have been examined. Levine and Reves (1998), for example, investigated the extent to which foreign language readers’ word-treatment strategies were task dependent and to what extent the word-treatment strategies were dependent on readers’ profiles. The results showed that word-treatment strategies were undoubtedly dependent on the reading task and to some extent were also dependent on a reader’s profile.

The impact of subject knowledge and awareness of task

One of the most important insights from a review of 66 studies involving traditional written texts and on-line texts incorporating both knowledge and interests by Alexander et al. (1994) was the impact of subject-specific knowledge. ‘Specifically when there was a match between subjects’ avocations or vocations and the subject matter of the text, there were significant and positive outcomes reported’ (p. 219). They added that when there is a poor match, readers cannot process the information in the text effectively. In this situation, students must rely on whatever relevant conceptual knowledge they can muster. In addition, when a mismatch exists, constrained from using text-specific strategies, readers must rely on general text-processing or problem-solving strategies to negotiate meaning from the text.
Carrell (1988) has shown, too, the importance of a reader’s background knowledge of the content area of the text (content schemata) as well as the rhetorical structure of the text (formal schemata).

Alderson and Urquhart (1988), on the other hand, while finding a high correlation between background knowledge of text and comprehension with Development Administration, Finance and Economics ESL students and texts relating to their field, did not find that ESL engineers did better on engineering texts. Alderson and Urquhart suggested that one factor explaining this result could be the linguistic proficiency of the engineers. There again this suggestion did not entirely take into account the differences in comprehension and they further suggested that there could be ‘idiosyncratic effects’ in particular texts (p. 182).

These differences in results serve as a warning that, while investigations of individual variables of the reading process are valuable, they do not produce the full picture of the reading process nor do they take account of individual differences. In a sense the various researchers have tried to overcome the problem of segregating variables by studying different sets of variables.

The research so far discussed has shown the relationships between language, culture, text structure and task to reading comprehension and recall. Besides knowledge of these aspects, readers need knowledge about metacognitive strategies in order to self-regulate the reading process to read for comprehension. At this point, then, the discussion turns to the area of strategy knowledge and use.
Knowledge and application of strategies in reading

Good thinkers, according to Brown and Pressley (1994) use cognitive strategies and the appropriate use of these strategies is engineered through two types of metacognition – a) long term knowledge about where and when to use the strategies they know and b) the use of monitoring and shifting of strategies where necessary. Much research has been carried out on the strategies used by both L1 and L2 readers and has also compared the strategies used by L1 and L2 readers.

Research with good/poor readers

Research with good/poor first language readers has investigated the range of strategies used, particular strategies, strategy use in relation to variables such as language background, text structure and cultural background. Olshavsky (1976), for example, investigated the range of strategies used by ‘good’ and ‘poor’ readers and found that ‘good’ readers used certain strategies more often than the ‘poor’ readers leading to the implication that strategy teaching would produce more effective reading. It may be that good readers use certain strategies but it does not necessarily follow that when these strategies are taught to poor readers that they will produce more effective reading. It may be that poor readers will develop strategies which are more suitable for their level, purpose for reading and situation.

An example of another study of strategy use, but with a variation, was Armbruster’s 1983 study from a metacognitive perspective. He focused specifically on the use of strategies related to textual features by ‘good’ and ‘poor’ first language readers. The results showed that younger and less mature readers do not concentrate on textual
features because they are not aware of the impact text structures have on learning. In addition, ambiguous words or confusions within the text affect cognitive processing. Collins (1994), commenting on Armbruster’s study, states that older and more fluent readers are more aware of text inconsistencies and can judge whether or not their comprehension is altered because of such inconsistencies. This may not be the case with older readers of text which is not written in their first language.

An early study of use of reading strategies was conducted by Olshavsky (1976). Specifically the study, using a metacognitive perspective, investigated the reading strategies of 24 tenth grade L1 students in relation to interest, high and low; reader proficiency, good and poor; and writing style, concrete and abstract. The study, according to Olshavsky, demonstrated that reading is a problem solving process using two types of strategies – problem identification strategies and problem solving strategies. The types of strategies did not change but the frequency did. More strategies were used when interest level was high, when proficiency was high and when faced with abstract material.

Rather than showing which strategies were used and how frequently, a study, again from a metacognitive perspective, by Finkbeiner (1998), suggested that German High school students may be ‘metacognitively illiterate’ and she added that university students in Germany may be similarly illiterate. Her statements were based on a study aimed at examining the role of learning strategies and interests in text comprehension processes with EFL students in German secondary schools. She found that a high percentage of grades 9 and 10 did not seem to be strategically challenged in the school setting. She argued that the school setting may, in fact,
prevent children from developing strategies, since the way text was processed was usually not metacognitively challenging. Her findings are in agreement with those of Anderson (1993) who found that U.S. students were unable to reason well about written material and suggested that one reason for this was that educational texts were poorly constructed. Beck (1993) reported similar concerns over the adequacy of school texts. Anderson (1993) claims that other explanations for these findings could be pressure to cover the curriculum and to help students pass examinations ‘that may not require much thinking’ (p. 34). These issues have relevance to the present study. Background reading, knowledge of the varying rhetorical structures of texts and metacognitive abilities, could considerably influence the reading practices of postgraduate students when they first study at an Australian university. The present study attempts to investigate the reading backgrounds of the postgraduate students from Thailand and India in their own countries in order to understand the influences from this background reading on their reading practices while studying at an Australian university.

Other studies have examined the issue of strategy use by ESL readers of English text. For example, a study conducted by Field (1984) focussed on reading strategies displayed by Chinese students reading in English. Field found that Chinese students’ reading strategies were shaped by their cultural assumptions and their background knowledge, a) by using traditional methods of reading leading to focusing on each word without always understanding the general concepts in a text and b) by slowing the reading process by assuming a philosophical meaning causing the reader to use concrete strategies where none were needed.
Also examining reading strategies of ESL readers of English text, Pritchard (1990) investigated how cultural schemata influence students’ self reported strategies and comprehension. The results showed that cultural schemata appear to affect readers’ processing strategies and their level of comprehension; students recalled more idea units when working with culturally familiar readings. In addition, it was found that students without the necessary background knowledge of the topic used comprehension-monitoring strategies as scaffolding to support their meaning-making endeavours.

The research with good/poor readers has shown that good readers use more strategies more often. They are also more aware of text inconsistencies and how these may affect their understanding of text. Moreover, as students operate from differing cultural backgrounds, they may need time to make the necessary adjustments when reading second language texts, particularly when studying in another cultural environment. The Finkbeiner study showed, furthermore, that students may not have the metacognitive strategies required for successful reading – strategies that lecturers often assume they have.

Native/non-native strategy use in reading

Much of the ESL reading research on strategy use has compared strategies used by native with non-native readers (Block, 1986a; Block, 1992; Carrell, 1989; Hinkel, 1994; Holm and Dodd, 1996; Horiba, 1996; Knight et al., 1985). It has been found that L2 readers used a less wide variety of strategies than L1 readers or highly proficient L2 readers. It should be noted that even fluent bilinguals, highly skilled in
reading in both their languages, usually read more slowly in their second language (Weber, 1991).

Similarly, Fitzgerald’s (1995) review of research in the United States of America of ESL reading showed that ESL readers seemed to use a specific process ‘less often, less well, and/or more slowly’ (p. 181). In addition, ESL readers used fewer metacognitive strategies and chose different ones, monitored comprehension more slowly and read more slowly than native readers. She points out, too, that language background may have affected preferences for certain text structures. Anderson (1991) found, though, that more proficient ESL readers used a wider variety of strategies. Block (1992) found that more proficient ESL readers took more action to solve problems but monitored comprehension more slowly than native speakers. Bilingualism and the effect of the first language are discussed later.

Another study illustrates different findings from Fitzgerald’s 1995 review. Mikulecky (1991) found that his sample of Russian students used more strategies in their L2 than in their L1. It may be that this sample of readers was not at a high level of proficiency. Their slow comprehension monitoring does tie in with Fitzgerald’s review of reading research in the United States of America. She found that L2 readers monitored their comprehension more slowly than the L1 readers. It is interesting to note, though, that Block (1992) found that language background did not affect the strategies used. Other language backgrounds, other than those she studied, (Chinese and Spanish) could, however, affect strategy usage. For example, higher reading proficiency has been found to relate to sensitivity about the orthographic structure of English (Brown and Hayes, 1985; Haynes and Carr, 1990).
It has been shown, too, that some reading skills are much weaker for non-English speaking background students than for local students. A study carried out by Farrell et al. (1992) and colleagues from the University of Western Sydney, ‘Long term deficits in English and technical reading skills among undergraduate students from non-English speaking backgrounds’, noted that skills such as using appropriate connectives, drawing analogies and recognizing principles of organization, were much weaker in the non-English speaking background student than for local students.

The study also showed that the same technical text presented different problems for international/migrant and local students. On the basis of this finding, Farrell et al. recommended that L2 students be given ‘assistance to develop reading skills and strategies transferable to a wide variety of reading tasks’ (p. 15). In particular, they needed to be taught to use cues to ‘generate and evaluate ideas appropriate for an English language cultural perspective’ (p. 15). Unfortunately, this study did not differentiate between the differing cultural backgrounds of the readers. It is discussed later, for example, how the different orthographies to which readers are accustomed, can affect their reading practices.

Problems with reading highlighted in another study (Burke and Wyatt-Smith, 1996) were discipline-specific terminology, reliance on general, specialist or bilingual dictionaries and having to re-read, resulting in surface level reading.

Other studies have focussed on the *differing levels* of strategies used by first and a variety of second language readers. Horiba’s 1996 study, for example, differentiated
between the level of strategies used by L1 and L2 readers. Horiba (1996) examined four groups of readers: L2 intermediate, L2 advanced, L1 Japanese and L1 English as they processed and recalled two passages that varied in degree of causal coherence. It was found that L1 readers focussed their attention on higher level processes such as generating inferences and invoking general knowledge. L2 readers, according to Horiba, focussed more on lower level processes and there were some delays in understanding words and sentences and resolving anaphoric relations. Horiba's (1996) study, however, reminds us that measures for L2 reading speed need to be used with caution. She found that advanced ESL students did not necessarily finish interpreting a particular segment of a text immediately but would return to it when they had the necessary information to help with the interpretation.

This piece of research shows that while less proficient second language readers often use a smaller range of strategies than first language readers and do so more slowly, that that situation is far from static. Reading is a dynamic, evolving process as evidenced by the adaptations these students were making to accommodate their reading at a particular point in time. In order to make adaptations and vary their strategy use, students had to be aware of the strategies they were using and their appropriateness.

In summary, the comparative research between native and non-native readers has shown generally that less proficient non-native readers use a less wide variety of strategies, less often, less well. They use fewer metacognitive strategies and monitor their comprehension more slowly. However, the more proficient non-native readers demonstrated a greater range of strategy use than the weaker non-native readers.
They may have been more motivated and interested because of their greater proficiency. It has been shown, too, that non-native readers use different strategies to native readers; for example, there is more use of dictionaries and more re-reading and less use of the higher level strategies of inferencing and making analogies (Jimenez et al. 1996; Reid et al. 1998). There is more discussion of non-native strategies later in the chapter.

**Intertextuality and strategy use**

Research on knowledge and awareness of strategy use has been shown to be important to reading efficiency but much of the research has been with the reading of single texts. Academic study, however, also requires the reading of multiple texts and complex abstract material. Relating strategy use to the reading of two texts, Chi (1992) investigated the mental connections made by 15 advanced Taiwanese ESL students while reading two short stories and the effect of self-report methodology. He found repeated evidence of readers metacognitively monitoring and controlling their intertextual linking of texts. This research shows that when ESL readers are ready they can not only interpret single texts but can relate to two or more texts effectively when given a learning environment conducive to making personal, meaningful connections between texts. The use of multiple texts to explain meanings in current reading is explored in the present study through the use of framing theory.

**Linking theory and practice**

However, identifying strategy use alone does not necessarily lead to more effective teaching of reading. Auerbach and Paxton (1997) found in their study of a reading
course for undergraduate ESL students using think-aloud protocols, interviews and comprehension tests, word-centred and meaning-centred strategies were used. However, the course fell short of the authors’ expectations. They felt the study did little to address the question of reading critically and they were worried that they were ‘sending the message that process is more important than content – that reading consists of applying strategies rather than engaging with a text’ (p. 256). They also could not come to the conclusion that any one strategy or combination of strategies was significantly effective in the promotion of metacognitive awareness; however, some of the students did gain an ability to ‘struggle with and challenge authors’ (p. 256) thus showing some ability to engage in critical reading.

It seems that research which investigates the differing variables related to strategy use must lead to instruction which incorporates the ‘whole’ process of reading rather than isolated parts and/or has to take into account the fact that reading is an ever evolving activity with different strategies being used at different times.

In addition to the many studies on strategies, their variety and frequency of use, and the relationship with other variables, the influence of first language on second language reading has also been the focus of many studies (e.g. Block, 1986; Upton, 1997). This influence of the first language will be discussed next.

**Bilingualism: The effect of first language on second language reading**

Issues which have been considered in reading research include the particular languages of the home countries and their effect on reading in English as a second
language and the orthographic and varying cultural discourse structures to which students are accustomed.

One study which focussed on the effects of specific first languages was that of Barrera et al. (1986). They found that strategies varied according to language dominance. However, when Block (1986a) investigated the effect of language background on types of strategies used by ESL and native readers, she found that language background did not relate to type of strategies. Other factors may have influenced the results such as the texts chosen for the study of the specific language backgrounds.

Other studies have focussed on the particular strategies used by L2 readers and L1 readers. Jimenez et al. (1996) investigated the qualitative differences in understanding two English narrative texts and two English expository texts with eight bilingual Latina/o students considered to be successful English readers. The researchers used the term bilingualism in their study 'in its broad sense to refer to the use of two languages on a regular basis' (p. 93). They acknowledged that native-like literacy in a second language is difficult to achieve and they did not attempt to place the students in their study on any part of the language proficiency continuum. They cited studies by Favreau and Segalowitz (1982) and Mack (1984), which showed that even adult bilinguals, who are proficient in both their first and second language, process text more slowly than monolingual adults; these slower reading times were for both their first and second language reading. What lay behind the success of the Latina/o readers on their study was the strategies they used for negotiating meaning. These strategies included the bilingual strategies of searching for cognates (limited use), code-mixing and translating as well as questioning, re-reading and evaluating –
strategies they had learnt to use with their first language. When these students were compared with monolingual readers, it was found that the monolingual did not note as many comprehension problems and accordingly did not record as many comprehension monitoring strategies nor as many repair strategies.

This research highlights the fact that bilingual readers, while they may use the same strategies as first language readers, also use a unique set of their own strategies derived from their first language, such as translating, code-switching and identifying cognates. Translation, in particular, is an important strategy for bilingual readers and is discussed next.

The role of translation: L1 influence

Many researchers have examined the use of the bilingual reader strategy, translation, a not uncommon strategy for understanding a second language (Block, 1986). Upton (1993) comparing lower level proficient students with higher level proficient students, using think-aloud protocols, found his lower level proficient participants used their L1 more than the higher level proficient participants when reading a text in English, and also used the L2 to confirm what they already knew. Moreover, the higher level participants used the L2 as the language of thought while working out meanings.

Upton (1993) also examined the written recalls of these Japanese ESL students when reading an English text and writing recalls in their own language or in their second language. His study found that the amount of use of translation directly correlated with the readers' English language proficiency. Less proficient ESL readers relied more on their first language to help them deduce text meaning than the more
proficient ESL readers. There were no significant differences in idea units recalled related to the language of recall.

Kern (1994) found, similarly, in his study with 51 French students that translation during L2 reading played an important and multidimensional role. It could facilitate generation and conservation of meaning by providing readers with the means of representing segments of L2 text which exceeded cognitive limits into familiar, memory-efficient form. In addition, as with the previously mentioned studies, it was found that, as expected, the low ability group of readers used translation most frequently and the intermediate and high level ability groups used translation least frequently. It would seem that, far from discouraging translation back and forth between first and second language, it should be encouraged, at least until other strategies are acquired which would possibly be speedier and would produce closer meanings.

Holm and Dodd (1996) investigated the influence of first language by focussing specifically on languages with an alphabetic system and those with a non-alphabetic system. They carried out a study to examine the relationship between first and second language literacy and the skills and processes that were transferred to the second language, using students from China, Hong Kong, Vietnam and Australia. The Hong Kong students in the study, who had not learnt an alphabetic system before being exposed to English, performed differently from all the other participants who had a background in the alphabetic system. They demonstrated poor phonological awareness in their first language which seemed to transfer to lack of ability in processing non-words in English. The findings, according to Holm and Dodd,
demonstrated that students from non-alphabet written language backgrounds might have difficulties with unfamiliar words when studying at universities where English is the medium of instruction.

Another study involving orthographic structures was the study by Koda (1986) which investigated the effects of first language orthographic structures on cognitive processing in second language reading. More specifically, two aspects were examined: a) the effects of the basic unit of representation on acoustic coding strategies and b) the effects of representational properties on lexical processing styles. The results demonstrated that the four groups, Arabic, English, Japanese and Spanish, utilize different information processing procedures in reading English and the L1 orthographic systems exert a significant influence on cognitive processing in L2 reading.

Not only do orthographies influence reading but so, too, do discourse structures. Kaplan in his 1972 study of essays of foreign students in the United States of America identified four discourse structures which differed from English linearity (Figure 2 (a)). While this study is somewhat controversial, it does nevertheless provide a useful basis for considering aspects of reading practices because it draws attention to the differing approaches to writing which may influence reading practices.
Figure 2 Discourse structures. Adapted from Kaplan (1972).

1. parallel constructions, with the first idea completed in the second part (figure 1b)
2. circularity, with the topic looked at from different tangents (see figure 1c)
3. freedom to digress and to introduce “extraneous” material (see figure 1d)
4. similar to 3, but with different lengths, and parenthetical amplifications of subordinate elements (see figure 1e) (cited in Clyne, 1981).

These discourse types were identified with genetic language types: 1 with Semitic, 2 with Oriental, 3 with Romance, 4 with Russian. As an example, cited by Clyne (1981), German scientists of mathematics and engineering generally adopt an Anglo style linear discourse structure while scientists from other branches of
science such as chemistry commonly use a non-linear structure. As Clyne (1981) points out, students often fail in Australian universities in spite of sufficient knowledge of subjects and high competence in them because they have not been sufficiently trained to abide by ‘formal rules which reflect features of a culture of which they are not a part’ (p. 62).

In summary it can be seen that a reader’s first language can exert a significant influence on the reading in a second language. Of particular note are the orthographies and the particular rhetorical structures used in other cultural contexts. The use of translation, especially in the early stages of negotiating meaning from unfamiliar texts, is an important strategy and one it seems which should be encouraged while students are adjusting to a different variety of texts.

So far we have discussed the research which has focussed on the individual variables which interact with one another in the process of reading or the product of reading, comprehension. The discussion continues with a review of research which has investigated interpretation or reflections on interpretations, research conducted from a more holistic perspective.

**Reflections on reading processes**

Among those researchers interested in interpretations from texts, are Marton, Carlsson and Halasz. Their joint 1992 study, using a phenomenological framework (in other words, interested in phenomena) investigated the differing interpretations of Franz Kafka’s parable *Before the Law* and the students’ explanations for their interpretations. The participants were from secondary
schools in Hungary and Sweden. The Hungarians in the study displayed more advanced understandings and focussed on the man and his acts in the text while the Swedish students focussed more often on the Law. The study implied, according to Marton, Carlsson and Halasz that there could be better understanding of literary texts by using variation within and between individuals, at the collective level. It also showed, as with other studies reviewed here, the uniqueness (in thinking and hence in interpretation) of specific groups of readers from different cultural backgrounds.

In a study of a different kind focussing on interpretations, Hinkel (1994) compared native speaker and non-native speaker evaluations of four short essays, two written by native speakers and two by advanced ESL learners. She found disparities in the interpretations between the native and non-native speakers of English. Despite being familiar with English language conventions, the non-native speakers, from South East Asian cultures influenced by Confucian and Taoist conventions, did not seem to share common background knowledge and the contextual assumptions associated with L2 rhetorical conventions and hence their interpretations were dissimilar to those of the native speakers. As with the Marton et al. study above, this study demonstrated that reading practices cannot be generalised.

Yet another study investigating the interpretation of text was that of Saljo (1982). Saljo sought to understand the differences in constructing meaning from a text on learning with Swedish students reading in their own language. The Swedish participants were asked to recall the text and then to answer questions about their
reading approaches. Saljo concluded that ‘it was the individual’s conception of what counts as knowledge in educational contexts which determines how a text is approached and what the outcome is likely to be’ (p. 9). Moreover, he found the students’ views on knowledge and learning in the university environment were challenged and his findings indicated that when the context changes, learners will change their assumptions of what it means to learn. Surface learning leading to ‘gross distortions’ (p. 197) in understanding of a text was, he stated, a product of the way knowledge and skills are passed to students within certain cultural situations. It is important for lecturers then to understand that reading cannot be viewed in isolation; it is a form of learning integrated into a student’s past experience, both educational and social. Rather than being a study of metacognitive strategy use in reading, this study investigated perceptions of knowledge and learning which influenced the approaches to reading.

Background experiences and educational systems have likewise been shown to influence the way students approach their studies. Kline (1993), using a social practices model of literacy, investigated the reading behaviours of eight undergraduate students in a study abroad programme in France. Data collected over 15 months through interviews, participant observation, inventories, and surveys revealed the existence of a student subculture informed by literacy patterns specific to the programme participants. The subculture arose partly in response to perceptions of French literacies as alienating and college literacies as inappropriate to the new setting. It was marked by gender-differentiated reading habits and by the emergence of small textual communities that functioned to reinforce native language identity. This study highlights the anxieties and
adaptive strategies experienced by speakers of a second language when placed in unfamiliar cultural settings and has implications for the accommodation of international students' learning styles and reading approaches, at least in the short term, in the Australian environment.

**Identifying framing expectations that students from different backgrounds bring to academic texts**

As shown in the above studies, strategic readers are not characterized by the amount of strategies they use but by the selection of appropriate strategies for a particular purpose, text or situation (Paris et al., 1991) or at least by strategies which will enable them to survive until more appropriate strategies are adopted. By using framing theory, Reid et al. (1998) investigated the expectations of students and the degree to which there was a mismatch of their approaches to reading with regard to the course materials and lecturer expectations. They found that there was a mismatch of expectations regarding reading criticality; some students (first language speakers of English) ‘simply lacked the higher order reading skills that are necessary to cope with a regime of wide and critical reading’ (p. 57). This ties in with Finkbeiner’s (1998) observations of German first language readers and Anderson’s (1993) observations of American first language readers mentioned earlier. Reid et al. (1998) found, though, that reading requirements and attitudes differed between disciplines and pointed out that students’ reading practices are a response to the ‘contemporary contextual demands of university study’ (p. 58). In this regard, then, students (and these were undergraduate students) were using strategies appropriate to the tasks they were asked to undertake.
Also using framing theory, Bell, 1997 (cited in Reid et al., 1998) found in preliminary research for the present study that Thai and Indian postgraduate readers had their own set of problems; they were unable to effectively use intratextual cues in texts and to understand the specialized vocabulary by referring to other texts, particularly journal articles, to uncover meanings which, they had found, were beyond the scope of their dictionaries. Other problems could be overcome, it was found, through increased awareness of reading processes enabling changes in strategy use to accommodate a different cultural environment (Bell, 2000).

These studies using frame theory have established that processes vary from one cultural background to another. The use of frame theory can identify the mismatches in expectations that can occur thus providing a fuller understanding of the reasons for students' approaches to text. Moreover, frame theory can help explicate the changes over time that students make to their reading practices to match institutional, academic and cultural expectations. Studies of metacognition in reading provide insights into students' awareness of these processes and the processes of change and their level of control over these processes.

The literature review of ESL reading revealed that researchers have clearly examined a multitude of factors that may affect the reading practices of a range of readers in order to understand the complexity of reading processes. These studies have been valuable in that they have shown that culture, background knowledge, language and knowledge of text structures affect comprehension and recall. Some
studies have also focussed on the relationships between, for example, recall and interest. Most studies, however, have not considered *how* reading takes place, the process of reading; they have tended to focus only on the product, comprehension and recall, of reading. Moreover, information regarding reading practices as they naturally take place is quite limited (Horiba, 1996).

Another aspect of ESL reading research is that much of it has been comparative in nature. Although much recent research has been with L2 readers, many studies have attempted to correlate the variables in comparative studies between L1 and L2 readers, thus comparing with a target monolingual competence rather than an L2 competence. Cook (1992) suggests that such comparisons may be invalid if we consider L2 readers to be different and, therefore, researchers should at least compare L2 readers to fluent bilingual readers rather than monolingual readers.

Studies indeed have shown, for example, that phonological systems from the L1, word meanings from the L1, and orthographies from the L1 can affect reading in the second language. In addition, the L2 users’ knowledge of the L2 may differ in various ways from that of the monolingual. For example, the grammar of the L2 is not the same as the ‘apparently equivalent grammar of the first language speaker’ (Cook, 1991: 562) … indeed, rather than having defective knowledge of English, the bilingual user of English may be viewed as having capabilities beyond those of the monolingual (Cook, 1992).

Often, too, ESL reading research is with ESL speakers as a mass, often Asian, without differentiating between the many Asian cultures or indicating the L2
proficiency. Different language groups could give different results (Carrell, Devine and Eskey, 1988). Moreover, many studies have used immigrant participants and have attempted to compare reading approaches to L1 readers’ approaches. Students who have recently arrived from their home countries to study for a period of three or four years, it is thought, could have different approaches to text because of their different educational and sociocultural backgrounds (Krashen, 1981).

Furthermore, only a few studies have attempted to study the many influences concurrently and few, if any, have tracked changes in the reading processes. Some have been with university students but few with postgraduate students and little research has been carried out with individual cultures at the postgraduate level. What research has been done with university students has produced less than positive results. Pressley, El-Dinary and Brown (1992) found that much of the comprehension instruction inspired by the theory and research of the 1980s does not promote good information processing. They claim that ‘good’ L1 adult readers (e.g. university undergraduate students) do not read in a sophisticated manner. They cite Snyder and Pressley’s 1990 study of L1 university students’ processing of academic texts. Cited also are studies by Wade, Trathen and Schraw (1990) which found that, although some undergraduates were using sophisticated strategies, unfortunately, the number comprised only 10% of the total sample and approximately one third relied on rote strategies. Individual variability in vocabulary knowledge, for example, and in the use of psycholinguistic strategies suggests that investigating average effects across readers in general may not be ‘enlightening in some areas of cognitive activity’
(Fitzgerald, 1995: 182). Sarig (1987), too, found that individual readers differ considerably, particularly in the selection of strategies rather than the total number used.

While there has been little research with postgraduate ESL students, there has been even less, if any, with postgraduate Thai or Indian/Bangladeshi students concerning their reading practices while studying in their own countries or how their reading practices change during study at an Australian university.
Rationale for the present study

The present study addresses the above concerns, namely, the lack of research of reading practices concerning the nature of reading, the *how* and *why* rather than the product or comprehension which takes place when reading. The study also addresses the lack of reading research of individual cultural groups of a non-English speaking background, particularly of international postgraduate students using authentic texts over a period of time. It did so by developing a research design which would enable the researcher to investigate reading as an holistic process with two discrete groups of postgraduate students from a non-English speaking background, namely Thai and Indian/Bangladeshi, over three semesters. The holistic process, it was envisaged, would lead to a better understanding of the reading practices of these two groups of students and the reasons which lay behind their practices. In addition, through conducting individual interviews as part of the process, the researcher was able to investigate each individual student’s unique approach to reading of general and discipline-specific text.

Moreover, this study, by investigating the changes in reading practices which took place across three semesters, was expected to provide insights into the adaptations these two groups of students could make in a new cultural context. The results of the study should add to the body of knowledge on international student learning, specifically learning through reading, at Western universities. More particularly, it should help supervisors of postgraduate students and university support coordinators to organise appropriate support especially in the area of academic, discipline-specific reading.
At a University level, the research attempted to address various other concerns. The concern about the literacy levels of all graduates, for example, has led to the Australian Association of Graduate Employers urging universities to incorporate communication studies into every subject (Illing, 1994). The findings from this study should help universities to understand some of the reading practices of postgraduate students from a non-English-speaking background.

Students and staff, besides being aware of the concern about literacy levels, are also aware of the level of support expected at universities. By investigating the educational and cultural influences on the reading practices of a sample group of postgraduate students from Thailand and India/Bangladesh, it was hoped the findings would lead to greater and more appropriate provision of service in line with the AVCC Code of Ethical Practice in the Provision of Full-Fee Courses to Overseas Students by Australian Higher Education Institutions.

The knowledge from the present study should lead to better service at the postgraduate level through appropriately developed units incorporating texts suitable for students from other cultural and language backgrounds. In addition, cross-cultural training for staff, resulting from this research, would incorporate knowledge and awareness of different reading practices enabling discussion of texts with a view to accepting differing interpretations. The data could be used also in critical linguistic studies with a socio-cultural emphasis and in the debate about literacy levels in the cross-cultural academic environment.
Overview of the theoretical framework for the present study

Although it has been suggested that theories used for investigating first language users’ reading may be appropriate for second language readers, using existing theories for native language speakers may lead to missing aspects of ESL reading (Bernhardt, 1991). The review of the four main theories used in reading showed their strengths and weaknesses. Psycholinguistic theory viewed reading as a ‘guessing game’ and studies focussed on top-down processing, inferencing and using the textual features only minimally. This conceptual framework does not take account of a critical element in the reading process, namely, background knowledge. In contrast, schema theory, while viewing reading also as a top-down process, takes account of background content and text structure knowledge. From this perspective, researchers can identify the interaction of general background and specific cultural background knowledge and its relationship to recall and comprehension of the text. While providing much useful information, schema theory, however, is unable to account for the interaction between top-down and bottom-up processes.

More recently, interactive theories have investigated reading from a perspective that views reading as an interaction of top-down and bottom-up processes. These interactions are viewed as being dynamic and evolving. In order to find out about readers’ knowledge and how they apply that knowledge in the context of reading, a growing body of researchers are now interested in metacognition and reading, for example, the role of goal-directed metacognitive processes such as comprehension monitoring ‘through which the processes of evaluation and regulation interplay for the purposes of re-establishing the construction of a text’s
meaning and developing its interpretation’ (Hacker, 1998: 167). Readers, however, according to Hacker, may feel they have fully understood a text, yet the text may not be compatible with their own prior knowledge or the text may be written in a way which is unfamiliar to them. To avoid this limitation, he suggests engaging students in dialogue about texts. In this way, researchers can eavesdrop on how students process text and their understandings of the text; specifically, it can help to identify the knowledge and application of the knowledge of the four metacognitive elements: self, task, text and strategies. The present study used think-aloud protocols (discussed in the next chapter) to allow the researcher to identify the processes that were taking place while participants of the study were reading.

The usefulness of framing theory was demonstrated with reference to Reid et al.’s (1998) study and Tannen and Watanabe’s (1993) work. At a more holistic level, framing theory helps to explain the expectations of readers when approaching text and the reasons for any mismatches in expectations, e.g. regarding the reading task. Framing theory helps to highlight four aspects – intratextual framing – what textual features readers use; extratextual framing – the background knowledge that readers draw on; intertextual framing – other ‘texts’ that readers make use of for understanding of a current text; circumtextual framing – the use of peripheral features, such as cover size and cover of a book to gain an understanding of the text genre.

The combining of metacognitive theory and framing theory in the present study helped to provide a more holistic picture than any of the above mentioned theories
could individually, thus avoiding missing vital aspects of the reading approaches by Thai and Indian/Bangladeshi students. The use of framing theory enabled the researcher to identify student expectations and the educational and cultural influences which guided their reading practices over a period of time; metacognitive theory helped to highlight the students’ metacognitive abilities while reading in their second language and how these connected with their framing of texts. These two theories are explained with reference to a diagrammatic view of the conceptual framework in chapter three.

The next chapter, chapter three, presents the design of the present study, grounded in a combination of frame theory and metacognitive theory, and describes the methodology.
Chapter Three

Methodology

This chapter presents the overall research design and the methodology of the present study. This research, a small scale longitudinal study, uses metacognitive and framing theories as a grounding to explore two specific groups of international postgraduate students' reading practices, adjustments and self awareness of adjustments to these reading practices when reading in English. It also explores the influences which have led to the adjustments in reading practices. Case studies with Thai and Indian/Bangladeshi postgraduate students reveal significant changes in reading practices between first and third semester, and the students' awareness of these changes.

The research design

Different purposes generally point to different ways of conceptualising problems, different designs, different types of data gathering, and different ways of publicising and disseminating findings (Elliott, 1991). The overall design of the present study, represented in Figure 3, was developed to investigate the reading practices of postgraduate students from Thailand and India/Bangladesh in their first and third
semesters at an Australian university and the influences on these reading practices. An holistic approach was deemed appropriate for this purpose.

Figure 3 Design elements

Legend
a = 1st semester
b = 3rd semester
Purpose of the study

Specifically, the study was designed to:

- Investigate the reading practices of Thai and Indian/Bangladeshi postgraduate students while studying at an Australian university during their first semester;

- Identify the educational and socio-cultural influences on these reading practices, some of which would be derived from practices and experiences in their home countries;

- Investigate the reading practices of Thai and Indian/Bangladeshi postgraduate students while studying at an Australian university during their third semester in order to identify the changes which may have taken place in their reading practices since first semester;

- Identify the changing influences which had impacted on their reading practices in order to gain an understanding of the reasons for the adaptations in reading practices postgraduate Thai and Indian/Bangladeshi students have to make while studying at an Australian university. This research will enable supervisors and university support systems to better support this changing process. This, in turn, should enable postgraduate students to adopt and adapt to more effective reading practices with greater ease.
Synthetic/holistic perspectives

The literature review showed that much of the reading research has involved examination of specific individual parts of the reading process in relation to each other. Research in second language is best approached from a synthetic/holistic perspective which focuses on the interdependence of the parts in the field or an analytic/constituent perspective emphasising the role of the constituent parts which make up the whole phenomenon (Seliger and Shohamy, 1989). This study was approached from a synthetic/holistic perspective in order to allow for investigation of the various interdependent parts of the reading process rather than on one or two constituent parts. Moreover, as the study was based on heuristic objectives, to discover, describe and understand patterns or relationships concerning reading practices when using English as a second language, an ethnographic approach was used incorporating case studies. Even an holistic approach requires boundaries, though; the objectives of the research defined the focus. The next segment on the figure shows that the design was set up in the framework of two theories – framing and metacognitive theory.

Framing and metacognitive theories

The researcher’s desire to understand in detail the reading practices of postgraduate students from Thailand and India/Bangladesh at two points in time led to the development of a conceptual framework for the study incorporating theories of framing and metacognition (Figure 3.1). By working within such an integrated framework, it was speculated that a more detailed analysis of reading practices would be possible.
Figure 3.1 Conceptual framework
The study considered the four components of framing in reading and the four variables generally accepted to be a part of metacognition, discussed in chapter two. The elements of framing: Intratextual, Circumtextual, Intertextual and Extratextual framing, could be compared with each other during first semester and between first and third semester and were used then to chart the framing as used by these students. The use of framing to examine the students’ accounts and reflections on their reading practices was particularly useful, therefore, to highlight some of the changes which had taken place. An original single case study with a Thai student had used framing theory only (Bell, 2002). It was found, however, that such a theoretical framework did not reveal all the complex thinking processes that are a part of reading.

Working also with metacognitive theory, then, enabled the researcher to identify the four generally accepted elements of metacognition in reading: Knowledge of task, Knowledge of text, Knowledge of self and Knowledge of strategies and their application. These categories enabled the researcher to identify the readers’ thinking about their reading and what they chose to do to make their reading more effective. The categories enabled the researcher, moreover, to identify patterns while bearing in mind that one must carefully consider what is ‘significant and meaningful’ (Patton, 1990: 406).

Components of metacognition could be compared and contrasted during first semester and between first and third semester. In addition, components of metacognition and framing could be cross related to produce a fuller picture. As shown in Figure 3.1, the
Knowledge of self component affects the Knowledge of task which in turn affects how the text is approached. Knowledge of task and Knowledge of text affect the strategies which are used to frame the text. For example, if the text is framed intratextually, the reader uses cues such as headings, pictures and diagrams located within the text. Also considered were the influences, socio-cultural and educational – which impacted on the participants’ reading practices. This helped in the understanding of why participants’ reading practices were the way they were in first semester and why they changed by third semester.

Referring again to Figure 3, the next segment relates to the choice of data collection methods.

Design - data collection

Qualitative Research Methods

Qualitative methodology was used in this study because the research questions sought to identify participants’ reading practices and the reasons for those practices. The research questions involved how postgraduate students approach their reading of text and why they approach texts the way they do. A brief look at both quantitative and qualitative methods illustrates their advantages and disadvantages for this study.
The two major types of research in the field of education are logical positivism or scientific method, employing quantitative research methods and the idiographic approach or naturalistic approach. This former approach assumes social reality is objective and external to the individual. The idiographic approach or naturalistic approach, on the other hand, uses qualitative analysis and focusses on the importance of subjective experience of individuals (Burns, 1990). Each represents a fundamentally different research paradigm.

Perhaps the greatest point of departure between the two approaches occurs in the interpretation of reality. The experimental inquirer assumes and seeks to uncover a single reality. The naturalistic inquirer accepts multiple realities which grow out of differing observer perceptions and constant change (Welch, 1983). The qualitative, ethnographic approach took account of the changing reading practices of the participants in the present study.

There are several considerations to be taken into account when deciding to adopt a qualitative research methodology. The ability of qualitative data to more fully describe a phenomenon is an important consideration not only from the researcher’s perspective but also from the reader’s. In highlighting the contributions that qualitative research methods can make, Burns makes the point that the human element has become recognised, increasingly, as a critical and determining factor in the definition of truth and knowledge.
Another consideration and one of the primary advantages of qualitative research is the insights that are afforded (Burns, 1990). Burns argues that, ‘Qualitative research has made educators realise that reality should never be taken for granted given that attention must be paid to the multiple realities and socially constructed meanings that exist within every social context’ (p. 10).

Qualitative methodology was appropriate for this study because the research was of such a nature that it needed to investigate issues in considerable detail (Patton, 1990) and because qualitative methods are concerned with processes rather than consequences, with organic wholeness rather than independent variables, and with meanings rather than behavioural statistics (Eisner, 1991). Interest is directed towards context-bound conclusions that could potentially point the way to new policies and educational decision, rather than towards ‘scientific’ generalizations that may be of little use for teaching practice.

The qualitative methods of research, particularly ethnography, for example, allow the investigator to maintain association with respondents. Using the qualitative approach, then, the study’s research questions were able to be addressed. In other words, the researcher was able to gain insights into the reading practices of two groups of Thai and Indian/Bangladeshi postgraduate students and how their reading practices changed and why their reading practices changed, over the course of three semesters.
Disadvantages of qualitative research

It is generally thought that the major criticism of qualitative methods is the problem of validity and reliability (Burns, 1990; Lincoln and Guba, 1985; Welch, 1983). The degree to which one can generalize results is also considered a problem. Guba and Lincoln (1985) have stated that generalizations cannot be made to a wider context with any degree of confidence.

Another limitation of qualitative methods, such as interviews and case studies, is the considerable time required, both in organisation and in the conducting of them. In addition, the mere presence of the researcher can have profound effects on the respondents (Guba and Lincoln, 1985; Parlett and Hamilton, 1976). Researchers need to be aware, too, that the interpretation, analysis and final reporting are, to some degree, related to the researcher's own value system, background and experiences.

To avoid the potential limitations of ethnographic and qualitative studies, in particular, reliability and validity of data, a variety of qualitative methodologies were used: observations of classes and lectures on a Thai university and an Indian university campus, interviews with students and staff at these destinations, and case studies at an Australian university, incorporating individual interviews and pair think-alouds followed by retrospective interviews.
Ethnographic/naturalistic approach

Ethnographic/naturalistic methods were chosen for the study as they allowed the reading process to be viewed from a synthetic/holistic perspective. Wolcott (1999) suggests the term 'holism' calls for 'making connections between things' (p. 79). Using ethnographic methods, it was hoped, the text could be viewed as but one feature of the social situation; other features include equally the values, roles, assumptions, attitudes, and patterns of behaviour of the text producers and readers (Flowerdew and Miller, 1996; van Lier, 1988). By describing the nature of social and linguistic contexts of reading, in this study, processes influencing the nature of reading are revealed (Green, 1990). The ethnographic approach was useful, too, because it tends to focus on 'how things are and how they got that way' (Wolcott, 1997: 348). Specifically, in the present study, ethnographic procedures allowed the researcher to come to an understanding of how the participants used framing and their metacognitive abilities to effect understanding of their texts. Ethnographic inquiry also requires some understanding of how an individual may be unique or may have characteristics in common with others (Wolcott, 1997). Hence most case studies use ethnographic methods (Stake, 1997). As Smith (cited in Zuber-Skerritt, 1998) states, literacy practices are intrinsic aspects of cultural variation and it is therefore a mistake to assume homogenous patterns of literacy acquisition or cognitive consequences of literacy. Ethnographic methodology, therefore, emphasises observation, interview and other modes of analysing the situational context as well as textual analysis. Examples of the use of such an ethnographic procedure in reading research are that of Doecke and Reid (1994) and that of Reid et al. (1998) in a cross-cultural study. Another
example of the use of an ethnographic approach in a cross-cultural study is that of Tan and Goh (1999). They used an interpretive ethnographic approach to assess the cross-cultural variations in student study approaches.

Case studies

This study, using an ethnographic approach, incorporated qualitative case studies, an appropriate method when the purpose of the study is to ‘provide a rich, intensive description of a single entity and the phenomena surrounding it’ (Ivey, 1999: 176). It incorporated individual interviews to investigate the reading practices involved in interpreting academic text by a sample of international postgraduate students from Thailand and India/Bangladesh who were studying at an Australian university. Pair think-aloud protocols, followed by retrospective interviews, were also conducted in order to establish how students read general-interest text while in the process of reading.

The study was designed to take into account its heuristic objectives, i.e. to discover and describe what postgraduate Thai and Indian/Bangladeshi students do when reading and why from the perspectives of the participants and from the inferences drawn by the researcher; the case study design was chosen because it is interested in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation (Merriam, 1990). The case study design allowed for recording of thoughts and opinions and thus could document ‘holistic description and explanation’ (p. 10). The case study approach was used, moreover, because it allows a researcher to describe
aspects of second language performance and development of one or more subjects as individuals (Seliger and Shohamy, 1989). Reading in any language is highly individual; in other words, no two readers approach a text in exactly the same way (Anderson, 1991; Ivey, 1999; Sarig, 1987). It is thought, too, that data from individuals can give greater insights than from large groups (Seliger and Shohamy, 1989). The need, then, to gain detailed insights into how and why readers from two different education-cultural backgrounds carry out the task of reading, but also how and why they individually approach their reading the way they do, pointed to the use of case studies.

This case study design, the composition of which is shown in Figure 3.2, incorporated two individual interviews with each of six Thai and each of six Indian/Bangladeshi postgraduate students in their first semester and again in their third semester at an Australian university. The researcher analysed firstly individual cases, then searched for patterns or similarities within the two cohorts, Thai and Indian/Bangladeshi students, to reach an understanding of how one case was different from or similar to the other cases in its particular cohort.
In addition, two pair think-aloud protocols, followed by a retrospective interview took place with pairs of the previously mentioned six Thai and six Indian/Bangladeshi participants in first semester and again in third semester. The pair think-aloud protocols provided data on the actual metacognitive processes of the students at the time of reading general-interest text; the individual interviews provided information on general aspects of reading and background reading as well as the readers’ views on their reading practices related to subject-specific academic text (see appendix 1). Later in the chapter, Figure 3.3 shows the different phases of data analysis from the interviews and the pair think-aloud protocols. The texts used in the study are described also later in this chapter. A discussion follows on verbal reports to demonstrate why the researcher chose pair think-aloud protocols or self-revelation to access the thinking of the participants of the general-interest texts.
Verbal Reports

Accessing the process of comprehending while reading requires the use of verbal report according to Olsen, Duffy and Mack (1984). Verbal reports, in addition, provide the means to examine many of the strategies used by students as well as the interaction of the text with the reader’s background knowledge and cultural experiences. There were three types of verbal report, classified by Cohen (1987) to choose from: self-report, self-observation, self-revelation.

This study made use of self revelation, i.e. think-aloud protocols, specifically pair think-aloud protocols followed by retrospective interviews for various reasons. A short discussion follows on the reasons for choosing think-alouds, specifically pair think-alouds followed by retrospective interviews.

Self-revelation

Self-revelation or think-aloud protocols owe their strength to the fact that subjects verbalise their cognitive processes while completing a task (Cohen and Hosenfeld, 1981; Ericsson and Simon, 1980; Nunan, 1992). Two assumptions are required to validate the think-aloud protocol data: an information processing model of cognition and the existence of a short term memory and a long term memory (Ericsson and Simon 1980, 1984). According to Olsen et al. (1984), ‘think-aloud protocol data should reveal the kinds of strategies used, the kinds of knowledge sources employed, and the kinds of representations constructed’ (p. 257). Although this method can only give the strategies
that subjects are conscious of (Cohen, 1984), this method can still yield rich data for analysis and evidence of the learning process (rather than the produce), providing a means of exploring the cognitive processes (Flower and Hayes, 1983). Think-aloud protocols, as well as providing the means to examine many of the strategies used by students also reveal the interaction of the text with the reader’s background knowledge and cultural experiences. Think-aloud data in the present study could, therefore, provide insights into participants’ metacognitive abilities, for example, their control and use of strategies, as well as the kind of framing they used to help understand text.

The method of protocol analysis has other advantages: ‘... there is no delay between reading and responding; the data are a record of ongoing behavior; the data are closely related to the text; and the data are analyzed by the researcher for evidence of strategies’ (Olshavsky, 1977: 662). The concurrent verbalizations, moreover, are made while the relevant information is still in the reader’s short term memory (Krings, 1987).

Objections to this kind of data have been documented by Nisbett and Wilson (1977) and include subjects not having access to their cognitive processes because most of them are unconscious; the verbalization task alters the normal structure of the task. Krings (1987) argues that most objections to the think-aloud procedure are related to probing after the event rather than concurrent verbalizations. Ericsson and Simon (1980) have suggested that while some verbal reports may be incomplete, this does not invalidate the information that is given.
Another objection cited has been that 'introspective data at best allow inferences (never definitive conclusions) to be drawn concerning cognitive processes' (Kern 1994: 454). Think-aloud protocols were suitable for this study, however, because, like Kern's study, it required high inference measures because of the exploratory nature of the study.

Ericsson and Simon (1980) have stated, moreover, that 'when verbal reports are elicited with care and interpreted with full understanding of the circumstances under which they were obtained, they are a valuable and thoroughly reliable source of information about cognitive processes' (p. 247).

Pair think-aloud protocols

While think-aloud protocols can provide valuable data it was decided to use pair think-aloud protocols, where the data are derived from a discussion involving interaction between subjects, rather than individual think-aloud protocols as pair think-aloud protocols have certain advantages over individual think-aloud protocols. For example, as Davies (1995a) states the setting is more natural, the thought processes can be stimulated by a need to justify as the discussion involves interaction between subjects (Haastrup, 1987) and there is a decreased chance of participants giving responses for the benefit of the researcher. Inherent in the pair think-aloud methodology, then, is participant reflection. The pair think-alouds, therefore, provided the opportunity to examine the reading practices in some depth. In this study, the general-interest texts were marked
with a green dot at the end of every paragraph. Participants were asked to pause at each green dot and discuss their thinking about the short piece of text they had just read.


Retrospective interviews

While pair think-aloud protocols appear a useful method, they do not, however, reveal all the cognitive processes that occur during reading and gaps may need to be filled in. A dominant participant may inhibit his/her fellow participant, for example, and the latter’s reports as a result may be incomplete. The use of retrospective interviews, used in numerous studies, immediately after the pair think-alouds can help to provide further insights on what is understood and how, by giving the participants the opportunity to comment on the think-aloud protocols. There is also the opportunity for clarification and provision of further insights. Combining think-aloud techniques with retrospective interviews helps to compensate for any shortcomings of each method individually.
(Haastrup 1987). Nunan (1992) has pointed out, too, that the use of retrospective interviews provides a larger quantity of data which can clarify and enrich issues raised in the think-aloud protocols.

Auerbach and Paxton (1997), Chi (1992), Haastrup (1987), Jimenez, Garcia and Pearson (1996), Upton (1993) and Wade, Buxton and Kelly (1999) have used a combination of think-aloud protocols and interviews which have proved useful. For example, the study of Upton (1997) was able to examine, through the use of pair think-alouds and retrospective interviews how strategies such as translation were used by bilingual readers. Previously, research had established ‘translation’ as a strategy used by L2 readers but had not described how the strategy was used in the process of reading. Upton (1997) found from his study that less advanced ESL readers used their L1 more than the L2 when faced with unfamiliar vocabulary. The more advanced ESL readers did not need to use the L1 as much when reading as they had a more extensive vocabulary base. The less advanced ESL readers, moreover, tended to use their L1 to work out sentence meaning while the more advanced ESL readers used the L2 to work out meanings.

Using pairs of participants with English as L2 or L3, Woodfield (cited in Trollope, 1992) employed the pair think-aloud method with retrospective interviews and found that these methods generated much rich data about inferencing strategies (the focus of her study) and also generated information about extratextual and intratextual framing strategies.
In the retrospective interviews, in the present study, questions were asked, not only to clarify any points made in the pair think-alouds, but also to allow the participants to elaborate on their reading processes if they wished. Because changes in reading approaches were of interest in this study, pair think-aloud protocols and retrospective interviews were again carried out in third semester as well as individual interviews.

The advantages of the combination of pair think-alouds and retrospective interviews were important to the present study. In order to investigate the reading practices of two cohorts of students, namely, Thai and Indian/Bangladeshi, it was necessary to gain insights into, not only the reading practices as they were taking place, but also to uncover the various socio-cultural and educational influences on those practices from participants’ own accounts and as inferred from the researcher’s observations (in the home countries and in Australia).

In summary, the pair think-aloud protocols provided a ‘window’ through which one could actually observe how the participants were approaching their reading. The retrospective interviews allowed questioning of, or confirmation of, the practices which had been observed by the researcher, and access to the interpretations of practices in context.
Pair think-aloud protocols have been used in ESL research but not much in conjunction with other methods such as interviews or have not been used to track or describe the intricacies of how reading processes are used or when they vary (Fitzgerald, 1995).

The use of individual interviews in conjunction with pair think-alouds and retrospective interviews in the present study helped to present an holistic picture of reading practices in first semester and again in third semester, highlighting changes in those reading practices and the influences on those changes.

Interviews

In first and third semester, the participants were individually interviewed to give them the opportunity to reflect on and discuss a piece of academic writing from their own discipline (which they supplied and read before attending the interview) and how they approached this and other academic texts.

Whereas the retrospective interviews which followed the pair think-alouds provided further insights into the students’ reading practices and clarification where necessary, of parts of their protocols, the individual interviews were carried out in conjunction with the pair think-aloud protocols in first and third semester in order to track changes in the participants’ reading practices. Interviews used in conjunction with think-aloud protocols (not pair think-aloud protocols) were chosen by Jimenez et al for their 1996 study of reading strategies of bilingual Latina/o students. Horiba (1996) used a
combination of written recalls and think-alouds to assess how the reading processes were taking place between ESL readers and native English readers; the recalls served as an indication of the connection between the reading process and the product (comprehension).

Semi-structured approach in interviews

The majority of the questions used in the individual interviews to ‘access the perspective’ of the students (Patton, 1990: 278) were semi-structured. The questions were generally framed using the four categories from frame theory; the questions related, therefore, to circumtextual, intertextual, intratextual and intratextual framing. For example, under ‘intertextual framing’, the participants were asked, ‘Does this book/article remind you of other books/articles in India/Thailand?’ Under ‘intratextual framing’, the participants were asked, ‘What do you think of the language and structures used in this text?’ Within these broad categories, other questions were designed to elicit information on metacognitive aspects. For example, to assess knowledge of vocabulary items, participants were asked, ‘Were there any words/phrases you did not understand? How did you find a meaning for those which were difficult to understand? (see appendix 1 for full list of questions).

Students, however, were given freedom to digress and raise their own topics as the interview progressed. Yin (1984) states that, by having open-ended questions, the interviewer can ask the respondent for the facts of a matter as well as for the respondents’
opinions about events. In addition, Borg and Gall (1983) suggest that the skilled interviewer, through careful motivation of the subject and maintenance of rapport, can obtain information [within ethical consideration] that the subject would probably not reveal under any other circumstances.

Webb et al. (1981) mention, however, that open-ended questions can be inefficient as information given may be irrelevant. The researcher endeavoured to ensure that the issues being questioned were well defined and thus did not lead to too much irrelevant material being offered. Receiving detailed information, it was felt, outweighed the likelihood of being offered irrelevant data.

The variety of interview procedures used in this study gave participants, with their differing approaches to text interpretation, scope to contribute information. They also enabled the researcher to ‘tap’ into the readers’ actual metacognitive awareness of their reading approaches. Qualitative methods, in particular the retrospective interviews, also gave the researcher the ability to probe for further relevant data. In addition, the detailed data from participants gave the researcher the ability to correlate and cross validate responses. Moreover, the detailed data provided the researcher with the means of understanding how or whether individuals are unique but also share common characteristics with each other (Wolcott, 1997). The main disadvantage of interviews is the cost in terms of time. The advantages, however, seemed to the researcher, to outweigh the time disadvantage:
Researcher can clarify respondents’ answers by asking additional questions;

Information can be secured through observation of body language;

Rates of cooperation tend to be higher than other methods;

There is the opportunity to identify each person providing information (Burns, 1990; Jaeger, 1988).

Observations and interviews overseas

In order to enable the researcher to understand students’ ‘thoughts and meanings, feelings, beliefs, and actions as they occur in their natural context’ (Schumacher and McMillan, 1993: 407) field trips were undertaken to university campuses in Thailand and India. Much of the research in reading is about the difficulties which students seem to have but not about ‘how they got there’ (Guthrie and Hall, 1984: 100). More specifically, then, the field trips were organised to provide valuable insights into how reading is taught, what texts are used, how lectures are presented and the cultural backgrounds which affect teaching/learning and interpretation of text. As Bloome and Green (1984) state, description of the social and linguistic contexts of reading, reveals the processes which influence the cognitive process of reading.

**Participants**

The participants were selected with commonalities in mind as, according to Schumacher and McMillan (1993), selecting participants with similar experiences to one another is a
criterion of ethnographic study. The six Indian/Bangladeshi and six Thai students chosen for the study had completed their undergraduate studies in their home countries and were undertaking higher degree study, either postgraduate diplomas, Masters or PhD studies. They all had the entrance standard of IELTS 6 as an English language proficiency level (this level has since been raised to IELTS 6.5). In addition, the Thai cohort, as did the Indian/Bangladeshi cohort, shared relatively similar cultural and educational experiences in their home countries.

Furthermore, Indian/Bangladeshi and Thai students were chosen because Australian universities are already recruiting students from these areas and are likely to increase enrolments in the near future. However, as there were less Indian students available, Bangladeshi students were asked to volunteer as participants from the Indian sub-continent. While much research has already been carried out with Singaporean, Hong Kong and Chinese students or Asian students as a group, there is little research, if any, with Thai or Indian/Bangladeshi postgraduate students. More importantly for the present study was the fact that the Indian/Bangladeshi and Thai students came from two different non-alphabet based language backgrounds. Although this study was not designed to be a comparative study of Thai and Indian/Bangladeshi reading practices, nevertheless it was expected there could be some indications between the groups of similar or dissimilar patterns; the different language backgrounds might highlight effects on their approaches to reading. The general aim of the study, though, was for the two cultures to provide two discrete descriptions of the reading traditions and practices associated with their own
countries and the changes in practices which they endeavoured to make over the course of three semesters. Moreover, aspects important in one context for one group often become apparent when differences are observed between two different groups.

As there were not sufficient enrolments in any one discipline area, the participants at the two Australian universities were selected from a variety of disciplines: geology, computing, telecommunications, art, education, pharmacy. The research shows, however, that different disciplines have different expectations and the variety of disciplines to which participants belonged in this study, it was thought, could highlight some of those differences, especially with regard to reading. Further detail is provided on page 142 so that the reader can more easily relate the participants to the findings.

The other cohort of participants, those interviewed in situ at their own universities, were from the Faculty of Education of a Thai University and from the Faculty of Geology at an Indian University. The researcher had the opportunity to interview a range of levels, from secondary school to postgraduate level at the Thai university and postgraduate level only at the Indian university. These observations provided data on the educational approaches used in lectures and in reading classes in these countries.

**Ethical issues**

The researcher ensured confidentiality and respected the students’ privacy and cultural differences. All the students involved in the research were advised of the nature of the
project and they were assured that their responses would be confidential. They were also informed that their contributions were voluntary and, if at any time they wished to withdraw from the study, they were free to do so.

**Choice of text**

For the two pair think-alouds, one in first semester and the other in third semester, two passages were chosen from the ‘This Week’ segment of *New Scientist* (1997), one entitled ‘Deadly worm may be turning drug-resistant’ (see appendix 2) and the other entitled ‘French officials on poisoning charge’ (see appendix 3). These particular texts were chosen because they were one page general-interest pieces with intratextual features of a picture, a table and a highlighted sentence situated in the middle of the piece. As the texts both came from the ‘This Week’ page they also incorporated a similar style of writing, enabling a comparison and examination of the changes in reading practices between first and third semester. In addition, the texts did not require any technical knowledge and the participants could be expected to have some background knowledge of the topics to assist them. The texts, also, did not deal with political, religious or any culturally sensitive matter.

The texts comprised only approximately 750 words and so could be read within the time allowance of one hour. (Participants had already intimated their lack of time). It was important, too, that participants had the time to read an entire article and not just a few paragraphs of a text. In this way, they could observe the structure of the entire text and
use any knowledge they had of intratextual features. The texts, too, were authentic in that there were no ‘planted’ inconsistencies or errors.

**Recording**

All interviews were tape recorded both at the Australian campus and on the Thai and Indian campuses, except where circumstances did not allow (noisy environment, reluctance of students). Verbatim transcriptions were undertaken.

**Data analysis**

The data analysis related to the framework of the study which was grounded in metacognitive and frame theory. Inductive data analysis was employed as an ethnographic approach was used. In other words, broad categories were used to analyse the data but detailed categories were not imposed upon the data. In research using an ethnographic approach, most categories and patterns emerge from the data rather than being imposed prior to data collection (Le Compte and Preissle, 1993; Patton, 1990; Schumacher and McMillan, 1993) but some topical categories can exist before the analysis takes place. In the case of the present study, these topical categories reflected the two theories grounding the research, metacognitive theory and frame theory and guided the initial analysis.

These were the categories generally thought to be important components of metacognition in reading, namely: Knowledge of self, Knowledge of task, Knowledge of
text structure and Knowledge and application of strategies (see chapter two). In addition, the categories from framing theory were also used: Intratextual, Intertextual, Extratextual and Circumtextual framing. Coded data, a useful procedure, for example, for identifying various strategies, was used because it shows relationships between variables (Firestone and Dawson, 1988) and enabled the broad categories to be broken down into further categories. Moreover, once categories have been established, as Le Compte and Preissle (1993: 237) have stated, ‘the portrayal of a complex whole phenomenon’ emerges.

As shown in Figure 3.3 the data analysis incorporated seven phases. Firstly, data were coded and put into categories, broadly defined framing and metacognitive categories, from the Thai individual interviews, the Indian/Bangladeshi individual interviews, and the Thai pair think-alouds and the Indian/Bangladeshi pair think-alouds. Summaries were written of the data and researcher observations to focus the study (Miles and Huberman, 1994; Schumacher and McMillan, 1993).

Secondly, the Thai interviews were then grouped, compared and re-analysed; similarly the Indian/Bangladeshi interviews were grouped, compared and re-analysed. Thirdly, the Thai interviews and pair think-alouds (shown in the figure as PTA) were grouped together and re-analysed and interpreted to provide explanations of the students’ reading practices. The same process took place with the Indian/Bangladeshi interviews and pair think-alouds. Through this three staged process, patterns of similarities were produced and differences were highlighted. The same process took place in third semester,
enabling a seventh phase, a comparison between case studies in first and third semester, thus demonstrating a multi-case approach (Firestone and Dawson, 1988). The data were reported from the third and sixth phases and then from the seventh phase (Figure 3.3).

As the aim of the study was to provide detailed data on the reading practices and the influences on the reading practices of Thai and Indian/Bangladeshi postgraduate students, the transcripts were analysed using ‘thick description’ as advocated by Lincoln and Guba (1985). The rich description helped to illustrate the reading practices which signalled, specifically, the framing and metacognitive differences between first and third semesters within each culture and, indirectly, between the cultures.
Validity and the use of intuition in data analysis

Multiple data sources were used in this study to generate varying perspectives on reading behaviours as qualitative research credibility is most likely to be achieved by pluralistic interpretations (e.g. triangulation) that embrace and explain cultural variations (Tedlock, 1983).

A researcher’s intuition provides a very rich source of subjective understanding of qualitative data but careful design of the study is necessary to minimize the threats to validity such as limited exposure to research settings, selective memory and bias (Firestone and Dawson, 1988; Patton, 1990). Being aware of these issues of validity, the researcher, after careful consideration, chose several methods for data collection which would enable cross validation (Schumacher and McMillan, 1993) to minimize the threats to validity.

Triangulation

Triangulation, then, was used to strengthen the study. Elliott (1991) explains that triangulation is not so much a technique for monitoring, as a more general method for bringing different kinds of evidence into some relationship with each other so that they can be compared and contrasted. According to Patton (1990) triangulation can be achieved within qualitative inquiry by combining different kinds of qualitative methods and studies using multiple methods to provide cross-data validity checks. With regard to the present ethnographic approach, Hammersley and Atkinson (1983) say, ‘the multi-
stranded character of ethnography provides the basis for triangulation in which data of
different kinds can be systematically compared’, providing an efficient means of
handling threats to validity.

In this study, Methods Triangulation and Triangulation of Sources were used to
overcome most of the bias or error that could arise by using a single method only (Patton,
1990). Cross-case analysis is attempted, too, (i.e. between case studies in first semester
and case studies in third semester) to enhance generalizability and to deepen
understanding and explanation (Miles and Huberman, 1994).

The individual interviews elicited information on general aspects of reading and
background reading as well as reading practices related to subject-specific text in the
Australian context. The pair think-aloud protocols provided data on the actual thinking
processes of the students at the time of reading general-interest text. In this way, data
could be gathered for a comparative study of the students when interpreting general-
interest text and when interpreting subject-specific, academic text; and for a longitudinal
study showing the changes in reading practices used by the students between first and
third semester. The additional information from the individual interviews, it was
thought, would help validate or add to the information from the pair think-aloud
protocols, thereby providing ‘rich’ data for the ‘intuitive’ analysis.
The use of pair think-aloud protocols and retrospective interviews gave the participants
the opportunity to become aware of, and then reflect on, their reading practices between
first and third semester. In addition, the participants were asked to confirm/deny the
findings and interpretations of data by the researcher because ‘researcher-constructed
descriptions of reality may be quite different from the meanings that participants use to
that interviews to elicit opinions about language behaviour are increasingly being used
with foreign language learners ‘who seem often to show a greater ability than might have
been expected to introspect usefully about their conscious learning strategies and
communication processing activities’. He warns, however, that there is ‘considerable
variation between individual cases in the amount of information they are able to access’,
i.e. difficulty of access relates to what elements of language behaviour are at ‘a conscious
level’ (p. 65).

Validity
In addition to the use of triangulation, data were also collected through observations of
teaching practices in India and Thailand. The observations, which took place before the
interviews and pair think-aloud protocols, were used to generate hypotheses and, during
the analysis phase, to help explain some of the findings, thus enhancing the results’
credibility. One hypothesis, for example, was that the formal English language
instruction and the informal learning would have influenced the application of
extratextual framing capabilities when reading in Australia. Another was that the varying
language usage, as described in chapter one, could impact on intratextual framing capability if English were not used for reading English written texts with any degree of criticality.

It is acknowledged, however, that, even with triangulation, researcher bias can still be present. Besides the procedures of cross checking through triangulation of methods, the inter-subjective approach was also used whereby students were asked to read the data to confirm or deny analysis to reduce the likelihood of researcher bias.

The Inter-subjective approach

The researcher was aware that the analysis of findings and, the later stage, the interpretations, could be influenced by her own biases. The participants were asked, therefore, to confirm or deny the interpretations of data by the researcher by later reading the transcripts. Participants, in addition, offered their own reflections of their reading processes in their individual interviews (demonstrating much more awareness of their own reading processes in the second interview). The students' views helped to confirm or deny data gathered from the pair think-aloud protocols, the individual interviews and from observations carried out overseas. Similar questions were asked in both individual interviews, allowing for comparison of the reading process between first and third semester. Consultation with participants in a study can also produce additional data, differing perspectives both during the study and at the analysis stage. In addition, the participants were asked to clarify their responses in the retrospective interviews which
took place directly after the pair think-alouds. In this way, any misinterpretation on the part of the researcher was uncovered and further clarification was provided.

As qualitative studies can produce a variety of interpretations, it is hoped that the combination of approaches described above and justified for use in this particular study has led to the ‘best’ interpretation of the data as possible at this time.

The next chapter presents the first semester findings from the data generated by the Thai postgraduate students studying at an Australian university. Data gathered from the observations and interviews undertaken at a Thai university helped to explain some of the findings.
Chapter Four

Thai postgraduate students’ reading practices in first semester

Introduction

As discussed in the previous chapter, the conceptual framework underlying this study combines metacognition and framing theories. Concepts derived from these two theoretical frameworks are used to explore the nature and origine of students’ reading practices. These are discussed, in all four results chapters, with regard to the broad metacognitive reading components: Knowledge of self, Knowledge of task, Knowledge of text structures, Knowledge of strategies and their applications, in conjunction with types of framing: Circumtextual, Intratextual, Intertextual and Extratextual framing.

In this chapter, the metacognitive components and the framing elements are examined with reference to the Thai participants’ reading practices during their first semester. The respective impact of home countries and Australian experiences on their reading practices are examined. Two research questions were addressed:

What are the reading practices of Thai postgraduate students when studying in first semester at an Australian university?

To what extent and how do the students’ home country and Australian experiences shape their current reading practices?
This chapter firstly presents the profile of the Thai participants and then provides insights into their reading practices during their first semester at an Australian university. This chapter, as well as discussing the students’ reading practices, shows the early stages of the students’ negotiation of the different expectations to accommodate to their new environment.

The data reported in this chapter are derived from the individual interviews, pair think-aloud protocols and the retrospective interviews conducted in the first semester of study of the Thai cohort of students. Two texts were used for the study, a discipline-specific academic text (chosen by each participant) and a general-interest text (chosen by the researcher). The participants were asked to read their own discipline-specific text prior to the interview and were advised that they would be asked questions relating to how they had approached the reading of this article. The general-interest text for the pair think-aloud protocols was chosen from the *New Scientist*, ‘This Week’ segment; it was read by pairs of participants who were asked to vocalize their thoughts as they were reading.

The chapter concludes with a summary and discussion of the results. It highlights the changes in the Thai students’ reading practices during their first semester at an Australian university, as self reported and as inferred from the data.

**Profile of the Thai students**

The six Thai participants were chosen for the study because they had only just arrived in Australia to embark on postgraduate study. They had all completed their undergraduate study at Thai universities and the main language they used at home was Thai. These common aspects enabled the researcher to investigate the Thai socio-
cultural and educational influences which might impact on their reading practices on first taking up their study at an Australian university. The researcher was then able to identify the changes in reading practices which were taking place as they progressed through their study.

Table 4 presents the participants, their disciplines and the academic texts used for the individual interviews and the general-interest text used for the pair think-aloud protocols in their first semester. Excerpts of the academic texts chosen by the participants are shown in the appendices where reference was made to them in the interviews.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Discipline</th>
<th>Academic text</th>
<th>General-interest text</th>
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<tr>
<td>A2</td>
<td>Design</td>
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<td>B2₂</td>
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While not being able to compare the practices of Thai students reading texts from a particular discipline area, the fact that the participants were studying in different fields enabled the researcher to gain insights into the relationships between the differing educational and knowledge backgrounds of the participants and their reading practices.

A1, aged 33 and female, as well as completing her studies in Thailand had also been a lecturer at a Thai university. She was enrolled in a PhD in chemistry in Australia. She had a secondary and tertiary background in chemistry. She explained that her reading experience in Thailand latterly consisted of reading textbooks related to teaching as she had had no time for research. The texts she read were in Thai or English.

A2, aged 25 and female, was a Thai Chinese enrolled in a graduate Diploma course in Design. In Thailand she had been a research assistant at Thammaset University, a journalist, an assistant teacher in German and Thai languages and secondary school teacher of art. She withdrew from her course after the first pair think-aloud and was replaced by a male (A22) who had been a lecturer in computer science in Thailand at a Bangkok College. At the time of the interview, he was enrolled in a PhD in computing. During his last ten years of lecturing in Thailand he reported that he had not written in English and only spoke in English when an English speaking lecturer visited. Like A1 he had done little reading in Thailand due to lack of time.

B1, female, was studying for a PhD in computer science; she had been a university lecturer in Thailand. Her experience in Thailand was similar to that of the other students. She said she only read to prepare for classes for her students. There had been no time for research.
B2 was also a university lecturer in Thailand and he was enrolled in the Public Health field of study. He withdrew from the university shortly after his first pair think-aloud. He was replaced with a postgraduate female student from the education faculty (B2₂).

C1, aged 30 and male, was a lecturer of art in Thailand. He was enrolled in a Masters in Visual Arts in Australia.

C2, aged 24 and female, was enrolled in a graduate Diploma in Banking and Finance in Australia.

A detailed discussion of the Thai participants’ reading practices during their first semester and the perceived influences on these practices follows. The order of discussion begins with Knowledge of Self followed by Knowledge of Task, Knowledge of Text structure and Knowledge of Strategies and their applications. Integrated into the discussion, are the four framing elements beginning with Circumtextual framing, followed by Intratextual framing, Intertextual framing and Extratextual framing. Data on the Thai undergraduate education were gathered while the researcher was on a field trip to Thailand. It is used to explain and better understand Thai students’ experiences and reflections on their reading practices during their first semester of study.

**Knowledge of self**

The six Thai participants appeared generally aware of their reading abilities and they had assessed them in relation to their expectations of study at an Australian university. Early in their first semester, the Thai participants demonstrated an awareness of a mismatch between their reading practices and what they thought was expected of them
at an Australian university. For example, they were aware that they had not done enough reading during their undergraduate studies in Thailand to enable them to manage the reading requirements for their graduate and postgraduate studies in Australia with ease. They were also aware that the Australian teaching methods were different from those they had been accustomed to in Thailand. They had realised their difficulty in discussing these differences with their supervisors or fellow students due to lack of fluency in their oral English.

The participants also recognized that they were no longer reading to memorise facts for examinations; they were, however, still reading, as one participant stated, to ‘get’ ideas, i.e. reading facts to ‘get ideas’ rather than to discuss or critique any texts they read. A2 pointed to the influence of the educational system in Thailand which encouraged reading to learn facts rather than reading to critique:

_There is not much interaction [with Thai teachers]; we cannot ask about passage – that is the way of life – respect for teacher; we do not argue; we read for information._

C2 offered another reason for the lack of discussion with lecturers in Thailand. She said that, in Thailand, students did not ask the teachers many questions because it was made clear that they [the teachers] did not wish to conduct long classes. However, because staff and first year students lived on the campus the researcher visited, students could visit their lecturers in the evening if they wished, so, although the lecturers may not have liked long classes, it appeared that they were willing to conduct one on one consultations at other times.
The researcher experienced this kind of interaction between student and lecturer and respect for status firsthand when giving classes at a Thai university. The postgraduate students would arrive with drinks and cake, sometimes, even small bags of home-prepared food for the lecturer. They offered to carry out small services – posting of letters, carrying of books and so on. These services could extend outside normal university hours. It was observed that, when a Thai lecturer fell ill and required treatment for a year at a hospital in Bangkok, one of the students and the student’s daughter accompanied the lecturer on each of her visits to hospital and attended to her needs also in her home.

The researcher also observed that respect is partly instilled through dress codes on Thai campuses. Students, at the campus the researcher visited, wore a uniform and, in first year, white ankle socks for the females. Staff wore a uniform on special occasions with various insignia denoting length of service and status. Such is the status of university staff, they were not required to wear black and white as school staff had to, for seven months, following the death of the King’s mother.

These socio-cultural insights helped to explain the context in which learning occurred in participants’ home country. The lack of experience in discussion and critiquing of text in the Thai undergraduate context helped, moreover, to explain the reticence by this group of students to engage in critical reading of text, despite their awareness of the expectations of Australian academic staff. A2, for example, had soon found that his supervisor expected him to read and to ask questions. Discussing text, however, was cited as a considerable challenge by several of the participants. Discussion of texts with peers was a practice missed by the participants from their undergraduate days. There were other difficulties which discouraged the participants from discussing
texts with their supervisors: pronunciation, the practice of translation and the lack of confidence in their oral abilities. A1 explained that she not only translated when taking down notes at lectures but while trying to speak with her supervisor even though she was aware that translating was making her discussions a slow and difficult process:

*Translating from Thai into English makes me feel confused about putting words together in the right order.*

While using this strategy, though, A1 said she was, at the same time, memorising technical terms in English, thus demonstrating a partial shift in strategy use to accommodate the learning of new terms.

Although there was opportunity to participate in some seminar discussions at their Australian university, A2 explained why this was challenging for them:

*The lecturer is the leader and the students are followers. The Western students speak more and some of the mature age students who are older than the lecturer, speak most of all because they believe their experiences are more worthwhile... The oriental students speak little because the talk is too fast and because of the special terms in the text.*

The explanation shows evidence of a cultural expectation that the lecturer should lead and the students should be followers. At the same time, there was the desire by students to be self-directed and to participate on an equal basis with the other students. However, their oral capacity and lack of knowledge of technical terms inhibited them.
A2 would very much have liked to participate in her design seminars and had much to offer from her varied professional background as teacher, researcher and journalist.

The six Thai participants appeared to be used to discussion among their peers in their home country. During her visit to a Thai university, the researcher was invited to take some postgraduate classes in text analysis. It was evident to the researcher that students were accustomed to working in informal groups and, in fact, it seemed almost impossible for them to work alone and offer comment on the text without first consulting with members of the class. They explained, too, how they found it difficult to express orally what they were thinking. One student expressed his difficulty in a rather charming way:

*I don’t speaking English but I smile!*

It was observed also that these Thai-based students seemed to always read quietly out loud when presented with a text pointing to a sound-system of learning. Pronunciation difficulties could disrupt this system of learning. In answer to the question, ‘what helps you to improve your reading?’, one Thailand-based student responded:

*Practise more a[nd] lear[n] more*

It was observed that many students did not pronounce two consonants without inserting another vowel and often missed out the second consonant, as in the response above – hence ‘I can’t go’ and ‘I can go’ often sound the same. Pronunciation could lead then to difficulties with interpretation of text as well as discussion.
A2 faced another difficulty when trying to discuss his research with his supervisor. He reported that he would not ask his supervisor to assist with the interpretation of a text as 'it would take him a long time to explain'. A2 has an Indian supervisor and has no doubt encountered the more descriptive literary style of the Indian academic. C1 had also noted that staff and authors expressed the same concepts differently; this utterance demonstrated his awareness of multicultural perspectives:

*Maybe the people of the world are the same, same ideas, same meaning of beauty, the same meaning of aesthetics but different culture ...*

**Knowledge of task**

As well as re-assessing their own abilities, as discussed under Knowledge of Self above, the participants were also coming to terms with the differing tasks that were expected of them at an Australian university. Different educational systems demand reading for a variety of purposes. In Thailand, at undergraduate level, the participants reported, as mentioned earlier that they read for examination purposes. In Australia, they now realised there were different expectations, the main one being for basic understanding of their discipline areas. Some of the participants demonstrated already in first semester a shift in their reading approaches to enable better understanding. For example, A1 demonstrated her awareness of the requirements of her new field of crystallography:

*I need to know how to grow crystals from solutions, how to choose solvents for mineral and need to know the factors and learn how to control the factors*
A1 had clearly developed a focus and knew what her immediate task was at this time – to read for specific information in the context of her specialist area.

A2 had developed a specific approach to the reading task based on language help from the Dean of Humanities in Thailand (who had spent several years in England). A2 said she asked herself before reading:

*What should I know, which details should I know about, statistics, graphs.*

The other participants had less specific goals. C1, for example, read ‘for understanding and for catching ideas’. He also added that he read, not to develop his own viewpoint, but to find out what the author’s view was as ‘he is a great writer’ showing the reverence he felt for the author and ‘expert’ of his text. His motivation to read was increased by the desire to help his students on his return to Thailand and to this end, when new ideas presented themselves in texts, he took note of them to pass on to his students. B1 also had more long term goals; she read, she said, not only to help her acquire knowledge in the short term but in order to enable her to write a book of her own when she returned to Thailand as few people there did research in the field of multimedia. While these long term goals are commendable, it may be that the participants had to become more focussed on what they need to know in the short term, like A1, in order to be able to grasp the concepts and proceed with their research.

**Differing expectations**

The reading tasks often met with difficulties due to the unexpectedness of the Australian university teaching methods. In Thailand, B1 stated she prepared sequences of overheads and notes for her students to help them understand new concepts. She
was finding, as were the other participants, that this level of assistance was not always provided in Australia, possibly because a certain amount of knowledge was assumed and/or students were expected to find information for themselves. A22, also a lecturer in Thailand, demonstrated his awareness of the differing expectations at an Australian university and a Thai university:

\[\textit{In Thailand, lecturers give ideas but now in Australia I have to get idea by myself.}\]

Tertiary study in Thailand appeared to be similar to secondary study in Thailand. For example, while observing an English reading class for secondary school students in Thailand, the researcher noted that the practice of giving ideas was carried on at secondary level teaching. Each class member was asked to read a sentence and give its meaning. More often than not, the teacher wrote her own interpretation on the board, translating into Thai to further clarify. As these students said, ‘secondary teachers give – they are the centre of study’. Reading seemed to be a very text focussed activity; the researcher did not observe any reading tasks which encouraged the students to become more independent learners.

**Circumtextual framing**

Circumtextual framing was commonly used by the Australian-based Thai participants once they had defined their immediate reading requirements. The participants chose strategies which would enable them to access appropriate texts. For example, they relied mainly on circumtextual aids such as the title, table of contents, author details and abstract. Presumably, these cues had been useful to them in the past. Colour,
another cue, peripheral to the text, was also mentioned by the Thai participants. C2, for example, was attracted to the colour of the front cover of her article – the colour purple – the royal colour in Thailand. It was reported that the title was often chosen because it not only signified a topic the participants wished to know more about, but to clarify a term; for example, C2 chose an article entitled ‘agency costs’ because she had not understood this term when it was mentioned in her compulsory text.

**Knowledge of text structure**

The circumtextual framing helped the participants to identify texts appropriate to their tasks. They then needed to have knowledge of the features in a text which would guide their reading and ultimately their interpretation. They needed, moreover, an awareness of the differently structured texts of English and Thai authors in order to be able to negotiate meaning.

C1, demonstrating this aspect of metacognition in reading, that is knowledge of text structures, explained his perception of the difference between a Thai and English sentence:

>Thai sentence is like a series, like step by step but English sometimes you must understand the whole sentence and you know the main idea of this sentence and the example ... in Thai you could take a small part and understand that totally without reading full sentence ...

From C1’s comment, it can be seen that sentence complexity and length of text seemed to be important factors in reading. It could be expected from the specific comments
made by C1 that Thai students could misinterpret English authored text by not reading to the end of sentences for complete meaning; indeed, they reported that long, complex sentences were difficult for them. The Thailand-based cohort confirmed the difficulty with complex sentences.

The researcher took a group of postgraduate education students for text analysis. These particular students were specialising in children’s literature. The researcher chose a children’s story entitled ‘Bobby’s Dream’ (see appendix 4) for the group to read and comment on. Although the text used a large font and used clear, simple language suitable for children the students stated they preferred reading Aesop fables in Thai because, they said, they were easier to read than the short children’s story the researcher had presented to them; Aesop fables, they explained, had ‘a few small pages’. The children’s story chosen by the researcher had only five and a half pages of large font. To feel comfortable with an English text at this stage, these students, then, confirmed they needed short, simple texts. Perhaps, because they were accustomed to reading for facts, as mentioned earlier, the students could only accommodate so much information in their short term memories and thus needed short texts.

The Thailand-based students mentioned that typographical features, large print and headings in a text assisted their understanding. The large print presumably made the text more visually attractive and easy to read; the headings helped to signpost important aspects of a text.

C2 provided additional insights. An English text written by a Thai author would be easy to read, she said, because the vocabulary would be simple and the print would be
larger than in English authored texts. She mentioned that she was familiar with American authored texts and they, too, when available in Thailand, were in large print.

However, if English authors 'organised well' as C2 had found with her current article, Agency Costs (see appendix 5) in which 'the introduction presented the background to the problem, what the problem related to and its effect, followed by further detail', she could understand relatively easily.

The differences between Thai and English text structures were also cited by the Thailand-based students as being an area of difficulty. They explained that there were no verb tenses in Thai; readers rely on adverbs for the timing of events. Adjectives follow rather than precede nouns and sentences tend to be of simple construction.

On the other hand, as B22 explained, Thai authors were rather more descriptive and discussed 'what they think'. Therefore, she, like C2, had found English authored texts to be more 'logical and helpful' and, as her comment shows, she relied on the use of intratextual cues:

*I got introduction, so I know what is general idea and for the main body has got headlines, what is that, so I can know what is the content and the conclusion.*
Knowledge of strategies and their applications

Intratextual framing

Using headings for selective reading

The participants knew how to frame intratextually from their English language lessons in Thailand. They knew, for example, to use the headings to find the main ideas and the first sentence in a paragraph to find the main theme. B1 and A2 reported that they had since found that not all main ideas are to be found in the first sentence of a paragraph. C2 chose the current article (appendix 5) because the last heading, 'takeovers in the oil industry' related to a question associated with a topic she did not understand and she thought this article could provide some answers.

Using headings, some of the participants were able to be selective in their reading even in first semester. C2 mentioned, for example, that she only read the relevant headings while reading from beginning to end of the text. One important strategy for her was to read and re-read in order to understand the first paragraph and hence the rest of the text. A2 stated that he used diagrams to help him select what was necessary to read.

B2 was also selective. She would look at the contents page, then the introduction, headings to the end of the text and then revisit the section of the text which described the main focus. After that, she said, she would look at the problem, then the conclusion; the conclusion, she found, usually stated whether or not a problem had been solved. If the problem had not been solved, she would use intertextual framing and seek solutions from other texts.
A2 also focussed on the conclusion due to the following advice from her Dean in Thailand:

If not sure, move your eyes – don’t worry about information and skim to next paragraph and find what text would like you to do. Don’t read line by line.

Best way to know about information, go to conclusion – the last sentence – and you can know more than 50% that writer would like you to know.

There seemed to be a certain reliance on the conclusion for information. Several participants, however, had since found that conclusions are not necessarily concluding paragraphs bringing together the main themes of a text but often provide suggestions for future research.

The Thailand-based students demonstrated difficulties with conclusions, too. Two separate classes did not look at the conclusion of their one-page texts (appendix 6) and, when asked, did not seem to understand the content of the conclusion. Perhaps there were not sufficient intratextual markers and they lost concentration before reaching the end of the passage. ‘Written texts, unless they are very brief, require a reader to carry along a great deal of accumulated information and to understand any details in terms of their position in a temporally unfolding sequence’ (MacLachlan and Reid 1994: 97).

Although the passage was brief, these students, struggling with their second language, may have needed more markers to assist. One of the Thailand-based cohort identified the root of their confusion in this way:

The complex sentences make me a lot of troubles. Sometimes we can’t find the main point or the conclusion.
The pair think-aloud protocol of C1 and C2 demonstrated similarly how, after reading all the text, the conclusion could still be misinterpreted. The conclusion read as follows:

Achim Harder, head of anthelmintic research at Bayer, the German company that makes praziquantel, says it is not clear why the drug is less effective in Senegal. Resistance is one possibility, he says.

C1, when asked in the retrospective interview about the meaning of the conclusion, interpreted very freely, saying the author described the outbreak of the disease and how humans, if they cannot fight nature, try a medicine without first finding out how the worms will react towards the medicine; the author only mentioned the drug in connection with Senegal. C2, on the other hand, thought the conclusion suggested that there was ‘not a lot of hope’ as there was ‘only one possibility’. C2 seems to have misinterpreted through adding the word ‘only’ to the text.

Reflecting on his general academic reading, C1 reported that, as he had time on his side, he did not require to read selectively. Although he read the first paragraph word-for-word to enable him to skim read the rest of the text, he reported that he read the ‘whole of books’ unselectively ‘looking for the different vision’. It may be that C1’s more extensive general reading will enable him to identify a variety of research questions whereas the readers who are focussing on specific problems in their field may be limiting their choice of research questions.
Using intratextual cues: graphs, tables

As well as looking at the text elements of introduction and conclusion, all the participants used intratextual cues such as headings, pictures, graphs and tables. While these intratextual features aided reading, there were still some difficulties. B1, for example, made use of tables and diagrams, but her article (see appendix 7) still took her six or seven hours to read over three days because she had to ‘double’ read. Tables, she reported, were easier to understand generally than the text although there were some tables she could not understand if the contents were not clarified within the text. B2 also reported that, while figures and boxes were useful, it was very important for international students to have the figures within detailed explanatory text.

Another intratextual feature, pictures, can also aid reading. C1 stated, referring to his academic article (see appendix 8), that pictures stimulated his imagination:

\[\text{The author use example of famous picture or famous sculpture so I can imagine}\]

C1 relied heavily on visuals at this stage, possibly because he was a student of art form, and described his preference:

\[\text{Normally I like to read magazines, design; the nature of design or art is people to accept the visual picture more than try to understand the text so for the magazine is news and have some, a lot, of picture and a little bit of explaining – so easy.}\]

Although a picture can aid reading, it was found in the pair think-aloud protocols that only C1 and C2 made use of the picture. There were two pictures at the top of the text;
one showed the people of Senegal in the river and the other showed the worm which was alleged to be drug resistant. C1 explained, with regard to these pictures, that he looked at the picture ‘to relate it to the text, to find out what the worm looks like and to find a relationship with a situation in Thailand’ demonstrating a desire to relate the pictures to a familiar cultural environment. He found that the picture ‘tells a lot of the culture of the people, the environment, the habit’ and he noted the use of plastic containers by the people depicted in the picture. Showing, too, his interest in the environment he noted that these containers illustrated how civilisation could create problems for people possibly alluding to their use for collection of water – water which could be contaminated. As mentioned earlier, C1 has found that pictures stimulate his imagination and he ‘sees’ a story; the other participants, however, did not use the pictures probably because they were not alluded to in the text. C1 used text features, especially visuals, because he was aware of his inability to understand textbooks. He explained:

...for me a text book mean use very hard words and the sentence is long sentence and hard to understand.

Despite having graphs, pictures and diagrams in their academic texts, the participants reported that they found that length and complexity of these texts compounded their difficulty in interpreting the material. To help them read more effectively, the participants used a variety of strategies. These strategies, their uses and effectiveness are discussed next.
Using memorisation

The participants demonstrated their ability to draw on a range of reading strategies, some of which they subsequently found to be unsuitable. They tried, for example, to transfer to their study in Australia, a strategy much used in Thailand – memorising. The greater amount and complexity of the academic reading coupled with unfamiliar vocabulary, they soon found, however, made this an inappropriate strategy. When B2 first arrived in Australia, she tried to memorise everything as she had done in Thailand, she said. In Australia, she soon realised, this was not possible. Posing the following questions, she demonstrated her dilemma:

Cannot pronounce one word, so how can you memorise, and if you don't know the meaning how can you remember?

C1 explained that, in Thailand, children were generally taught English with Thai pronunciation and, by the time they were fifteen, they knew it was wrong and had to change but, according to C1, it was too late. Learning correct pronunciation is a skill the participants need to focus upon while in Australia in order to not only memorise for understanding but in order, too, to communicate orally. One of the Thailand-based cohort spoke, too, of the relationship between reading and acquisition of vocabulary:

Sometimes, we can't to find the words that we want to speaking. Because English isn't my language, so we must to read a lot to make ensure that we can remember many words.

The greater amount of English vocabulary, however, contributed to their problems. B2 gave the example of the English words, 'good', 'excellent', 'fantastic'. In Thai, she
explained, there is only one word with all these meanings to remember. She had, however, already devised a strategy to cope with this problem. She wrote short notes or summaries of what she read and, on occasion, would also sketch a diagram to assist her understanding. To aid memory, C2 and A2 stated they used the study strategies of highlighting and underlining. In this way, too, C2 explained, she could remember which paragraph the point was in and this saved time later when she needed to revisit the point. As well as highlighting main ideas B1 highlighted phrases which appealed to her such as ‘library without walls’ demonstrating an ability to appreciate language for its own sake, even in first semester.

A2, likewise, used to memorise everything he read, even English newspapers but, he now also realised, this strategy did not work for him any more. The following comment indicates a significant shift in his perception of reading:

\[ \text{If I don't use [vocabulary] will forget in two days so no point and it takes time, so I read to understand}. \]

A2 has given ‘voice’ to a significant cultural shift in his reading approach brought about by the different expectations of reading for his current study.

**Translation**

Many of the participants mentioned, too, the problem of text complexity. C1 explained that their difficulties related to the Thai system of teaching by translation:

\[ ... \text{we study English by translation in Thai, in Thai sentence; we don't study by understanding so we have the problem like when we, when I was five years old} \]
I study the ABC and about seven years old I start to make the sentence, study like this and the teacher give you ten sentence and as the homework tomorrow you translate into Thai, then tomorrow they give you the Thai sentence and you translate to English like that so when we study more advanced we found that the sentence is not the same as the basic study; some sentence is long sentence and have sub sentence inside it; is difference from Thai sentence.

The continued use of translation as a strategy was proving to be very time consuming partly because of, as mentioned by B1 and B2, the problem of translating English words which have a number of meanings. They, too, were trying to understand ‘in English word’. It was also difficult choosing the correct meaning, according to C2. She said that Thai students who graduated in different countries often use different Thai words to explain concepts they had read about in English. C2 did little translating because of time constraints and the difficulty in finding the appropriate Thai word; the process she said only served to confuse her.

A22 also explained his habit of translating written texts in Thailand for his students. He said he translated his English texts into Thai for handouts and overhead transparencies because his students would take one or two weeks to read a two page article in English because, he reported, ‘they are not familiar with the vocabulary and cannot find the meaning in a sentence’. Two of the Thailand-based students confirmed that Thai students had considerable difficulty finding meaning in texts through translation. One stated, ‘I can’t transform English to Thai’.

Despite providing translations for his students, A22 now found that he had a problem communicating when placed in the context of an Australian university with different
reading materials. He found it particularly difficult when faced with oral discussion of his research with his supervisor. He explained his feeling of overwhelming inadequacy when he first arrived at his Australian university:

*I can’t communicate, can’t talk.*

A1 had not yet abandoned the strategy of translation although she was aware of the inadequacy of translation as a strategy. Translating into Thai, she realised, made it difficult to write about topics in English. The practice was also time consuming and ineffective; she translated still from English to Thai during lectures but often, she said, ‘cannot follow’. She explained:

*I hear but don’t understand*

Translation could not be abandoned, she said, because she only understood some of the content and had to translate to find meaning. Translation from English texts into Thai is something she always did while in Thailand so it was a difficult habit to break. She was, however, reminding herself to take down some lecture notes in English in order to make the transition from translating all information into Thai. However, the English language patterns, she said, confused her and if long sentences are used at lectures it affected her ability to listen and she ‘loses consciousness’.

Another aspect of language transference was mentioned by A1. She acknowledged that the language difficulties are not only English language ones but also Thai language ones. She did not like, she said, Thai language grammar and structures either and used to spend four hours reading to prepare for her own teaching. As she said:
reading materials. He found it particularly difficult when faced with oral discussion of his research with his supervisor. He explained his feeling of overwhelming inadequacy when he first arrived at his Australian university:

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I have never been interested in language; it makes me feel afraid. I must now give attention to language – find it very tiring.

Inferencing

Another strategy, re-reading is a common strategy used by L2 readers. Complex structures can necessitate reading and re-reading for understanding; despite re-reading, however, there can also be complete misinterpretation. For example, the New Scientist text stated in paragraph 3:

Drug-resistant schistosomiasis is unheard of but scientists fear it is possible, given the spread of strains of malaria that are drug-resistant.

C2 interpreted as follows:

... there they think it is possible to buy some drug resistance [to] this worm by using the spread of strain of malaria ...

Later she added:

I think praziquantal is the spread of strain of malaria

Malaria was not interpreted as an example of drug resistance and this may have been because of the structure of the sentence with the past participle ‘given’ coupled with the knowledge that malaria is a disease and so C2, trying to make a connection with prior knowledge, inferred that praziquantal must be a form of malaria.
Understanding technical terms: using dictionaries

Technical terms were another aspect which was mentioned by the participants as causing difficulty. English technical terms were used in Thailand but, as B1 explained, many more technical terms were used in articles in Australia – many more than she had seen before. She explained that technical terms were difficult because she did not know where they came from. A list of acronyms and explanations were supplied on the first page of the article which she brought to the interview (see appendix 7) but, unfortunately, she could not understand all the explanations. Many lecturers produce handouts of glossaries and explanations. Perhaps some checking is required to ensure the terms have been appropriately understood for the context.

Dictionaries were used by the participants to help translate technical terms and other unfamiliar vocabulary. Dictionary use, however, was soon found to be less than satisfactory. B2 explained that she often came across technical terms which were not in her computing dictionary because they belonged to the multimedia field. In this case, she would ignore the term, read on and then just guess. Another strategy she would use would be to seek help from an Indonesian friend in the computing field. B2 used to use a ‘talking’ English/Thai dictionary; now she used an English/English dictionary and a computing English dictionary as computing terms do not exist in a Thai dictionary, she explained.

A1 also used an English/English dictionary and translated herself to Thai as she was aware of the difficulties inherent in using a Thai/English dictionary; as she said, ‘it don’t give exact meaning’.
C2, on the other hand, stated that she would still prefer to use an English/Thai dictionary but she forgot to bring it to Australia. She used a variety of dictionaries – a dictionary of finance, a dictionary of law and an English/English dictionary.

Finding the main point in a text, A2\textsubscript{2} said, did not mean he could understand it and so he, too, would resort to a dictionary – or more than one dictionary:

\begin{quote}
Sometimes it [the dictionary] gives difficult words so have to look up these words, too.
\end{quote}

His current article took him three or four days to understand but he did not need a dictionary as he knew the topic and could pass over any difficult words and those he did not know he would find from reading other articles. So already A2\textsubscript{2} was using some intertextual framing with the purpose of extending his vocabulary range rather than always relying on his dictionary.

A2, the design student, stated in the retrospective interview that she used five dictionaries – a design dictionary, an art dictionary, an architecture dictionary, an environmental science dictionary and an Oxford dictionary as she is studying human environment design and must know about ‘human behaviour, culture, society and geography …’. The dictionaries are providing her with limited additional information. She explained that she might use the Oxford dictionary and then the design dictionary to ‘know more the meaning, it [the design dictionary] give more information, give autobiography of artist to which I refer for more information’. Given time, she may source other texts for more extensive information.
Study strategies

A variety of study strategies were used by the Thai participants when reading during their first semester. B2, for example, reported that she wrote numbers on the text, corresponding to the order in which she felt she had to consider the data; this strategy seemed to help her organise the data so that it was more comprehensible. She also circled unfamiliar vocabulary using coloured pencils to mark different topics, noting in the margin comparisons with earlier paragraphs of the same text.

C1 and C2 reported using study strategies to help them remember the content of text. They highlighted and underlined important points. In this way, too, C2 said, she could remember which paragraph the point was in, so saving her time later when she needed to revisit the text.

Reading on, looping back and guessing

A variety of other strategies were used, not only to help remember key elements in the text but to help understand the material. These strategies included reading on, looping back and guessing vocabulary from context. The strategies of reading on and looping back were frequently suggested by the participants during the pair think-alouds when there was confusion. For example, B2 stated that he did not understand ‘about praziquantel and schistosomiasis’:

B2: when they develop from praziquantel, develop to schistosomiasis or schistosomiasis develop to praziquantel?
B1, reflecting her realization that B2 thinks that praziquantel may be another disease, helped to clear the confusion by referring to a past paragraph:

**B1:** I think this sentence talk about schistosomiasis has proved difficult to treat so some scientific believe praziquantel is less effective in

**B2:** ah, yes, yes, the praziquantel is a drug

Explaining why he was confused, B2 said:

*They [the authors] never talk about praziquantel*

Here he was referring to his expectation of more explanation and clarification of terms in the introduction, as explained in the retrospective interview.

B2 demonstrating peer monitoring, referred B1 to the first paragraph again and here they differentiated between schistosomiasis and praziquantel:

**B2:** yes, yes, it is a drug

**B1:** praziquantel is the drug and schistosomiasis

**B2:** schistosomiasis is the disease from parasite, yes

**B1:** yes

Looping back and forth was a strategy which not only confirmed meanings but helped to define the structure of the argument:
C2: ... they said in the next sentence, they said the drug works only on the mature form of the parasite

C1: but this, so this against this or is support?

C2: it supports the last paragraph

C1: yea, you sure?

C2: yea, because this says it work only on the mature form of the parasite and they say praziquantel doesn’t work, it doesn’t kill immature worms; this means it cure only mature worms; it kills only adult worms, so this one

C1: oh yea, because in the last one they say they always have immature forms of the parasite in their body

C2: this is why

C1: so they prove that they kill only the mature form of the parasite, yea, you are right, so this is support

Not only did C1 and C2 help each other define the argument, they then inferred possible causes:

C1: yes, so this snail is the carrier of this kind of worm and

C2: and maybe this kind, this people eat them

C1: or the fish eat the snail

C2: yea, like cycle

Looping back is not always a successful strategy, however, as demonstrated by B2. B1 had noted that, instead of not being able to cure the disease, the strain in Senegal was stated to be ‘less sensitive’ to the drug.
**B2:** what less sensitive; the disease less sensitive or the human or mice less sensitive about praziquantel than to strain?

**B1:** no, they talk about what sensitive but they said the massive epidemic of schistosomiasis was found less sensitive in different countries

**B2:** less sensitive to praziquantel than to strain, what strain...

Here they looped back:

**B2:** in past two paragraphs is, he don't talk about schistosomiasis; he talk about the strains; not sure

Clearly, for B2, there was a mismatch of expectations. The author was taking too many leaps without supplying sufficient connections between paragraphs. B1 suggested then the strategy of reading on and B2, as we see, found his answer:

**B2:** he [the author] compare difference of mansoni in laboratory, strain from Senegal where there is a massive epidemic of schistosomiasis; he talk about the disease what part less sensitive to drug, yes, it is a disease, less sensitive to drug; the drug is praziquantel, less sensitive to drug than strains in Portugal and Kenya.

Looping back then was used to clarify the meaning of ‘mansoni’. B1 referred B2 to the first paragraph where he found that schistosoma mansoni is the parasite and B1 confirmed this. As well as looping back and reading on, B1 and B2 consistently monitored each other’s interpretation of the text; the process of questioning and responding to each other helped them to evaluate their understanding.
Reading on, making inferences and repetition

Reading on and inferencing were also demonstrated in this dialogue to find the meaning of ‘susceptible’. In addition, repetition was used, indicating a participant’s awareness of a key point in the interpretation, closely related to unexpectedness (i.e. that it is expected that drugs work):

C2: *I am not sure the meaning *‘susceptible’, maybe it is not been affect so much to the drug, by the drug, so because the next sentence it says there is early signs that more than four strains* (the text actually said up to four strains’ but they correct this point soon after) *will be tolerant of the drugs; that mean the drug is not working, will not work for this kind of worm.*

Peer monitoring and making inferences

B1 and B2 demonstrated their ability to work out precisely what the problem was that was being discussed in the text through a combination of strategies: reading on, peer monitoring, making inferences and evaluating the material. After confirming from the first paragraph that schistosoma mansoni is the parasite, B1 read on and deduced that, if patients were treated using praziquantel, they would be free of mansoni eggs and would recover. B2 did not think this was right and explained that only 20% of patients in the study were free of mansoni eggs. Here B1 related the argument of the World Health Organization which was not impressed with the research results. The following dialogue shows how they then made their inferences:

B1: *maybe it was not possible to eliminate all eggs*

B2: *if the number of eggs should fall by 90% the WHO would be happy*
Then B2 questioned the meaning of ‘fall’ and B1 explained:

\[ \text{The people who [are] affected by these parasites} \]

B1 evaluated the problem:

\[ \text{This mean there are some parasite that against the drug that act resistant in the people body but this number is very small and not significant, so not a big problem.} \]

They then compared the figure of 23 persons who were not cured out of a total of 1800 people and considered that this was a small number. B1 noted that this was also James Bennett’s opinion and continued to evaluate the problem:

\[ \text{B2: because he treat the mice only six weeks} \]
\[ \text{B1: and six weeks is the parasite still have been immature} \]

B2 then concluded, using repetition again to emphasise two key points, the ability to kill immature worms:

\[ \text{So praziquantel does not cure immature worms so praziquantel is still in the human body because praziquantel does not kill immature, it kill mature worms, not kill immature worms so in six week that he treat in the mice and the result in six week it is, not sure; I think that is the problem.} \]
C1 and C2 demonstrated how they made an inference in relation to the treatment after noting that the mice treated in the laboratory were treated only six weeks after infection, again using repetition:

C2: ... that mean parasites still very small; is not mature

C1: it not mature

C2: yea, very little one, not grow up to be a large one and can lay eggs so praziquantel does not kill it, does not kill the little worm; it kill the large one, maybe

C1: oh, yea

They hypothesised that, if praziquantel can affect only the mature adult worm, then a ‘new kind of thinking’ was required to fight the worm.

C1, moreover, noted that the worm affected people in only some countries so perhaps scientists, he said, should be looking for ‘the habits or some culture which affects’.

Using the strategy of reading on, this inference, however, had to be revised:

C1: oh, so many countries, so not only one country

C2: yea, more than 70 [countries]

C1: ... this outbreak not by habit or culture, not cause it; weather or atmosphere [maybe cause it]...

Then C2 evaluated the situation using the adjective ‘special’ to denote his impression that the worm was different from what he might have expected:
Worm in Senegal is special, they have some antibody or something to protect themselves ...

Comprehension monitoring

The pair think-alouds allowed the researcher to also explore the comprehension monitoring which was taking place between the pairs. B1 and B2 in the following dialogue demonstrated how they monitored each other to confirm a key issue – re-infection - by using repetition and by connecting the idea of re-infection with the dialogues about immature worms:

B2: it is possible that people are being re-infected

B1: mean infect again

B2: so fast that they always have immature worm in their body, yes?

B1: yes, this is right; and the drug cannot kill this one in their body

Another key point was then discussed. B2 inferred that the dam construction was the cause of the spread of biomphalaria snails. Monitoring and discussion, however, do not always lead to a satisfactory conclusion. In this dialogue it can be seen that B1 is not convinced of B2’s deductions:

B2: he [the author] talk about the building of the dam and scientists believe the development of biomphalaria snail which harbour s. mansoni; so, I think such irrigation and the building of two dam and the construction of irrigation is a cause of the spread up of biomphalaria snails; that biomphalaria snails, is the cause of s. mansoni, right?

B1: you think this outbreak because the water, the river
B2: yes, the water river and this, eh

B1: and the spread of biomphalaria snails

B2: because they are, eh, yes, it is a development of the spread of biomphalaria snails – is the snail which harbour of s. mansoni so in this case mansoni can increase because it have, ah, biomphalaria snail

B1: am not sure (giggles)

A conclusion was finally worked out. B2 asked a crucial question: ‘I don’t know about the snail; does it like fresh water?’ B1 then conceded that B2 could be right about the snail (thus maintaining harmony) but pointed out that the author has no evidence to prove why the drug praziquantel was less effective in Senegal and agreed that the snails may only be one possibility and that drug resistance is another. As B1 said:

There are too many reasons why there is still parasite in Senegal.

C1 and C2 engaged in the exercise of inferring several motives for the arguments between the scientists and the World Health Organization:

C1: ...WHO want to prove their success, successful to help the people

C2: yea

C1: and the scientists want to prove or want to make some research more for the money [than] for research

C2: or maybe they want to be compared together

C1: yea
C2: or compete with each other and be the first one to come out and say, 'ah I found, I found it' [the cure]

C1 later inferred collusion. C1 and C2 had noted that Gryseels’ research did not discuss ‘how did he do it, just said only 20% free from eggs of this kind of worm but he did not say how he treated the people ...’. C1 said it was ‘funny’ there were no facts and said Gryseels and the current British scientists could be ‘friends together’. The use of evaluative language, ‘funny’ and the phrase, ‘friends together’ indicate that the situation, in his opinion, is not as he would normally expect, given the status of the researchers and the WHO organization.

Again, showing a propensity for philosophising and using his knowledge and interest in the environment, C1 inferred that man’s interference can do more harm than good:

C1: so the problem is we destroy the circle of nature; when have a lot of snails, then perhaps in some season, in summer the river was low level and the sea comes in and kill the snails but when they make the dam they have a lot of fresh water

C2: fresh water

C1: fresh water, so the snails, nothing to kill the populations ... I am interested in the last part about the salt water about the snails because it is something funny; as the human, I mean, something human try to conquer, try to win the nature, but that because [there are] a lot of things we don’t know about the nature, it may be more problems.
Tentative evaluating

Although not used to evaluating text, the participants were in fact demonstrating signs of evaluating both the text contents and credibility of authors. B1, for example, although she had not heard of the author of her academic text before, judged that what he wrote must be true because he used quite a few technical terms. Being able to use technical terms signified to her that the author must be of some repute. This in itself may not seem sufficient evidence but she then noted the information at the end of the article which stated that the author was a professor of computer science and engineering at Florida Atlantic University and founder of its multimedia laboratory.

C2 demonstrated a shift from previous expectations with regard to form and content of a conclusion. The conclusion in her academic text, (see appendix 5) she found, referred to only the final topic, and not the whole article. Normally, she reported, she would have expected the conclusion to cover the whole article but conceded that perhaps this was an appropriate conclusion, as, to cover the whole article, could have been confusing. The conclusion then was judged in terms of its level of complexity rather than for its effectiveness as a conclusion.

C1 judged the general-interest text as a whole. He thought that it was written like a ‘general report’ because there was not enough evidence presented to argue the case for either the World Health Organization or for the other researchers.

In addition to the not inconsiderable intratextual framing being used, incorporating text-based strategies, there was some evidence of extratextual but little of intertextual framing. As is demonstrated in the following paragraphs, though, not all background knowledge and experiences necessarily aid understanding.
Extratextual framing

Readers are always able to frame extratextually, using whatever background knowledge and experiences they may possess. A1, for example, could examine and understand the formulae on page 29 of her academic article from her background in general chemistry (see appendix 9).

The following example demonstrates that not all background experiences can be drawn on to expedite understandings of new content. C2, for example, had to read Australian Law. She could invoke background knowledge of Thai law which is based on British banking law. The regulations, however, she explained, were the major point of difference between Australian and Thai law. The way the law is enacted in Thailand is completely different from Australia. The law in Australia, she said, laughing, is used to solve disputes:

Straight to court, different culture

In Thailand, she explained, because companies wished to avoid sullying their reputation by going to court, they always tried to negotiate a resolution first. This usually involved money, she said, again laughing. On reflection, she considered, though, that there was one use for this subject – it provided good references for her to mention in her writing.

B1 mentioned that she had no background knowledge to assist her with multimedia studies; she only had some background in computing to draw on. She made here an important point about information from books and information learnt from experience:
If I have to read a book about the engineering, cannot imagine well, you cannot imagine knowledge

Asking students to simply read further may not be the whole answer to the building of conceptual knowledge. Some experiential learning may have to be considered.

Lack of background knowledge not only can inhibit understanding of one text but can inhibit reading of additional texts. B1 told how she had only read one other similar article to the one she brought to the interview since arriving in Australia because she only had some knowledge of communication and networks from her Masters course to draw on and thus further reading was difficult.

The participants were able to demonstrate extratextual framing, however, when reading the general-interest text as they had some knowledge and experiences they could draw on from their life in Thailand. For example, A2 related the text to the situation in north east Thailand:

A2: they have this problem in the north east of Thailand and it is a problem of the poor; they do not know about it – they do not know how to treat this parasite – how to prevent it getting into the body.

Going beyond the text and trying to find solutions for their own country, A1 and A2 discussed the role the media could play:

A2: in my opinion, in the case of Thailand or in the case of the undeveloped areas or poor locations, I think it is, umm, media should have a role in this
problem because of, every day these people can know about the information from the media ... giving information by the media is the best way – educators must give the results from this problem to this kind of people.

A2 also wished to know further details not explained in the text such as the life cycle of the parasite. A2 was clearly interested in the topic and was not satisfied with the level of information given in the text. She did not seem to wish to study the issues in the text itself but to go beyond the text and relate parasitic disease to her home country. This could mean she was not aware of the arguments presented in the text.

C1 and C2 could also frame extratextually, using their experiences with snails in Thailand after heavy rainfalls to discuss the dam’s contribution to the increased snail population in Senegal.

This part of the chapter discussed the reading practices, in the framework of metacognitive theory and framing theory, of the Thai participants in first semester at an Australian university. It also discussed some of the reasons for those practices. The description and examples provided thus addressed the two research questions cited at the beginning of the chapter:

What are the reading practices of Thai postgraduate students when studying in first semester at an Australian university?

How do the home country and Australian influences shape their reading practices?
Intertextual framing

Generally the participants had come to Australia with little reading behind them and so it was difficult for them to link arguments and views presented in their current reading with previous readings. C2 explained why it would have been unwise to have read academic texts in Thailand other than those suggested by lecturers. Students, she said, read to answer examination questions and there was the fear that, if they read other than the prescribed texts, information learnt from those might not be appropriate for the examination questions. Besides, she added, lecturers in Thailand gave out outlines of the examination and advised students which chapters would cover the questions. There was clearly little room for other than rote learning with this system. There was also little opportunity to discuss different cultural examples for lecturers used Thai examples on overhead transparencies instead of American examples from the prescribed texts.

In addition, lecturers such as B1 had little time for research and, in any case, it was difficult to find research articles in Thailand – especially ones such as she brought to the interview – an overview of multimedia systems.

C1, on the other hand, had done some reading in Thailand, especially on the topic of 'composition in art'; this reading had enabled him to frame intertextually and make meaning from his texts in Australia. He had not, however, had much experience in following up references because of the difficulty of borrowing books in Thailand. The process, he said, was long and complex. For example, both C1 and A2 explained that, even if they visited the prestigious Chulalongkorn university library, it could take a whole day or they might not be able to borrow at all if the university chose to admit only its own students.
There were varying degrees of academic reading being done in Australia for various reasons. C2 had found that books were already on loan when she visited the university library. Another problem was the fact that new subjects such as computer risk in business were not covered by publications in the library. She also felt there was little time for following up references. She asked, ‘why follow up other texts, when the one compulsory text is quite a lot for me’.

B22 pointed out that reading between texts was difficult for her because she had been used to step-by-step guidance during her undergraduate studies; the lecturers in Australia, in contrast, she said, did not state precisely what they wanted. She explained the mismatch in expectations between her lecturers and herself:

_They [Australian lecturers] do not say, ‘I want the issue, I want the problem’; we have to think about that._

The participants soon found that learning in an Australia university was an independent enterprise and they were expected to engage in self-directed learning. Even lecturer assistance was not available when questions needed to be answered as B2 found. When she asked a lecturer for assistance, his response only served to reinforce the fact that she could not expect the same level of guidance as in Thailand for he said:

_Now everybody listen in the same time what I said; it mean you got the same information from me._
The grammatical form of this utterance possibly highlights another problem. While the sentence may merely reflect the student’s language ability, the lecturer may have been of overseas origin himself, as many are. Based on the participants’ accounts, it appeared that students may have to negotiate the differences between not only their own culture and a perceived Australian culture but had to also consider that Australia is a multicultural society and lecturers and supervisors may display a variety of expectations.

Intertextual framing can also be carried out through the Internet but the participants considered it had limitations. A2 used the Internet but not for extensive literature searches, he said, because it ‘take a long time’. The participants were aware that many of their reading strategies were time consuming and it is reported later how they tried to make changes in their reading practices to enable them to read more quickly and efficiently.

**Cartoons**

Childhood non-academic reading proved useful for understanding the general-interest text. As C1 and C2 explained, additional knowledge of snails came from their reading of Japanese cartoons. Japanese cartoons, they explained, were very important to Thai children as they were educational; ‘the writers have sound scientific knowledge’, they said. Another benefit from reading these cartoons was that their style ‘make students have imagination’ as opposed to American cartoons which, they explained, were ‘too fixed’, leaving little room for personal projection and construction. Thai cartoons, on the other hand, were very serious, they said, because ‘Thai culture, we don’t want to teach the student in enjoying, in enjoyable way’ and so C1 and C2 said they had to convince their parents that these cartoons contributed to their education. This insight
into learning as a 'serious business' may account also for the participants' lack of reading generally. It may not have been considered a pleasant, valuable experience apart from the cartoons.

Newspaper articles

Other sources of information came from the reading of newspapers. Many of the Thailand-based students stated that they often read the Student Weekly to help them with the English language. They were able to understand the articles, they said, because they had a background knowledge of the news items and/or had seen the issues on television.

In Thailand, readings in undergraduate classes were generally supplied by the lecturers and usually comprised newspaper articles. This may have been because there was, according to these students, a lack of texts in their university library. There would be discussion generally in Thai and students could be asked to write a summary, also in Thai. Reading was generally a group activity and meanings would be found through asking group members before using a dictionary or even through guessing. It was found, too, that English language classes comprised mainly grammar and writing lessons. Over half of the Thailand-based cohort stated that they did not read texts in their English classes. Participants' accounts of their English language class practices in Thailand help to explain their lack of confidence with the language and their reticence about tackling academic texts on their own during their first semester.

While the participants demonstrated reading practices that were related to their Thai educational and socio-cultural background, some changes in their reading practices had begun to take place even during first semester. A summary follows of the Thai
participants’ initial reading practices; then there is a discussion of some of the changes in their reading practices and the influences which led to the changes.

Summary of the Thai participants’ initial reading practices at an Australian university

The participants’ responses from the interviews and the pair think-alouds, discussed above, demonstrate that the participants relied mainly on intratextual framing where they made use of textual cues such as headings, tables and pictures. It was found, however, that tables, which incorporated a variety of statistics, could be difficult to understand. If the tables or indeed the pictures were not directly referred to in the text, they became less useful, even confusing. The participants had a variety of text-based strategies at their disposal. Two bilingual strategies, translation and dictionary use were found to require modification. English/Thai dictionaries, it was noted, did not necessarily provide the appropriate meaning. Likewise, translation without the use of a dictionary proved to be time consuming and again finding the most suitable meaning for a vocabulary item proved to be difficult. Where possible the participants drew on extratextual framing, their background knowledge, to help them understand texts.

Making analogies

The pair think-aloud protocols also provided insights into another strategy used by the participants – making analogies, made possible through their background knowledge and experiences from their home countries. C1 and C2 used the analogy of the eating of raw fish by certain groups of the Thai population to relate to the ingestion of the parasites discussed in the text. There were many education programmes in Thailand, they said, designed to alert the population to the risks of ingesting parasites from the
raw fish. This knowledge helped them to understand the importance of finding a suitable drug to counteract the effects of the parasites.

Evaluation of text content was demonstrated to a limited extent with regard to the academic text and the general-interest text. Whereas the evaluation of academic text centred around textual elements such as the conclusion and the credibility of the author, evaluation with the general-interest text focussed on the content and meaning, using background knowledge and experiences. For example, when referring to the experiments with mice and the researcher’s deductions in the general-interest text, A1 said, ‘we need more proof to support his [the author’s] idea’ and then justified the limited research, presumably from past laboratory experiments of her own, by stating, ‘it is hard to conduct the experiment because hard to control’. A2 believed the researchers did not have good results because of ‘the different species’ but this aspect was not followed up.

On reading about the disagreement between the World Health Organization and the British scientists, C1 and C2 stated that this situation was ‘funny’, showing their reaction to the behaviour displayed by the WHO and the scientists. In the retrospective interview C1 explained why he judged the situation to be ‘funny’:

*It is funny because I think WHO is the organization which works without benefit and they do work for the people... They [the researchers] don't have the evidence ... I don't think they can talk like that; I think they have no right to speak like that.*

C1 thus demonstrated his ability to scrutinize a text for supporting evidence for an argument and, at the same, articulated the conflict he found in the text – the reputable
organization with high ideals engaging in arguments with researchers without sufficient evidence.

C1 and C2 also evaluated the type of research that was carried out prior to the building of the dam and criticised the lack of awareness of possible consequences, showing their ability to go ‘behind’ the text content:

C2: sometimes they did not think about the effects because they think of only, ok, we will improve the human life to be better than before so

C1: dams, to get the farms

C2: they did not think about what will come after

C1: yea, they are not, no real knowledge, their research is not covered all of the things or effects to humans, maybe before they made the dam [there should have been] the research about the culture

Where possible the participants used extratextual framing as well as intratextual framing to aid their understanding of texts. The participants could not, however, demonstrate much use of intertextual framing.

Discussion of changes in reading practices during first semester

In summary, the six Thai participants in first semester displayed an awareness that their home country reading experiences and background knowledge had not fully prepared them for their graduate and postgraduate studies in the Australian environment. A discussion follows of the changes and adaptations that were made by the participants and some reasons given by the participants for these changes.
New reading practices for a new environment

The Thai participants soon noted that their background and experiences from their home country could inhibit their ability to read a range of texts with full understanding. In particular, the participants found that the Thai teaching methods, reading practices, purposes and expectations influenced their reading in a way which was not necessarily appropriate in the Australian environment. They soon became aware, moreover, that many of the reading strategies they brought with them from Thailand were not effective for the amount and type of reading they had to tackle at the postgraduate level in the Australian environment. How a second language is acquired can have a bearing on the level of comprehension; more direct learning leads to less confusion of concepts (Downing, 1973). C1 explained how there had been little opportunity to acquire effective reading strategies. Reading to children in Thailand was not a common practice, he said. Children were often asked to read to a grandmother, especially if her eyesight was failing or she was old. He himself, he said, used to read books about plants to his grandmother. Although this practice may have been good in some ways, it did not allow children to acquire effective reading strategies because he said:

\textit{It is very boring for children and then they cannot understand what they read.}

The Thailand-based students described a range of difficulties they had with reading: lack of vocabulary, knowledge of meaning, grammar, structure and lack of time. One poignant comment said it all:

\textit{I can reading but I no meanings.}
However, despite a background with little childhood reading, little reading other than of compulsory texts at university, all the participants were anxious to engage in self-directed learning. Even the Thailand-based students expressed a strong desire to read competently in English. One expressed her desire this way:

*I don’t understand in English book. That I want to learn it very much because it important to use for thesis.*

Another Thailand-based student spoke of the implication of not being able to understand English text:

*I don’t understand in English book; [therefore] thesis is difficult to make.*

Those participants studying in Australia demonstrated their metacognitive awareness of what was required to succeed at university in Australia. B1, for example, said she would have to read more to gain further knowledge. She also mentioned that, if she continued in the multimedia field, she would have to ask her supervisor to explain some of the concepts – something she would not have done in Thailand. At this time she skipped sections she did not understand.

C2 was aware of the constant reading she was now expected to do and realised, she said, that she would have to time-manage to fulfil her course requirements.

New strategies were being developed. Memorisation was a strategy which was heavily relied upon in Thailand. The participants realised that they could not now remember the large amount of material incorporating unfamiliar vocabulary. They now spoke of
reading for understanding rather than to acquire vocabulary or memorise facts. A different sequence, important for their postgraduate study, was also mentioned: reading for understanding followed by memorisation. A study by Marton et al. (1996), with 17 Chinese mainland teacher-educators identified various relationships between memorization and understanding. Among them was the notion, that ‘we more readily memorize or remember what we understand’ (p. 76). Identified in this study, also, was the concept of understanding through memorization.

Linked to memorisation is translation – another strategy which was commonly used in Thailand. Again, because of the large amounts of reading, the difficulty of finding appropriate meanings and the time it took to translate, meant this was no longer a satisfactory strategy. According to O’Malley et al. (1985), as second language proficiency improves, translation declines over time. The participants were already making transitions by trying to read and think in English through taking notes in English when possible, using English/English dictionaries instead of English/Thai dictionaries and asking non Thai speakers for assistance. General knowledge, A1 reported, was derived from reading local Australian newspapers although they were difficult for her to read but they helped her to ‘think in English’. Reading and thinking in English would also, the participants realised, help them to communicate better orally with their supervisors.

It was found, too, that the participants, apart from A2, were still content to read single, simple texts rather than try to compare texts, author views or question the material presented. As C2 explained, she would not make judgements about a text, she would ‘just read it’.

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More evaluation of text might have been possible if there had been more opportunity to engage in discussion of the texts. The participants' perception of reading at an Australian university was that it was a solitary activity as can be seen from this statement of B2:

_No-one going to tell you how to do that; no-one care; you have to do it [the reading] yourself – quite private._

Overall, the data indicates that these students were, in first semester, aware of the different reading requirements at an Australian university and were gradually coming to terms with them. The following chapter presents data which demonstrates how the participants' perceptions of the reading requirements and their own abilities further shaped their approaches to reading in their third semester.
Chapter Five

Thai postgraduate student reading practices in third semester at an Australian university

Introduction

The research discussed in this chapter relates to the reading practices of seven Thai participants in third semester of their study at an Australian university. This chapter discusses the adaptations and changes in reading practices the Thai participants had made since first semester with reasons for the changed reading practices. This chapter discusses, in addition to the adaptations and changes the participants had made in their reading practices, the extent to which the socio-cultural factors, for example, the Thai teaching methods and reading strategies learnt in Thailand, still influenced the participants’ reading practices. This part of the study, therefore, addresses the following research questions:

What are the reading practices of Thai postgraduate students in third semester at an Australian university?

What are the influences which may have led to changes in their reading practices by third semester at an Australian university?

As in first semester, the analysis was based on two sources of data – individual interviews and pair think-alouds. Once again, for the individual interview, each participant chose a discipline-specific text and read it prior to the interview. The analysis was also based on the researcher’s observations and students’ self reports when reading a general-interest text in a pair think-aloud setting followed by a
retrospective interview. The general-interest text was once again taken from *New Scientist, 'This Week' segment* (see appendix 3). Thus, the article was of a similar structure and style to the one used in first semester to enable comparison. It was considered to be of general interest, not too lengthy and incorporated a picture and a table that could be used as intratextual cues. Table 5 shows the participants, their disciplines (there had been some substitute participants, shown as A2_2, B2_2 and B2_3) and the texts used in the study.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Discipline</th>
<th>Academic text for individual interview</th>
<th>General-interest text for pair think aloud and retrospective interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Computing</td>
<td>Ramakrishnan Srikant and Quoc Vu and Rakesh Agrawal (1997). Mining association rules with item constraints. Paper presented by at 3rd <em>International Conference on Knowledge Discovery in Databases and Data Mining</em>. Beach, CA, August.</td>
<td>B1 and B2₂ carried out the pair think aloud</td>
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<tr>
<td>B2₂</td>
<td>Education</td>
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<td></td>
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<tr>
<td>B23 (individual interview)</td>
<td>Education</td>
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Two of the original participants, A2 and B2, had withdrawn in order to take up study elsewhere. A2, who had been a replacement for the individual interview in first semester remained to participate in the individual interview and the pair think-aloud with A1 in third semester. B2 took part in the pair think-aloud with B1 before leaving the university. Her replacement, B3, a Masters student of Education, undertook to participate in the individual interview. She was in the third semester of her study and although this student's responses could not be compared with the others, they were written up and analysed as they incorporated some interesting points.

The order of discussion for this chapter is slightly different from chapter four. Firstly Knowledge of task, then Knowledge of text structure and Knowledge of strategies and their applications are presented. Knowledge of self is discussed last because it incorporates the participants' reflections on their changing reading abilities and practices. Integrated into the discussion, as in the previous chapter, are Circumtextual framing, then Intratextual framing, Intertextual framing and Extratextual framing, showing how participants' framing meshed with their metacognitive abilities, related to the aforementioned task, text structure and strategies. Finally, a summary and discussion of the Thai participants' reading practices and the influences on their changing reading practices by third semester are presented.
Knowledge of task

Re-defined purposes for reading

In first semester all the participants had displayed an awareness that reading was not for memorisation of facts for examinations, but for broadening their knowledge base. With regard to their academic reading, discussed in their individual interviews, more defined reading purposes were displayed by all the participants in third semester. A1, for example, who read in first semester to find out as much as possible about the new field of crystallography, now reported that she was not only reading to find out specifically what research had already been carried out in the field and to ‘find answers’ but to investigate the most appropriate method for her own experiments by reading closely the experimentation sections in articles. Furthermore, she had now learnt that books give ‘broad ideas’ and journal articles give more specific details such as experimentation details.

B1 stated that she now read ‘to get the main idea and understanding [of] the paper’ rather than in detail unless, she said, the paper was very important when she would read word for word. The shift to selective reading rather than close word for word reading was a significant change for B1.

A2’s purpose for reading ‘whatever was relevant’ to his topic was also more defined. He aimed to find out ‘weaknesses’ in algorithms described in a text so that he would be able to generate a new algorithm. Another participant, C2, was reading for knowledge but, specifically, she said, to fill the gaps she missed at lectures because she ‘can’t catch the words’.
Selecting academic texts

Some of the participants, although displaying more focus in their research field, were still tentative about actually selecting academic texts which would be useful for their research areas. A2 stated that he still relied on his supervisor to choose articles for him; he then used the references in these articles to find more information. B1 found her article on the web but only after her supervisor had recommended it to her because she then knew it would be useful. Very rarely, she said, did she read anything which her supervisor had not recommended. A1 even asked the researcher of this study to choose, for this interview, one of three articles she had brought.

Circumtextual framing

It is important for all postgraduate students, whether course work Masters students or research Masters and PhD students to access a wide variety of readings for literature reviews and to analyse research methodologies used in studies in their own fields in order to plan their own studies. A deeper understanding of circumtextual features accompanied changes in the participants’ perceived purposes for selecting texts. As in first semester, circumtextual framing helped some of the participants to select their texts. C1 had been shown a collection of articles by his supervisor from which he found a title which included the word ‘spiritual’ and thought this would be suitable as he is studying ‘spiritual Buddhism’.

A significant difference observed in third semester was the use of abstracts. Most of the participants had a keyword in mind before checking the title and abstract. C2, for example, noted the word ‘diversification’ in both the title and abstract and thought it would aid her understanding of this topic (see appendix 10). A2 provided another example of more astute use of circumtextual framing in third semester, by making use
of the abstract first and then the conclusion (see appendix 11); he demonstrated his perception of the difference between the two text elements, saying:

The abstract talk about what this paper is going to talk about and the conclusion can be show that the reasons the algorithm is better than like information about the result or sometimes the conclusion will give me about related work.

A2\textsubscript{2} demonstrated here, moreover, that he was interested in ‘related work’ and presumably would follow up other research which was mentioned.

A1 had now also found the abstract to be important as it had, she said, all she needed (see appendix 12). She first of all read the introduction and the conclusion, then the abstract because, she explained:

it is short and it gives the method and what is the conclusion.

In first semester, A1 was finding it difficult to read long, complex texts; she now seemed to have devised a strategy to enable her to read without having to engage in trying to negotiate meaning from whole texts.

From the above examples it can be seen that those participants who were confident enough to select their own academic texts were making more use of circumtextual cues such as title and abstracts. It could be, too, that the use of abstracts as a selection aid, was generating confidence because the participants could, by this means, select texts that were suitable for their study with greater accuracy.
Other circumtextual features that were used were display features such as colour and design.

Using peripheral details

The colour of book covers was noted as an attraction in first semester. In third semester, demonstrating once again the Thai students’ liking for visual cues and colour, C2 stated that the lines around the abstract made it look ‘attractive’ (see appendix 10). B23 mentioned that she liked book covers to be colourful, attractive and modern. American business books, she said, were user friendly and she gave the example of Becoming a Master Manager because it had a pale blue cover, many diagrams in blue and headings with blue lines.

Other peripheral details, besides the title and abstract and colour were also being noted by most of the participants, such as the author’s name and country of origin indicating the students’ increased understanding of the purposes of circumtextual features.

In third semester, overall, the participants demonstrated more defined purposes for their reading which, in turn, led to greater selectivity in their reading. A significant change when framing circumtextually was the use of abstracts which provided enough information to allow the participants to decide if the text was useful for their study.
Knowledge of text structure

In addition, to the increased use of circumtextual framing by the Thai participants, there was also evidence of increased use of intratextual framing relating to their increased knowledge of differing text structures.

Intratextual framing

Revising reading order

As in first semester, all the Thai participants framed predominantly intratextually although there was evidence, too, of increased intertextual framing specifically in their academic reading as opposed to more general reading. Reading in a pre-planned order was a strategy still being used by all the participants; in third semester, some changes had been made to their order of reading, indicating increased awareness of text structure, academic text structure, in particular. As mentioned, A1 read the introduction, conclusion and then the abstract in that order. She tried not to concern herself with language structures as she had done in first semester, because, she explained:

If I concern about the English structures maybe forget what I would like to remember

This is a significant step for A1 who had displayed considerable anxiety when faced with English language patterns in first semester and had thought she had to ‘give attention to language’ before all else.

Several of the participants reported that they now read the conclusion before the main text. C2 said she now read the conclusion first because ‘conclusion include
everything'. By reading the conclusion first, she presumably was able to be more
selective and therefore more time efficient. In first semester, she said, she photocopied
whole chapters and then found she had no time to read them. Besides, she added,
photocopies were expensive.

Looking for detailed explanation

All the participants still looked for considerable detail in the introduction of a text
otherwise they said the text would seem difficult. Even the introduction in the general-
interest text was thought to be 'too specific'. For example, C1 mentioned in particular
the term 'prion protein' which was mentioned in the first paragraph without any
explanation. The need for 'explanation' could relate to the inductive method of
reasoning often followed by students from South East Asia whose writing conventions
often follow a 'because, therefore' sequence (Kirkpatrick, 1993). In addition to lack
of explanation, long, complex sentences still appeared to create difficulty. C1
explained his technique for using sentence structure to find meanings:

   To find the structure of the sentence... find subject, verb and object and...the
   phrase or other sentence to explain the word or subject.

This technique had its limitations, though, because he could not generate anaphoric
relations especially with the word 'it'. C1 showed an awareness that generating such
relationships is critical to the construction of coherent representation of text.

All the participants demonstrated an increased awareness of intratextual features. Of
particular note, was the changed order of reading; several read the conclusion first,
using it as an overview. Nevertheless, even in third semester, all the participants still
had not become fully accustomed to the lack of explanation in the introduction of an English authored text. Other difficulties were reported also. C2, for example, said she was still missing other intratextual cues for several reasons. If she felt she was running out of time she might ignore a phrase or sentence in brackets; ignoring a phrase in brackets, she was aware, could alter the meaning; she might assume, too, she said, that she knew what a topic was about; she might also misconstrue, she stated, the meaning of a vocabulary item such as ‘charge’ because it could be defined in many ways.

Another participant, B1, identified what she required to read a text easily. She reported that, although she understood the main ideas, she could not follow her readings ‘in detail’. She required papers with very good examples, concrete examples, she said, which she could visualise.

Another problem was cited concerning writing conventions. In terms of text patterns, A1 thought the English and American authored texts used patterns which made it a lengthier process for her to understand the concepts.

Although she could understand complex sentences in Thai, she said, those in English could cause difficulty:

_It is very hard to find what is the main point of the sentence that they [the authors] want to tell the reader._

As in first semester, several participants alluded to the Thai system of teaching as being a cause for some of their reading difficulties.
The influence of Thai teaching methods and Thai texts

The participants’ reflections on their reading practices from their individual interviews showed that, even in third semester, the Thai teaching methods and the Thai texts to which they had been accustomed, still influenced their reading practices. A1 explained that her English language classes focussed on ‘correct or wrong grammar’ adding further ‘but [we] don’t understand what is the meaning’. A2 further explained why it was easier for him to read in Thai; he knew where to find the important points in a text:

*In Thai we don’t have like general statement for the first sentence in this paragraph and describe the detail of this statement so we have to find out the main points of that paragraph by yourself.*

Moreover, he explained that in a Thai text, one would generally find the main points towards the end of the paragraph, although conceding that the English structure of main point in the first or last sentence of a paragraph with detail in the middle was fairly easy to follow; the fact that English was not his first language made it more difficult, however. Unfamiliar phrases and individual vocabulary items still made it difficult for him to understand unless the text were related to his work in which case it would generally be quite clear.

In summary, the participants reported that they were more aware of differing text structures in their academic and general reading. To overcome the difficulty of finding the main points and the essence of a text, most of the participants stated that they were now using a different order of reading – often beginning with the conclusion or abstract and then conclusion. They were, nevertheless, clearly aware that they still had
difficulties to overcome – lack of explanation in introductions and long, complex sentences and texts without concrete examples. Several participants also mentioned that the Thai education system was also a source of difficulty because the Thai system focussed on grammar rather than on meaning.

To help overcome some of their difficulties related to complex English authored texts, all the participants had developed more text-based strategies. These are discussed in the following section.

Knowledge of strategies and their applications

As discussed above, all the participants used the overall text structure and text elements such as introductions and conclusions to help them ascertain the contents of the text. As in first semester, all the participants also made use of the intratextual features such as headings, diagrams and tables; some of the participants, however, were using these features in different ways and some were using quite different strategies to help them accommodate to their required reading.

Intratextual framing

Using headings to avoid irrelevant reading

Headings were still thought to be useful but now they were not used to help understand every single word as had often been the case in first semester. B23 reported, for example, that she only needed ‘to know the whole scope first’ before looking for six key themes using the content and examples and headings of the article she was reading; she would then proceed to study the six key themes, having eliminated those she thought unnecessary for her current purpose.
C2 highlighted a problem with headings when engaging in intertextual framing. Two of the headings in her academic text were not clear, she said: 'geographic diversification' and 'consumer and business credit diversification' (see appendix 10) because, when reading other texts on similar topics, she would find that different headings would be used.

**Using diagrams**

Diagrams were also reported to be useful by all of the participants but only if one had a relevant background to understand them, according to A1. In her current academic text, *Solutions and Solubility* (see appendix 12), she said, she could understand the diagrams because she had a background in morphology. B1 reported another reason for understanding diagrams. She could understand diagrams, she said, because of other reading, thus showing how attention to an intratextual feature can be enhanced by intertextual framing.

Some participants displayed increased metacognitive ability in that they were differentiating between the usefulness of intratextual features. C2, for example, although still using headings, reported that she did not necessarily use boxes, diagrams or tables as these 'can waste your time' trying to understand them. Only if they did not incorporate too much detail, did she use them.

Another intratextual feature which was used by two of the participants was graphs. B1 explained how graphs provided her with comparisons of, for example, algorithms, enabling her to understand which algorithms were most useful. Task graphs, in particular, were important aids for A2 because they reminded him, he said, of the
process of translating a material programme to a task graph, although the text did not explicitly state this was an important part of the process (see appendix 11). In this case, the graph provided detail which the text did not. Usually details in the text were required to clarify tables, figures and other intratextual visual features. Examples in boxes were noted, too, as being useful but again only if there was sufficient explanation in the text – a point mentioned in the first semester interviews.

It could have been expected that the table in the general-interest text would have been useful as it displayed more details of victims from around the world than the text did and could have been used as a ‘fix it’ strategy when the participants were confused about the numbers of victims of CJD. All the participants said it was overlooked, however, because its position in the text was "not good" (it was placed at the bottom left hand corner of the page). C1 and C2 added that the table was not referred to directly in the text and this, too, made it less useful. In fact, C2 did not look at the table at all.

Clearly, in third semester, the participants did not feel obliged to use the intratextual cues, tables, diagrams and headings. They had become more metacognitively aware of their usefulness and, if there was too much detail to assimilate or if the text did not provide a connection to a table, then they ignored it in preference to focussing on the text itself. Pictures can be another useful intratextual cue; the participants’ use of these in third semester is discussed next.

**Using pictures**

In first semester, the participants reported that the pictures were not helpful as they were not referred to in the text. One of the participants, in third semester, A1, had
devised a strategy to overcome this problem. If she encountered a picture of a kind she had not seen before and it was not explained in the text, she said she looked for other texts with similar pictures, put them into groups to ‘think about the effects’; in this way she illustrated her ability and confidence in using intertextual framing to clarify issues in current reading.

Again, as with the first general-interest text, the pictures were not thought to be useful because none of the participants had sufficient background knowledge; they reported that they had never seen a picture of a brain before and again, the pictures did not relate to the text.

Showing their ability to interpret the pictures, nevertheless, two of the participants spoke of different purposes for the pictures. A2 suggested that the pictures could be used as evidence in court when charging those involved. A1 thought the picture had a more general purpose, to show ‘the horror of the victim to the public as most people think the brain is important organism of human’.

While defining the use for the pictures, which did not include assisting them in the reading of the text, all the participants ‘saw’ different images in the pictures. B1 and B2, for example, thought the picture depicted a needle pointing at the holes. B1 recalled a snake bite and B2 suggested that the ‘needle’ was more likely to be a representation of a rope because she knew from experience that one ties a ‘rope or anything similar around a snake bite to prevent poison going to the heart’; this dialogue demonstrates that making associations with background knowledge can result in misinterpretation.
Another example of misinterpretation through lack of any kind of background knowledge was provided by C1 and C2. They also ‘saw’ something else in the picture - the pituitary gland with a doctor making a hole in order to extract the hormone with a tube. They thus confused the process of extracting growth hormone with the result of its injection into patients. The caption under the picture may have added to their confusion.

The caption under the photograph read:

Body of evidence: victims’ brains are riddled with tiny holes

Perhaps the word ‘victims’ has been confused with ‘corpse’ thus producing an incorrect interpretation of the picture. The picture in fact depicted a slide being held between forefinger and thumb.

While pictures are often thought to be useful aids when reading, it has been demonstrated by some of the Thai participants that pictures are only useful when a reader has sufficient appropriate background knowledge to interpret them. A1 was the only participant who had devised a strategy to monitor her ‘reading’ of a picture; she searched for other similar pictures in other texts, compared them and deduced the meanings they portrayed.

Noting highlighted features

Another feature found within a text, a highlighted separate sentence, can be considered a circumtextual cue as it is peripheral to the main text. Sometimes these cues are considered distracting (cf. Reid et al., 1998); all of the participants thought the highlighted sentence, ‘When reports of a link with CJD surfaced, most countries
banned the natural hormone', was useful, though not, as one might think, to emphasise a key point, but to make the passage easier to read by breaking it into two segments.

Again, as in first semester, the participants referred to their preference (albeit indirectly) for simple, short articles; even in this article which was only one page, the highlighted feature helped to break up the text into manageable segments.

**Linking back and forth**

Another text-based strategy that was used in first semester, and once again revealed through the participants' think-aloud data with the general-interest text in third semester was the use of the strategy of linking back and forth within and between paragraphs. C1, for example, explained that he often looped back to clarify meanings and he and C2 used this strategy when trying to work out the quantity of growth hormone that had been distributed. In paragraph six of the general-interest text, they noted that 15,000 ampoules of untreated hormone were sent to hospitals between June and October 1985. How, they wished to know, did this figure compare to the 30 grams mentioned earlier in the paragraph? They read on and found that 5 grams were packaged into 5,000 ampoules. Then looping back to the previous paragraph, C1 was able to infer that 15,000 ampoules meant probably 15 grams of human growth hormone extract.

Another example of how looping back and forth can aid interpretation was provided by C1 and C2. This example demonstrates, moreover, how they used repetition to emphasise two key elements, growth hormone and disease and how C1 inferred the effect of the growth hormone:
**C1:** ...I think they use growth hormone to help the children from this disease because the children is lack growth hormone so they give them a dose... so the doctor use growth hormone to help them and... link to the first paragraph to help.

**C2:** this is possible that the growth hormone, I mean the prion proteins in the body have a loss so they use this growth hormone to reduce or inactivate this hormone to the normal level and because sometime like, people have high hormone they have a problem but if we can reduce it to the normal level they can continue going.

**C1:** is possible like that, but I think prion protein is very important to the body to... so when they use growth hormone it affect to the prion protein and then maybe, it terminate the prion protein, gets this disease, CJD, Creutzfeldt-Jacob disease.

It can be seen here how C2 misinterpreted, believing that the purpose of the growth hormone was to ‘reduce or inactivate this hormone [prion protein?] to the normal level’.

Any speech event represents the overlapping and intertwining of many relations concerning the context as well as the content of communication (Tannen, 1993: 22). The conversation between C1 and C2, in the context of the oral pair think-aloud, showed how C1 maintained harmony and, at the same time, offered another possibility. C1 responded, ‘is possible like that’ and then inferred another possibility, ‘then maybe it terminate the prion protein, gets this disease…’.
A point that was missed was that the culprit was the growth hormone ‘that had not been treated’. The text read:

It is alleged that they [the scientists] released doses of growth hormone that had not been treated to inactivate the rogue “prion” protein that is thought to cause Creutzfeldt-Jacob disease.

Therefore, the protein needed to be destroyed or else CJD would occur.

Participants had mentioned before how long, complex sentences confused them and, in this case, an important clause seemed to have been overlooked. C1 seemed to believe the growth hormone destroys a necessary element for the body, prion protein and, as a result, CJD develops.

**Using problem solving strategies**

The strategies of reading on, looping back and making inferences, critical for academic study, were not mentioned to any great extent in first semester. After a further two semesters’ of study, though, most of the participants demonstrated the use of these strategies in their pair think-alouds. Looping back and forth was also demonstrated in third semester with regard to problem solving. A2, for example, questioned the figures in the text. The text stated 15,000 ampoules were sent to the hospital but then the text stated that only 10,000 were sent. A2 thought the problem lay with the 5,000 ampoules distributed between October 1985 and February 1986; reading on, he was able to confirm that the problem did indeed lie with the 5,000 ampoules because the text stated that Mollet and Cerceau were aware of these 5,000 ampoules. He then inferred that these 5,000 ampoules were sent to France.
Overall, it can be seen that the strategy of looping back and forth was a useful text-based strategy for some of the participants. The fact that readers may need to loop back and forth illustrates why the Thai participants were concerned about texts which are too long. If the texts are long, readers may not be able to loop back and forth and hold the information in their short term memory.

**Learning new vocabulary**

Another strategy mentioned by all the participants in both first semester and third semester, was dictionary use. A change had taken place by most of the participants by third semester. All the participants, apart from C1, had made the transition from using English/Thai dictionaries to English/English dictionaries (that transition had in fact already begun in first semester). C1’s comment showed, that, although he had not made the transition to an English/English dictionary, he fully understood the drawbacks of using an English/Thai dictionary:

*I can use dictionary to know that but I don’t know the correct meaning or the concept of this word.*

A new strategy for C1 which enabled the learning of new vocabulary, also reduced the need to read minutely a complete text. He now read the first two paragraphs of texts word-by-word because he now realised, he said, that an author often used the same terms over and over and therefore it was useful to find out the meanings in the early paragraphs. Thereafter, because of the detailed work with the first paragraphs, he said he could guess the content of the rest of the text.
Another strategy being used by C1 involved taking notes of ‘special sentences’ which his lecturer used and which, he had observed, created interest among the other students. Extended reading was enabling him to now make connections between the material presented at lectures and in other texts.

Vocabulary acquisition was also carried out through the use of non academic ‘texts’. A22, for example, reported using newspapers for biotechnical terms and different phrases. He explained that general vocabulary acquisition also helped him with language ‘that is actually used in our life …’

B23 stated that she, also, seldom now used a dictionary because she did not expect to understand every word. If she had to check a meaning she said, she used an English/English dictionary because it gives ‘the key word that linked to the article’ and she could use the synonym from the dictionary in her written work, thus showing that reading for her, too, is partly for preparation for writing. She said discipline-specific jargon is still a problem and she gave the example of the word ‘fidelity’ used in a text concerning educational change. When she encountered this word, she did not understand the concept, she said, and thought:

\[ Oh, \ I \ am \ very \ honest \ but \ I \ don’t \ know \ about \ it \ [this \ term]. \ Very \ interesting English \ (laughing). \]

**Understanding technical terms**

Understanding technical terms is necessary for understanding discipline-specific discourse. In first semester, the participants had all mentioned their difficulty in this area. Some of the participants again mentioned this difficulty even after two
semesters' of study. Others had developed strategies to overcome this difficulty. A1 still reported having problems with technical terms because, although she had a Chemistry background, the crystallography terms, she explained, were completely new to her.

On the other hand, technical terms were no longer a problem for B2 as, she said, she was now familiar with them. Reading many papers, having discussions with her supervisor and emailing Thai friends were strategies which had assisted her understanding of technical terms.

A2, however, still needed to use the strategy of translation to deduce the meaning of technical terms although Thai students, she said, were used to using English terms usually found in American publications which they then translated. Sometimes this practice was confusing, she explained, because some of the meanings would be lost in translation. A2 also noted that technical papers in Thailand are not 'so complicated - just write easy for the reader to read' and she explained why this was so:

...when we writing we write Thai word and then bracket with English word and sometimes a Thai word does not make sense; when we read a technical word in Thai, if we do not have English word in brackets sometime we don't know what it is about.

All the participants were aware that checking technical terms in dictionaries produced limited success. C2, for example, used a variety of dictionaries and explained why even using English dictionaries caused difficulty because of the lack of specificity:
...even you read in English dictionary like financial dictionary, you have no clear idea what is about ... ah, because you don't have any background about it so sometime you try to think in your own language, you don't know which word you would like to use for this specific word and like, ok, what can I say about some word even I have a dictionary in Thai business language, translate from English to Thai ... it is not enough because it is like this dictionary there is no specific in finance or in banking or in any area it just cover all business term so sometime we could not find specific words that we want ...

In third semester, all the participants demonstrated a selection of strategies they had devised to help them learn new vocabulary. More English/English dictionary use as opposed to Thai/English dictionary use was in evidence but there were still problems with finding meanings for discipline-specific terms. Compound words also caused problems. The participants' accounts of how they tackled these are described next.

Using strategies to make meaning from compound words

While technical terms caused confusion, discipline-specific jargon caused even greater confusion. C2 explained that the reason lay in the structure of the terms and she provided the example of ‘exposures’ (p. 21) from her academic text (see appendix 10). She could find this word in a ‘normal’ dictionary but did not know how it related to ‘risk exposure’, ‘interest exposure’, ‘loan exposure’. She had tried Thai and English business and finance dictionaries. Another compound word ‘credit culture’ was explained to her by a Tanzanian friend. Some other difficulties were resolved by consulting a Thai friend whose mother was in the money lending business, thus drawing on the mother’s knowledge and experience in the field.
Making sense of abbreviations

As well as technical terms and compound words, abbreviations were also cited as being problematic by all the participants. In the text for the third semester pair think-alouds, A1 and A2 and C2 said they did not realise that the abbreviation CJD stood for Creutzfeldt-Jacob disease because, they said, the abbreviation was not in capital letters in the text. In Thai texts, C2 explained, an abbreviation would not only be in capital letters but, in brackets after it, would have been Creutzfeldt-Jacob when the term was first mentioned. This would be in line with most academic texts unless certain abbreviations were presumed known.

Overcoming limited vocabulary

All the participants had mentioned strategies for circumventing their limited vocabulary. They used dictionaries, did other reading in order to make connections and, in the case of C1, read the first two paragraphs of a text minutely in order to deduce the main meanings before reading further. Other strategies were mentioned during the individual interviews. B2, for example, said that she skim read texts, adding that it was usually better to read whole sentences rather than part sentences while she ‘thinks about the meaning’, thus reflecting her recognition of the fact that English structures often require the reader to read to the end of sentences or even the end of paragraphs to acquire the total meaning. At the moment, she reported, she had only ‘computer vocabulary’ but she said she would read in more detail when she had acquired more vocabulary.

Knowing more vocabulary, though, does not necessarily mean it can be summoned when needed. A1 said she knew much more vocabulary now but ‘it [the vocabulary]
doesn’t come to my mind suddenly’. In Thailand, she explained, she read in English and translated into Thai; translating in this direction was easier as she only had to ‘think one way’. But translating from Thai to English, she said, was ‘very hard’. This is a point for lecturing staff to consider. Often they supply glossaries but, unless the students have the opportunity to use the new vocabulary items, they may not find them readily available in their short term memory.

**Translation and memorisation**

Other strategies, translation and memorisation were two strategies still being used in third semester by all the participants. A1 explained why she still had to use translation although she recognized that it was a time-consuming practice:

*I cannot think everything in English so I cannot choose appropriate words to explain my idea to any other people and cannot summarise it in English ... read in English, think in Thai, translate back to English.*

She further explained that, although it was easy to find a Thai word for an English word, it was difficult to find the appropriate English word for the Thai word because she could not understand ‘the deep meaning’ of English words and so could not use them. Once again, the influence of the grammar-oriented style of English teaching in Thailand was mentioned as being the cause of not being able to read and think in English.

A1 highlighted another difficulty in relation to translation. She said she read in English, put words into Thai word order but when she translated from Thai she had to think of the most appropriate English word first and then put it in the correct order; so
there are two stages that have to be accomplished in order to acquire a reasonable translation – finding the appropriate meaning and then using correct word order. Another strategy, discussion with a Thai friend was being used by several of the participants. C2, for example, would speak frequently with a Thai friend whose mother was in the money lending business. She explained how examples from Thailand could be discussed when using the Thai language:

\[
\text{We can give the examples in Thailand like she says, 'my mum do like this, this is the same'; maybe it must be the same because we could not find in English that how to explain this particular subject but if make clear sentence or our own language we can understand more.}
\]

B1 mentioned another aspect of discussion with Thai friends. She emailed Thai friends about problems using the Thai language with some English terms. In order to discuss the problems thoroughly, she explained, she had to provide background; this was easier to do in Thai than in English.

In addition to translation, memorising was reported as being used to aid understanding. It was explained in first semester by C1 that Thai text can be understood from small segments and both B1 and B2 reported that they could extract main ideas quicker from a Thai text even though it is wordier because they could skip segments which were not of interest. When reading more complex English text A2 explained how he used memorisation. At the same time as reading a segment of text, he was linking with what he had previously read and memorised.
Another significant change with regard to the use of memorising was explained by B2. She reported that she could not remember material she had read but had realised this was not important and put it this way:

*In my country, we memorise a lot but here we learn how to get the information, how to access the information – life long learning.*

Pronunciation was mentioned in third semester, again, too, in relation to memorising and understanding. The author of C1’s academic article was Charles Pickstone (see appendix 13). ‘Charles’, C1 explained, was a ‘normal’ name but names like ‘Pickstone’ can cause problems because they are completely unfamiliar. He explained his difficulty when he came across unfamiliar names:

*I don’t know how to pronounce and when I don’t know how to pronounce I cannot pronounce in my mind so I cannot remember and that give me a lot of problem in lecture ... because the lecturer talking about somebody, some author; I don’t know what he is talking about.*

Not being able to visualise the name, would make it difficult for C1 to find further readings by the author and, even if he did, there would still be the problem of memorising a name with which he was unfamiliar, possibly impeding his comprehension of a text.

C1 mentioned in connection with the general-interest text that ‘strange’ sounding names could present a problem. The French names in the text confused him, he said, and made it difficult for him to remember them especially as there were several
paragraphs between the mention of the names. The name, ‘Korman’, was mentioned in the same paragraph (paragraph 8), in the first and last lines, but it seems this was not close enough to make an easy connection. Rayner and Polltasek (1989) observed, after reviewing a large number of studies, that ‘associations between the printed word and the appropriate pronunciation are activated during reading and appear to be important in comprehending text’ (p. 211).

To assist memorisation, strategies such as reading on, re-reading, reading for gist and then for detail were mentioned. A1 explained her use of these strategies:

_The first time I cannot remember every detail about it so I have to revise, re-read it, and draw some points._

It seemed from the participants’ accounts that translation and memorising were still two significant strategies for them. They stated that they were aware, however, that these strategies were not without problems. Often translation did not uncover the precise meanings and it was time-consuming. The participants demonstrated, also, how memorising was used in conjunction with looping back and forth but how this strategy was limited if difficult to pronounce or unfamiliar words were presented to them.

_Study strategies: making notes for future use_

There were other strategies which, while time-consuming like translation, were still being used; time-consuming strategies such as note making, however, had been adapted to better accommodate the new requirements of postgraduate study at an Australian university. Note making was carried out, not only to memorise content and
to aid understanding, but now also to prepare for written work later. A1, for example, highlighted the points of interest, on second reading, took notes and tried to paraphrase them for insertion in her own writing. B2, after making an outline of what she read, read it again and inserted her notes, then, in order to have her work monitored, asked her lecturer to check what she had produced. C2 also took notes in preparation for writing; her notes included underlined key points which could be easily seen when she returned to her notes.

In summary, intratextual framing had increased significantly and adaptations had been made to the strategies that were used in first semester. Headings were being used to select relevant parts of the text rather than to guide the reader through the whole text. Translation was being used less as it was time-consuming. Most participants had now transferred to English/English dictionaries; they acknowledged that dictionaries, though, were not without problems as they could not be sure they had found the most appropriate meanings. More reading, though, had led to a lessening of some of their difficulties. For example, greater knowledge of technical terms had been acquired from reading many papers.

**Extratextual framing**

While intratextual framing had increased significantly by third semester, extratextual framing was still used only to a limited extent and, at times, hindered understanding. Nevertheless, some of the participants demonstrated how they attempted to use background knowledge to guess vocabulary items, to evaluate texts, to generate inferences and to make moral judgements.
Guessing using background knowledge

In the general-interest text, used for the pair think-aloud in third semester, one of the vocabulary items illustrated how background knowledge could confuse. The vocabulary item was 'urea'. B1 and B22 decided 'urea' meant acid and left it at that. A1 thought 'urea' was a substance that could be used to test the effect of the hormone rather than as a decontaminant and A22 further misinterpreted:

*You mean that we got growth hormone from urea?*

To add to his confusion, A22 recalled a case from Thailand where a doctor cured himself of a disease by 'drinking the urea from a famous monk'. The recollection of this event led to his confusion over two issues and he asked A1:

*This hormone extract from urea or not?*

*Does it mean that drink urea or not?*

Even when A1 and A22 read in the last paragraph that experiments showed that urea could not completely remove the CJD agent from the heavily contaminated sample, they were still not sure if a patient had to drink urea to remove the contamination.

When questioned in the retrospective interview, A22 said that, although he had a clear picture of the text content, he was still confused about how urea was used because he thought it was synonymous with 'urine', because of his association with events recalled in Thailand. He explained his confusion in this way:
Drink the urea or juice [of] the urea and find out what happen after the patient take that hormone and body eliminate that hormone through the urea and check the urea so I not understand.

A1, on the other hand, did not think ‘urea’ simply meant ‘urine’. Her chemical background informed her that it is a chemical substance that has a specific formula and can be prepared from urine. However, this knowledge was not sufficient to help her determine the usage of urea either.

Knowledge gleaned from television fiction was reported as being another way of determining meanings. C1, however, when trying to draw on knowledge from televised fiction to guess the vocabulary item, ‘cadaver’, incorrectly deduced that it meant ‘one of the gland in the body’. Even though he did not equate ‘cadaver’ with ‘corpse’, he was still able to understand the text.

The other participants did not mention explicitly difficulties with vocabulary items in the general-interest text.

Only one of the participants had the necessary background to guess the meaning of another vocabulary item, ‘ampoule’. A1 was able to guess the meaning correctly as, she explained, she was used to ordering substances in ampoules for the laboratory where she worked. Her background in science also helped her to understand the issue of contaminated growth hormone as the following comment illustrated:

I think some substance that come from brain organisms, I think it is contaminated easily and last for longer time.
B1 and B2, however, not having such work experience, demonstrated how the word 'ampoule' could be misinterpreted and B2 made an incorrect connection when B1 suggested 'ampoule' meant 'case':

B2: do you know what the ampoule mean?
B1: I guess it; it is like a case in the hospital
B2: case study

Another example of misinterpretation of a word was demonstrated when B1 and B2 discussed the five officials who had been charged with involuntary manslaughter. The text read:

Cercone is one of five officials who have already been charged with the involuntary manslaughter of children who contracted CJD after being injected with growth hormone extracted from corpses. The others are …

B1: do you think all of them have been in charge of their work with the children which is being injected already with the ... I know only the first one deal with the children but for the others they deal with the hormone
B2: one of them is growth hormone programme.

There was either an inability to discriminate between such phrases and their differing prepositions as 'to be charged', as in the text, and 'to be in charge' and/or the confusion arose from the expectation that officials would be 'in charge' rather than 'be charged'.
There was confusion, too, when the author referred to an earlier case where two French officials were charged over distribution to haemophiliacs of clotting factors contaminated with HIV, as B1 and B23 demonstrated:

**B23: HIV, CJD**

**B1**: I am not quite sure, maybe CJD have some side effects because they say clotting factors contaminated HIV.

These two participants showed a lack of observance of important prepositions such as 'with' as in contaminated 'with HIV' and they did not make the connection between this case and the present one. They did not realise the previous case was mentioned in the text to show that Cerceau and Molet would have been aware of the consequences of distributing growth hormone from corpses that had not been reprocessed. In the retrospective interview B23 was asked why the scientists were using the hormone. B23 answered showing her lack of comprehension of the connections the author was making between HIV and CJD:

*I think maybe they try to inject if you got HIV already they give this to make you more stronger.*

B1 then suddenly understood; the trigger may have been the reference to 'make you more stronger' which he equated with 'growth' and then he recalled the discussion about children.
He said:

_Oh, I think they use this hormone for children to ... about the growth... to make the children more strong or more growth something like this with growth hormone extract_

An interesting point made by A1 was that she could use background knowledge from her undergraduate studies to help her with her academic reading during first semester, but could no longer do so as her topics were now completely new. It was mentioned in the previous chapter that students often had little or no background knowledge, even in first semester. A1 explained, referring to her studies in crystallography, why lecturers should not presume knowledge:

_This area is, like not popular in Thailand at the moment._

Personal experiences and knowledge affected interpretation of the events in the general-interest text. Again alluding to medical practices in ‘some countries’, A1 said, when commenting about the use of the natural growth hormone, ‘the person cannot sincerely trust the doctor’. A2 agreed saying, ‘there is a point, you have to be careful’ and cited the case of people contracting HIV from blood transfusions. By using this background knowledge, the participants were possibly adding connotations to the events described in the text that the author never meant to imply.

One way of filling in knowledge gaps is through attendance at lectures. However, A1 and others stated that they found it difficult to follow lectures and ‘catch the words’.
She spoke of how this felt:

...we are not sure that we learn anything from some classes like...

management, she just talk and talk and talk and we watch each other – 'you know anything, no!'

A worthwhile endeavour for future research would be an investigation of the accessibility of lectures because, after all, these should be a valuable resource to students.

Evaluating texts

Despite the struggles to understand texts and acquire more knowledge, there were signs of evaluation of text segments such as the conclusion as well as text content in first semester. In third semester, B23 looked at another aspect, cultural differences in the content of texts. She had found that the fundamental cultural differences in material described in her compulsory readings in Australia were unsuitable for her work in Thailand. One text, The new meaning of educational change discussed management with ‘vision’ drawing on staff initiatives (see appendix 14). While the text was ‘very interesting’ she said she could not apply the concepts to her work in a government office in Thailand because there was no way to survive ‘vision’ in a situation where personnel left every year through retirement, rotation and promotion. Her office, she explained, focussed on staff development. This meant, she said:

Giving information to staff, not giving opportunities to initiate change.
The use of the evaluative language ‘very interesting’ shows, too that she perhaps did not expect to find such cultural differences in her readings.

Another example of evaluation was demonstrated by A1. Her evaluation of her academic article centred on the amount of detail that was given. Her current article was not, to her, satisfactory because it did not compare the results with others (see appendix 12). Brief details only were given, she surmised, because the author had split the data up to produce several articles, and she would have to follow up the author’s other articles in the library.

The general-interest text produced data which revealed evaluation of this text at three levels: in terms of suitability for a general readership, in terms of presentation of argument and in terms of the author’s message. A1, for example, thought that it could be read by anyone interested in cures for diseases. A2 and B1 possibly because they were from the computing field, did not think the article was suitable for the general public, but for doctors or scientists.

In terms of presentation of argument, B1 and B2 judged the text to be ‘one-sided’ as the author did not mention any disadvantages in the use of the synthetic growth hormone, failing to notice that the text was not written as a comparison between synthetic and natural growth hormones but to highlight possible negligence in the use of natural growth hormone.

With regard to the author’s message, C1 judged that the author was supporting the argument for the use of the synthetic growth hormone although he did not state categorically that it was wrong to use the natural growth hormone; C1 had noted that
the author used evidence against its use rather than projecting himself into the text; he described how the French health professionals continued using the natural growth hormone even after Canada and the USA had expressed concern, then left the readers to form their own opinion.

Evaluative language was displayed by C1 when he described his impression of the situation discussed in the general-interest text; he said that a few French people ‘do something tricky, not try to do the right thing’. His use of the word ‘tricky’ shows that some unexpected event has occurred. C2 then tried to justify the actions of the doctors (perhaps demonstrating the natural respect for a professional) by saying that they may have thought that the natural growth hormone was preferable as treatment as it came from a body and was not a chemical. Drawing on her knowledge of Thai attitudes and their preference for natural products, she continued her justification:

... we should substitute by the same kind of hormone that is natural so that is why they extracted it from the corpse because they have the idea if we lost it [growth hormone] we have to give the same thing that have in the body to substitute.

C1 demonstrated his ability to analyse the situation further, drawing on his knowledge of an occurrence in Thailand. A friend of his father’s decided to donate his organs but when he died they were useless, C1 said, because the organs were destroyed ‘from inside’. Therefore, C1 concluded, because the natural growth hormone could be contaminated, the synthetic growth hormone should be used.
I don't think a dead body can create something that when we alive it work, but then we die it maybe out of operation already, so how can we make sure that after we die that organ is not poisoning or spoilt already?

Despite the lack of background knowledge all the participants demonstrated that they were prepared to guess vocabulary items and to discuss and even evaluate the text from personal experiences; in other words they were prepared to invoke whatever background knowledge and experiences they possessed to help them interpret the general-interest text.

**Making inferences**

Another aspect of extratextual framing, besides guessing and evaluating using background knowledge, is inferencing. There were many examples of inferencing in connection with the general-interest text in third semester. In the following example, statements of uncertainty were followed by an inference using the table in the text. A1, having confirmed that nearly 50% of the people contracting the disease, CJD, were from France, stated she was confused. She referred to the table, ‘from this table I am not sure I understand clearly – 50 person from France suffer from CJD, then A2 inferred a link between the growth hormone and CJD:

**A1:** nearly 50% are France, oh, confused, 50 are France, another 40 are other nations

**A2:** this one according to the ... 50 of the 90 plus people are French so the most of this lot sent to France

**A1:** more than 50%
A2: Yes, French people contract so the main problem is in France; is there any record for another country? Yes, it is France, 50, Britain, 22, another is 3, another is 4; CJD is linked to growth hormone treatment so this is ...

A1: from this table I am not sure I understand clearly – 50 persons from France suffer from CJD

A2: yes

A1: it mean people in France, there are many people got sick, more than other countries

A2: yes, so many people, there one, two, three, four, five country, France, Britain, United States, New Zealand and others; total is 94, 50 person who contracted CJD were in France so the main problem is in France

A1: so from this table we think the investigator thinks CJD caused by the growth hormone, I think maybe

Showing her ability to think ‘beyond’ the text, A1 wondered if another factor may have caused CJD. A2 conceded this was possible but, in this case, he felt CJD was caused by the contaminated hormone, clearly believing there was enough evidence in the text to support this theory.

Further inferencing

Respect for organizations with status and authority may influence interpretations. In first semester all the participants demonstrated their respect for the World Health Organization which played a part in the text they read for the pair think-alouds. This semester all the participants once again displayed their respect for a well-known organization mentioned in the general-interest text, in this case, the Pasteur Institute.

A1 was concerned, for example, that the Institute was involved with ‘something bad’.
She questioned, along with A2₂, after looking at the figures for the two countries, why Britain and the USA did not check before using the hormone. A₂₂ inferred that doctors probably did not know about the contamination at first and only after occurrences of CJD did they know to check. Also alluding to the prestige of the Pasteur Institute, he judged doctors felt they could trust the product because the Institute was famous.

**Making moral judgements**

In addition to inferencing and evaluating, moral judgements were made by the participants, based on their own experiences and cultural views. The following dialogue demonstrates how C1 and C2 assisted each other through question and answer, during their pair think-aloud, to make meaning of the first paragraph in the general-interest text, ending with C1 making a moral judgement on the situation:

**C2:** I don't understand what is the 'prion protein'

**C1:** is some growth hormone affect the body to affect the prion, the proteins, something like that because this disease very wrong so cause mistake of the doctor so they should be sent to jail.

**C2:** so it mean this kind of hormone is not rightly treated before release to the public and this important to the body of the people?

**C1:** yea, because growth hormone is, I think, it is a side effect of growth hormone which doctor should care but they don't; they ignorant so it cause this disease.
The use of evaluative language, ‘this disease very wrong’ shows that C1 is aware that this is not the normal course of events.

C1 demonstrated a strong reaction to the general-interest text when discussing the use of natural growth hormone in the retrospective interview. His view was:

*I don’t think they have right to do something like that.*

In Thailand, he explained, relatives had to sign for the release of organs for transplanting after the death of a relative. Nevertheless, possibly because he had heard of cases where this had not happened, C1 thought that perhaps permission had not been given to extract growth hormone (although this was never even hinted at in the text). He stated:

*In hospital, they [staff] can go into the room and just extract it [growth hormone] from the dead body; no-one knows, just the officials.*

He then inferred there would be reason to steal because the synthetic version of growth hormone was probably more expensive than natural growth hormone.

Moral judgement and inference are displayed when reading the general-interest text when C1 surmised that the untreated growth hormone had either been used because the pharmacists ‘do not care about this’ or maybe because of ‘high demand’. Later, in the retrospective interview, C1 explained the Thai cultural expectation that growth hormone would be in ‘high demand’; in Thailand, high demand was created due to the wish of many Thais to be as tall as Europeans. The demand meant the hormone was
very expensive. It was suggested during the reading of the first semester text on drug resistance to certain parasites that money may take precedence over safe practices.

It might have been expected that B1 and B2 could invoke background knowledge as A1, A2, C1 and C2 could. They stated that there was little research done in the field of growth hormone use in Thailand because of lack of funds and, in any case, 'no-one care to talk about it'. Either Thais would rather not discuss such medical practices, even if they know of them, or there is little interest, as B2 suggested:

_Thai people are more interested in politics because they know the politicians._

In summary, it can be seen that most of the Thai participants were willing to draw on whatever background knowledge that they had to help them interpret the general-interest text. Through their background knowledge and experiences, they demonstrated that they could generate inferences, evaluate texts and make moral judgements. Although most of the participants had limited specific background knowledge, they showed that, with sufficient interest and motivation, they could still frame extratextually.
Intertextual framing

Acquiring local background knowledge

The participants in third semester demonstrated their awareness of the need to acquire cultural knowledge, as well as linguistic and discipline-specific knowledge. To increase local background knowledge, all the participants in first semester said they were reading local newspapers. Now newspapers were only read for specific purposes, according to B1 and B2, such as finding a car because the newspapers were perceived as ‘boring’. As mentioned in first semester by C1 he lacked the cultural background knowledge to enable him to understand local events, such as the Patrick dockside dispute in Australia, explaining:

*I do not understand the layers, last year’s news, so I cannot understand this situation.*

A2, on the other hand, knew enough about Australian land rights to relate the issue to the general-interest text. Other ‘texts’ such as television and film can provide additional vocabulary as well as cultural insights. A1 actively acquired vocabulary, she reported, by checking with a dictionary after viewing the television news. She also watched, she said, American movies because they were ‘easy to understand’. Complexity again was mentioned. For example, A1 said the ‘X files’ was difficult to understand because the ‘story is complex’. English programmes, such as ‘Keeping up Appearances’, were clear and provided useable general vocabulary. Another ‘text’ the television documentary can also provide cultural insights. A2, for example, viewed a documentary on prostitution in Thailand and was surprised to find such an issue reported on so publicly:
I was surprised to hear it being reported here because actually in Thailand there are many things that cannot be said in public because they are related to police corruption.

Interestingly, Thai people have few inhibitions about discussing death but, despite having a liberal attitude toward sex, are uncomfortable discussing sex (Kaplan, 1997).

In addition to the general reading, all of the participants reported increased academic reading which arose from the necessity to fill the knowledge gap (which they had identified in first semester) for their chosen academic disciplines. Of particular note, was the reading of journal articles. Several participants mentioned that they now realised that books were ‘mostly theory’ but journal articles (to which they had limited access in Thailand) were useful for reading about up-to-date research. C2 explained why she had not read journal articles in first semester, saying she ‘did not know [about them]’.

Another reason for increased journal reading was participants’ greater confidence in accessing library and Internet sources. All the participants had realised, too, that, with increased reading, came increased understanding. In first semester, C2 had found, however, that reading the unit guidelines and some brief reading from the reserved texts in the library was sufficient reading for her course. The textbooks she bought were hardly used. It may be that students’ understandings are delayed if course requirements are such that they do not demand much reading. More investigation needs to be carried out concerning the personal reading development of students as opposed to the course reading requirements.
All the participants reported that increased academic reading, as well as some general reading, was being carried out in third semester. As discussed in the next section, all the participants used knowledge acquired through their academic and general reading in conjunction with other background knowledge acquired from experiences in their own country.

**Intertextual/extratextual framing**

**Making analogies**

In third semester, argument by analogy and comparison were demonstrated to a greater degree than it had been in first semester. These analogies were possible due to a combination of participants’ background knowledge and reading in Thailand and in Australia. For example, C2 related the text to events reported in Thailand where insufficient testing had been carried out on medicinal herbs and drugs. C2 recalled a particular case of a Thai person dispensing a secret herbal formula; people, she said, felt better but there had been no tests on the formula to investigate possible side effects. Pharmaceutical drugs could be suspect too, she said, making a closer connection with the text. She remembered cases of children with brown teeth because their mothers had taken drugs when pregnant. C2 then recalled another event in Thailand. Drug companies, she said, sent new drugs to Thailand for testing on HIV patients. Doctors were concerned about the drugs but the patients were going to die so they did not worry, she said. She recalled, too, that it had been reported in the Thai newspapers just prior to her departure that the USA wished to test birth control drugs and some Thai doctors had said it would be too dangerous to use the drugs at this stage. A1 also recalled the thalidomide tragedy when babies were born without limbs. She inferred that the discovery of the cause of these events related to the situation described in the text:
Maybe like this case, CJD, they found what is the cause of this disease after – after, they find out this come from growth hormone.

The participants not only recalled events in Thailand but found analogies in the United States of America and Australia showing how broader perspectives could be stimulated by the text, in turn helping to stimulate discussion of the moral issues implied by the text material. A1 recalled, when looking at paragraph eight, in which it was stated that ‘Cerceau was aware that some untreated hormone was distributed in the second half of 1985’ that Bill Clinton had apologised to the black people of the USA for testing drugs on them. A22 recalled the situation in Australia where Prime Minister Howard was called on to apologise to the Aborigines for past governments authorising the placing of Aboriginal children with white parents. Relating this to the Clinton apology, he said:

I think that is the same situation because that is the morality, like apologise for the mistake in the past.

Those participants who recalled such events demonstrated their increased ability to go ‘beyond’ the text to predict the development of events. Some of the participants had, moreover, demonstrated increased knowledge of events in Australia, events which they were able to use as analogies when discussing the general-interest text.

Making connections with other academic readings

The participants’ accounts in their individual interviews and the pair think-aloud data revealed that understandings were derived not only from background knowledge and
experiences but also from reading other texts. The significance of intertextual framing had been noted by all the participants and wider academic reading was revealed in third semester in comparison to first semester. All the participants seemed to have realised that they required further reading for clarification and expansion of their knowledge and to cite authors in their written work. B1 explained the benefit:

*Read more frequently and help to more understanding.*

Other benefits were reported. A2_said he could now predict through his greater reading of academic articles, the content but not the details, of an academic journal article and B2_said that her increased reading had enabled her to become aware of contradictions. For example, she said, some articles on the topic of the importance of ‘vision’ stated that ‘vision comes later’ while other articles stated ‘vision comes first’. Her own opinion on the matter was that it depended on the organization and she mentioned earlier the difficulty of incorporating ‘vision’ into government departments in Thailand.

**Managing the increased reading**

Intertextual framing involves not only reading of other texts in order to make connections between them but also following up of references. Following up references is critical for academic study. B1, for example, acknowledged the usefulness of following up references in her academic reading, saying they helped her to find more technical detail. Through her increased reading, she could identify, too, what made a text easy to comprehend. Good examples, she said, were very important, especially concrete examples. She cited the example of the supermarket from her current academic text (see appendix 15); the supermarket, she said, was easy to
visualise but three-dimensional examples were more difficult to visualise. B1 had developed a strategy for coping with her increased reading. Because she had to ‘know everything’ and therefore had, she said, to ‘remember everything’ she categorized everything she read into groups – groups of researchers using certain techniques, for example. The one disadvantage of focussing her research on one area, ‘association rules’, was that, she said, she had forgotten all the other areas in computing that she had learnt.

Finding other texts, C1 reported was still a laborious task. He still found library searches very time-consuming but he needed to visit the library now to find books to explain terms he did not understand in current reading. He was finding, though, like the other participants, that increased reading lead to better understanding:

_The rock with Joshua use to sleep on and he dream about God ... so I can link the idea of spirituality in earth and rock with the very old... and I know how the artist use that spirituality in this material_ (see appendix 13).

Even in third semester, however, C1 never followed up references from reference lists, preferring to find texts specific to his needs in the library at random. He explained how following up references would take too much time:

_Some [references] is very interesting but if I stop my reading to find out I lost my time ... Thai people we don’t give importance to reference so much._

C1 was clearly still influenced by his lack of experience in following up references in Thailand. He was also not used to citing authors in text and, as a result, found this a
difficult practice especially as he had not organized himself to keep records of his reading. Perhaps because of his lack of following up on references, C1 missed the circumtextual cue, the name of the journal, *National Painting* which was located at the foot of the first page of his academic article.

Another benefit of increased reading was a greater awareness of in-text referencing, according to C2. She had not known in first semester that she would have to develop this skill. In Thailand, she explained, ‘you wrote from the head or from your understanding’ without citing the works of others.

B2 also mentioned that in Thailand, lecturers ‘did not pay attention to quoting’ and she had had to seek advice on plagiarism from her supervisor when she first arrived in Australia. She stated that she no longer had problems with this aspect of her writing. However, she still did not follow up references.

Overall, it seems that the Thai participants, while recognizing the importance of following up references, were still tentative about doing so. This stems from an educational system which requires little referencing and following up of references. Gradually, all the participants, it is hoped, will become accustomed to this practice. Those who were following up references were developing strategies to manage the greater amount of reading; one of those strategies was memorisation.

**Using memorisation**

All the participants had mentioned the strategy of memorisation in first semester with regard to remembering facts in a single text. In third semester, A1 explained the use of memorisation when reading a range of texts. She said she consciously tried to
memorise, then jotted down notes in order to remind herself of the different viewpoints presented in different journal articles. She said that she needed to write notes in order to ‘see the relationships’. Linking views and arguments will enable her, too, to write a well-rounded literature review. Making connections between texts is a significant change from first semester when A1 had reported she was ‘very confused’ when reading. She still translated, though, because it was easier for her, she said, ‘to memorise in my own language’ but memorising, as she explained, enabled her to make connections between texts:

*If I can memorise something I can relate each other [information from different authors], I can understand all of them.*

Discussion was mentioned by some of the participants in order to remember content in a text. B2, for example, had found that, if she read and then discussed a reading, it was easier for her to remember the content. She usually discussed her reading with her work boss and an Indonesian friend, she reported.

In first semester, two of the participants, C1 and C2, explained the importance of reading cartoons when they were young. Childhood reading was shown again to be of assistance when interpreting the current general-interest text. For example, from the reading of fairy tales, C2 said, he could guess the meaning of ‘dwarfism’.

**Using other reading resources: the Internet**

Besides drawing on information from newspapers and cartoons, several of the participants in third semester reported using much more often than in first semester two important sources, the library and the Internet. Even in third semester, though,
these two sources were not being used to their full potential. The Internet was found, in some cases to be too time-consuming. A1 reported that, although she ‘lost too much time’ using the Internet, she realised its importance because ‘many more people publish on the Internet’. Internet use was time-consuming for C2, too. She put it this way:

_Oh, is too much, it overwhelm me, overload like you find one word, they give you one thousand record, oh God..._

Another participant, B1, also used the Internet and would follow up by asking authors for papers, if necessary. Using the Internet was a significant change for B1 who, nevertheless, said that she still found much of the information difficult to read.

Because of lack of time to search for sources in the library, another participant, A2 said he, too, was making use of the Internet. The increased reading, he reported, helped him to make connections between the work of different authors and he could now identify the various researchers in his field.

Other uses had been found for the Internet. B2, for example, reported that she used the Internet daily to find samples of computer programmes; she never read from books, she said. She had thus found an easier alternative to textbooks. B1 and B2 said they also used the Internet to read Thai newspapers. B1 read them in English but B2 read them in Thai.

Overall, intertextual framing, necessary for academic study, had increased significantly by third semester. Of note was the confident reading of journal articles, an unfamiliar
genre to most of the participants. The greater amount of reading, moreover, had changed the type of reading that was being done. Instead of reading to memorise facts, the participants were considering their texts from an evaluative, critical perspective. More use of the Internet was a significant change; not all the reading on the Internet, though, was done explicitly for academic study. Much of the Internet reading was for keeping up with the local news in their countries. Nevertheless, as was demonstrated earlier, background knowledge gleaned from a range of sources can be invoked to help in the interpretation of general-interest text and possibly of academic texts.

The following segment now reports the reflections of the Thai participants on their reading practices in third semester and the reasons for the changes in their reading practices.

**Knowledge of self**

In first semester, the Thai participants had become aware of the need to change their reading practices in order to accommodate to their new study environment and they had also begun initiating changes in their reading practices. In third semester, they had made significant changes; participants had increased the use of intratextual framing and intertextual framing. A major influence on these changes appeared to have been substantially increased self-efficacy. At the same time, increasing self-efficacy was a consequence of the more successful reading practices now being used by the participants.


**Increased self-efficacy**

Despite the challenges, the participants were experiencing increased confidence which they expressed in a variety of ways. The participants could all report that they were reading faster and with more understanding. C1, for example, reported reading for three hours a day as opposed to one hour in first semester and reading three times the material in that time. A22 could differentiate between reading for understanding and reading for a few details; the former could take one or two days, the latter might only take one to two hours, he said. C1 mentioned his ‘comfort’ zone. In first semester all reading was ‘scary’ but now at least he felt comfortable reading magazines and newspapers because they were not ‘serious’, in other words, he could adopt a relaxed attitude when reading material not directly related to study purposes.

B22 said her increased confidence was due to being able to read without always having to re-read. Showing her growing confidence in her ability to understand her reading material, she said:

*I can pick up very fast.*

B1 reported that she could ‘pull out’ the main ideas easier and faster and understood more. Her increased ability and confidence in her reading had had an impact in other areas. For example, B1 reported that she could now discuss her research with her supervisor, providing him with details of key points which, she said, he might not know about. This now took her less time than in first semester when, it was reported, the process was long and difficult.
A1, too, was enjoying increased self-efficacy. She stated that reading was the only language skill that she felt confident in because she spent more time practising this skill. As well as feeling confident, she recognised that she was benefiting in other ways from the increased reading; she was acquiring more academic and general knowledge and could remember ‘the form of the sentence’; this knowledge could be transferred to her writing and speaking. This was an important aspect for A1 – the transfer of skills, especially to speaking. She said she was still shy and had no time to think about ‘what is correct and what is incorrect sentence’.

In lectures, in contrast to first semester, she could understand ‘more and longer sentences’ although, she said, she still needed a break between sentences to think about the meaning. She might occasionally, she said, still translate overhead transparencies. B23 said she felt more confident, also, despite her limited vocabulary. She estimated that she now understood 80% of her reading compared to 10% when she first arrived in Australia.

**Evaluating**

With increased understanding came increased attempts to evaluate text content, text elements such as conclusions and implications. Not all the participants, however, felt they had the ability to evaluate an author’s work. C2, for example, explained the dual aspects of respect for the author (authority figure) and her own lack of background knowledge:

> I don’t think I can disagree because I assume the author know; also I don’t have basic knowledge about this before.
Participants, besides acknowledging the benefits of reading more, could also relate their preferred modes of study. Studying in groups and in places where there were people around seemed to suit them better. They liked the seminar mode but were frustrated that they could not participate. Participation required better knowledge, more fluent oral skills, better listening skills and confidence.

In order to give themselves more time for the required reading, changes had also been made on the ‘home’ front. B22, for example, reported that she had arranged to eat only ‘ready made’ meals and no longer attended parties.

Acknowledging the need for further change

Participants demonstrated awareness not only of their own increasing abilities, but also of where they lacked efficient strategies. B1 acknowledged that she found reading difficult and could not, she said, understand an English article as she would a Thai article; and even in the computing field she would only understand 90% of an easy article, she said. A1, although being able to discuss more with her supervisor, also explained her limitations:

*I only answer the questions that supervisor ask me; I don’t dare to tell, to ask him first or to argue some points, you know.*

A1’s confidence was also undermined by the teaching style of her supervisor. Her purpose in reading academic texts was to gain knowledge of crystallography and, specifically, to find an appropriate method for her own experiments. Her supervisor, however, felt it was important for her ‘to read and learn by error’. This did not feel ‘safe’ to A1 and Thai people generally like to feel ‘safe’, she said. She did not feel
comfortable, she said, carrying out experiments without knowing ‘theory to explain’.
Because of her inhibitions in terms of expressing herself orally, she said:

*I can’t tell him what I feel.*

It may be that being forced to step outside her ‘comfort’ zone will challenge her
further; too much discomfort, on the other hand, could upset her newly-found
confidence and be detrimental to her academic progress.

**Forming a good working relationship with supervisors**

A good relationship with a supervisor was clearly important to the participants. A2₂,
showing signs of considerably increased self-efficacy, was not only evaluating text, he
was discussing his opinions with his supervisor while maintaining the Thai
conventions of respect for authority and harmony. For example, when A2₂ judged that
the algorithm mentioned in his current academic text was suitable only for a small
problem, not for a large, more complex problem, he felt able to discuss this with his
supervisor. He said he and his supervisor initially may differ in their opinions but, after
discussion, would agree.

B₁ also felt confident enough to consult with her supervisor if she encountered
difficulties, she stated. B₂₂, on the other hand, only consulted with her boss (she
worked part time). It could be assumed that the increased self-efficacy was partly a
consequence of being able to discuss reading materials and research with supervisors.
Even discussion of text with partners, as in the pair think-alouds, helped the
participants.
As A1 explained, discussion can jolt the memory:

*Can get the answer and remind me [of] something.*

Despite increasing self-efficacy and the resulting changes that were taking place, a dimension of reading, seldom referred to in the literature, was mentioned by one of the participants – the emotional level of reading.

**The emotional level of reading**

Texts, especially literary texts, can generate strong emotions. C1, increasingly self-aware, realised this dimension of his reading was missing – he could not feel the emotion in an English text as he could with a Thai text. He explained:

...when I speak English, it is something like pretending; it is not my word, it is something like unreal but when speaking Thai I can put any emotion...when I read about Picasso work, Picasso's work about the Korean massacre, the queuing group of people, something like that, I got the feeling of why horrible but when I read in Thai word it mean more strong, the feeling is different.

This is an aspect of reading that requires further investigation for ‘feeling the emotion’ in a text may lead to greater understanding of a text.

In general, all the Thai participants reported increased self-efficacy. Being able to read and understand more had, in turn, led to increased reading. Their increased knowledge of their own abilities and increased understandings had led to several other benefits. Several of the participants stated that they now felt able to discuss their research with
their supervisors. They stated also that they could write and speak better. There was evidence, too, of attempts to critically evaluate texts.

Despite the encouraging changes which had taken place, the participants stated they were anxious to improve further and would continue to read more to increase understanding, showing their awareness of the need to not only be acquainted with the research in their field but to also be able to make connections between the various research activities.

The participants demonstrated determination to improve their reading practices but they still felt many anxieties. C1 in his final comment gave insights into his own, and possibly the other participants’ lingering anxieties. He reported he was still ‘riding on the tiger’s back’. It was dangerous, he explained, to try and stay on the tiger’s back and equally dangerous to fall off!
Summary and discussion of reading practices in third semester

The research data discussed in chapters four and five related to the research questions:

What are the reading practices of Thai postgraduate students in first semester at an Australian university?

What are the home country and Australian influences affecting change in their reading practices?

What are the reading practices of Thai postgraduate students in third semester at an Australian university?

What are the influences which may have led to changes in their reading practices by third semester at an Australian university?

The discussion in this segment centres on the changes that had taken place between first and third semester and the influences on those changes. A comparative analysis of the seven Thai students' reflections on their reading between first and third semester showed increased awareness of task, increased use of intratextual framing with a wider range of text-based strategies and more use of extratextual framing with general-interest texts. More significantly, there was increased use of intertextual framing, reflecting the participants' increased metacognition: greater awareness of postgraduate study expectations, greater confidence in their reading practices and abilities to negotiate meaning from a variety of texts.
Increased awareness of task

In first semester, the Thai participants were coming to terms with the differing expectations at an Australian university. They reported realising that, instead of reading for examinations, they were expected to read for greater understanding of their discipline areas. Moreover, they were expected to search for information for themselves.

In third semester, all the participants generally had a clear idea of, not only what needed to be read, but where the information could be found. Being able to access resources through an unfamiliar library system or through the Internet was an important skill for postgraduate study that all the participants had developed to varying degrees.

Improved intratextual framing

Intratextual framing, as in first semester, was used extensively. Its form, however, had changed in that participants tried to make more connections within the text, used time-saving strategies of skim reading and paid attention to visual cues such as graphs, tables and diagrams, at the same time discriminating between helpful and unhelpful intratextual devices. Although reading more and acquiring more understanding, there were still some difficulties to be faced, for example, with in-text features, such as tables, diagrams and figures.

The participants in this study reported the following reasons for their varying degrees of difficulty with these features: lack of explanation, too many statistics and lack of reference between some visual features and the text.
The Thai teaching style and a background reading Thai texts were again cited as being considerable influences on their current reading.

Several studies have suggested that training in text structures can significantly facilitate comprehension in high-intermediate proficiency ESL students at university level (Carrell, 1985) and adult students in academic ESL programs (Carrell, Pharis and Liberto, 1989). Tang’s 1992 study provided tangible evidence of the positive effects of graphics on intermediate ESL students in a multicultural classroom where a tree graph was provided by a teacher to represent a classification text. Some assistance with interpreting such features, possibly in a pre-semester orientation course, could well prove beneficial to international postgraduate students.

Extratextual framing with general-interest texts

Extratextual framing, as in first semester, was applied more to the general-interest text than to the academic texts. When the participants had background knowledge relevant to a text, as was demonstrated with the general-interest texts, they used strategies they could not use with their academic texts: making analogies, recalling events from their background knowledge and experience, making connections between these events and the text, extending the text by suggesting solutions to problems in their own countries or discussing peripheral issues or future possibilities such as government officials apologising for past mistakes (with reference to the misuse of some drugs). It is possible that, with some background experience, postgraduate students could more easily and quickly transfer these strategies to their academic reading for improved understanding of the material. As mentioned by one participant, this would be better given in the form of some experiential course (ideally pre-semester) than from just readings, although the increased reading did contribute to better understandings.
Strategy adaptations and changes

Changes in strategy use between first and third semester centred mainly around memorisation and translation.

Memorising for life-long learning

Changed perceptions by the participants with regard to academic expectations, in particular, the need for substantial reading, led to changes in the use of the long-held strategy of memorising. Instead of using this strategy for learning facts, all the participants recognized that this strategy was more appropriate for understanding material and for life-long learning.

Realising that learning the how is just as important as, if not more so, than learning the what is a significant change in perception of the requirements of postgraduate study.

Translation

An important strategy, especially at the beginning of study in a second language environment is translation; this strategy was being relied on less in third semester but was still required, not only for conceptual understanding but also for discussion of cultural differences. Connected to translation is dictionary use; the responses revealed less reliance on English/Thai dictionaries because the participants were aware that often the most appropriate meaning could not be found in a dictionary. This was especially the case with discipline-specific terms. More reading of English texts, discussion with supervisors and Thai friends and sourcing of the Internet were strategies which were gradually taking the place of translation and dictionary use.
Intertextual framing

In first semester, all the participants had identified a lack of local, cultural knowledge which would have enabled them to read and understand local newspapers. In third semester, as newspapers had been found to be ‘boring’ because the news did not relate to events in their own country, television and films had been substituted as a means of deriving local knowledge; the use of television and films to access local knowledge had met with some degree of success as illustrated by one of the participant’s comments on Aboriginal land rights and other Aboriginal issues.

Increased academic reading was also in evidence in third semester. As mentioned above, the greater confidence in using library and Internet sources had greatly facilitated the participants’ ability to read more. Nevertheless, two of the participants acknowledged that accessing the library was still difficult and time-consuming for them and one of those participants had not begun to follow up references, relying instead on single texts chosen at random. This certainly seems to be an area where greater assistance could be given. There are many library tutorials available at the university; it may be that some of the participants did not sign up for these tutorials or they were not specific enough to their needs. Perhaps students require the assistance of their supervisors in the first instance so that they know they are accessing the appropriate kinds of texts from the most useful sources.

Overall, the Thai participants had made substantial changes in their reading practices to accommodate to their new study environment. While some of the participants were still adhering to practices which were laborious and time-consuming, in the main the changes they had made were facilitating the amount and kind of reading which they were required to interpret and evaluate at an Australian university.
Chapter Six

Indian sub-continent postgraduate students’ reading practices in first semester at an Australian university

Introduction

As in the previous two chapters which focussed on the groups of Thai students, the conceptual framework underpinning the exploration of Indian and Bangladeshi participants’ reading practices combines the theories of metacognition and framing. In chapters six and seven, the metacognitive and framing elements are examined with reference to the reading practices of Indian and Bangladeshi postgraduate students. The impact of their home countries’ experiences and the Australian expectations and experiences are also examined. In addition, the observations and interviews and pair think-aloud protocols conducted in India are presented to help explain the results from the participants who were studying in Australia. The following two research questions were addressed:

What are the reading practices of postgraduate students from the Indian subcontinent when studying in first semester at an Australian university?

How do the home country and Australian influences shape their reading practices?

As with the Thai participants, two texts were used for the study, a discipline-specific academic text chosen by each participant and a general-interest text, chosen by the researcher. The participants were asked to read their discipline-specific text prior to
their individual interview and to be prepared to discuss how they approached their reading of that text. The general-interest text was the same text from the *New Scientist* as was used with the Thai participants in first semester. The pairs of Indian and Bangladeshi participants, likewise, were asked to vocalize their thoughts about their reading processes as they read the text.

This chapter presents firstly the profiles of the Indian and Bangladeshi participants and then gives insights into their reading practices during their first semester of study at an Australian university. The results and examples from the individual interviews, pair think-aloud protocols and retrospective interviews show not only the participants’ reading practices in first semester but the changes they were already making to their reading practices during that first semester.

The chapter then presents a summary and discussion of the results and the changes in reading practices that had taken place during first semester at an Australian university. It presents insights into the participants’ reading practices as self reported by them and as interpreted by the researcher from the data.
Profiles of the Indian and Bangladeshi participants

The six Indian/Bangladeshi participants were chosen for the study, as were the Thai participants, because they had just arrived in Australia to undertake postgraduate study. These participants had all completed their undergraduate study in India or Bangladesh and the main language spoken at home was a language other than English. These commonalities enabled the researcher to some extent to investigate the socio-cultural and educational influences impacting on the reading practices of these participants during their first semester at an Australian university. Table 6 presents the participants, their disciplines and the texts used for the individual interviews and the pair think aloud protocols used in first semester.

Table 6 Participants’ disciplines, academic text and general-interest text, first semester

<table>
<thead>
<tr>
<th>Participant</th>
<th>Discipline</th>
<th>Academic text</th>
<th>General-interest text</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2</td>
<td>Computing</td>
<td>Software engineering class text</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Telecommunications</td>
<td>Reed Solomon Error Correction (Dr. Dobb’s Journal. Jan. 1997)</td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>Pharmacy</td>
<td>A hydroxypropylcellulose (HPC) system for the immediate and controlled release of Diclofenac Sodium EUR. J. Pharm Biopharm. 41(4) 262-265. 1995</td>
<td></td>
</tr>
</tbody>
</table>
A1, A2, B1 and B2 came from India. A1’s background was in geology and his current topic is coal mining and its impact on the environment. He grew up in a home with books which covered such topics as Indian practical aspects of religion and culture and history. Books as gifts, however, were not very common. A1 had had some work experience prior to taking up his postgraduate study in Australia.

A2 was studying computing science. Because he is the youngest in his family, he had to stay near home to look after his parents, and had, therefore, studied in a nearby affiliated college to a university. Besides access to texts, it has been shown that contextual features can also influence students’ approaches to learning, among them, type of institution, language of instruction and course studied (Ninnes et al., 1999). A2 felt his undergraduate education was of low status. His studies, in addition, were conducted in Panjabi, adding to his feelings of inadequacy.

The other participants from India, B1 and B2, on the other hand, came from universities of which they were proud, although they spoke later of the differing levels of access to resources. B1 is in the telecommunications field and B2 is a pharmacist; both had had work experience.

Two of the participants, C1 and C2, were from Bangladesh and were medical practitioners. They, too, had both worked for several years.

Presented now is a detailed discussion of the reading practices of the Indian and Bangladeshi participants during first semester at an Australian university and the perceived influences that shaped those practices.
The researcher visited an Indian university and gathered data on reading practices through interviews and pair think-aloud protocols with postgraduate students from the disciplines of geology and education. Their insights and reflections on their reading practices and the influences from their home country were used to give a better understanding of the experiences of the Indian and Bangladeshi participants’ experiences at an Australian university during first semester.

The order of discussion, as in chapter four, is Knowledge of Self, Knowledge of Task, Knowledge of Text Structure and Knowledge of Strategies and their applications. Integrated into the discussion are the framing elements, of Circumtextual framing, Intratextual framing, Intertextual framing and Extratextual framing.
Knowledge of self

All the participants soon realised that there were many challenges ahead of them. In particular, they were aware they faced a significant knowledge gap. To bridge this gap, they were aware they needed to do more reading. However, like the Thai participants, they lacked confidence in reading genres to which they were not used. The type of academic texts the participants brought to the interview reflected their confidence in reading academic text. A2, the least experienced reader by his own admission, brought a book, never having read any journal articles. A1 brought a report as he was used to this genre in India. The other participants brought articles but were not yet confident reading this form of writing. B2 was reading an article because he needed to learn about ‘dosage control’. C1 brought an article, the first of its kind she had read, and so could not evaluate it in relation to other articles. C2 brought an article which was easy to read, he said, because it was written by an author whose first language was not English.

A2, although being concerned about his English language abilities, felt that his greatest challenge was ‘understanding the concepts’. So once again, as with the Thai participants, the Indian/Bangladeshi participants by and large had not read journal articles in their field. Moreover, from observations in India, the participants would have been used to a more structured teaching approach than they were experiencing in their Australian universities. There also seemed to be a close relationship with their supervisors – a relationship which continued long after students left university.
Knowledge of task

Early in first semester all the participants displayed an awareness that the purposes or expectations of reading differed from those to which they had been accustomed. In India, like the Thai participants, they said they read for examination purposes and, as B1 explained, they used memorization to learn the fundamentals. Now, he had found, he had to read to ‘keep in touch with the latest paper or for open book examinations’. He reported feeling uncomfortable with the ‘open book’ examination format. It made him feel stupid because he only had to know where the information was in a book and, he felt, it allowed students to be lazy; he mentioned that many of the local students, he had noticed, only began studying a couple of weeks prior to the examination date. For an examination in India, he said, he read for many weeks prior to an examination, took notes and kept re-reading those notes. So, although assessment by examination is often equated with rote learning, B1’s comments point to substantial, systematic reading for understanding. This is in line with Biggs (1996) findings that Chinese heritage cultures use repetitive learning as a deep learning strategy to ensure accurate recall of well-understood material.

Other purposes for reading were now found by all the participants to be for the writing of literature reviews and assignments. In India, none of the participants had had to write lengthy responses to questions, nor had they had to in-text reference. So, they found, more reading was required in order to make connections between various research studies and in order to accomplish a good academic style of writing with appropriate referencing.

One participant, however, had decided not to extend his reading. A2, the student with the least background in English reading, had made a conscious decision not to try and
read further; he felt it was better to be content, at this stage, with reading and memorising the lecture notes only. This was a practice carried over from his undergraduate study days. As one of the India-based students commented, she never took personal notes, relying instead on class notes provided by the lecturers. Another India-based student, on the other hand, reported that he preferred to take responsibility for taking down his own notes and explained this way:

*sometimes some things are missed by teachers and we, I, think it should be written in our own personal language*

He added, though, that he made his notes with the help of teachers or seniors (senior students/research assistants who were available at their university to assist all postgraduate students). The reason for having notes, he reported, was to ‘read and finally produce ... whatever is asked’. The lecturers provided a general idea of topics, put information into sequential order and gave advice on how to answer a topic.

The participants’ reflections and accounts with regard to their knowledge of task, indicate that, generally, students in India, even at the postgraduate level, are required to memorise facts in order to re-produce them when needed. The India-based students’ comments were particularly useful as they provided insights into the level of assistance given at their university. These students were provided with mentors in the form of senior students or research assistants. The lecturers, moreover, provided very structured lectures and gave advice on how to tackle assignments. There was no mention of being required to critically analyse text in writing or through oral discussion.
The researcher observed several lectures while in residence at an Indian campus. One, in particular, although designed for graduates who had worked in the field of geology for several years, was presented in a very structured, step-by-step fashion and the audience were asked frequently if they understood one part before the lecturer proceeded to the next stage.

At another lecture, this time for postgraduate education students, the researcher observed the level of respect expected of students. The lecturer would ask individual students for answers to specific questions; before answering, each student had to stand.

From the India-based students’ comments it is not difficult to see why there may be differing expectations with regard to the tasks required of a postgraduate student at a Western university as well as the level of independence required of them.

**Circumtextual framing**

Having deduced some of the purposes for reading at a Western university a range of circumtextual devices was used by all the Indian participants to select academic texts for their study. It will be recalled that none of the Thai participants in first semester selected their own academic texts relying instead on their supervisors to select appropriate texts for them. In contrast, only one of the Indian participants, A1, brought a text chosen by his supervisor.

All the participants looked at titles with topic key words in mind in order to predict the content. B1, for example, used the cue, ‘error correction,’ to track down reading in his field through the computerised system in the university library, showing his ability already to use the library resources. B1 also checked the date as he wished up-to-date
information and also the author’s name (see appendix 16); he saw that the author was an analyst who worked for Goldmann, Sacks & Company and, using his background knowledge of the company, deduced the author’s writing would be credible.

As was noted before with the Thai participants, abbreviations can confuse or mislead. B1 at first thought the author came from New Zealand but soon realised that the abbreviation ‘nl’ was not an abbreviation for New Zealand, as that would have been presented in upper case letters.

Other circumtextual cues were also used. C1 reported that she looked at the abstract; in addition, she noted that the references were recent and mainly from America (see appendix 17) although she could not say what the American origin implied. She noted that there were no references from Bangladesh so she predicted she would have to be content with reading about her topic ‘excessive weight preoccupation’ in the context of a Western culture.

The general-interest text did not need to be chosen by the participants. Therefore circumtextual framing could only be used to help understand the content and type of text. B1 provided the only example of framing circumtextually. He read the title, ‘Deadly worm may be turning drug resistant’ to ‘define’ the article. He reported that he deduced from the title that the article was about:

Doing research as to why they [the parasites] are turning drug resistant and possibly as they may be developing an alternative drug.
It can be seen from his comment that he predicted the article would be about research and would involve an alternative drug. B1 is a pharmacist and so could be expected to make such a prediction. Also from the title he put the article in the category of Research and Development which was really too prescriptive but shows his expectation that an R and D piece of text would carry a title such as this one.

All the Indian/Bangladeshi participants demonstrated that they had knowledge of the various circumtextual devices which could help them select their academic texts or define what their texts were about. Having selected their academic texts, all the participants then used their knowledge of text structure to help them make meaning from their texts. Different text structure could inhibit their meaning making, however, as discussed below.

**Knowledge of text structure**

Most of the participants had accessed texts in India or Bangladesh which contained a variety of text structures. Some of the participants stated that the structure of specific academic texts could create problems for them. The India-based cohort explained, for example, how misinterpretation could occur with academic texts and they gave the example of a complex physics text:

*There if you slightly miss the meaning of the sentence, that will create a different thing to your mind, that will completely [generate] wrong concept.*

The general-interest text, *The New Scientist* article, on the other hand, they said, was sequential and therefore easy to read.
All the participants reported that, while in India, they had used mainly American authored texts. Some of the participants stated that they found the organizational structures of English authored texts to be more complicated than Indian authored texts. It has been proven that texts, which are out of line with readers’ expectations about textual patterns, can have disruptive effects (Stone, 1985).

One participant, A1, on the other hand, reported that he had become used to the Anglo ‘logical’ style of reports he had had to read while working in India. In fact, he reported that he now found the Indian authored reports to be too ‘descriptive, informative, sometimes boring’; sometimes, he added, ‘you may forget the content’.

The CSIRO report which he brought to his individual interview (see appendix 18), he found to be ‘more communicative’ than an Indian text because it had short sentences. A1’s reading of American authored reports during his time in the workplace enabled him to compare the style with Indian reports. He said he preferred the American style; referring to the Australian report he brought to the interview he said it was ‘logical’ and he liked the short sentences and paragraphs.

In terms of placement of important items in a text, however, A1 demonstrated how there can be a mismatch of expectations. For example, A1 reported he could not find information located where he expected it to be. He was surprised to find, he said, that the purpose of the report and the institute’s name (where the report originated) were not given importance; he expected these items to be referred to in the first paragraph. Most of the other participants, however, found the Indian authored texts to be easier than others. A2 had a text written by a Dutch author (see appendix 19) and felt the text
was not written 'in sequence' (ref. Clyne, 1981). He explained that Indian authored
texts were easier to understand because the authors explained all the steps carefully
and did not presume prior knowledge. Indian authors, he added, would use simple
wording and not synonyms that are not used in every day speech. It was conceded,
though, that often American authored texts presented better and had better examples.
It will be recalled that Thai participant, C2, also thought American texts presented
well.

Presentation aside, in order to be able to understand an American authored text, B1
said he would have to refer to an Indian authored text to have the content explained in
more simple terms. B1 described the more step-by-step, explanatory style of Indian
writers with regard to the general-interest text. In particular, he described his
expectation of the introduction, an expectation confirmed by the India-based cohort:

_If this article had been written by an Indian there would have been an
introduction describing in brief the disease, history, when it started,
transmission, life cycle. Later he [the author] would have mentioned that the
drug praziquantel was not entirely effective._

Rhetorical organization was not as expected either. C1 and C2, referring to the body
of the general-interest text, stated that paragraph six, which described the research with
mice, should have directly followed paragraph four, possibly because there was
mention in paragraph four of laboratory experiments. The last sentence of paragraph
four states:

_Some scientists believe that praziquantel is less effective there._
The first sentence of paragraph five states:

The claims have infuriated scientists at the WHO.

There is therefore a link between paragraphs four and five but C1 and C2 possibly did not connect ‘believe’ with ‘the claims’. They possibly needed more explicit links between the paragraphs.

The following dialogue shows their confusion about the middle paragraphs of the text and indicates their need again for more explicit discourse markers:

**C2: it is not clear**

**C1: so many factors which contribute; the conclusion, I mean the last three or four paragraphs are [about] resistance, but in the middle?**

**C2: connections**

**C1: there should be relevance from one paragraph to another**

All the participants, then, were aware that text structure could inhibit their understanding, in particular the lack of such features as subheadings and detailed explanation especially in the introduction. The organization of the introduction in the general-interest text was certainly not as they expected it to be. B2 described how an Indian author would write an introduction. He said there would have been ‘more language’. His comparison of the treatment of the introduction by an Indian author and an English author reflects his expectation that there would first be more description:
...he [the author] is showing that the drug is not resistant against this thing; he [an Indian author] would just have made it a later point; what I personally feel is the disease, schistosomiasis, would have [been] given a basic [synopsis] of it in the first paragraph – what the disease is like, he [the Indian author] would have gone in brief of that and then would have gone on, the effects and all these things.

All the participants commented also that they had found that the conclusion was too brief and it did not help to clarify the main points in the main text. The final comment by C1 shows the conclusion does not, in any way, fulfil her expectations:

Although it is an international problem, it [the passage] did not mention where the problem was to be found. He [the author] has not put all the ideas together in the conclusion – perhaps this paper is not finished.

C2 concurred saying: all ideas should be in the last paragraph.

Two of the India-based students (referred to as I₁ and I₂) also thought the final paragraph of the general-interest text was not complete and provided a fuller explanation of their expectations, as shown in the following dialogue:

**Ind.1:** because the resistance is one possibility, but it should give another possibilities too; this is why I said it is incomplete

**Ind.2:** and conclusion should be not like this conclusion, should be like this, what the recent approaches in this field that were invented or invention, what
should be the invention regarding this and what should be the cure of this disease and what the precautions should be taken by the people and by the scientists; also what they spread, the quality of water, food, water, drugs and all this kind of things.

Their expectation seemed to be that the writer should provide a detailed, structured discussion in the conclusion.

All the participants, generally, had certain expectations of text structures, such as the conclusion. They reported that the conclusion, for example, should comprise the main ideas in the text. C1, C2 and A2 expected a reiteration of the main points. None of the participants expected any kind of judgment to be made in the final paragraph. This lack of expectation may influence their level of criticality when reading.

These students’ observations are in line with many other studies that suggest that different types of text structure affect comprehension and recall. Carrell’s 1984a study demonstrated that different cultural groups responded better to certain text structures. For example, her study showed that Arabic speakers remembered best from expository texts with comparison structures and least well from causation structures. Korean and Chinese speakers recalled best from texts with either problem-solution or causation structures and least well from either comparison structures or collections of descriptions. The fact that the Korean and Chinese students could recall better from problem-solution structures does not mean, of course, that they comprehended better. Because the general-interest text described problems without solutions, the participants may perhaps have felt a certain disorientation and their comments on the conclusion point to this. Together with text structure are the orthographies of native languages.
which can pose difficulties for second language readers; the participants in this study, however, seemed to be familiar with the Roman alphabet and did not mention this aspect. There may, however, have been greater ‘cognitive restructuring’ taking place because the native languages are very different from the target language (Segalowitz, 1986). For example, there may have been greater ‘cognitive restructuring’ when the participants went through the process of translating into Hindi, discussed later in this chapter.
Knowledge of strategies and their applications

The Indian and Bangladeshi participants used the text structures of introduction and conclusion with varying degrees of success. In order to overcome some of the difficulties related to the organization of these text elements, a variety of strategies were used by the Indian and Bangladeshi participants in first semester. Most of these strategies tended to be text-based and involved making use of intratextual features such as headings, diagrams and tables.

Intratextual framing

As did the Thai participants, all the Indian and Bangladeshi participants relied mainly on intratextual framing to make sense of their texts in first semester. They relied on close text reading and, if any of the signposting devices such as diagrams, boxes with summaries and headings were missing from a text, the participants reported, it would be difficult for them to read the text.

Several of the participants were aware of the importance of the varying intratextual cues. A2 reported that these devices helped him to understand ‘the interrelationship with the topic’ and summaries helped explain the chapters. C1 found the summaries a memory aid: ‘author highlights important points so easier to remember’. C2 explained his specific use of tables; he used them to find the main points which validated the study; he then re-read and linked the reading with the tables in the text. Demonstrating self monitoring, he would note, he said, if the tables made sense in relation to his reading – if they did not, then he knew he had misunderstood the material.
Another intratextual cue that can aid understanding is a picture. In this general-interest text, however, it was not considered useful by any of the Indian participants. The Thai participants told how they liked pictures to relate to the text or to their background knowledge. A1 and A2, on the other hand, looked at the picture, not to relate it to the text, but with an interest in what the larger of the two pictures portrayed. It showed to A1, he said, the ‘real impact on the people’ and to A2 ‘what sort of living [Senegalese had]’.

A picture may not be seen as important if it does not contain additional information. As B1 reported, he paid little attention to the picture because it provided no new information; it merely reminded him of conditions in India:

*Senegal is a backward place... the conditions shown in the picture are very similar to most places in India which are not developed – where people use river water which is dirty for washing and all the morning ablutions and, yes, that could be one of the reasons to breed especially mosquitoes and other stuff.*

Size, was considered another important feature of a picture. C1 and C2 stated in the retrospective interview that they had not looked at the picture but might have done if it had been larger.

Captions under pictures can also aid readers. Two of the India-based group, however, demonstrated how readers do not always connect captions to pictures. They at first mistook the picture of the worm for a depiction of the intestine, despite the caption stating:
Still waters: up to 90 per cent of villagers living around the Senegalese town of Richard Toll may be infested with schistosome worms (above).

Later, upon reflection, they said the worm 'looked like the intestine'.

Headings, another intratextual cue, were considered very useful for guiding reading. C1 stated that she was somewhat confused with her academic text because there had been a lack of headings; she explained how background knowledge can compensate for lack of such textual cues:

* I miss subheadings; you know what you are looking for, but not a problem as it [topic] is related to our work [medical work].

In first semester, all the participants reported on the importance of intratextual cues such as headings, diagrams and tables and could describe, moreover, the specific areas of usefulness for each of these cues. They could also explain when pictures were or were not always a useful feature. Other strategies that the participants used involved the search for the meaning of individual vocabulary items.

**Focussing on vocabulary**

In order to help interpret texts all the Indian/Bangladeshi participants relied on, as discussed above, text-based strategies. As well as relying on headings to guide their reading, they all used a variety of other reading strategies; these strategies, as well as helping to make meaning of texts, illustrated also their awareness of different Engishes. At the micro level, all the participants were aware of the many meanings of English vocabulary items. C2’s comment here, for example, showed his awareness of
the evolving nature of language and the need to be aware of meanings for different contexts:

*English is a language which is different in [different] countries, from person to person and it is not a static language... individual words and phrases are different.*

Illustrating his awareness that English learnt in one context may need to be adapted for another, C2 gave as an example the case of India where people are used to British English; many students, he said, were now studying in America or Australia and therefore the kind of English they were brought up with might not be appropriate. This is in line with Bell’s 1994 study on Singapore English in which the English language differences of Singaporean students at a Western university were reported.

In first semester, C2 and the other participants used close line-by-line reading as a strategy, focussing on individual vocabulary items. Other strategies for deducing the meaning of unfamiliar vocabulary were guessing from context and ‘linking paragraphs back to front’ as mentioned by C2, demonstrating his ability to infer backwards and forwards; later in his individual interview, he said he monitored for comprehension through checking with classmates.

The need to have a range of general vocabulary including colloquial vocabulary as well as discipline-specific vocabulary was noted by C1. Items which defied guessing, she said, were colloquial items such as ‘yo yo’ and ‘zest’ found in her interview academic text.
Reading on and re-reading

Other strategies, such as reading on and re-reading in order to deduce the meanings of vocabulary items, were demonstrated with the general-interest text by all the participants. A2 explained his use of the strategy of reading on.

If you do not understand the word, go over another ten lines – that is why my reading is very slow – I have got to find the meaning; I usually find the meaning of the word in between the neighbouring lines.

By stating that he read ‘between the neighbouring lines’ A2 demonstrated his awareness that meaning is not necessarily explicit and needs to be gleaned from close reading of context.

Using repetition

Another strategy, not mentioned by the Thai participants but reported by several of the Indian/Bengali participants, was that of repetition. A1 commented on the importance of this strategy and his reason for using it. He repeated, he said, the name of any unfamiliar words which seemed to be important, in order to memorise them. For example, from the opening paragraph, he repeated the words, schistosomiasis’, schistosoma mansoni’ and ‘praziquantel’, the three main points of discussion in the text. This Indian participant, moreover, did not seem to be inhibited by pronunciation of unfamiliar terms, as most of the Thai participants seemed to be. However, two of the India-based cohort did mention their difficulty with the pronunciation of ‘schistosomiasis’ as they had never seen the term before.
Making meaning using suffixes

Another text-based strategy that was mentioned was that of using suffixes. One of the India-based cohort explained how she used this strategy to deduce quickly that schistosomiasis was a disease.

*When we name a disease ‘itis’ or ‘isis’ is been attached to it, that is a common thing that generally happens ....so this is a disease caused by this particular parasite and this parasite has developed the resistance towards praziquantel.*

Having deduced the meaning of schistosomiasis through her knowledge of suffixes, this student was then able to move on and understand its relationship with the other particulars in the text.

**Deducing meaning from the text: making connections between paragraphs**

Looping back and forth was an important strategy used by all the Thai participants. Similarly, all the Indian/Bengali participants demonstrated their use of this strategy. The following dialogue, for example, shows how C1 and C2 worked out the relationship of the word ‘outwit’ (in the first sentence of the first paragraph) with the drug, praziquantel, by looping back and forth, even if they did not deduce its actual meaning:

*C1: have you understood ‘outwit’?*

*C2: outwit*

*C1: outwit*

*C2: past tense – began to outwit, it mean drug*

*C2: there is a drug praziquantel*

*C1: getting clear of that drug; then they have only one*
Presumably C1 was inferring, in the last line, that the worm is ‘getting clear’ of the drug. The reference to ‘then they have only one’ demonstrated his ability to read on to the sentence at the end of the third paragraph:

There is only one alternative drug.

This connection, that was made between first and third paragraphs, was perhaps made possible by the fact that the sentence stands alone at the end of, and is not buried within, the paragraph.

Overall, the Indian/Bangladeshi participants demonstrated a variety of strategies for deducing the meaning of individual vocabulary items. Of note were the use of repetition to help memorise unfamiliar vocabulary and the use of suffixes. The latter strategy demonstrated a knowledge of the construction of English words.

Another important strategy for international students, translation, is discussed below.

**Translation**

Translation, an important bilingual strategy as shown from the data from the Thai participants, used in conjunction with dictionaries, was demonstrated also by all the Indian/Bangladeshi participants. In first semester, the Indian/Bangladeshi participants used English/Hindi dictionaries or, in the case of C1 and C2, English/Bengali dictionaries. They explained the benefit of translation:

*It is easier to understand own language and therefore the concepts.*
While understanding the benefits of translation, C1 and C2 displayed their awareness of the pitfalls of translating:

_Sometimes the words which I am looking for I can't get in that dictionary_

_[English/Hindi]; then I go [to] another dictionary which is English to English._

Most of the participants reported also seeking the help of other students who spoke their own language when they required assistance with making sense of a piece of text.

Not all the participants, though, used their first language to discuss the general-interest text. A1 and A2 did use Hindi. As A2 was interested in finding out details of the process of the disease, schistosomiasis, how it is passed onto humans and why it is resistant to the drug, A1 explained what he knew of the disease in Hindi. A1 and A2 also discussed the first two paragraphs and paragraph six in Hindi; this was the part where the experiments with mice were mentioned. In the retrospective interview, A1 explained that he used Hindi to clarify the text as A2 ‘was giving much emphasis on malaria’. A2 claimed, in the retrospective interview, that he had just been using the case of malaria and its resistance to cocaine as an analogy.

The India-based cohort explained why they often discussed a text in their own language. They said they could often understand clearly what they were reading but could not elaborate in English. They explained:

_we do not talk to each other in English; we talk to each other in Hindi_
Once again, illustrating the Indian student's lack of confidence in discussing readings in English, another Indian-based student said:

*Our communication is generally in Hindi; we only read in classes or in books some things in English; we read English books, papers and we only understand that book and written things but we communicate in Hindi so our interpretation in English is not great.*

In sum, the comments from the individual interviews with the India-based students indicate that Indian postgraduate students may understand much more than we imagine; some of them are just not able to discuss or write about their readings in English. The fact that the Australia-based students were almost totally discussing their texts in English rather than code switching shows that a significant shift may have taken place, even in first semester.

**Study strategies**

Besides using a variety of text-based strategies to deduce meaning, a variety of other strategies was used by the Indian participants for study purposes. These included underlining, highlighting, memorising and note making. B1, for example, showing considerable pride in his note making skills said he took 'beautiful notes' by hand when he was reading to aid his learning; the notes had to be taken down by hand, he explained, as he would not be able to concentrate if he did the noting on a computer. At the same time as making notes, he read line-by-line.

A2 explained why highlighting was useful:

*When I go through the paragraphs, I sometimes go back if I feel any problem
The importance of highlighting, as well as repetition of key points, was explained, too, by one of the India-based students:

*This is the way of Indian students to read important line first; we study all lines without knowing, without understanding what is written, then second, we repeat it, and then underline the main points.*

Relating to the general-interest text, this student explained, too, that it was easy to find the main points in the first paragraph by noting typographical cues, words written in italics; furthermore, he explained, ‘specific name must be written in capital letters and generic name must be in small letters’ in order to help him differentiate between items.

**Missing cues**

Despite having a variety of text-based strategies to assist with understanding of texts, the participants still met with difficulties. C2 explained why he had to read whole texts from end to end:

*Then I can get the important ideas like, and because English is my second language so if I read from this part of the study [only] I may miss many things.*

Not having the ability or confidence to select what is relevant to read, makes the reading process, at this stage, a long and arduous one.

A reader, though, can read everything in a passage but still misinterpret. Seemingly simple vocabulary, for example, can be misinterpreted and C1 and C2 demonstrated this difficulty with paragraph nine which read:
The WHO says the number of eggs should fall by 90% but need not be eliminated altogether.

The dialogue went as follows and showed the misinterpretation of ‘altogether’:

**C2: this finding**

**C1: more than 90%**

**C2: they can eliminate it step by step**

Besides individual vocabulary items, sentence structure can also lead to confusion, particularly if there is a lack of connectors. This was demonstrated when B1 discussed the conclusion which reads:

Achim Harder, head of anthelmintic research at Bayer, the German company that makes praziquantel, says it is not clear why the drug is less effective in Senegal. Resistance is one possibility, he says.

**B1: yes, I think it [the conclusion] is pretty optimistic because if a person could get resistance to everything you know since this is a deadly worm and it is going against most of the drugs that are being produced so he [the author] says resistance is one possibility so he is optimistic.**

The placement of the final sentence with the word ‘resistance’, without any connectors to the rest of the conclusion, may have contributed to an interpretation that humans could become resistant to the disease rather than the worm being resistant to the drug.
The dialogues by the participants in conjunction with their reading of the general-interest text highlighted the reasons for some of the reading difficulties. Readers may misinterpret, even simple, everyday language if there is not sufficient context in the text to guide them. In addition, important items in a paragraph can be misinterpreted if not supported by clear signposts or connective phrases. Despite these difficulties, the data from the pair think-alouds demonstrated that several of the participants were willing to evaluate the general-interest text.

Evaluating

As mentioned earlier, most of the Indian/Bangladeshi participants expected to glean considerable detail from the introductions and conclusions in a text. It is not surprising, therefore, that, when evaluation was demonstrated, it centred on these two segments of the text. A2 illustrated this with his judgment that he found the conclusion in the general-interest text to be satisfactory. Showing his evaluation in general terms, he said:

*It is a good conclusion because we cannot find the actual cause of this [resistance to the drug] so that is why he [the author] is telling it is not clear.*

A1, however, disagreed, using evaluative language in the form of the word ‘just’ to demonstrate that he did not think the problem was as serious as presented:

*Not exactly – some of the research is telling that there is drug resistance but some of them [researchers] are telling ‘no, it is not possible’ – just result of social pressure, people make a hue and cry about this problem, so conflict.*
The following extract shows two of the India-based cohort demonstrating their ability to evaluate content more specifically related to the research discussed in the text.

**Ind.1:** *The parasite there in fact was more of it*

**Ind.2:** *mm, they say*

**Ind.1:** *more dominant*

**Ind.2:** *was conducted only on persons in particular areas ... particular locale*

**Ind.1:** *yes, in some particular locality but the localities were widespread so again we cannot say that it is totally true that the disease is resistant and the parasite has become resistant to that drug.*

These students, during the retrospective interview, stated that they thought more experiments were needed as research was still ‘in a dormant stage’. C1 also commented on the actual research described in the text, specifically with regard to Gryseels’ results (paragraph 8) that ‘they [the researchers] should consider statistically after a year’.

Another form of evaluation – judging the readership of the article – was demonstrated by another India-based student. He explained that two intratextual cues – the ‘binomial nomenclature – Schistosoma Mansoni’ and the use of italics when writing the term, would be understood by science-based readers.

Even in first semester, then, some of the participants could demonstrate their ability to evaluate the text. Their evaluation took the form of judging argument and judging the content, the credibility of the research, described in the text. Both are important forms of evaluation for postgraduate study.
Making inferences

Another strategy, inferencing, was demonstrated by some of the participants in addition to evaluation. Inferencing, however, tended to be used only with the general-interest text. Much of the inferencing was carried out by B1 and B2, possibly because of B2’s pharmacy background and his particular interest in ‘drug dosage’. They discussed the experiments with mice in paragraph 6 and used inferencing to problem solve. In the following example, B1 and B2 suggest a possible cause for resistance to the drug:

About the mice – though mice is basically used in place of men, I mean human beings, so the drug seems to be kind of, the mice develop resistance once they were given regular doses of praziquantel so irregularity in the dosages could be one of the reasons for the resistance towards the drug.

The use of ‘kind of’ as a hedge indicates, too, measurement of an idea against expectations (Tannen, 1993). In this case, B1 was weighing up the ineffectiveness of the drug.

Another example of inferencing occurred when B1 and B2 read paragraph eight. The author compared results in Puerto Rico, Kenya and Senegal and, from the data, B1 inferred another possible cause of resistance to the drug:

Perhaps the drug does not work on mice from Senegal because the Senegals are maybe immune to the drug.

In another example, B1 and B2 discounted one possibility and added another:
The reason for the ineffectiveness may be because the population is large and that is why the drug is not having much effect and maybe the building of dams should not be blamed.

Unlike the Thai participants, the Indian and Bangladeshi participants did not pass moral judgement on the building of dams without due regard to the local population; rather they felt that the building of dams should not be cited as contributing to the ineffectiveness of the drug.

Inferencing was used also by two of the India-based cohort with regard to causal factors influencing the effectiveness of the drug, praziquantel. This dialogue also demonstrates the complementary style of conversation, often observed in the Indian dialogues:

**Ind.1:** ... so in every population there must be the mature worms

**Ind.2:** and immature

**Ind.1:** and immature so the immature ones were not killed and the healthy people were infected or even the infected people, the diseased people, were also re-infected by the same immature worms

**Ind.2:** it seems that they might not have administered this drug on those healthy persons in which the immature parasites ...

The use of repetition of 'immature' shows, moreover, their mutual emphasis on this key issue.
The same two students demonstrated another strategy, monitoring of each other’s thinking, in conjunction with inferencing in the following dialogue when they were discussing the possibility of natural immunity:

**Ind.1:** due to this low immunity

**Ind.2:** no, because it hampers with our own natural immunity it decreases our natural immunity as it is written here that the drug...

**Ind.1:** no, the drug was in concert with the natural immunity, it seems that the immune system might...

**Ind.2:** ah, it was the immune system, but because the disease is new to the people of that particular area, so the natural immunity for that disease is not present in the people so maybe, probably because the drug does not get that immunity from the immune system

**Ind.1:** that support from this immune system

**Ind.2:** from which it gets support, that’s right, it is not able to affect

Overall, the dialogues demonstrated that, in first semester, the participants relied mainly on intratextual framing and text-based strategies such as reading on, re-reading, using text cues (headings etc.) and translating. Evaluating and inferencing were demonstrated, in addition, by some of the participants. Evaluating was demonstrated by A1 who had a certain confidence in his own abilities; his partner in the pair think-aloud spoke of considerable anxiety at this stage of his studies but he, too, attempted to evaluate the text, possibly because of the influence of A1. The data show that inferencing may be carried out, even in first semester, too, if there is sufficient background knowledge.
Intertextual framing

Intertextual framing, however, was not in evidence despite the fact that reading of a variety of texts enables students to make connections between texts, to build knowledge from interconnected concepts. These related concepts enable a reader to interpret texts. Without them, students may have difficulty understanding what is expected of them or what to expect when reading discipline-specific texts. All the participants reported that they were aware they had not done sufficient reading in their undergraduate days to enable them to make connections between material presented in one text with that presented in others. What reading was done, according to A1, was ‘superficial’ and B1 described his reading in India as:

Not with respect to any kind of getting to know about anything but rather to find out what is new, not to know about in depth.

The participants’ reflections in the retrospective interview provided insights into the home country influences which had led to feelings of inadequacy when reading at an Australian university. When reading English texts at university in India, the participants’ discussion of those texts was in their first language, Hindi or Bangla. All study was carried out in Punjabi by A2. The reading in India was designed for learning facts for examination purposes and not for evaluation of content or comparison of research studies although B1 described how he read and re-read notes for understanding.

A1 realised that it would have been beneficial to him to have read all the articles he is now reading. Although journal articles were available to him at work, he had no time
to read them. In any case, his work was ‘result oriented’, he explained. C1 reported that her reading, too, prior to arriving in Australia was work related. She only read clinical articles which were child health related, specifically for diseases of children under five years of age.

As a result of the lack of prior reading, little intertextual framing could be used with the participants’ current academic texts. Some intertextual framing was possible with regard to the general-interest text; C1 and C2, for example, had read about ecological diseases. However, they had not heard specifically about schistosomiasis.  

Another pair of participants had done some related reading. B1 and B2 were able to draw on knowledge acquired from reading about the Aids virus in India – a considerable problem in their country. Invoking this knowledge from what he had read about Aids, B1 referred to the issue of educating the public in India:

They [the population in India] don’t realise that it is the virus which is dangerous... they should be told the HIV, not the Aids; you do not get the HIV that is the virus which stops everything... Johnson has HIV but that does not mean he will die of Aids; he will live for 25 years at least, 25 more years.

While their knowledge, was not used to directly help them interpret the text, it was useful in discussing issues peripheral to the problem described in the text. Information such as that above came from reading newspapers in India – a very important activity in India as A1 explained:
It is like getting a cup of tea in the morning, if you do not get your cup of tea, you think you have not done anything in your day.

Emphasising the oral culture from which he came, A1 related how reading newspapers in India, is a ‘social activity’. The newspapers, he said, were very descriptive and the front pages were always about politics and ‘anything social’. In the rural areas, the people, he added, shared the newspapers and discussed their content in tea shops. A2, highlighting his lack of reading background and lack of confidence in reading, even in India, reported that he did not read newspapers in India.

It was mentioned by several participants that play was more important than reading in India. The Australia-based Indian/Bangladeshi participants said children were not read to when young but two of the India-based group said children were read to by mothers as this was part of a mother’s nurturing role. A1 mentioned that grandparents used to orally tell stories to their grandchildren and he followed this custom with his own young daughter and reported his enjoyment in doing so:

I manipulate the stories and I laugh at myself what stories I am telling her!

Another contributory factor to the lack of reading was the lack of reading resources in India for the participants; B2 was the exception – he enjoyed good library facilities as his university was sponsored by a wealthy businessman. Nevertheless, even for him, there were not sufficiently varied texts to facilitate following up on references to allow for further understandings of the text material. B1, in contrast, never visited the library where, he said, there were few books anyway, certainly few technical books such as he
was now reading in Australia. He used to buy his books, in any case, so he could mark them and make notes. B1 earlier remarked on his enthusiasm for making notes.

The availability of reading materials is also affected by the priorities for research in any particular country. C2 explained why he could not read about his topic, psychiatric morbidity, in his country, Bangladesh:

_Being a developing country, researchers are not so much concerned with this field of research ... the attitude is: Let me live first, let me breathe first, then we think about the psychiatric morbidity._

He further explained the lack of reading materials about psychiatric morbidity in his country. The condition, he reported, was not perceived to be serious although he himself thought that 25% of the population of his own community suffered from a mild to severe form of psychiatric morbidity – a similar figure cited in the research for Australia and Britain.

**The influence of the Indian teaching style**

Another factor mentioned by all the Indian participants was the Indian teaching style. The style, it was considered, did not assist the students to adjust to the requirements of an Australian university. A2 explained:

_First thing, teachers [in India] go through everything, everything and they solve problems; if you can’t solve problems, they will solve the problems; actually there is a very bad trend in India – if students do not understand in class, they [the teachers] do tuition work and they charge money._
This style of teaching, according to A2, did not encourage him to engage in self-directed reading. On the other hand, through careful step-by-step teaching, the lecturers assisted the students to understand the material. The researcher experienced first hand at an Indian university, as previously mentioned, carefully staged lectures for an audience of postgraduate geologists who had been working for several years. The lecturer, at every stage, checked for understanding from his audience. The lack of lecture room resources was also apparent. An overhead projector worked somewhat erratically and the blackboard was so pitted the chalk broke frequently. Because of the indifferent resources, the students, then, had to rely even more on the teacher’s carefully staged presentation. As a result, many Indian students could well feel overwhelmed when first experiencing the Australian style where students are expected to ‘fill the gaps’ in lectures from further reading on their own, not to mention the quick reading expected of overhead transparencies during the lectures. They have to negotiate unfamiliar library systems and learn to use and assess journal articles, not only as single texts but in the context of multiple texts.

The teaching, specifically of the English language, was commented on also. The Indian participants commented that the Indian teachers of English were ‘not very rigorous’. Homework comprehension questions from readings would be set but not checked. Answer books could be bought but, if students’ answers did not match the book’s answers, there was no opportunity to discuss this with the teachers.

Texts used in English language classes at undergraduate level highlighted another problem. Most of the texts focussed on English literature. For example, A1 studied *Arms and the Man*. He enjoyed such reading and considered English instruction to be
for ‘relaxation’. The India-based cohort confirmed that reading classes at undergraduate level used literary texts, citing the works of Shelley, Keats and Milton. They believed these readings were valuable, both as an aid to developing concentration and as a means of learning unfamiliar vocabulary such as the word ‘thy’. Although vocabulary such as this is not relevant to understanding general and academic texts, the students thought they should understand it as part of the overall learning of English. This is a different attitude to reading from the Thai participants who considered learning to be ‘a serious business’. The classics provided enjoyment for the Indian and Bangladeshi students; however, these texts did not provide either knowledge of academic genre or vocabulary to assist with academic reading.

Students can also intertextually frame through the use of the Internet. Although the participants now had access to electronic texts, only A1 commented on his use of the Internet to gain further knowledge. The students did not have consistent access to email or the World Wide Web and the India-based cohort confirmed that Internet facilities were not available to them at that time but the facility was planned for the next few years.

For various socio-cultural and educational reasons, then, the participants, at this stage, had limited ability to recognise allusions to other texts. Nevertheless, because of their reading of Indian texts, they did have an awareness of different writing styles. C2 demonstrated his linguistic awareness by noting:

*English is a language which is different in [different] countries, from person to person and it is not a static language; that is the problem; even the British I can understand but I cannot understand Aussie; sometimes I feel different.* We
are, you know, a British colony so there are British English in my country so we use the British accent but nowadays people go to America or [Australia] thus the individual words and phrases would be different.

Evaluation of academic content, moreover, can only take place if a reader has done extensive reading. A1, because of his reading of Indian reports in the workplace, was able to evaluate the CSIRO report he had brought to the interview; he deduced that it was ‘more of a marketing report’ (see appendix 18). He felt it was not a scientific report because the author had omitted to state how many samples were taken and what exactly they were.

Another aspect of intertextual framing, following up references, is discussed next.

**Following up references**

Following up references is an important skill for postgraduate study but not all the participants were using this aspect of intertextual framing. A2, the least confident participant had, because of his lack of reading background, made a conscious effort, he said, to learn only what was presented by the lecturer rather than follow up references. The following comment demonstrates his lack of confidence in himself:

*If we go to such stuff [references], we will confuse ourselves.*

One participant had a very good reason for reading widely. C2 wished to prove to his research panel, the efficacy of a particular research methodology. This methodology involved using the procedure of ‘back translation’ with a questionnaire written in his own language, with his own people and then translating it into English. Through
further reading, he was able to supply several articles to the panel describing such a procedure used by others in India.

An aspect of reading not mentioned by the Thai participants was the lack of home country references. C1 expressed disappointment in the range of references highlighted by her lecturer. She would have liked references from Bangladesh, as she was interested in malnutrition prevention and treatment in the context of developing countries. An important further point, highlighted by C1, was the fact that international students had to work harder than local students to find their own resources as a result of not being supplied with home country references, relevant to their study.

In summary, the participants' accounts in their individual interviews indicated that they felt ill prepared for study at an Australian university. Not only had they not read multiple texts, they had not been encouraged to read journals; these were seldom available in any case. The belief was that learning of fundamentals came from textbooks and, as B2 reported, journal articles were not considered 'a major source of learning'. The students soon found out that much of the required reading at postgraduate level is from journal articles. The Thai students, it will be recalled had no experience with journal articles, either.

**Extratextual framing**

In addition to having done little reading, several of the participants had little background knowledge, other than general knowledge, or experience which could contribute to their interpretation of specialised academic texts. Yet various studies
have shown that background knowledge aids interpretation (Carrell, 1983b, 1987; Garcia, 1991).

Those participants who had knowledge from the workplace were able to apply it to their readings. A1, for example, demonstrated how he could apply knowledge from having worked in his field of coal mining by relating it to the CSIRO text he brought to his interview. He could evaluate the content because of his knowledge of coal quality in India and demonstrated this ability by explaining that the coal in India, although rich in mineral matter, was uneconomical to wash and research was being undertaken to find more cost effective methods for cleaning the coal. Despite having some relevant knowledge, he was aware, though, that his knowledge in the geology field was 'superficial'.

Another example of the use of extratextual framing was provided by C1 and C2 who could draw on some general medical knowledge. C1, however, who was studying excessive weight preoccupation found that, as her topic was more a Western than an Eastern problem, her knowledge of Indian cultural practices could cause conflict when she read about the topic from a Western perspective (see appendix 17). She explained the different perceptions regarding weight this way:

> Although young females in Bangladesh like to be slim, magazines do not generally focus on dieting but on healthy eating... if one is over forty years of age, one would generally wear the Shari, because if overweight, one can still look nice.
C1 added that ‘fat is still beautiful’ among the older generation in India. Despite the overt representations of women’s weight, C1 was anxious to find out if excessive weight preoccupation was, in fact, a problem in Bangladesh and hence her frustration at not being given references from her part of the world.

Close reading of her academic text, highlighted the emphasis C1 placed on certain vocabulary items. She noted the variables found to be weight loss predictors of weight loss attempts among girls – body dissatisfaction, high body weight, depression and anxiety (appendix 17). The text, however, stated ‘social anxiety’ rather than just ‘anxiety’ as the last variable. C1 may have missed the significance of the adjective ‘social’ not understanding the full extent of peer acceptability with regard to body weight in a Western culture.

The other participant who had background knowledge in the medical field was C2. He had already conducted some research in Bangladesh related to his present study and therefore could draw on this knowledge when interpreting his text on psychiatric morbidity. He, too, had also identified some cultural differences in medical practices. Health in Bangladesh, he explained, was much more of a family matter:

*If one member of a family is suffering, all the family would be anxious and their harmony will be lost.*

C2 also mentioned the fact that, in Bangladesh, many people resort to sorcery if Western treatment is not effective. Often, too, they put their faith in herbal treatments comprising of, for example, only coconut juice.
Although noting and being interested in the cultural differences, C2 was not willing to allow his family to become affected by Western practices and so did not allow his family to watch Australian television believing that many of the programmes were culturally unacceptable. He may have been depriving himself of information regarding social and cultural practices in this country that could have contributed to wider understandings of his research field, not to mention the opportunity to acquire ‘local’ Australian vocabulary.

In contrast to A1, C1 and C2, A2, the least experienced reader, felt that his lack of background knowledge added to his acute embarrassment and anxiety. He put it this way:

_When I study something ...new subject... I feel very embarrassed, very frightened... it demoralise me and I get nervous...actually if I am understanding I am very happy and if I don’t then I become more nervous and nervous._

There were other reasons for the lack of some participants’ background knowledge. B1, for example, stated that he had little background knowledge to draw on for his academic reading because of the level of expertise in his home country in the telecommunications field. What little knowledge he had, he said, came from his studies in engineering at undergraduate level; he added, too, that there were few technical books available. To illustrate the immensity of the knowledge gap he felt, he compared himself to an American child:
Possibly he [the author] is living in a world which is 20 years ahead of mine...if I asked a seventh grade child or an American child about video back up systems they would know about them.

As a result of the knowledge gap he and the other participants reported having to work long hours to learn the basics in their academic disciplines.

All the participants were able, however, to invoke background knowledge when reading the general-interest text. A1’s extratextual framing related to his knowledge of how parasites survived in drought ridden, mountainous areas of India when there is some shallow water. He knew, too, how these parasites can appear ‘out of the skin of humans’. For this reason, he reported, he always took boiled water with him on his field trips to the Punjab. A2, on the other hand, had neither experienced nor read about parasitic problems but had heard about malaria; hence the reason for confusing schistosomiasis with malaria when initially reading the text. The sentence in question read:

Drug-resistant schistosomiasis is unheard of but scientists fear it is possible, given the spread of strains of malaria that are drug-resistant.

A contributory factor may have been the structure of the sentence containing the word, ‘malaria’. A2 may have been confused with the past participle ‘given’ and jumped to the conclusion that the author was discussing drug-resistant malaria which fitted with his schema of malaria and its resistance to cocaine.
Although acknowledging that background knowledge was important for reading, A2, nevertheless, reported using the strategy of memorisation if all else failed:

*If you are reading this sort of passage, you must have some knowledge but if you don’t, you have to think about it [the passage] or memorise.*

A1 mentioned earlier his habit of repeating unfamiliar vocabulary and memorising them but memorisation does not seem to have played as great a part in reading for the Indian participants as it did with the Thai participants.

**Making analogies**

Those participants with background knowledge demonstrated also that they could use it to generate analogies. B1 and B2 illustrated this ability by relating the text content to waterborne disease in India. They discussed jaundice which is usually found in the villages of India. They then talked about two plants which clog the waterways despite importing beetles to deal with the plant. These plants, they explained, cause stagnation and then the breeding of mosquitoes takes place. They also mentioned another disease, Dengue fever, and how it is usually contracted by people who ‘do not live in good conditions, no good water supply, the area is not clean, no proper sanitation’.

In another example, A2, although misinterpreting the reference to malaria in the text, used a useful analogy in that he related the use of one drug only for both malaria and schistosomiasis:

*A2: ...no medicine for malaria except cocaine*

*A1: really*
The use of the word 'really' by A1 shows he is measuring A2's statement against his own expectations. In this case, A2, unlike A1, believed malaria to be a form of schistosomiasis.

B1 and B2, similarly used an apt analogy to explain the resistance to the drug:

_B1_: one reason [for the resistance] could be natural phenomenon in the sense when you have cold, common cold or fever and for every time you get that and you keep on having, oh, let's say, closine or something again and again, your body becomes

_B2_: yea

_B1_: resistant, I mean does not react to the drug.

One of the India-based group demonstrated how she, too, could relate the immunity issue in the general-interest text to her background knowledge. In this case, this student related the text to the specific, polluted conditions she personally had to endure every day around her university. In conjunction with her analogy with her living conditions, she inferred the cause of the drug’s ineffectiveness in Senegal:

_Ok, because I have studied science, connected, so I think I can understand this because our body you know there are certain good amount of germs in the air, only when we are coming to Tuc [university] you can see how much of garbage and dirt is there, so why are we not always having fever or we are not having some disease? – because our body has got a natural immunity and there are_
antibodies in our body which kill the germs which enter into our body, so I think here he says that maybe the drug why it is not able to affect the spectator.

One of the India-based group, as well as relating the text to his knowledge of malaria also demonstrated the use of codeswitching, a practice not observed with the Australia-based students:

*Malaria very much familiar with this; the eggs live by mosquito in stored water and stored water you can find everywhere in India, even big cities too, and that breeds malaria...Lakhs [hundreds of thousands] of people are going to die by malaria.*

Codeswitching can be seen in the English newspapers in India and therefore one could presume it is a common practice. Perhaps the Australia-based students had given up the practice since immersing themselves in an English-speaking environment, as they did not demonstrate the practice in their pair think-alouds.

Despite not having specific background knowledge related to the text, all the participants demonstrated that they could draw on some background knowledge to create analogies and create inferences which helped them interpret the issues in the text. Those participants, such as A1, moreover, with specific background knowledge related to his academic field could use that knowledge to evaluate his academic text. The data from the pair think-alouds and the participants' reflections showed that, even with little, not necessarily directly related knowledge, they still had the ability to use that knowledge to help explain general-interest text but the ability to generate
inferences and create analogies was restricted when reading academic text without knowledge directly related to that academic field.

**Going beyond the text**

Although not having specific knowledge related to the general-interest text, the participants were able not only to make analogies and generate inferences but to go ‘beyond’ the text to discuss literacy and its relationship to health education. B1 illustrated how a lack of understanding of the spread of some diseases by many of the Indian population could lead to more widespread disease:

> You have to realise that 60% of the people are not literate so when the plague broke out, people thought it was the mice which were the reason for the spread of plague; however, it is not the mice it was the flea on the mice, so they were like more into kind of killing the rats, and the fleas could get parasites or some of the animals too.

The text raised another issue, again related to health in India, the use of fresh water. Two of the India-based students wondered about the fresh water from the dam mentioned in the text:

**Ind.1:** *if this particular disease is spreading from fresh water it means again it puts a question mark on whether we should use fresh water or we should be careful about using this*

**Ind.2:** *I think fresh water*

**Ind.1:** *even fresh water is not free from germs*
Ind.2: but I think there is a difference between fresh water and clean water can always find out the difference so that too, people should be careful about that.

Educated but not literate

There were further discussions of literacy in relation to reading by the India-based students. The following dialogue indicates their intense interest in their environment, their propensity to philosophise and their belief that reading literacy does not fulfil its purpose if people do not address the many problems in India:

Ind.1: in India literacy means simply you may read or write especially in local language; it is not necessary that you can speak or learn English

Ind.2: but if we read all these books of history, but if we don't think about life, if we don't think about society, how it should be and what is useful to mankind, then it is useless to become literate

Ind.1: awareness is also necessary, awareness to life, awareness to living conditions, awareness to any sort of problems if India is facing pollution problems then people should know about what is the pollution

Ind.2: I think you can't be said as a literate person because even as you can see in those department [in the university] also there are teachers who have four or five sons

Ind.1: ...literate persons behave [like] illiterate persons – no difference between illiterate and literate persons

Ind.2: ...these are literate but not educated, I think

Ind.1: no, we are educated but we not literate
This dialogue illustrated, moreover, a relational type of learning where the students enjoyed having the opportunity to relate their reading to social issues in their country.

Overall, the dialogues demonstrated that most of the participants were enthusiastic about relating their reading to events in their own country. It may be useful in first semester to provide texts relating to issues in students’ own countries to give them the basis for reading and understanding their academic texts. This would also send a clear message that their knowledge of events in their countries and their cultural practices are valued. This point will be discussed later in chapter eight.
Summary of initial reading practices at an Australian university

The responses from the participants in first semester showed that they, like the Thai participants, had noted that their educational experiences in their home countries had not fully prepared them for study at an Australian university. A discussion follows of the participants’ reading practices on first arriving at an Australian university and some of the changes they had already made during their first semester.

Even with a range of text-related strategies at their disposal, the participants found reading difficult. The differing expectations with regard to academic study, the English-authored text structures, their knowledge base which was not necessarily consistent with what was required, and their lack of academic reading, were some of the problems the participants reported facing.

The English authored texts were found to be complex and confusing by most of the participants whereas the Indian authored texts, to which the participants had been used, provided more explanation and less complex language. Moreover, the Indian authored texts used a different organizational structure.

In addition to being aware of the differing organizational structures of English-authored texts, all the participants were aware of their lack of academic reading, particularly in the journal article genre; they had been educated to read textbooks as they were considered to be the main source of the fundamentals of any subject. The lack of experience in reading journal articles, together with their lack of background knowledge, has led to considerable difficulty negotiating the text structure as well as the meanings.
To overcome their difficulties, all the participants were using a range of intratextual
cues such as tables, diagrams, pictures and headings. To overcome vocabulary
difficulties, all the participants, to differing degrees, guessed from context, read on,
looped back, translated into Hindi and used a dictionary.

Dictionary use was found, however, to be problematic as English has various meanings
for the same word. English/Hindi and English/Bengali dictionaries were used in first
semester but the use of translation with the aid of a dictionary, it was soon found, was
time-consuming and also problematic as it was often difficult to find the appropriate
meaning for an English term in their own languages. Of course, students feel they
should find the 'right' word and that coupled with the amount of linguistic information
provided, especially in ESL dictionaries, can often complicate the matter. It might be
useful if students such as these could attend an orientation course which incorporated
sessions on becoming familiar with dictionaries such as the *Cobuild* dictionary, so that
they could gain confidence in consulting them as a multifaceted source of linguistic
and cultural information.

Various study strategies were also described including highlighting and underlining.
These strategies, learnt in their own countries, aided memorization of facts for
examination purposes. Laborious handwritten notes were another form of study
strategy for remembering content. Another strategy, repeating unfamiliar vocabulary
for the purpose of memorising, was also mentioned. Devine (1984) has investigated
the internalised process models of readers: sound centred, word centred and meaning
centred and found that strategies such as repeating unfamiliar words in order to
memorise, may stem from a sound model of reading rather than from a meaning model
of reading; this practice may well fit with the oral culture of the Indian participants.
Most of the participants used the strategy of guessing and all, except B1, assumed they had the correct meaning; B1 monitored his interpretation by comparing the information in the tables and the text and re-reading. If, Glenberg et al. (1985) pointed out, students do not monitor their interpretations they may find their assumptions are wrong and may suffer from ‘illusions of knowing’. Cultural influences also play a part and can give rise to alternative interpretations. If encouragement were given to discuss interpretations of text, the varying perspectives of students could enhance and extend their knowledge.

All the participants reported also that they used strategies such as reading on and re-reading which slowed the process of reading down significantly. Other aids to memorisation were underlining, highlighting, making notes and repetition.

Another text-related strategy, inferencing, was demonstrated when there was background knowledge to draw on. For example, B1 and B2 were able to make inferences while reading the general-interest text because of B2’s background knowledge of pharmacy.

While intratextual framing was in evidence, there was little demonstration of intertextual framing. Although a requirement of academic study is much reading, at this stage, all the participants, while noting the usefulness of reading widely, were not doing so. They read only what was necessary to address assignment tasks, to clarify what they must read or for information on, for example, setting up experiments in their fields.
Because of the lack of reading, the participants also had difficulty with the practicalities of in-text referencing in their own writing but also were unaware of, as pointed out by Swales (1990), the affiliations to other texts that these references might have signalled.

Several of the participants had workplace experience. However, while workplace experience is valuable, the participants realised that their lack of academic reading, due to time constraints in the workplace, had now limited their ability to connect with studies described in other texts. A1 was the exception; his reading of coal research reports was proving useful to his present studies but, even he, felt that he would have benefited from more journal article reading while still in India.

The participants’ reticence in reading no more than they had to, at this stage, may reflect their oral culture. Reading is more difficult than speaking. As Robeck and Wallace (1990) stated, reading requires a wider range of general knowledge, it provides less contextual support, it uses different forms of discourse organization and different anaphoric devices.

Presenting students with various texts, however, is not necessarily a solution to bridging the gap between prior reading and present reading. According to Hynd (1998) students may not necessarily engage in thinking like their peers in their discipline by merely being presented with various texts offering differing viewpoints. She pointed out that students with little background knowledge (and she refers specifically to history studies) will read still for facts rather than ‘to understand why the interpretation of events is different’ (p. 38).
In addition, there was little evidence of critical evaluation of text. This lack of critical evaluation was no doubt due in part to the lack of prior reading but also to the differences in expectations of textual organization, in particular, the purpose of a conclusion. In addition, as Hynd (1998) explained, students are more likely to engage in critical reading of multiple texts if they have some background knowledge. Lack of critical language awareness, respect for authority (including the authority of authors), and unwillingness to challenge the written word, result, according to Flowerdew (1998), from colonial education. The findings that there was a lack of critical thinking displayed by the Indian participants during first semester is supported by Ninnes et al. in their 1999 study with Indian students at an Australian university.

**Using background knowledge**

The general-interest text did generate discussion using background knowledge from India. Alexander et al. (1994) have shown that when there is a match between readers’ background knowledge and interests there are significant, positive outcomes. For the various reasons they explained, however, our participants had little background knowledge to draw on and so could not frame their academic texts extratextually although they could draw on some background knowledge to help process the general-interest text.

Background knowledge can of course inhibit as well as aid understanding. A2’s knowledge of malaria led to his initial confusion. The endeavour to make one’s background knowledge relate, when it does not, may be a misplaced strategy in the early days of reading unfamiliar text in one’s second language.

In the case of B1 and B2 there was considerable discussion beyond the text because there was, as well as knowledge, a high level of interest. Finkbeiner (1998) and others
have shown a correlation between interest and strategy use with students whose first language is not English. Inferencing was demonstrated with the general-interest text, especially by B1 and B2. Again they had the interest and B2 had the pharmaceutical knowledge. C1 and C2 had medical knowledge but did not use it to make inferences. Possibly different kinds of background knowledge (which seemingly are similar and relevant) may lead readers to approach text somewhat differently. Another reason could be that background knowledge is not invoked, even when it could be, when the readers are still not confident with their reading abilities in their second language and are still ‘text bound’.
Discussion of changes in reading practices during first semester

The Indian and Bangladeshi participants soon realised during their first semester at an Australian university that they lacked sufficient academic reading and knowledge of their discipline area. At the same time they realised that they had to read for different purposes, not for examinations, but for developing a more holistic view of their research area. There was increased awareness, too, of the different text structures they had to negotiate in their English authored readings. In order to accommodate to the requirements of their study and to fill gaps in their knowledge, they made some adaptations and changes even during first semester.

Many of the changes involved text-related strategies. One of those was dictionary use. At first, the participants had used mainly English/Hindi or English/Bengali dictionaries. As dictionary use had been found to be problematic, the participants reported now using Indian authored texts to help explain the content of their current readings. These texts had a more explanatory and step-by-step style that made them easy for a reader to follow. The participants were already making some use, too, of English/English dictionaries to find appropriate meanings. Another strategy was to seek out other students who spoke their own language for a discussion of their texts. The participants made more use of the text, too, by reading on and re-reading, in order to make connections between paragraphs and hence to deduce meanings.

Extending text

Even with difficulties relating to text structure and unfamiliar vocabulary some of the participants demonstrated, nevertheless, that they could, not only draw on their background knowledge to offer solutions to the problem described in the text, they also could relate the text to problems within their own Indian communities with suggestions
for solving these problems. This awareness of multiple perspectives is to be encouraged in postgraduate students. It would seem that, apart from the direct knowledge that some of the participants possessed, other reasons for their ability to extend their reading could be a certain level of confidence and acute interest in welfare issues in India. It may be, too, that their enthusiasm for discussing 'beyond' the text stems from their oral culture.

It has been demonstrated by Tobias (1994) that a substantial linear relationship exists between interest and prior knowledge. Several other studies have shown a positive correlation (Alexander, Jetton and Kulikowich, 1994; Alexander, Kulikowich and Schulze, 1994). It may well be, in third semester, the other participants will develop the confidence, and hopefully interest, required to extend their reading.

**Self-efficacy**

The participants, even in first semester, spoke of their awareness of increased self-efficacy. There was still the challenge, however, of reading academic text, particularly of the journal article genre related to their disciplines.

Although still lacking confidence in their ability to read academic texts, the participants had noted increased benefits from their academic reading. Al reported that many things were clearer to him now and if he had done his present amount of reading in India he could have written, he said, 'some wonderful papers'. Through his present reading he said he felt he was developing a more holistic view of his field and, at the same time, was able 'to collate the detailed analysis with the original setting'.
Increased reading, through following up references, had enabled A1 also to write more clearly. Having seen how various studies are written up and how models are presented, he now spent some time, he said, producing diagrams of his own so that, ‘at the first instance he [the reader] can visualise actually what it [my study] is’.

Those participants who had prior experiences in the workplace demonstrated a certain confidence to go ‘beyond’ the text when reading the general-interest text. However, as was noted in the case of C1 and C2, the experience had to be closely connected to the text content, linked with interest and/or confidence in their linguistic abilities. At the same time as acquiring background knowledge in the workplace and in their home countries generally, the participants had become distanced from academic reading and possibly had lost some of their study skills.

A2 seemed to suffer the greatest anxiety of all the participants when he first faced the large amount of reading required for postgraduate study. He explained the extent of his anxiety:

When I saw the books here, I was planning to move back and my brothers encouraged me and that is why I am staying here.

He, in first semester, decided to read only his lecture notes, still needing time to develop his confidence in reading other texts. The fact that he could invoke background knowledge and produce an analogy between malaria and schistosomiasis demonstrates that, with some assistance in acquiring background knowledge or experience, he could apply strategies such as these to his academic reading.
In first semester, it would seem that the ability to make adaptations to, or change the reading strategies, related to the participants' level of anxiety, level of interest and level of confidence. With sufficient interest and confidence, it seems that readers can draw on background knowledge when their in-text strategies are not adequate or they have little other similar readings to draw on. Background knowledge, however, unless specific to the academic reading, may only serve to confuse.

How the participants addressed their difficulties, increased their self-confidence and developed reading practices to better accommodate to their new academic environment are described in the next chapter.
Chapter Seven

Indian sub-continent postgraduate students’ reading practices in third semester at an Australian university

Introduction

This chapter discusses in detail the various adaptations and changes that had taken place by third semester. Examples are provided to illustrate the participants’ use of metacognition and framing when reading. The participants’ descriptions of their reading practices in their interviews highlighted the changes in their perceptions of their own ability and how these changes influenced their reading practices. The pair think-aloud protocols gave insights into the actual reading practices as they were taking place and some of the thinking guiding these practices. The research questions addressed in third semester of the participants’ study were:

What are the reading practices of Indian and Bangladeshi postgraduate students in third semester at an Australian university?

What are the influences that may have led to changes in their reading practices by third semester at an Australian university?

Once again, participants brought a text from their own discipline area that they had read prior to the interview. Excerpts from these texts, when applicable, are displayed in the appendices. The text for the pair think-alouds was the same New Scientist passage as for the Thai participants (see appendix 3). As mentioned in
chapter five, this text was considered to be of general interest, not too lengthy and incorporated intratextual cues, such as a table and picture which could be used to aid understanding of the text.

Table 7 shows the participants' disciplines, their chosen academic texts used for the semester three interviews and the text for the pair think-alouds.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Discipline</th>
<th>Academic text</th>
<th>General-interest text</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2</td>
<td>Medicine</td>
<td>Pair think-aloud with C1</td>
<td></td>
</tr>
</tbody>
</table>
C2 was unable to attend the second individual interview in third semester due to pressure to finish his Masters and the birth of his first child. As shown in Table 7, his substitute C2₂, also from Bangladesh, was studying in the discipline of computer Science where he was undertaking a Masters.

The discussion in this chapter, as in the other results chapters, is organised around the metacognitive and framing components of reading. The order of discussion for this chapter is firstly Knowledge of task, Knowledge of text structure and Knowledge of strategies and their applications. Finally, Knowledge of self is discussed, providing participants’ reflections on their changing reading practices. Circumtextual framing, Intratextual framing, Intertextual framing and Extratextual framing are discussed as they interconnect with the metacognitive components of reading, mentioned above.
Knowledge of task

Knowledge of task is a prerequisite to developing appropriate strategies. The participants' accounts in first semester reflected their awareness that reading for postgraduate study at an Australian university was for the purposes of building knowledge in the discipline area, for making connections between different researchers' work and for evaluating research described in various texts.

Redefined purposes for reading

Possibly because of the participants' raised awareness of their lack of knowledge during first semester, there was a more focussed sense of purpose demonstrated during the second interviews in third semester. All the participants had realised that more reading was required and this was now carried out to acquire more background knowledge, to aid understanding of the concepts and for writing purposes.

Various accounts were provided of participants' changing purposes for reading. Several of the participants reported being able to target texts relevant to their study because of their greater focus. B1, for example, demonstrated his new sense of purpose when he commented that he used to look at a title in the library and just take the book but now, he said, he knew what it was that he wished to read. So a clearly defined purpose by third semester had enabled him to access only relevant texts.

Another participant, A1, explained his need for more knowledge, and described why he had chosen to read the academic article (see appendix 20) which he had
brought to the individual interview:

...environment related to that which is relevant so I mean wherever I go
if someone ask what is, I mean how, where coal is deposited, I mean it
gives me a very good idea and this is a very compact and very
comprehensive work and they have done for about seven, eight year they
have put together.

He added that the accumulated data had been made into a model, a fluvial
model of lower permeable coal measures of two areas, one of which he was
interested in for his own research. He was especially pleased, too, he reported,
to have found some very relevant maps in this article. Altogether this reading
provided information on how the coal was formed in that area and this, he said,
he could use for his literature review.

A1 had another reason for reading. He read, he said, in order to specifically
note quotes which he could use in his thesis writing and he explained how he
had developed the strategy of classifying his notes to fulfil this purpose:

I am not just jotting down separately I am asking if this is relevant to
this, is this relevant to introduction, this is relevant to conclusion (i.e.
introduction and conclusion in his own writing).

B2’s first comments indicated that he, too, was reading with a greater sense of
purpose than in first semester. His research is focussed on the drug Artemisinin,
a recently developed anti-malarial drug and so he chose the article (see
appendix 21) on Artemisinin in order to find out about 'the latest development, what are the drugs being developed and coming on the market'. Artemisinin, he explained, is a drug which has been used in China for many years but its full potential has not been realized and so it has not been developed and marketed. He wished, he said, to carry out research with this drug as it was going to benefit victims of malaria when he returned to India.

These participants generally selected journal articles which reported recent research and development. At this particular stage in his research, B1 also reported that he read to find information which would help him develop his experiments.

Some of the participants also reported that, as well as reading articles which would provide background knowledge, they read them to assist with assignments. C1, for example, stated that when reading she was attending to the academic writing conventions in the articles in order to improve her own writing. She mentioned the elements in an article which assisted her:

_The sentence, the vocabulary and the way they have written the paper._

Reading for B1 had a longer term purpose than for the others. He reported that he was interested in reading which would assist him to progress to a PhD. (He is at present doing a Masters). He has asked his supervisor to give him a Master’s project with 'stepping stones' so that he can continue developing it to PhD standard.
Overall, the participants in third semester were displaying greater selectivity in their reading. This had come about as a result of redefining their purposes for reading. The purposes for reading by third semester included reading for greater knowledge, reading for writing and reading for information to help develop experiments.

Text search

Although the participants knew what their tasks were, they displayed varying levels of confidence with regard to text searches, in particular, searches for journal articles. The following examples illustrate the tentativeness with which most of the participants accessed academic journal articles. B2 searched for the current article under the drug name, but still relied on his supervisor for guidance:

_We know the journals but we go for what our supervisor know; he has a wider range of knowledge [laughs]._

A1, on the other hand, found his article through references in a book by the authors. Fortuitously, he found the journal article lying in his laboratory.

B1 attempted the search on his own through the catalogues in the library and found this article after disregarding several others which seemed less interesting. Although confident in using the library system he was still pleased, nevertheless, to have his choice validated when his supervisor later suggested

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the current article.

One participant, C2, unlike the other participants, did not yet know how to use the computer system to locate texts and found the academic text for the individual interview by chance, he said, as it was located near computer security. In India, he said, he would also choose at random. He relied on circumtextual framing, as discussed below, to choose a relevant text.

In general, the participants’ accounts regarding selection of texts, demonstrated that they still experienced a degree of tentativeness when accessing texts in the library or on the Internet. They all reported that they felt better if their supervisors helped with the choice of academic texts.
Circumtextual framing

Although still relying on supervisors for help in selecting appropriate texts or to confirm their choice, all the participants were demonstrating the use of circumtextual framing, such as titles and typographic features, to assist with their search for readings. Metacognitive knowledge includes being aware that the title provides clues about the topic of a passage. C1, for example, wished to compare local and international student health care issues and the title, ‘international health study’ indicated that the authors were describing a comparative study in the field (see appendix 22). She noted the title was in bold and capitalised and stated this showed importance. She found the article through intertextual framing. She saw a reference for it in a related paper and she acquired the article through inter library loans; she did not know where the article came from but knew it was not from Australia. Although the article was written in 1986 she did not think there were more recently related topics available. The article did not give the information expected, however. She expected to read about the kinds of health problems experienced by international students but the authors ‘just look at the diagnosis and what are the different types of diagnosis’. The information, however, was still useful as the authors found 50 diseases that international students were subject to.

Peripheral features such as the abstract and biography also provide messages about a text. C1, in addition to checking the title, looked at the abstract which, while in small lettering, was in dark print; this, she said, made it easier to read; she also said she knew she should read the abstract to:
find the author's purpose, some of the methodology and some reasons.

C1 also located the name of the journal at the foot of the page. She knew that the Journal of American College Health provides specific information on student health.

C2 also checked the title, found one Ethics in Science (see appendix 23) and judged this to be appropriate for an assignment. He noted, also, that the title reflected what was contained in the passage and was referred to in the conclusion. He did not know what ‘CEPE 97’ meant although he thought it could refer to a conference. He did not check the name of the author; in any case, he said, he had not read any other publications by this author, Ladd, and so presumably he had no way of judging the credibility of the author.

The size of an article and print styles also have implications. C1 already mentioned the bolded title which she judged meant the article was important. A1 noted the size of his publication and from that evaluated the text as being ‘a sort of keynote address’. B1 noted the use of the presentation features, in particular the use of italics, in the introductory paragraphs in each segment of his article (appendix 24):

They are like an alert, an interesting point.

This kind of presentation suggested to him that the article was an overview and not a technical piece.
Other circumtextual cues include biographies of authors. B1 was the only participant to use this cue but only during the interview; he had not looked at the biography before attending the interview. He found, to his surprise, that the author had written eight papers on the topic (see appendix 24) and, therefore, had some degree of credibility. Impressed, he said:

_He has done some bit of work ... I feel this guy knows something about what he is talking about._

Then he noticed that Cox had a BSc from Stanford – ‘he must be smart’, he added.

None of the participants, when reading the general-interest text, checked the title or alluded to the author as they were now doing with their academic texts. This is possibly because circumtextual framing is only being used at this stage to enable correct selection of a text rather than to evaluate the contents or cross reference data between different studies.

Another circumtextual feature that was checked in the general-interest text, however, was the highlighted phrase in the centre of the text; B1 and B2 judged it to be ‘like a conclusion’. While finding out about CJD in the first paragraph they had to, they said, read the whole article first to understand this ‘conclusion’. Hence the phrase, although placed prominently in the centre of the article, was not useful to them while reading through the text.
Overall, the participants’ accounts indicated that they were more aware of circumtextual features and were using more of them for the purpose of selecting texts appropriate for their study or to judge the credibility of the author.
Knowledge of text structure

Besides noting the circumtextual features related to a text, all the participants noted, at a micro level, the differences in English and other writing styles. One significant shift from first semester was the decreased concern about the readability of the texts and the increased interest in the language differences. C1 illustrated this point by mentioning the simpler style of Indian writing. She gave an example of the simpler vocabulary used by Indian authors:

_This sentence – “it has been established that international students visit the centre”, maybe they [Indian writers] would use “it has been seen that international students visit the centre”. (appendix 22)._

She added that the more complex vocabulary did not now necessarily upset her understanding of a text, presumably because her range of vocabulary had increased; showing her increased confidence and interest, she said:

_I now find it very interesting to see how many types [of vocabulary] people can use._

Location of data in a text usually indicates its level of importance. A1 mentioned during his first interview in first semester his expectation that some of the content in his Coal Report would have been placed at another point in the text to give it importance. B1, in third semester, mentioned also this mismatch in expectations. The segment ‘Other Issues’ on p.33 of his academic text (see appendix 24), he felt, could have been with Background and Issues. He
expected, he added, to read about all the necessary background information at
the beginning of the text.

B1 did, nevertheless, find the article he brought to be easy to understand
because it was like 'a story book'. He felt anyone could read it and understand
it because it was not technical. Also references by the author to popular fiction
such as Dick Tracy, Maxwell Smart or Star Trek made the text 'very
comfortable'. Technical papers, he said, scared him because they incorporated
equations which he did not yet understand. Not all papers were scary, though;
some were very 'sweet', he added. When asked what he meant by 'sweet' he
explained that a paper is 'sweet' when it is easy to understand and the author
'has gone to particular pains to explain how he got this, how he got that'.

Style of writing was also mentioned by B1. His article had been written, he
said, as he had been taught to write: 'make your point and then explain it'. He
explained that students in India were taught to write in point form to save the
examiner's eyes, and to underline the points or keywords to attract the
examiner's attention. This comment may account for the signposts or cues that
the participants were looking for in a text to aid their understanding.

While some participants were still coming to terms with the differing
organizational structures in English-authored texts, others were gaining
confidence with their academic texts. C1, for example, after her struggles in
first semester with complex text, demonstrated her awareness of, and ease with,
the different elements in an English academic text. The introduction, she
explained, provided the purpose of a study and the background; the methodology could be found in the abstract. She was aware, she reported, that some abstracts, did not contain the purpose. Her confidence had been developed, she said, through classes in Health Science for postgraduate students which compared abstracts for content so, she said, ‘we have done it practically’. Despite having knowledge of the elements of text structure, notably in third semester, the usefulness of abstracts, and the amount of content in an article can be critical to comprehension. In first semester, C1 reported having problems with articles which contained description of more than one piece of research. The academic article she had brought to the interview in third semester (appendix 22), she reported, was written ‘in a way that is easy to understand’. The author had written, she added, about only one piece of research, a single, longitudinal study; the article she had brought to the first interview involved several studies and, as a result, was more confusing for her. With the realisation that articles with several studies confused her, she had therefore elected to select only texts, as far as possible, which were commensurate with her present abilities.

The participants from Bangladesh provided further insights into why the organization of English written texts could be difficult for students from Bangladesh to understand. C2 explained that in Bengali, the introduction would be written differently; there would be ideas but they would not be as organized as in an English authored text, and would not cover the main ideas; the introduction would not be as large. C2 said, laughing, ‘actually we chat’ adding that the Bengali introduction served as a ‘gateway’. He was aware now that the
introduction in an English text would provide much more information than in a Bengali text. Several of the Indian participants, on the other hand, mentioned that the introduction of a Hindi text would give detailed explanation.

The Bengali participants explained, moreover, that the body of the text in Bengali would be more descriptive. C2 said that even though the information was sometimes described under headings, 'there is no relationship'. He said, 'I think it is lacking'.

These comments seemed to indicate that the participants from Bangladesh had come to accept and even appreciate the structure of English academic texts.

In contrast, B2 offered an Indian perspective. While also mentioning different text styles, he, however, expressed unease with the English style. He said that if his article (by a Saudi Arabian author) had been written by an English author it would have had less explanation (see appendix 21). He found his chosen text to be 'good, simple, logical'. The introduction, for example, he explained, gave most of the necessary information:

\textit{data on the drug, the structure, why it is used, its potency.}

He also thought the conclusion was satisfactory as it connected to information given earlier in the text.

The participants seemed to expect an almost complete overview of a text to be
provided in the introduction. C1 and C2 indicated this expectation when they stated that the introduction to the general-interest text was useful to them because it almost covered ‘the whole theme’; it explained the ‘main idea’ and gave reasons.

Besides containing less explanation than expected, the introduction of a text may include unfamiliar vocabulary. C2, who seemed to be struggling more than the other participants to understand his academic article, illustrated this point. He reported that the introduction of his academic text (appendix 23) was difficult because of the type of vocabulary used - ‘like abstract things, abstract ideas not clearly explained’. He said he was not familiar with this ‘type of English’ as it was not language concerning computers. It has to be said that his article was a philosophical piece and the language, therefore, understandably, would be ‘foreign’ to him. It is useful, though, to develop broad perspectives of a discipline and students need to acquire less discipline-specific vocabulary in order to be able to read ‘around’ a topic area.

Several participants indicated they experienced a mismatch of expectations with regard, not only to the content of introductions, but also to the content of conclusions. C1, for example, looked at the conclusion in the general-interest text and thought that, although the author’s conclusion related to the content of the text, it would have been better if he had provided some solutions, indicating, as in first semester, her differing expectations of the purpose of a conclusion.
It can be seen that all the participants were knowledgeable about the differences in text structures. At the same time, they provided varying accounts of their liking for the differing structures, in particular the introduction. The participants’ accounts showed that there are differences between Bengali texts and Indian texts and highlighted the fact, moreover, that it can never be presumed that students from neighbouring countries share the same knowledge and reading experiences.

**Knowledge of strategies and their applications**

The greater awareness of postgraduate study expectations, particularly with regard to reading, and the awareness of differing text structures were reflected in all the participants’ changing strategies. In first semester, all the participants had focussed on intratextual framing and hence text-based strategies. Intratextual framing was used to an even greater degree in third semester.

**Intratextual framing**

All the participants reported that they had refined existing text-based strategies, such as skim reading and re-reading, and had also developed new ones, such as information search strategies.

**Information search strategies**

The strategies for seeking information in a text changed between the first and second round of interviews, partly due to the fact that participants had a more precise idea of their reading objectives. A1, for example, said he now knew what he was looking for in an article:
Showing his understanding of what each element of the text provides, he reported that he now started from the last page, as he did with this article. So he read the conclusion first, the abstract second and then the details of the passage. He needed to read the conclusion first, he said, because the abstract did not ‘tell what the author has got’. The abstract, according to A1:

   give what they [researchers] are going to do but I want what they have got.

Another participant, C1, demonstrated how she was quite systematic about looking for main ideas, too, although she was not completely confident in her ability to understand a passage after one reading. She reported using the following reading order to assist her understanding of a text - abstract, introduction and the discussion and the tables. She used this order, she said, because these elements were linked to the discussion. Illustrating her greater degree of metacognitive awareness, she had noted, too, that authors put results into the discussion section. Another strategy she generally used was to look at the beginning of the paragraphs for the main ideas; however, as the article she brought to the interview was an important one for her, she read ‘all over, beginning, end, in the middle’ and deduced ‘what he [the author] says is very good’. By looking all through a passage, C1 said that she would probably find what was related to her area of interest.
Word order, it seemed, was an important part of planning to read and involved knowledge of text structures and their content. Other features of a text, as in first semester, were heavily used such as headings and diagrams.

Using intratextual cues: headings

All the participants mentioned that they relied on headings to guide them through their reading. Another use for headings was reported by C22.

It took C22 one hour to read his academic text (appendix 23). He explained, ‘if I try to understand more then I take more time but I just want to go through, it not take too much time’. He reported how he used the headings to not only guide his reading but to select what to read. He noted, too, that the headings were bolded to ‘attract the reader’. In this passage, he first read headings, then the body of the text. He mentioned specifically the heading ‘New technology and new ethics’. The author, he said, had already alluded to the topic so before reaching this heading, he had some idea of the topic, showing he was already linking information between paragraphs, as were the other participants, in order to make meaningful connections. C22 explained his use of headings in this way:

*The headings guide the reader to the areas of interest. Sometimes, I only read the headings to know what the content is about.*

Comparing headings in Bengali texts, C1 stated she was now aware that the headings in English authored texts bore a relationship to the text as headings in Bengali texts, she believed, did not.
But what happened if a text had no headings? C1 reported that, if there were no headings as in her current academic article, her main strategy for understanding the text would be re-reading. This also assisted her, she said, to memorise and then to understand.

**Scanning and re-reading**

Other strategies used by all the participants included scanning and re-reading. A1 outlined the procedure he used when first approaching a text. He scanned first, he said, to find the material which was relevant and/or interested him and underlined or bracketed the sections of relevance or quotes he wished to use later in his writing. If a paper were relevant, as the current article was, A1 would read it through three times; this article of 26 pages (appendix 20) took almost one and a half days to read. This was a shorter length of time than in first semester, though. In first semester it was difficult, he said, to read even one or two pages sometimes. He admitted to reading parts of this article which were not relevant to him because, and he laughed as he explained, he had developed an interest in reading this article. The increased reading and confidence in reading, may have helped generate interest in the material.

Again demonstrating his growing interest and enthusiasm for reading, A1 said he used the intratextual features such as headings and examples because he was interested in reading about the topic, and quoting important examples:

*I am getting a world example; here I got example in an international publication.*
Another participant, C1, explained that, as she was at the beginning of gathering data, she might read an article ten or twelve times. When asked why she read an article so many times, she replied:

*so that I don't miss anything, maybe if I read two or three times, I will miss something.*

With the general-interest text, intratextual framing was involved in the checking of the text elements of introduction, conclusion and the highlighted sentence in the middle of the article. C1 was aware of the significance of the highlighted sentence. It, she explained, 'magnify and more attractive because this is important theme of the whole'. Although the sentence was significant, C1 and C2, as did the other participants, realized they needed to read the article first before they could understand it.

**Using tables, figures and diagrams**

Other intratextual features such as tables, pictures, figures and diagrams held varying degrees of usefulness for the participants. A1, for example, judged that the tables were not useful in his current article because the organization where he had worked in India had more up-to-date information. So extratextual and intertextual reading helped him to evaluate this article's data (appendix 20) and to ignore or adapt the information given.

The photographs, A1 said, were also not useful to him but he saw them as being
useful for the authors as they demonstrated the authenticity of the study:

*the photographs, yes proved what they are telling.*

By proving the authenticity of the study, the photographs would have helped A1 evaluate the worth of the study. He did concede that the diagrams were useful to him as they could be adapted for his own written work.

B1 had found another use for tables. As well as providing information in connection with the text they also provided information, he said, regarding companies in his field and possible jobs for the future. B1 seemed to be future oriented. He mentioned earlier reading for a future PhD rather than just for his Masters.

C1, on the other hand, had reservations about tables. She mentioned, as in the first interview, how confusing it can be for her to read more than one study in a paper at a time; a few tables can be helpful but many tables of statistics can become confusing. In her current academic text (appendix 22), though, the tables had a purpose other than providing information. She explained that, for her, the tables in her current text helped to differentiate the content:

*He [the author] separated the diagnosis ... compared the domestic students [with the international students] ... so you can identify each.*
She noted that the authors did not differentiate the countries from which the international students came, the data merely stating, S. East Asia; she was surprised that the countries were presented *en masse*.

The usefulness of graphs was mentioned by one participant. B2, it will be recalled, read for information on experiments. He looked, therefore, at the graphs (see appendix 21) while reading as they related, he said, to his experimentation. The graphs, he noted, connected to the text and so he could, he said, read ‘back and forth’, to make use of these connections.

Pictures are another intratextual feature that can aid comprehension of a text. As there was no abstract in his academic article (see appendix 24), B1 stated he looked first at the pictures because then one finds out:

*what they [the authors] are talking about and you know that this is what they might address.*

Pictures, to him, are worth ‘a thousand words’. He recalled when he did some research for a Melbourne professor, his [the professor’s] lecture notes comprised only pictures which he felt were sufficient:

*Why would you want to read the whole thing which is written in such small letters and strain your eyes when you can just look at it [the picture] and understand it. They are more soothing to the eye than the text. They catch the person’s attention.*
His educational background partly explains his liking for drawings. He was taught to draw diagrams whenever possible instead of writing; professors had told him that examiners would rather see that a student had understood from a diagram than having to read through hundreds of papers. This is an aspect of the teaching/learning practices that was not mentioned in first semester and explains why students such as B1 make full use of visuals.

While pictures and diagrams can be useful to a reader, intratextual devices can at times be viewed as distracting or even a hindrance. The picture in the general-interest text, for example, was considered less useful than the table by all the participants. This could have been partly because they did not understand exactly what was in the picture. From the retrospective interview it was found that none of the participants actually identified the holding of a slide in the picture. B1 and B2 thought they were looking at fingers holding sutures. A1 and A2 felt that the picture was of little use as they had never seen a brain before. The picture was not considered very useful in the first pair think-alouds because it was a familiar scene to the Indian participants. This time C1 and C2 stated that the picture was unhelpful because it did not relate to the text at all. This reason was not mentioned during the first pair think-alouds so perhaps participants were now searching for connections in their reading.

The table in the general-interest text was of more interest to the participants. C1 and C2 found it useful because it provided statistics for a few countries and A1 and A2 said it was useful to see where other cases were located. B2 described
the data in the table thus:

*it is shown here in the corner of the first line here that CJD cases are linked to growth hormone treatment; like France was like 50 and the US is 15 and even the other countries banned this hormone.*

As Canada does not appear on the table, B1 and B2 surmised first of all that Canada did not have any cases of CJD. Then B2 inferred that Canada had probably been included in the category, ‘Others’.

Again, referring to the lack of linking with the text, C1 stated that the table would have been easier to read if it had been related to the text. C2 evaluated the text type based on this lack of linking, stating that it was not a scientific article because the author would have referred to the table.

In summary, it seems that intratextual devices such as headings, diagrams, tables, graphs and pictures can be useful when reading a text. However, as in first semester, the participants reported that these devices were only useful if they were referred to in the text and if they had background knowledge to help them identify the content, or in the case of a picture, the images. Some participants, moreover, mentioned that too much detail in, for example, a table, could confuse.
Reading on and re-reading

Besides making use of intratextual cues, all the participants demonstrated their ability to make connections within a text and to clarify issues in a text by reading on and re-reading. C1 and C2, for example, deduced that the second paragraph in the general-interest text was ‘supporting the theme’ of the first paragraph. They noted the first phrase in the first sentence, ‘after examining the pharmacy’s records’ and then noted that 20,000 ampoules were distributed between 85 and 86. The figures seemed to attract their attention, too.

They found out from the next paragraph that the officials did ‘these things with due knowledge and they knew of the possible consequences of their action; yet they supplied the things’. The use of the word ‘yet’ implied that events were not as they would expect.

They noted the ‘relation of idea’ between a past event when French officials were convicted in the mid 1980s for not stopping distribution of a product to haemophiliacs. In addition, C1 thought she saw another connection with the present case and laughed:

Another idea, two of the doctors were jailed at that time.

Her laugh may have indicated surprise at the fact two doctors were jailed, an unusual event.
The word 'jailed' was misinterpreted by A1 and A2 who thought it meant 'sacked'; possibly this seems a more appropriate consequence to them. In any case, the failure to correctly interpret this vocabulary item did not interfere with their reading. Likewise, when B1 and B2 discussed the first paragraph, they stated that it was about 'a growth hormone that has caused this [CJD] disease' and 'former officials have been sacked', possibly indicating their expectation, too, that officials would be removed from office rather than put in prison.

**Peer monitoring**

Another strategy which was in greater evidence in third semester was peer monitoring. One pair of participants, C1 and C2 demonstrated in the following dialogues how they monitored each other and how they moved back and forth between paragraphs to clarify issues. In paragraph one, C2 tried to monitor C1's interpretation but they did not reach agreement unless there was tacit agreement because there was no further discussion on the matter:

\[ \text{C2: are they doctors?} \]
\[ \text{C1: yes, two of the doctors} \]
\[ \text{C2: they were officials} \]
\[ \text{C1: not... those who were involved here.} \]

They left it there and moved onto the fifth paragraph.

As C1 and C2 read on, they saw the relationship with the first paragraph. They noted that the hormone from the cadaver was treated with urea to inactivate the
protein, and at this point, realized the first paragraph gave details of the protein. C1 tried to justify the use of the growth hormone, 'they thought they inactivate this prion protein, so they are not getting this disease; that is why they are still using'.

Then C1 asked what happened on 14 May 1985. They noted the 30 grams of growth hormone that was awaiting packaging 'should be reprocessed'. C1 asked 'why' and in the ensuing dialogue a close complementarity is demonstrated as they work out the interpretation:

\[
\text{C2: because the urea will inactivate this prion protein but this was not being inactivated by the prion protein; this has not been inactivated and already they have sent}
\]

\[
\text{C1: mmm, 15,000 ampoules}
\]

\[
\text{C2: untreated hormone}
\]

\[
\text{C1: were sent off hospital}
\]

\[
\text{C2: between June and October 1985}
\]

\[
\text{C1: mmm, June to}
\]

\[
\text{C2: June to October}
\]

Now they linked between this paragraph and the previous one to determine the turn of events:

\[
\text{C2: here you see in the previous paragraph, after 1985, they first link the disease with the, ah, with this protein, the previous paragraph so}
\]
after 85 but before 85, even June to October, they sent 15,000 ampoules to hospital without being
C1: without being treated

They laughed when they discovered the discrepancy, presumably indicating their surprise again that an institute held in high regard was involved in possible malpractice:

C2: but the Pasteur Institute sent 5 grams without
C1: [laughs] sent from the institute to the pharmacy
C2: and this [laughs]
C1: the pharmacy records indicate that this was later packaged into about 5,000 ampoules, packaging into 5,000 ampoules that were distributed

Despite the ability to loop back and forth within a text, several of the participants demonstrated that they still missed vital information.

Missing cues
All the participants demonstrated that they could find the main ideas in a text and work out the relationships between the ideas in different paragraphs. However, it seemed that intersentential connectors were being missed. A2, for example, demonstrated misinterpretation with the following paragraph:
After 1985, when the first reports of a link with CJD surfaced, most countries — including Britain, Canada and the US — banned the natural hormone and began using a synthetic version. However, France and some other countries opted to continue using hormone from corpses, after subjecting it to an additional purification procedure using the chemical urea.

He stated:

... Canada, US they have synthetic corpses and France continue this.

A2 possibly needed the addition of a phrase to show the link between ‘version’ and ‘natural hormone’ such as ‘and began using a synthetic version of the natural hormone’. He may also not have noticed the signpost, ‘however’ indicating a change in procedure.

Incorrect monitoring was also demonstrated. In this example, subsequent monitoring corrects the confusion. The sentence in question was:

According to the Pasteur Institute, 50 of the 90-plus people worldwide who have contracted CJD from growth hormone are French.

C2 misinterpreted ‘90 plus’, thinking it meant ‘aged 90 plus’. Then C1 misinterpreted the numbers. She stated that ‘they have got 50 worldwide’ and C2 replied, ‘all from France’. The second misinterpretation seemed to follow on
from the interpretation of 90-plus as ‘aged 90 plus’ showing how incorrect monitoring can have a follow-on effect.

C1 and C2 then read on ‘But whether the untreated batches released after 14 May 1985 were to blame for any of these cases is unknown, as all the affected children began their treatment before this date’. To clarify they referred to paragraph six where it stated:

On 14 May 1985, France-Hypophyse told the Central Pharmacy that 30 grams of growth hormone awaiting packaging should be reprocessed using urea.

So they deduced that there was no treatment done on the growth hormone until after this date ‘because from this date they say that 30 grams should be treated’. They confirmed with each other that, after that, a link was discovered between the growth hormone and CJD.

C1, however, still expressed puzzlement and C2 tried to assist:

_C1: this sentence is unclear to me – “but whether the untreated batches released after 14 May 1985 were to blame for any of these cases is unknown as all the affected children..."

_C2: oh, it is clear

_C1: began their treatment before this date

_C2: no, it is clear because the affected children they are getting this prion protein}_
C1: mmm
C2: ah, they are getting treatment with this hormone before
C1: after
C2: before, they are getting treatment before that date and they also get
treatment after that date with this
C1: urea
C2: with urea, with hormone ... so it is not clear whether they contracted
the disease due to the supply of the ... before the supply of the hormone
before 14 May or
C1: treatment with urea but treatment [laughs] by the hormone
C2: ok

C1 showed in the retrospective interview that she was aware of why she was
confused. She stated she thought ‘treatment’ referred to treatment of the
hormone but it meant treatment of the children by the hormone. She now
realized that attention to the fine detail in textual cues is very necessary for
satisfactory interpretation.

Selective reading within a text
As well as using a variety of strategies to deduce meaning the participants now
realized they had to be selective in their reading to save time. A2, who
struggled with the reading in first semester, had now also devised some new
strategies. He asked himself questions before reading in order to find the
necessary information. In this case his questions related to a report he had to
produce:
What are the symptoms of the disease, also the effect of this disease in Western Australia or the World?

Apart from asking questions prior to reading, A2 used other strategies to avoid reading all the content. He underlined the symptoms, noted the diagram early in his academic text (appendix 25) which he judged to be very useful and read also the boxes on page 7 which displayed algorithms which he needed to use in his study.

Tables were now being used to help select information as explained by B1. He would look for figures in a table, he said, that ‘cater for his system only’. He added that the idea is ‘to get to know your stuff’. He would not look at economic issues, he said; he picked out only technical items. He said he found selection easy; ‘if I know what I am looking for, then I can find it’. However, he recognized that some research done today is out of date by tomorrow and, showing his awareness that tables do not necessarily supply up-to-date information, he said:

*You cannot learn anything from these tables; you just get an idea.*

However, if something is accepted worldwide, such as Viterbi’s algorithm, mentioned in his academic article (see appendix 24), he felt it was worthwhile learning it, as so far no-one had challenged it. B1 demonstrated then that he knew how to select and judge the validity of scientific knowledge.
Other methods enabling selection of relevant materials were mentioned. B2 stated he was more selective than in first semester and had found a method which was ‘more time saving’. He explained it this way:

*I read the abstract and I saw is pretty good and what I was looking out for and then I went to the conclusion and I found it to be more good, found what I wanted was there and then I started reading the middle.*

He used to read the abstract and the whole article but, he said, he might find, when he got to the end of the article, that it was not what he wanted. He explained that he had changed his reading approach to accommodate the large amount of reading which he had to do now. He read for four hours a day now instead of two but his speed in reading had not increased, he said, because he still took notes and drew graphs while reading.

**Strategies for finding meanings of unfamiliar vocabulary and abbreviations**

Besides the strategies reported for selecting what to read, various strategies were reported for deducing meanings of unfamiliar vocabulary items. For example, when A2 was asked why “Keyhole” had quotation marks around the word (appendix 25), he said ‘because this word means different than actual meaning’. However, he did not know what the word meant. Much of his reading, at present, concerned medical problems as he was developing a computer diagnostic program. His lack of medical background meant that medical terms were a problem. He said he gradually found out the meanings of
words he did not know through involvement in his work and by asking
Australian friends and the consulting doctor.

Dictionary use, therefore, is not necessarily the first means or the only means of
establishing the meaning of a vocabulary item. B1, who did not generally have
any difficulty with vocabulary items, said that if he did have difficulty with a
technical word, he would ask someone who was in the field. He never used a
dictionary and had not even seen a technical dictionary. B1 did have some
difficulty with abbreviations, though. For example he did not know what MT
stood for (see appendix 24) but, on further searching, he found the company
name, Metromix and as Metromix begins with a capital letter, he deduced that
MT ‘must be a company rather than a term for something’ (see appendix 24).

Generally, C1 did not use a dictionary, either, although she felt she should.
Often, she said, she could find a meaning from the surrounding text or by
reading the whole paragraph or even the whole sentence where unfamiliar
vocabulary was located. If she did not need the particular paragraph she would
be ‘lazy’, she said, and not look at the dictionary. If the passage were closely
related to her field of research, though, she said she would look at the dictionary
or ask her husband, who also was a medical doctor. The dictionary was useful,
she added, for general vocabulary. The medical vocabulary she found in a text
was understandable as she had studied medicine for five years. However,
prescription drugs were another matter, as she explained:
In our country, we know if I see the prescription I understand what for because I know the drug name and I know the company ... but here I don’t know the word, because I don’t know the brand name.

Some assistance with names used for prescription drugs seems to be a necessity for health science students. They cannot be expected to engage in discipline-specific discourse if unaware of drugs and their usage, just as other students would require an understanding of technical terms associated with their disciplines.

Some participants continued to use a dictionary. A2, for example, continued to use a dictionary to find out meanings of difficult vocabulary. However, whereas in semester one he had used the Hindi/English dictionary extensively, in third semester he used the English/English dictionary more than the Hindi/English dictionary because he found it easier, he said, to understand as there were explanations and sample sentences to guide him. Instead of being a time-consuming tool, A2 had now found that the dictionary provided guidance in language usage; sessions in dictionary use in first semester, as mentioned earlier, could well prove worthwhile.

To find the meaning of whole sentences and sometimes single vocabulary items, other strategies were used. B2, giving the example of a word such as ‘precautions’ (see appendix 21), reported that he would have to read other articles. Scientific terms, though, he said, he found in an English/English dictionary. General vocabulary, he said, was less understood than technical
vocabulary. He also reported that he might not know about some of the analytical methods used; in this case he felt it was not enough just to read books; ‘one must ask someone working in the area’ he said. That ‘someone’, however, did not seem to be the supervisor, reflecting his respect for the supervisor and his desire not to unnecessarily question him/her.

You got to find out everything first from a book, then you ask the person.

It is not good on your part to ask everything of the supervisor [laughs].

One participant reported using a combination of strategies. B2 said he often guessed meanings but used the dictionary to confirm the meanings. ‘I don’t want to get it wrong’, he said, laughing. He used various methods for guessing. He tried, he reported, to think of a similar word, a similar sound, look at the surrounding words or put the word into another sentence. He never translated into Hindi, he said. B2 also had a set of strategies for understanding chunks of text. He generally skim read, he said, only reading word-by-word if he did not understand some part of the text; then he might have to read something five times. He stated, ‘if I don’t get it I won’t go on’. B1 also mentioned that it would be useless to continue reading if the first part of a text were not understood. Again this practice of understanding the first paragraphs first seems to be a reflection on the carefully staged teaching practised in India.

Translation

Another means of finding meanings is through translation. All the Indian participants used translation to some degree in first semester. In third semester,
C2 was the only participant consistently using translation. When he read, he said, he automatically translated to Bangla but he realised, as had the other participants, that translation was not the perfect strategy. He could not necessarily find the specific word he needed for the English word. Sometimes, as he explained:

_The one word takes a whole sentence in my language._

C2 gave examples of the kinds of words from his text which were difficult for him to understand: ‘gadfly’, ‘sanctioned’, ‘grist’, ‘medieval’ (see appendix 23). It was mentioned earlier that C2 had to read a philosophical piece which had vocabulary unrelated to his field of computing. Generally, he said, with words such as these, he tried translating the word to Bangla and if that were not satisfactory he used the dictionary; if, he added, he wished the ‘proper meaning’ of a word, he checked the dictionary first and then translated to Bangla, thus showing how he selected processes to meet specific needs. C2, unlike the other participants, thought it was quicker to find out a meaning for himself because, he said laughing, he would have to spend time otherwise finding the right person to ask.

The above reflections from C2 show that, even in third semester he relied on translation. This may have been related to the content of reading he was expected to do – content with which he was completely unfamiliar. The other participants were using a variety of other strategies when they encountered unfamiliar vocabulary, as discussed below.
Monitoring, using context and making inferences

With the general-interest text, monitoring, using context and making inferences were strategies that were demonstrated in third semester when unfamiliar vocabulary was encountered. The strategy of translation was used only to a very limited extent. As in the first semester pair think-alouds, the dialogues demonstrated the ‘talking through’ of unfamiliar terms. B1 and B2, for example, when asked the meaning of ‘cadaver’ in the retrospective interview, used monitoring, context and inferencing strategies to deduce the meaning:

*B1: it is I think, dead bodies*

*B2: yes, that is corpse, I think*

*B1: the leftovers*

*B2: because if they want pituitary glands they cannot take from a live one, it has to be corpse [laughs]*

During their pair think-aloud, C1 and C2 also had to use monitoring and context to find the meaning of ‘cadaver’. Their dialogue showed protracted discussion involving the words ‘corpse’ and ‘cadaver’; the word ‘morgue’ finally clarified the meaning of ‘cadaver’ and ‘corpse’ for this pair:

*C1: they said something from growth hormone come from, extracted from corpse*

*C2: yea, they extract from corpse, from the pituitary gland of the dead body*
C1: mmm, dead body

C2: yea, cadaver

C1: here they said they contracted, ah, CJD after being injected growth hormone from corpse, not from cadaver

C2: reads ... you see

C1: pituitary gland

C2: doctor who oversaw the collection

C1: yea

C2: from the pituitary glands from the morgues

C1: I know, from cadavers

C2: here, they have clarified, from the morgue, corpse mean the dead body ...

An example of the use of the strategy, translating, was provided by A1 and A2. When asked what dwarfism meant, this pair resorted to Hindi to find the meaning. They also resorted to Hindi during their first pair think-aloud but used the strategy less in the second pair think-alouds. It is possible that A1 discussed the issues in the text in Hindi, because A2 was lacking in confidence. He possibly would not have used this strategy if paired with any of the other participants.

Although the participants still focussed on individual vocabulary items as they did during first semester protocols, they also, in the third semester, tended to ignore details that were troublesome. For example, details such as the health scandal in France and the lack of treatment of the growth hormone, thought to
cause Creutzfeldt-Jacob disease, were not mentioned by A1 and A2. When looking at the introduction, A1 stated that injections of an untreated substance had been given and caused 'some sort of disease'. There was no discussion about this disease and the use of the hedge 'some sort' shows they were weighing up the meaning of the disease. When the researcher asked if they had heard of Creutzfeldt-Jacob disease, they said they had not, but when asked if they had heard about Mad Cow Disease, they said they were aware of that, but had not made the connection with Creutzfeldt-Jacob disease. This was possibly because of their dislike for, and hence avoidance of, complex terms that may have been used in other articles about the disease.

B1 and B2 also glossed over details. For example, when discussing the second paragraph, B1 stated:

If [the passage] mentions the person investigating it ... he brought charge against the sort of people and he says that documents allegedly indicate a sense of something really fishy about the entire deal.

Yet this paragraph mentioned important details such as Marie-Odile Bertelle-Geffroy, the investigating magistrate who brought the charges against Henri Cerceau and Marc Mollet. The use of the word 'fishy' indicates his evaluation that events are not as would be expected.
In the retrospective interview, B1 mentioned that he had 'trouble with these French names'. The Thai participants, too, had expressed their difficulty with comprehension when they encountered vocabulary they could not pronounce.

The Indian and Bangladeshi participants seemingly were uncomfortable with the foreign sounding names and the unfamiliar terms. No names were used in their conversations and 'the things' was used instead of 'untreated growth hormone'. This is certainly an important factor worth noting that students may be inhibited by unfamiliar terms in their academic disciplines to such an extent that they may not use them unless given the opportunity to become accustomed to them.

Even with the aid of a dictionary, C2 explained, pronunciation could still be a difficulty. As he had to read for a literature review, he said, he had to use a dictionary frequently. He used English/English and Bengali/English dictionaries and a thesaurus. He explained that it was difficult to work out the pronunciation from an English dictionary because it was not in his language. For example, he thought 'put' should be pronounced as in 'but'. This had implications when discussing his research with his supervisor, too, he said. Once again, there is an indication that sessions discussing the use of dictionaries, could be very valuable.

C2 demonstrated how he, too, did not focus on specific details such as names of officials but rather focussed on the overall meaning. Here he discussed the first paragraph:
It is clear two officials are going to be held for that charge of doing some misdeed that may be poisoning because they do not treat for, you know, the, mmm, the growth hormone.

While all the participants were making a transition from Hindi/English or Bangla/English dictionaries to English/English dictionaries by third semester, their reports indicated that this transition had not necessarily helped them with pronunciation, an important element for their comprehension of texts. C2 mentioned, though, that the increased dictionary use had contributed to his significantly increased vocabulary acquisition.

**Evaluating**

Despite the avoidance of terms or concepts unfamiliar to the participants, some evaluation of the material was still taking place. Various means were used to judge the material as demonstrated by the following participants.

After reading his academic article (appendix 24), B1, for example, made the judgment that it was an overview and not a technical article because ‘there are no formulae’. The author, in addition, had mentioned, he said, that there was much scope in the field for further research.

A1 deduced that his article (appendix 20) was a ‘sort of technical, geological report on two coalfields’. His reading of coal reports in the workplace in India had given him the knowledge with which to compare this report. He deduced, for example, that the data in his article was not as up-to-date as his own
organization's data. He explained why this was so; his own organization focused on borehole data whereas the current report was about field data which, he said, tended not to be as up-to-date or as reliable. He also realized that some of the maps in the article were inaccurate because 'of their knowledge at that time'. At the same time, the article gave him useful information which is 'very relevant for having a better grasp of the subject'. His readings previously in India had been very specific and this article gave him, he said, the broader picture.

B2, through other reading about methods of testing purity of the drug Artemisinin, could deduce that the method described in his academic text brought to this interview was 'quite good', adding his own thoughts, 'when you have got something simple why go for something which requires money for it'.

Two of the participants, C2 and C1, however, did not feel able to evaluate at this stage. C2, for example, rather than evaluating, comparing or developing ideas, talked about 'taking' ideas from the text, reflecting his greater degree of diffidence compared to some of the other participants. However, C2 did say that he did not agree with the author's views on copyright. With reference in his text (appendix 23) to the development of software, C2 said he felt that a developer was entitled to his financial reward because he, too, had a home to sustain. The Indian concern for family perhaps initiated the expression of C2's views on this matter.
The other participant who did not yet feel confident with evaluating a text was C1 who, it will be recalled, still preferred simple, one-study texts; even with one-study texts, she was not always able to evaluate what she was reading initially. With her current article (appendix 22), a single, longitudinal study, she thought she was reading a research review and then, on reflection, decided it was a research paper. (In the first interview, C1 was quite confused with the reading because she had mistakenly believed it to be an article on one study rather than a review of studies). She reiterated the fact that she found it confusing if the author wrote about several studies and provided many tables of statistics.

Several of the participants demonstrated their ability to evaluate the content of the general-interest text. When the researcher asked in the retrospective interview why France had continued to use the human hormone, A1, for example, answered ‘because they must be getting money out of that’. This could be a cultural assumption although it could be a likely conclusion. Economic reasons, however, were never alluded to in the text.

Showing their increased awareness of different genres, C1 and C2 compared academic reading to general-interest reading. This article, although they had never read a New Scientist article before, was much easier to understand than an academic text, they said, because it had no complicated terminology in it. C1 gave other reasons for being able to understand an article such as this. She explained that, to read academic journal articles, one needed to have knowledge
of statistics and as, she added, there was a link to epidemiology, one had to have knowledge of epidemiology, too.

The basis for evaluating the validity of the general-interest article was articulated by C1. She said, she judged the contents to be reliable because the facts had been presented with a date:

*If this is not what you call a reliable source they cannot put the date.*

Of note is the fact that she did not relate the validity of the data to the status of the researchers and officials cited in the text.

**Making moral judgements**

As well as some evaluation, some of the participants demonstrated their ability to make moral judgements with reference to the distribution of the untreated hormone. B1 noted the crucial ‘time factor’ in paragraph five, explaining, ‘from 1985 to 1986 they still use the contaminated…’ He concluded:

*Basically everything was illegal; they kept on doing them* [distributing the non-purified ampoules] *when they knew they were doing something wrong; they knew it was contaminated but they did not stop.*

Both B1 and B2 felt that, as in other countries, France should have stopped using growth hormone from cadavers as shown in the following dialogue:
B1: so basically irresponsible then neglect to...

B2: yea, and it was shown that almost 15,000 ampoules of untreated hormones were like sent to hospitals within June to October 1985 and then they should have done something about that

B1: yip

Peer monitoring and other metacognitive strategies

Peer monitoring, necessary for clarification and checking interpretations, was demonstrated in the pair think-alouds with the general-interest text. In this example, C1 and C2 monitored each other to clarify some of the issues in the early stages of reading:

C1: the growth hormone

C2: for the prion protein which may cause that CJD disease

C1: yes, CJD

C2: the CJD disease is Jacob disease

In another example, B2 did not at first realize that contaminated growth hormone had been distributed over a period of ten years. B1 clarified this:

B1: yea, but that is what I have been saying; it is like from June 1985 to February 1986 they continued using that hormone and in a purified form

B1: that is a period of ten years

B2: mmm

B1: yea, February 1986 and this is February 1996

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**B2:** *ah, yea* [laughs]

Monitoring and inferencing strategies were used together in this example to construct meaning:

**B2:** *Cerseau and Mollet like were aware of the possible consequences...*

**B2:** *they were obviously still distributing it* [the growth hormone].

At this point, B1 referred to the introduction to make a further inference:

*That is why it says it is a public health scandal; they just went big and big and big and not stop.*

In order then to understand what was meant by ‘public health scandal’, B1 and B2 needed to use the strategy of reading on, in this case, as far as paragraph four.

Another example demonstrates how C1 and C2 inferred three interpretations when they discussed the discrepancy in distributed ampoules:

**C2:** *the 5,000 ampoules, I think there is some deliberate mistake here*

**C1:** *yea, I think so* [laughs]

**C2:** *or maybe too busy to be careful or not*

**C1:** *maybe they were not aware of, I don’t know, maybe something happened*
Like the other participants, they noticed that the untreated growth hormone had been distributed for a year, till February 1996.

They then queried the figure of 10,000 ampoules, referring to the sentence, ‘However, Korman’s office put the figure at only 10,000 ampoules’ and inferred an interpretation of the discrepancy:

\[
\text{C2: these 10,000 ampoules, these government officials put the figure only 10,000 ampoules though here it is 15,000 ampoules and 5,000 ampoules, 20,000 ampoules}
\]

\[
\text{C1: maybe they don’t consider because they don’t know anything about the 15,000}
\]

The participants clearly thought it useful to ‘talk through’ meanings and monitor each other’s interpretations. Reading of academic texts might be eased if there were opportunities, such as this, for pair or group discussion.

**Study strategies**

As well as striving to make connections within a text, the participants used a variety of study strategies to help remember and understand the text. During the first interviews, it was reported by several participants that English authored texts tended to be ‘complex’. B2 had developed a new strategy to assist with his academic reading. Because writers, he said, often present data too concisely in graphs, he now not only drew graphs to help him understand the content, but
split the graphs presented in a text into segments, thus extending and
simplifying the information. He said:

_The researcher’s points are often overlapping and so I go by one, two ..._

Study strategies also included note taking and drawing. As B1 read, he said, he
noted equations and developed his own diagrams by hand. Writing by hand
helped him to learn better, he said, adding that he can write faster than he can
read.

One participant, however, had a different perception of note taking. C1
mentioned her decision _not_ to take notes. She used to take notes when reading
but now thought this was a waste of time; her procedure now was to sit down
surrounded by her papers, highlight the important points, write her text by hand
and then ‘finalize’ on the computer. C1, it will be recalled, found difficulty
when faced with too much information. Papers which are still difficult for her,
she said, were those that gave many references, many statistics and many
reasons that were ‘clumsy’. When asked to explain the word ‘clumsy’, she said
‘so many results and so many things he [the author] put together’. Even if a
‘clumsy’ paper had headings, she said, it would be difficult to understand,
especially if there were tables of statistics.

The study strategies of highlighting and underlining were utilized by B2. He
used the strategy also of re-reading, he said, if he did not understand something
but pointed out that he did not read the whole article, just the relevant lines. He
no longer memorized for examination but memorized information for understanding, as C1 also said she now did.

B2 mentioned using a new strategy; he said he now used index cards which enabled him to select points rather than reading whole articles.

Overall, the participants’ accounts demonstrated increased awareness of task, text structures and text-based strategies suitable for academic reading. At the same time, there had been, by third semester, increased awareness of the need to read multiple texts to enhance their knowledge of the current research in their fields.

**Intertextual framing**

All the participants in first semester showed that they were aware that they were required to carry out further reading in order to be able to intertextually frame, i.e. make connections between texts in order to understand various research projects within their discipline and the arguments and debates taking place within their discipline. By third semester all the participants had substantially increased their amount of reading apart from B1 whose reading had decreased from fourteen hours to between eight and ten. However, the eight hours’ reading was, he reported, more effective. He explained:

*The thing is when I read I don’t gain much; I just read it [the text]; you don’t remember it but when you study you actually try to remember it, try to use it, use what you have learnt.*
B1 was now aware, too, of the usefulness of reading ‘from one book to another’ to follow up on items of interest, usually to find out the meanings of equations. He added that, to fill his gaps in knowledge, he had been forced to learn how to use the library, something he was not used to doing in India. He recalled that he did not follow through on references in first semester because he was ‘just starting off’ and he was given material which, it was presumed, he knew about, and therefore was not encouraged to read other texts.

As well as greater study gains, other results from the increased reading were mentioned. A1, for example, said that his increased reading had helped him to ‘understand more concepts’. B2 also was more interested in framing intertextually. He said that he followed up references, for example, with a greater sense of purpose whereas, in first semester, he was ‘not too keen’ on following up references. He realized now that he needed to do other reading ‘to understand the main text’ he was currently reading.

There were other reasons, besides lack of knowledge of the library system, for the participants’ lack of reading in first semester. The small amount of reading in first semester was a reflection for some participants on their workplace practices. C1 explained why she had not been able to read in Bangladesh over the last few years:

> Now I am studying and at that time [in Bangladesh] I am practising [medicine], I am seeing my patients, I am not reading.
Lack of familiarity with the conventions of academic writing was another reason cited. According to C1, even reading while at university in Bangladesh was not very rewarding. She explained, 'I studied but didn't understand'. As well as increasing her understanding since arriving in Australia, C1 reported that she now knew how to read:

\[ \text{I know how to read, how meaning, how to look at the paper ... now I know what abstract contain, what introduction contain; the introduction provides the purpose of a study and the background, the methodology can be found in the abstract.} \]

While workplace experience is valuable for building knowledge of the field, it seems we must be mindful of the skills that are possibly being lost - the reading, writing and study skills.

Increased reading, from one or two hours to six hours in a day, led to benefits for A2 also. He, like the other participants, knew he had to read more in order to 'understand more concepts'. In addition to greater understanding, A1 stated that his reading had helped him with his writing. His supervisor wished him to write clearly so he worked, he said, at producing clearer diagrams so that 'at the first instance he [the reader] can visualize actually what it is ...[that he is writing about]'. His reading had enabled him to refer to various studies and authors' models, adapting some diagrams to suit his purposes. He had also noted, he said, with reference to his academic article, some of the references and
might follow up some of them. He found now that he had already read some of
the referenced material. Showing his greater interest in following up on
research, he said he would like to contact the authors of his academic article but
did not know their present address. As they were from India, it was difficult to
find out addresses, he explained.

From his other reading in Australia, A1 realized that the reports from his
organization in India – the Central Mine Planning and Design Institute in
Ranchi, Behar, 'has got most relevant and authentic information'. The
Australian government either did not have the information or it was four or five
years old, he explained. On a recent field trip to India A1 made himself known
to the Chief Executive of the Company so that he could get easier access to
information – a valuable strategy.

A1 did not visit any libraries on his recent visit because, as mentioned during
his first interview, it is very difficult to find books in libraries. One only went
to libraries if one had sufficient time, he said. A professor, he explained, might
be holding a book and might say he will return it to the library the next day but
he might not be able to return it the next day so it is 'a time taking process
because life is like that'.

Intertextual framing was limited for B1 in India too. He had a good university
library but not all books in his field were available and it was not possible for
students to buy books. For example, solutions manuals were given only to
professors so students had to try and solve problems on their own but they could
not bother the professors for the solutions to their unsolved problems. This comment, while highlighting the lack of resources, indicates, too, that, despite the carefully staged style of teaching, students, in fact, had to be self-reliant and regulate their own learning.

B2 said he could probably read articles, such as his current one on a pharmacy related topic, at his university in India. Certainly, most companies would keep journals such as this, he said. B2 also read journal articles while working and spent approximately two hours a day reading then; this, incidentally is the amount of time he spent reading at university in Australia during his first semester. Access to texts in India did not seem to have been a problem to B2 indicating the diversity of funding in India for resourcing of university libraries.

C22, on the other hand, had never seen an article such as the current one (see appendix 23) before in Bangladesh or India. As his text did not have any references, he surmised the writer was discussing his own ideas. If he did not understand a text, he would, he said, go to the end and check the references, read one, and then ‘backtrack’. C22 thus demonstrated his awareness that further reading could provide a useful back up to his dictionary use and translation work. He had never studied any undergraduate units on ethics and therefore extratextual framing was also limited. In fact, he did not recognise the word ‘ethics’ and mispronounced it ‘etics’, he said. From the dictionary he learnt that it meant ‘principles.’
This participant, however, still demonstrated a reluctance to read English-authored texts. He read Indian authored books rather than articles, finding them easier to understand, he said, because the authors used ‘easier’ words. Several Indian participants have mentioned the use of simpler vocabulary used by Indian authors. C2 surmised that perhaps Indian authors write simply because they do not ‘have much capacity to make it [the text] very high English’. He added, laughing, that what he wrote was probably very simple, too, because he did not have ‘the deep knowledge about English literature’ and therefore did not know which word was ‘appropriate’. He said:

_when I think in Bengali, I cannot convert into English properly_.

Further explanation was provided by C2 (who, while being a Bangladeshi participant, had done his university study in India) as to why some Indian students had little background reading and now had difficulty with academic writing; he himself did not need to reference in India, he said, because they had different types of assignments there, more practical assignments. Most of his reading was for ‘self interest’, he explained. He also did not do much writing except in his English unit and his additional literature unit which he had to take as his own language was not offered as a subject. In English literature classes he studied _Julius Caesar_. The English unit comprised mainly lectures on grammar rather than classes. He said he found it difficult reading for assignments now because of his lack of English reading. He managed his computer programming course by using ‘the key words’ for understanding.
This participant had acquired additional vocabulary in the same way as the Indian participants through the reading of English newspapers in Bangladesh. When reading the newspapers, he would try, he said, to translate an unfamiliar item of vocabulary into Bangla and then note the use of the English word in the context for future reference. He mentioned, as did the other Indian participants, that the newspaper was a vital part of life:

_I used to read my newspaper before breakfast but in Australia no time, everything we have to maintain, many things, we have to buy, we have to cook, we have to clean, everything we have to do ourselves ...._

Many students find their off-campus life stressful and this must impact on their study, especially when trying to settle families.

No intertextual framing was displayed during discussion of the general-interest text. In first semester, there was a reference to knowledge of parasitic disease gained through television. In the retrospective interview C2 mentioned utilizing other texts to 'understand the basic things' and A1 mentioned using books for basic knowledge, too, but none was referred to during discussion of the current, general-interest text.

**Reading on the Internet**

In first semester the Indian participants had begun to access another source of reading, namely the Internet. The importance of Internet use is shown by the many university courses which are now online for both on-campus and off-
campus students. Resource information and discussion groups have been set up and undergraduate students are encouraged to use these resources. Despite the availability of these resources, our postgraduate students it seems, from the following comments were not, in their early days of study, introduced to the Internet. Internet access was something the students had little of, if any at all, in their home countries. Interestingly, A2 did not hear about the Internet until the end of first semester, through friends and other students. Now he discussed his work with others in the USA because he felt the USA is ‘advanced’ in the field of computing science. He also used the Internet to investigate how similar research work has been done; he said he explored the use of interfaces and questionnaires and samples to acquire the knowledge to proceed with his own project.

The Internet was also used by B2 in third semester to frame intertextually – something which he did not do in first semester. He described why he found this resource so useful. When searching for an article, he said, ‘in the Internet you get the heading, the year and then the authors and the name of the journal; a few of them mention a bit of the abstract’; he then could follow up the reference at the university library, he said. Similarly, C2, who had not accessed the Internet in first semester, was now using it for academic work but also for general news from his own country and ‘out of curiosity’. C1, likewise, checked the Internet for background and statistical data on her country for her studies.

Therefore, if given the opportunity, the participants would probably have read
some other ‘texts’ to clarify some of the unfamiliar concepts in the general-interest article. At the same time, the data shows that the participants have found a means of overcoming the lack of texts and/or references supplied to them which could have provided data for home country related research.

Another participant described his use of the Internet for other purposes. B1, after checking the meanings of equations by finding a similar paper that addressed the same issues by another author and after checking tables to find companies in his field, then followed up with an Internet search. He had done a little research on the author of his current academic article, Viterbi, on the Internet and found out the company for which he worked. He had also found out what exactly the other companies did, whether they were marketing companies or research oriented. He then could make, he said, a value judgment that, if these company lists have been published in the IEEE publication (from which this article came), they must be ‘pretty good’.

**Discussion of readings**

Reading of many texts, while valuable through enabling the participants to make connections between the research of a variety of authors, is not sufficient for full understanding of the content. Discussion of readings is necessary to assist readers to become aware of differing interpretations of text and so extend their knowledge. By questioning understanding of a text against another’s understanding, deeper comprehension can be reached (Hacker, 1998). There was, unfortunately, little discussion of texts with supervisors. It was mentioned that supervisors assisted with writing, the more visible task. B1 said he would
like to discuss texts as he ‘might get an idea’ but his supervisor only asked if he had read certain articles and did not show an inclination to discuss them; and there was no-one else from his field living in his residence. He tried to enter into discussion with someone by email but he discovered he was ‘selfish’ and did not wish to discuss.

Discussion had also been noted as important for the understanding of academic texts by C1. In her faculty, Public Health, she said, discussion of readings in groups was encouraged. She had noticed, moreover, that some of the students understood the readings better if they had also studied related units earlier.

The increased reading displayed by all the participants had benefited them in various ways. They reported having acquired more discipline-related knowledge, being able to make connections between different researchers’ work in their fields and being able to write better. Being able to access the Internet was a significant means of extending their reading; it could be used in conjunction with the university library to follow through on articles or abstracts found on the Internet. While discussion of readings had been noted as another worthwhile activity, most of the participants reported not having the opportunity to participate in this kind of activity. This was disappointing as discussion of text not only allows students to share interpretations and perspectives but allows them to draw on their background knowledge.
Extratextual framing

Background knowledge has been known for some time to contribute to the ability of readers to understand a text. All the participants in first semester realised the importance of background knowledge but also realised that they did not have sufficient knowledge of their discipline areas, nor indeed of local cultural matters. They were all aware that they needed to extend their knowledge.

As demonstrated, students can usually invoke extratextual framing to some degree to assist in the interpretation of text. C22, while thinking that he had no background knowledge of ethics (the topic of his academic article), did recall later an experience of a friend who had found out about computer ‘experts’ overcharging clients for minor problems, making use of the fact that their clients knew little about the workings of their computers. His lecturer in Australia provided further material.

He told a story in his first lecture about The Wheel where a prisoner was asked to turn a wheel every day of his thirty day sentence. The wheel itself was outside the wall and he did not know whether he was grinding flour or milling corn or doing something else. At the end of his sentence he found that the wheel was not connected to anything; the prisoner screamed and died. The lecturer related the story to computer students and C22 interpreted the significance of the story: ‘in the running for money and those things, afterwards actually we will not get anything’. The lecturer also discussed World religions and principles so, C22 said, he could see the connections between the lecture
and this text, especially after he read *The Wheel* for himself. C2 says he would continue to read about ethics and computers in the future if he had the time. Clearly this lecturer stimulated interest in the topic by orally telling the story (it will be recalled that Indian students are used to oral story telling) and by discussing it in a general philosophical framework. He had also motivated students like C2 to do further reading.

Significant extratextual framing was used with the first general-interest text leading to dialogue encompassing issues of welfare in their own countries and attempts to offer solutions to the problems described in the text and problems in their own countries. In the first passage, A1 and A2, for example, could relate to a known disease in India, malaria, and its resistance to several drugs. A1 had heard about worms ‘not read but have heard about them; there is mostly in the mountainous parts of India and even those parts are not very near very drought-ridden areas so shallow water; sometimes they come out of the skin…’

Although extratextual framing always occurs since it is impossible for readers to avoid drawing on their individual experiences, the participants generally could not relate to the third semester text in the same way as they did with the one provided in first semester. One reason could be that the content concerned a culturally unacceptable situation, the use of synthetic drugs to treat abnormalities. The use of synthetic drugs seemed to be more acceptable to the Thai participants. As A1 explained:

*In India what I find generally they don’t go for these artificial things,*
generally even doctors don't press it; they believe in natural processes, natural way.

Later A1 added, referring to dwarfism in particular:

God create this dwarf, something like that... they don't treat it as a disease.

Two other participants, C1 and C2, while using little extratextual framing to comment on the passage as a whole, did, however, draw on their scientific knowledge to work out the meaning of the vocabulary item, ‘urea’:

C1: urea can inactivate the protein which causes the disease

C2: urea is a protein itself, a protein derivative, a nitrogenous chemical and nitrogen, the urea consists of two

C1: molecule

C2: two elements, one is nitrogen and another is hydrogen and mix up and then it called urea

C1: urea, you can synthesize urea in the laboratory from nitrogen and from hydrogen or it can be derived from anywhere, from animal protein

When asked in the retrospective interview what else ‘urea’ could be used for, C2 replied ‘fertilizer’ indicating his awareness of farming practices. C1 and C2 explained also in the retrospective interview that they could use the strategy of guessing to work out the meaning of this passage because they were both
medical people. Although they had medical knowledge, however, the same level of interest was not generated as in first semester, leading one to suggest that, because there was not the same cultural acceptance of the use of growth hormone as noted earlier with the Thai participants, there was not sufficient interest to engage in discussion of such a text.

**Acquiring background knowledge**

While background knowledge was acknowledged as being important for reading, some participants, even those with some relevant background knowledge, as reported in first semester, had found that it was not easy to extend that knowledge. C1 said, for example, that, because she was not allowed to practise medicine in Australia, it was difficult for her to extend her knowledge of drugs; moreover, as the names of the drugs were different from those used in Bangladesh she said she had to ask the sister at the Health Service for information regarding their usage.

She could demonstrate, though, that her background knowledge could give her the means to understand her academic text (appendix 22) and identify the author’s purpose:

*He presented the information that, even though only 13% of students were international students, they visited the health service more often than the local students*
The author, she said, wished to impart this information in order that some more help could be given to the international students.

The passage was easy to understand, as she explained:

*It is health related and what he is talking about I already know.*

As mentioned earlier, although she could understand the text, she said she could not really evaluate this article because she did not have sufficient background knowledge and related reading.

Several of the participants mentioned strategies which involved eliciting the help of professionals, not only lecturers but also professionals in the medical field. A2, for example, said he drew on information from the consulting doctor from Royal Perth Hospital to enable him to progress the computer programme he was developing as there was nothing in his background to prepare him for a project associated with the medical field.

Another participant, A1, added to his knowledge through a return visit to India. While there he also organized a networking opportunity to allow further access to data; he made his way, he said, through the hierarchy of his company and the Chief Executive was now known to him. He explained what this meant:

*I think I can get better favour from the organization side.*
A1 knew he needed to gather data from India because, he had discovered, the Australian government did not have the information he required or, if it did, it was four or five years old. He would have liked to further extend his knowledge through discussions by email with colleagues in India; however, as he explained, this was seldom possible as email access to India was limited.

In the computing field, there were other difficulties for Indian students. B1 explained that he could not access much background knowledge from prior readings in India because networking to Indians is about ‘joining to computers’. He said India was not a leader in the field of telecommunications because it did not have the research laboratories or the funds. There was some research going on but not ‘on the fast track’. For these reasons, Indian researchers, he said, tended to go to America and did not return. They realized, according to B1, that if they went back to India, it was like going back to the ‘cave age’:

*The pace is very slow; you cannot have things done really quick because 800 million people there; everyone needs to be serviced; that takes more time; everything takes time.*

All the participants illustrated their determination to extend their background knowledge for their studies by devising strategies to help them do this. The participants’ accounts showed that, in some cases, acquiring more knowledge could be difficult, particularly, if there were not the resources in their own countries or cultural differences in Australia such as the use of different names for drugs. It seems that supervisors not only need to be aware of students’
knowledge gaps but of the difficulties they may yet face in trying to fill those gaps.

**Knowledge of self**

The participants' reflections on their own reading practices, and the strategies they now used to negotiate meaning, provided insights into why their reading approaches had or had not changed between first and third semester. The participants reported that they realised they had a considerable knowledge gap, that research journal articles were structured differently from Indian authored texts leading to a mismatch of expectations as to where to find information in a text, that they needed to read more and needed to learn how to access the university library system, that their educational background relying on memorising did not necessarily promote critical thinking, that they did not have the skills to intertextually frame their current readings e.g. through following up references. There was an awareness, too, that there were different Englishes with differing meanings and that there was a connection between reading and writing; without more academic reading, they realised their writing, too, was not going to progress.

When asked in the retrospective interviews about the main difference in reading approach they had noticed in themselves, several aspects were mentioned. B1, for example, said he was more ‘target oriented’; he now identified what he needed to read to solve a problem.
Another participant, B2, on the other hand, did not feel he had changed much. He stated that if he did not understand a passage he would still have to read it ten times (and he laughed at this). He explained that authors assume the reader knows everything and if one does not, then one has to read other texts for clarification. He still felt he read very slowly but he was reading more and selectively.

Significantly, the participants' reflections in third semester did not focus, as they did in first semester, on their lack of language ability, lack of conceptual knowledge or lack of knowledge about the Australian university teaching and library systems, although they were still aware of these aspects, rather the reflections concerned their strategies for overcoming any perceived disadvantage they may have encountered.

Socio-affective strategies were among those mentioned. For example, to increase concentration and peace of mind, B1 had found that he could read better outside on the campus as opposed to inside the library where he found it to be too quiet. This could relate to the oral culture to which he was accustomed. He mentioned the lack of opportunity, moreover, for discussion in the library due to the study carrels which inhibited contact with other library users.

Another socio-affective strategy was to cooperate with peers to solve problems, build confidence and pool information. Several of the participants mentioned seeking advice or clarification from peers or professionals in their discipline.
area. Seeking advice from supervisors was not generally the preferred mode for clarification. C1 mentioned being able to work in groups for one of her units. The other participants did not have this opportunity and tried other means of cooperative learning such as emailing other researchers.

Some additional aspects of self knowledge were uncovered in the third semester interviews. The participants could identify what their problems were and what they were doing about them. A1, for example, stated that he did not have problems with technical terms or structures; his problem was still concentration although his concentration had increased considerably since first semester. He estimated:

...initially 40% concentration, now it is more than 60%...

He said he planned to increase his concentration to 80%. A1 was confident in his reading during first semester but now acknowledged that he ‘misses links’ between sections of a passage and, he said, this was due to ‘not really having the habit of reading’. Not being used to reading had also affected his concentration, he said. At one stretch he said he could now cover one or two pages. The amount of reading had increased, too. Now he was reading, he claimed, 100% more than in first semester. Despite, his greater confidence in himself and in his reading, particularly, A1 reported at a meeting towards the end of his doctoral study that he was ‘panic stricken’. Not only was the pressure of time stressing him but so, too, was the unavailability of his supervisor. ‘My supervisor hides when he sees me coming’, he reported. A1’s increased sense of confidence may
well dissipate unless he is given the encouragement he enjoyed during the first three semesters of his study.

Background sociocultural influences still impacted on the participants’ practices. A1 reported, for example, that it still gave him more pleasure to ‘go for outing, go for play’ than to read a book. (This follows through from his childhood, where children were encouraged to go out and play rather than read or be read to). Nevertheless, his acquired enjoyment and interest in reading have extended to his daughter. He would like his daughter to know some of the stories he has brought from India, translated into English. He will not read them to his daughter himself, though, but will ask his wife to read the stories to his daughter.

Regarding general reading, A1 explained why an important part of his life was no longer relevant. He no longer read the morning newspapers because whatever was happening here did not matter to him.

As for other ‘texts’ such as television, A1 explained why he did not enjoy watching television in Australia:

*The humour is very cheap, humour is not intellectual humour, just physical humour whereas in India I find that the TV. programmes are wonderful, beautiful.*

Indian television, he stated, was much more intellectual. In India some of the
programmes were so interesting, he said, that people rearranged their work schedules to view them. During the showing of a recent series, all over India, A1 said that you could not see a single person during the one hour showing. The oral stories of history and culture clearly fascinate the Indians and are an important part of their lives.

**Implications for writing**

As discussed earlier, oral discussion can help students work out meanings in texts. Another linguistic link with reading is writing. Writing conventions can be learnt from reading. One participant, in particular, C22 mentioned the reading/writing connection and the difficulties he was experiencing with his writing. In Bangladesh, he said, people were not worried about their own writing style because nowadays they only wrote letters. C22 said he had had a considerable problem when he first attended university in Australia because the lecturer would say, ‘oh, you have no structure at all!’ C22 explained that he did have a structure, but it was a Bengali structure and this structure which, he said, Bengali students were used to, influenced their writing and even their speaking. Even now he said, at the micro level, he used ‘she’ for ‘he’ because there are no separate words in Bengali and the gender is recognized from the context. As our Bangladeshi participants did not read Bangla texts during undergraduate study in Bangladesh, it was the Bangla texts from school days which were still influencing their ability to write in English. C22 further explained the educational system in Bangladesh. He reported that school study of English involved the study of grammar. At university level, students had to understand the facts, present the facts, perhaps in Bengali, perhaps in English, to their
teacher and learn to use the dictionary. There was no concern, he said, about structure. Even examiners, he added, were not concerned about structure. C1, the other Bangladeshi participant explained:

*In my country, they give more emphasis on the contents; a good descriptive one, it is ok; no worry about grammar.*

On a positive note, the difficulties which still remained were being overcome; the participants knew what they had to do to address their difficulties. In other words, their knowledge of self, their abilities and how they could be harnessed, had increased. This aspect of Self knowledge, self worth, is discussed next.

**Self-efficacy**

Self-efficacy is an important aspect of Knowledge of self. According to theory and research (Bandura, 1995) self-efficacy makes a difference in how people think, feel and act and, in terms of thinking, a strong sense of competence facilitates cognitive processes and performance in a variety of settings including academic achievement.

The participants in this study reported a significant rise in their confidence levels and consequently less anxiety about the outcome of their studies. They could demonstrate a ‘can do’ attitude. The main challenge for a reader of a second language may well be psychological rather than linguistic, according to Barfield (1995) and this seemed to be the case in this study. A2, for example, while reporting that he had improved his ability to read more and extend the
purpose of reading to applying the knowledge to non-academic fields, felt his
greatest achievement was his greatly increased confidence. He felt confident
enough to take part in discussions with American researchers through the
Internet (a new mode of searching and communication for him). This was a
significant change for a student who did little reading in childhood or
throughout his tertiary studies and, indeed, did not enjoy reading.

Other participants, too, spoke of their increased confidence. C2 said that, in
Bangladesh, even reading an English newspaper was ‘cumbersome’ even though
he studied in English in Bangladesh. Now that he had no access to Bengali
newspapers, he had become more familiar with English reading and he felt, he
said, more comfortable reading in English. He explained why this was so:

*I am immersed in English so it make me more, what you call, make me
more familiarize with things.*

Studying on an Australian campus was believed to be very important. If C1 and
C2 had both studied through an Australian university but still in Bangladesh,
they believed, they said, that their reading practices would not have changed. C1
actually wished to continue her study in Bangladesh but her supervisor advised
her to stay in Australia. If she had gone back she would, she said, have been
immersed in a totally different language with different structure. She explained
the benefit of studying in Australia:
Here, everything helps, academic environment, library environment, being here.

Being able to use the library resources more efficiently had also contributed to the participants' feelings of self-efficacy. C1 told how delighted she was to find 96 references when she inserted an author's name into the library computer system. Her method in first semester of trying to follow up references from one paper to another was not really satisfactory, she said.

The increased confidence also transferred to the participants' writing. Understanding the structures in English texts, such as the connections between paragraphs and other conventions, helped them to correctly structure their own thesis writing. C2 stated that he was aware now of correct grammatical structures in texts and explained the importance of this knowledge in relation to his writing:

_I know a structure is necessary and it facilitate writing and if I can structure the things now I can put the flesh and make the shape. If you don't put the structure, you get lost, lost in your data._

C2 further explained that, although he and C1 were used to reading medical materials, they were, however, not used to using correct grammatical form because the teachers frequently used Bengali words to make the students understand. He explained:
That is why they don’t bother about grammar; may not be correct
English, not be at all in English, just to make understand.

The teachers may not have ‘bothered’ about grammar but the comment
underlines the fact that the teaching aim was for understanding, not just for rote
learning.

Such was C2’s confidence in his ability to follow appropriate academic
conventions in his own writing through his increased reading, he stated that now
he did not even worry about whether what he wrote was ‘good or bad’. He put it
this way:

It will convey my idea to some extent and nowadays I know what to write
and how to write; maybe sometimes it is journalistic, not scientific
enough but it improves a lot.

It was significant that self-efficacy was experienced by B1 and B2 despite not
having changed many reading strategies and such was their confidence in
themselves that they did not feel they had to justify the fact that they had not
changed much:

B2: I don’t change much; when you change you lose time, never know
what is going to work for you

B1: people don’t change because the thing is probably he has done it this
way and he is used to it

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B2: and if something works for you, you don’t have to change

Both stated, however, that they were now much more interested in reading and had a renewed sense of purpose:

You have got to keep reading in case something new comes out.

All the participants remarked on the benefits of increased reading. A1 described his substantially increased self-knowledge. He stated he had extended his reading as well as the purposes for his reading. He demonstrated his increased interest in reading by stating that he would like to have time to read books written in Hindi or Sanskrit because many dealt with ‘sustainable development’ and could ‘give some better idea in the present circumstances’. Unfortunately, much of the knowledge was ‘hidden’, he said, because he could not understand many of the Sanskrit words.

Supporting students in their initial reading at university is clearly very important. Engendering interest, giving encouragement and motivating through presenting purposes, such as using information for the writing of their own literature reviews, may give students much needed confidence to proceed and develop their own strategies for the large amount of reading that is required for postgraduate study.

It is important, too, for reassurance to be given to students that it is not necessary to understand all vocabulary and, indeed, it is expected that they will not
understand all vocabulary. Good meaning-making strategies, according to Langer et al. (1990) are more influential than language proficiency per se in explaining reading competency. In the case of our participants, their changing strategies compensated for, not only a limited vocabulary range, but also for lack of background knowledge. A2, in particular, demonstrated that a student need not come from a strong background in reading to acquire effective strategies if given adequate support and encouragement.

A safe, non-threatening environment was mentioned by A2 as having aided his progress and, as a result, reading had become very important to him. If an article seemed difficult to understand he gave the reason as ‘still lack of reading’. He still had difficulty with vocabulary items but, he said, ‘the main thing is the concepts’ and to better his understanding he kept reading. He was finding, too, that his newly acquired knowledge allowed him to make comparisons outside of the academic field; he could now compare lifestyles between Australia and India, he said. The increased confidence may be a reflection of his increasing ease with the English language as shown in his use now of an English/English dictionary. He himself attributed his newfound confidence to the ‘good learning atmosphere’:

> When you live in a good atmosphere, then your knowledge becomes more and more.

In first semester, he felt, ‘I can’t do this’ and now, he said, he felt there was ‘nothing which threatens me’. It seemed in first semester that A2 was the
participant who was most at risk; he was about to return home within the first three weeks of his arrival in Australia but was persuaded to stay by his brother. He demonstrated a significant increase in self-efficacy in the space of two semesters.

Other participants cited their personal reasons for their increased sense of well-being. B1 stated, too, that he felt ‘more comfortable’ generally. When asked what he meant by ‘more comfortable’, he became quite animated and explained, ‘self motivated, determined, confident [voice rises] that is all I can hear, confident I am, oh my God!’ Confidence had come, he said, from having to do a project on his own, ‘I can say it is mine, my work; that makes me confident’. This is an interesting point; often lecturers introduce group work believing students enjoy working together (which they certainly seem to do) but perhaps this form of study, while giving a sense of security, does not entirely boost self confidence and self image (ref Volet, 1999).

Another reason for increased confidence was given by B2. He had realized, he said, that his difficulties did not so much centre around reading in English but in discussing text orally. Now he was much more confident and this was manifested in his altered relationship with his supervisor. He explained:

*I think my supervisor believes in me. If I don't understand it [the readings] I ask him and he is very nice and I feel free to contact him any time.*
Another participant, C2 spoke of his self perceptions. He was aware that his reading had improved; six months ago, he said, he would not have been able to understand his academic passage and would have had to read it four or five times. The reason for his improved speed and understanding, he said, was due to the fact that he was using English every day. His understanding had also improved he felt, due to reading more about similar topics. He felt better in himself, too, because, he explained, he did not have to keep going to the dictionary ‘again and again’. He summed up his reflections thus:

_I am tuned in to English._

He was ‘tuned’ in to English to such an extent, in fact, he said he could no longer speak Hindi immediately and needed a few days to become fluent again. However, he said he still did not _think_ in English. He had thought this was strange and had checked this out with an Indonesian student and found that that student also could not think in English although using English every day.

The participants’ reflections on their increasing abilities and greater self worth are in line with research by Pajares (2000) who stated that students who developed a strong sense of self-efficacy would be in a good position to educate themselves when they have to rely on their own initiative. Demonstrating an example of how powerful encouragement can be, he quoted a doctoral student as saying, “You know, Professor, I’ve come to the realization that, although it is important for me to believe that I can do this, it seems equally important for me to believe that you believe I can do this”.
B1, too, was aware of significant changes in his reading approach, including increased concentration. He said he was much more focussed; he was ‘oriented to something’. He no longer wasted so much time when choosing a text; he used the index in the library, found a book and then left immediately because he had discovered, he said, that he could not study in the library; it was too quiet for him; he liked to sit outside and see people walk past; he said he did not find this disturbing and could concentrate better this way, reading far quicker than in first semester.

Tiller (1995), in a paper presented to Missouri Western State College, reported that freshmen had lower self-efficacy than other years. However, there was little difference between the other year levels although they were higher than the freshmen. It would seem important to enhance self-efficacy no less than skills training (research skills, academic writing skills etc.) in the interests of academic achievement and to set in motion some interventions to stimulate and promote this throughout the years at university. The Indian and Bangladeshi participants demonstrated that, with increased confidence and increased awareness of their abilities, their reading practices could be adapted and changed to accommodate the amount and kind of reading required of them. They still had difficulties, however. More access to discussion groups, support from postgraduate research programs (ref. for example Jenkins and Bell, 1997 reporting on a program for postgraduate physiotherapy students) and encouragement at the supervisor level could well make the ‘journey’ less
arduous.

A discussion of the main reading practices being used in third semester, the changes in these reading practices since first semester and the factors influencing these changes, are now discussed.
Summary and discussion of reading practices in third semester

The research data discussed in chapters six and seven related to the research questions:

What are the reading practices of Indian and Bangladeshi postgraduate students in first semester at an Australian university?

What are the home country and Australian influences affecting changes in their reading practices?

What are the reading practices of Indian and Bangladeshi postgraduate students in third semester at an Australian university?

What are the influences which may have led to changes in their reading practices by third semester at an Australian university?
This part of the chapter focuses on the changes which took place between semester one and semester three. The catalyst for these changes may well have been participants' growing metacognitive awareness, especially of their own abilities and the mismatches in expectations in terms of text order and textual content. In addition, they had become aware of a significant knowledge gap, a lack of conceptual understanding of discipline-specific content and how more reading was required not only to fill the knowledge gap but also to be in a position to review the arguments between researchers within their discipline and for writing purposes.

**Knowledge of task**

Overall, the participants were, in third semester, refining and changing their reading practices to accommodate their increased awareness of the requirements of postgraduate study at an Australian university. All the Indian/Bangladeshi participants showed evidence of metacognitive planning by deciding on the purpose of their readings. The purposes included gaining knowledge of concepts, finding phrases and sentences in writings which could serve as models for students' own writing and to enable participation in discipline-specific discourse.

In order to fulfill these purposes, participants needed to acquire more efficient strategies. Advanced organization was evident; several participants mentioned that they had, out of necessity, learned about the computerized library system at the university; this feat needs to be related to the lack of access to library facilities in their own countries and hence lack of knowledge of library facilities.
in general. Circumtextual framing had also increased and assisted in the
determination of content, the relevance and importance of content of a text. The
genre of a text, in several cases, was also deduced through circumtextual
framing. Being able to more efficiently frame circumtextually enabled the
participants, too, to find the information they needed in a more focussed and
less time-consuming manner. More details were being sought out, for example,
with regard to text title, author and his/her background in order to facilitate an
appropriate choice of text for reading.
Knowledge of text structures

In addition to being able to select appropriate academic texts, all the participants demonstrated, too, that they were, in third semester, more aware of English authored text structures. They were more aware of the text features and what to expect in each segment of the text.

Their greater knowledge of text elements enabled the participants to select which texts to read. The summary, for example, provided sufficient information to ascertain if the contents were appropriate for their reading task. Knowledge of text structure also enabled the participants to be selective within a text. In addition, some of the participants reported their awareness of the connections between paragraphs and that headings in English authored texts bore a relationship to the text as, for example, the Bengali headings did not. The greater knowledge of text was demonstrated in the participants’ comparisons between academic text structures.

Increased intratextual framing

While circumtextual framing had increased, intratextual framing was again the main means of understanding the texts. Headings, tables, pictures and text elements such as the introduction or conclusion specifically were used to guide or check understanding. Text structures still caused some confusion but not as much as in first semester.
As in first semester, there was reliance on text-based strategies, such as re-reading, reading on, reading from context, inferencing, monitoring and evaluation of text with the general-interest text.

Evidenced in third semester were more questioning and evaluation of academic and general-interest text content, too. Connections were being made between the lectures and texts they were reading, for example, by noting ‘special terms’ lecturers were using and which the participants subsequently read about in their texts.

All the participants demonstrated that they knew where to find information in the text. Of significance was the fact that most participants had developed selective strategies which enabled them to cut out irrelevant reading. Examples were the use of headings to scan only, extracting information from tables or simply reading the abstract and conclusion. Only one participant, however, checked his understanding of tables with his understanding of the text.

Other cognitive strategies demonstrated by some of the participants were classifying information from a text in order to insert it appropriately into a piece of writing, and re-drawing graphs from a text in order to split the information into less complex chunks.

A greater range of vocabulary can also aid understanding. Word meanings were found through guessing from context, by asking someone in the field or through a dictionary. A significant step was the general use of English/English
dictionaries rather than Hindi/English or Bangla/English dictionaries. All except one participant were using much less translation, as the practice did not necessarily lead to the most appropriate meanings and it was also time-consuming.

Another aspect of metacognition, knowledge and application of strategies, showed, as in first semester, a reliance on text-based strategies. In third semester, though, there was an increase in ignoring of unknown vocabulary. This could indicate, firstly, failure to comprehend, and secondly the hope that reading on will explain any unfamiliar vocabulary. On the other hand, it could indicate increased confidence. It is, of course, a metacognitive strategy to determine which words do not need to be understood to understand the passage. Jimenez et al. (1996) during a comparative study with Latina/o and monolingual Anglo readers found that successful Latina/o readers paid significantly more attention to unknown vocabulary than did successful monolingual readers. It could be that, in the short space of time, our participants are comfortably using some native reader strategies such as reading for gist in the knowledge that they do not need to understand every word.

Another significant change was the use of more resources external to the text. Index cards as a study strategy and English/English dictionary use, the Internet, the library system and English newspapers were all mentioned as sources of data and as a means of checking meanings. These sources enabled the participants to rely on intratextual framing when they did not have the opportunity to invoke extratextual or intertextual framing.
Memorization

The strategy of memorizing facts was mentioned frequently during interviews in first semester. Memorization was mentioned again in third semester but its use had changed. In first semester A1 mentioned his strategy of repeating vocabulary he considered to be important several times in order to commit them to memory. Instead of repeating unfamiliar terms in order to commit them to memory, C1 was using memory after reaching understanding. She explained:

One must first understand the passage and then it helps to memorize otherwise one forgets. Many people memorize the Koran but do not understand it, but if they memorize after understanding, then they will not forget.

Intertextual framing had also increased and reflected the increased confidence with which the participants were now approaching their reading. All reported a substantial increase in their reading coupled with increased understanding. This they put down to ‘more reading’ which is in line with Wickert’s (1989) findings that more reading contributes to better understandings.

Reading of other non-academic texts could help increase general vocabulary but there was not the time, or perhaps most importantly, the incentive to read newspapers or watch television because there was little opportunity for discussion of the issues presented in these media. These participants chose instead to align their reading with subject-specific content.
Extratextual framing with general-interest texts

Extratextual framing did not increase much between first and second interviews. Background knowledge could be invoked from work experiences in the case of A1 and B2, C1 and C2. These were, of course, culture-specific experiences and did not necessarily contribute to a full understanding of current texts.

Lack of discussion of general-interest text

Apart from the participants’ raised awareness of text structures, reading purposes and their own abilities, two major differences were observed by the researcher during the second round protocols with the general-interest text. There was no discussion and no offering of solutions to the problems described in the text. When reading the first general-interest text, extratextual framing was used to generate significant discussion both about the material in the text and issues in their own countries. This extended emotive discussion was missing in the second round, as there was little extratextual framing. To aid understanding of their texts, though, participants were generating analogies through what knowledge and experience they had either from their home countries or from Australia. Participants, moreover, were making conscious efforts to accumulate local knowledge.

Although it could have been expected that the text would interest particularly B2, C1 and C2 with their medical backgrounds, this was clearly not the case. During the reading of the first passage, solutions and reasons were offered for the resistance to the drug, Praziquantel. Perhaps with their highly developed sense of nationalism (as displayed in the pair think-alouds in first semester), the
participants would have preferred to have read an article which could be related to their own country, as pharmaceuticals could be. It may be too that, as one participant said, the issue was not a problem in India. The exception was B2 who had studied dwarfism in pharmacology and so found the passage ‘very interesting’. His interest, however, did not lead to discussion, possibly because his partner in the pair think-aloud did not have any relevant background.

If class group discussions are encouraged, it seems that, even if students have a preference for oral discussion work, that this may not be possible without the relevant background knowledge and interest.

Despite the increased use of intratextual framing and the greater understanding of text structures and, at the micro level, individual vocabulary items, and increased use of intertextual framing through the reading of multiple texts, there were still challenges facing the participants.

**Remaining difficulties**

Unfamiliar vocabulary, pronunciation and complex structures were the main difficulties faced by the participants when reading in third semester. The participants used monitoring and context to work out meanings; often, though, they ignored unfamiliar vocabulary items.

Negotiating complex structures was another problem. Although some of the participants had gained work experience before embarking on their studies in Australia, experience which could feed into their readings, some still felt
confused with texts which incorporated many references, many statistics and many explanations. Nevertheless, it was reported that a high level of detail in tables and diagrams was not as intimidating as in first semester. Some of the participants were aware that it was not necessary to read all the detail and, if they felt it was necessary to understand all the detail, they would search for someone in their class to assist.

The difficulty of trying to read about several studies in one paper indicates that the curriculum, certainly in first semester should incorporate not only research from students’ own home countries which they can relate to but also single study articles rather than reviews which can initially be confusing for students with little academic reading behind them. Confusion probably stems from earlier learning from the single-passage paradigm that posits that comprehension is the act of understanding single texts (Hartman, 1994). Instructional strategies also focus on individual passages. However, according to Hartman, good readers ‘connect and relate ideas to their previous reading experiences over time’ (p. 616). Students, therefore, need to be assisted as soon as possible to read and analyze many studies.

Missing the connections or signposts within a passage was another difficulty. Other participants commented on problems with pronunciation. The difficulties yet to be overcome in the reading of texts also impinge on the writing process, another important aspect of postgraduate study.

Overall, the Indian and Bengali participants had made significant changes in
their reading practices. There were still difficulties to be overcome but all the participants were experiencing increased self-efficacy which would help them make further changes when they had sufficient content knowledge and vocabulary range.
Chapter Eight

Discussion

In this chapter is presented firstly a discussion of the conceptual framework underlying the study reported in this dissertation and first described in chapter three, with particular reference to the changes in reading practices and the influences on these changes. Then there is a discussion of the implications of the research with recommendations.

The conceptual framework

A conceptual framework was developed to provide theoretical directions for the design of the research and a conceptual basis for the interpretation of the results. The main study aimed at understanding the reading practices of two discrete cohorts of postgraduate students, respectively from Thailand and India/Bangladesh. The study, moreover, tried to identify the range of influences on these students’ reading practices. The longitudinal nature of the data provided evidence of both metacognitive and framing changes in the participants’ reading practices from the first to the third semester of their study at an Australian university and the reasons for these changes.

The conceptual framework (see Figure 8) underlying the present research was developed gradually over a period of time and several studies. An earlier case study, for example, of the reading practices of one postgraduate Thai student was underpinned by framing theory on its own (Bell, 2002). That study provided
insights into the different framing devices which this student incorporated into his reading activities. The study revealed how a focus on framing processes only was unable to reveal the complex thinking processes which preceded this student's use of framing.

Figure 8 Conceptual framework for viewing the reading practices of Thai and Indian/Bangladeshi students

The limitations of using framing theory on its own were highlighted and informed the development of the conceptual framework for the present research. A combination of metacognitive concepts as they relate to reading (Knowledge of
self, Knowledge of task, Knowledge of text structure and Knowledge of strategies and their application) and the four aspects of framing (Intratextual framing, Circumtextual framing, Intertextual framing and Extratextual framing), it was speculated, would produce a more holistic view of reading practices. Furthermore, a holistic approach, it was speculated, could incorporate the complex interdependencies of educational and socio-cultural influences on reading that would explain reading practices and their changes over time. The conceptual framework thus captures the multi-dimensional, dynamic and developmental aspects of reading practices.

The dynamic and multi-dimensional aspects help to explain how the four components of metacognition inform the framing processes and their changing interdependencies. The metacognitive concepts, moreover, are essential to represent the significance of readers’ regulatory processes in reading. The metacognitive and framing dimensions of reading, however, should not be considered as forming a taxonomy. The elements of the two dimensions inform one another and often overlap. For example, through examination of the framework, one can identify the relationship between Knowledge of task and Circumtextual framing; a student identifies the task or purpose of reading and this in turn leads to the use of circumtextual framing in order to choose appropriate texts for the purpose. As Kluwe (1982) states, how and when people regulate and monitor their thinking depends on the task and the strategies they can use for the task. Looking at the Knowledge of text structures component and its relationship with Knowledge of strategies and their application and Intratextual framing, it can be seen that knowledge of text structures allows students to make use of
intratextual framing which draws on the students’ knowledge of in-text strategies and their applications. When students adhere mainly to intratextual framing, their metacognitive processes highlight why they can only frame intratextually.

Increased use of intertextual framing over time is also highlighted in the framework (see Figure 8.1 and Figure 8.2 for comparison). Where all the participants mentioned using an element of metacognition or a component of framing, this was categorised as ‘some usage’. If little or no mention was made of the use of an element of metacognition or a component of framing, then this was categorised as ‘little usage’. If there was considerably more use of an element of metacognition or a component of framing by third semester, this was designated ‘high usage’. The study showed how reading of general and complex academic texts allows a student to invoke intertextual framing whereby he/she can make connections between texts, question content and evaluate content in relation to each other. The framework shows, too, how lack of relevant background knowledge inhibits readers from framing their reading extratextually. Another element in the process of reading and just as important, according to Kluwe (1982), is a person’s assessment of his/her own self-regulatory abilities. In regard to this aspect, all the participants in this study spoke of their increased self-efficacy (see Figure 8.1 and Figure 8.2) which motivated them to meet the demands of their reading tasks. This aspect relates to the Knowledge of self component of the framework and its relationship with Knowledge of task, Knowledge of strategies and their application and use of various elements of framing, in particular, intertextual framing.
The developmental aspect of the framework reveals general trends in reading practices between first and third semester. While the study was not designed to be a comparative study in the sense of comparing Thai and Indian/Bangladeshi students, certain trends were clearly identified between those two cohorts over three semesters. For example, as both cohorts of participants became more metacognitively aware of the purposes for reading and the differing text structures they were confronted with, they made increased use of intratextual framing. Conversely, as they used more intratextual framing, they became more adept at recognising the differing text elements and negotiating the meanings of unfamiliar vocabulary items. As they read more texts, they were able to intertextually frame and, in so doing, critique and evaluate the arguments presented in the various academic texts. This was quite a feat as, for some postgraduate students, reading critically can remain a problem throughout their study period (Kiley, 1999). The conceptual framework and methodologies incorporated into the framework highlight that reading practices are part of a dynamic, evolving process.

Of course, students do not think or read in the same way, even if they come from similar backgrounds. Identified in this study were subtle differences between the cohorts of students and within the cohorts. During the first weeks of study at an Australian university, for example, both cohorts stated that they realised that the purpose of reading was not necessarily just to pass examinations or to memorise material as they had been used to doing in their home countries. The Thai participants stated that they realised they had to read in order to understand, to ‘catch ideas’ and to ascertain the author’s view (showing their respect for authorship). The Indian/Bangladeshi participants, on the other hand, had decided
they had other purposes for reading: to keep in touch with current research, to enable them to write literature reviews and to attend to in-text referencing (which they had not been accustomed to in their countries) in their assignments. The Indian/Bangladeshi participants’ purposes seemed to be rather more practical than the Thai students’ at this stage; their articulation of purposes for reading highlighted their understanding of the various requirements of postgraduate study.

With regard to selecting suitable texts for their study, both cohorts made use of various circumtextual cues such as titles, tables of contents, author details and abstracts. The Indian/Bangladeshi students, as well as looking at the name of the author, went further and checked the author’s credentials – his position, in which institution or company he worked. An interesting cue used by the Thai students, not mentioned by the Indian/Bangladeshi students, was colour. Certain colours attracted them to texts; of course, colour may not have enabled appropriate choice of text but it certainly played a part in their motivation to read particular texts and thus this could be an important factor for curriculum developers to be aware of.

The conceptual frameworks (Figure 8.1 and Figure 8.2) highlighted the usage of intratextual features over other features in first semester by both Thai and Indian/Bangladeshi participants. They mentioned that organizational structures in texts in their own countries, were less complex. Thai and Indian/Bangladeshi authors used, the participants reported, simple vocabulary and simple construction of sentences. Both cohorts also reported that there was considerably more explanation to be found in introductions in texts in their respective countries. In addition, the Thai participants mentioned that print was larger in their texts,
making them easier to read. One Indian participant mentioned another confusing issue for him apart from complexity of structures – the placement of items in an English text. Items which he thought were very important were not given prominence in the earlier parts of a text, as he would have expected. Several of the Indian/Bangladeshi participants voiced their dismay about the construction of conclusions; they felt the conclusions in the general-interest text and their academic text were ‘incomplete’ as they did not tie together all the ideas from the texts, did not discuss the issues enough and did not present solutions.

Many similar strategies were used by both the Thai and Indian/Bangladeshi participants in first semester; these included dictionary use, translation, memorising, repetition, reading on, re-reading, inferencing and some evaluating. Some of these strategies were not used in the same way, however. For example, repetition was used by the Thai participants to aid memorising of key words in a text; some of the Indian participants used repetition, not of key words, but of unfamiliar words, in order to memorise these. The Thai participants mentioned an interesting factor for memorising which the Indian/Bangladeshi participants did not. They could not memorise key words or terms, they said, if they could not pronounce them. It was noted by the researcher while at a Thai university campus, that her classes of postgraduate students usually spoke quietly out loud while reading a passage pointing to possibly their use of a sound system of learning for which pronunciation would be an important factor.

As might be expected, the educational and socio-cultural experiences of the two cohorts of participants impacted on their reading practices in different ways.
Much of the general knowledge had come from the reading of newspapers in their respective countries; the Thai students mentioned, in addition, their great liking for Japanese cartoons and their knowledge of snails which assisted them with the reading of the general-interest text, came from such cartoons.

The educational and socio-cultural backgrounds also impacted on the participants’ expectations with regard to the content of their academic texts and other sources. One Bangladeshi participant realised that the topic of her academic text – excessive weight preoccupation – was more of a Western problem than an Eastern problem. An Indian participant, who had to study Australian Law, had realised that it would have little relevance to her when she returned to Thailand. Another Bangladeshi participant had noted that the use of a medical practitioner was much more of a family affair in his country compared to Australia. Also he noted the fairly widespread use of ‘sorcery’ and other forms of healing in Bangladesh which he had not found in Australia. This participant had also found Australian television programmes to be culturally unacceptable and would not allow his family to watch them. One Thai participant also reported his surprise at the presentation of material on Australian television, particularly in documentaries. He, nevertheless, was prepared to watch them with interest. Specifically, he mentioned a documentary about prostitution in Thailand because this topic would not have been discussed so openly in his country.

The education systems had an impact on the participants’ reading practices, too. The Thai participants, in their accounts, told of the step-by-step style of teaching with much support through handouts and translation of English texts into Thai.
Similarly, the Indian/Bangladeshi participants spoke of a step-by-step style of teaching and lecturing with information being given to the students. Both cohorts cited the fact that this style of teaching coupled with English language lessons which were grammar based rather than meaning based, restricted their ability, at least initially, to make meaning from their texts in Australia.

The participants’ cultural backgrounds, too, affected the amount of conceptual knowledge that they brought with them relating to the disciplines they were studying in Australia. One Indian student mentioned the lack of expertise in the telecommunication field in India, resulting in few technical publications and hence his lack of knowledge in the field and a Thai student spoke of the lack of knowledge in her country of crystallography. One of the Bangladeshi participants had experienced the same problem; his country was not concerned about his topic of study – psychiatric morbidity – because it was, he said a) thought not to be a problem in Bangladesh and b) considered to be of significantly less importance than other medical matters.

The conceptual framework demonstrated the changes, too, in reading practices that had taken place between first and third semester. Of note was the greatly increased use of intertextual framing. This was partly due to the recognition by all of the participants that postgraduate study at an Australian university required much reading. The two cohorts of participants, however, identified some different reasons for undertaking more reading. The Thai participants mentioned the need to read more to learn about their field of study, to find out specific information, such as experimental methods and to fill gaps from lectures. The
Indian/Bangladeshi cohort, while also reading for more knowledge in their fields of study, said that they were reading, also, to observe the discipline-specific academic writing conventions and to take note of quotes for their own writing. This cohort, then, were seeking to progress their writing skills as well as acquiring more knowledge of their study areas.

More intertextual framing, particularly with academic articles, was possible through access to the Internet and the university library system. The Thai students, generally, however, stated that using the Internet was too time-consuming. The Indian/Bangladeshi students, on the other hand, seemed to have embraced the Internet with much enthusiasm.

While both the Thai and Indian/Bangladeshi participants were reading more texts, both cohorts reported a continuing lack of confidence in selecting their texts. The Thai participants preferred their supervisors to provide guidance in the choosing of their texts; the Indian/Bangladeshi participants would choose their own texts but preferred their supervisors to validate their choice.

To help select texts, it can be seen from the conceptual framework that more circumtextual framing was used in third semester. In particular, the use of abstracts had increased for both cohorts of participants. In addition, the Thai participants once again mentioned the use of colour and how they enjoyed reading texts which were ‘colourful and attractive’.
As both cohorts increased their knowledge of text structures, they also increased their knowledge and use of intratextual framing. Again, though, there were, according to the participants’ accounts, several differences in the two cohorts’ perceptions of text structures. With regard to overall text structure, two of the Indian participants, for example, mentioned that information was not placed in the texts where they thought it would be. With regard to deducing the meaning of vocabulary items, the Indian/Bangladeshi group reported little or no dictionary use; they ignored words or troublesome details they did not know and only one participant was still using translation. The Thai participants, on the other hand, still used dictionaries but English/English not English/Thai, and translation for technical terms and for compound terms such as ‘risk exposure’ because, they reported, it was easier to memorise in their own language. The process, however, was very slow. They explained that translating from English to Thai and back again required first of all the appropriate meaning of a word, then knowledge of the correct word order in English. Again, as in first semester, they said they could not think in English, as they had learnt English in Thailand through a grammar-based system and could not, therefore, understand the ‘deep meaning’ of words.

Using their own language helped the Thai participants, however, to memorise more easily. There had been a shift in the perception of the importance of the strategy of memorising; in third semester, several of the Thai participants mentioned that they did not just memorise facts; they also memorised parts of a text in order to be able to link previous paragraphs with those following or to see the relationships between multiple texts, and one participant alluded to the fact that memorising was for life-long learning. There was little emphasis placed on
memorisation in third semester by the Indian/Bangladeshi participants except for the remarks by one of the Bangladeshi and one of the Indians that memorisation was for understanding.

While intertextual, circumtextual and intratextual framing had increased for all participants, there was little change in extratextual framing when reading academic texts. This again was due to participants’ lack of experience of their academic disciplines. The general-interest text did create interest and comment from the Thai participants. They were able to generate analogies with events in Thailand such as the lack of testing of medicinal herbs in their country or the testing of new drugs for HIV patients in Thailand by other countries.

The Indian/Bangladeshi participants, however, did not take the opportunity to discuss the general-interest text presented to them in third semester. The Thai participants, possibly because of their socio-cultural background were happy to discuss the topic, growth hormone. Perhaps they could relate to the topic because some Thais use the hormone, as they explained, so that they would become as tall as Europeans. In India and Bangladesh, it seemed that the use of growth hormone was not culturally acceptable as one’s growth was considered to be in the hands of the gods.

Overall, both cohorts of students had experienced greatly increased self-efficacy. One of the highlights for all the participants was being able to discuss their academic work with their supervisors. The main reason given by all the
participants for the increased self-efficacy was a safe, non threatening study environment.

The two cohorts of participants demonstrated through their accounts of their reading practices and their pair think-alouds many similarities in their reading practices in first semester and during third semester at an Australian university. At the same time, there were also differences in strategy use, differences in their motives for using certain strategies and differences in the extent of usage of certain strategies in first semester and during third semester.

While the study design was not developed to be a comparative study, the holistic nature of the framework with the incorporation of both metacognitive concepts and framing theory proved useful to explain, not only the reading practices of the Thai, Indian/ Bangladeshi participants in this study as two discrete cohorts but, through the participants’ accounts, to identify some of the similarities and differences between the practices of the two cohorts. Using metacognitive theory in conjunction with framing theory provided a more comprehensive conceptual framework, that could accommodate the participants’ reflections on their reading, their choice of strategies when framing their reading, the reasons for their choice of strategies as well as their actual reading processes. Furthermore, the combination of both metacognitive theory and framing theory enabled the researcher to discover and analyse the changing processes which had taken place between first and third semester. A more holistic view of reading, with much richer data could emerge and allowed more complex analysis, than would have been the case by using metacognitive theory or framing theory in isolation.
Finally, a range of influences, based on the participants’ prior experiences in their home countries and their Australian experiences, on their metacognitive and framing processes could be identified and analysed. These influences are now discussed in turn.

Figure 8.1 Metacognition and framing used in 1st semester
Influences on reading practices

Various changing influences were identified during the course of the research as impacting on the participants' reading of academic and general texts. A discussion of four major issues related to the social and educational complexities, mentioned in chapter one, are now reviewed with regard to how they influenced the reading processes of the participants in this study and brought about conceptual change (see Figure 8.2). By reviewing these issues, it is possible to formulate implications for pedagogical practice. The four main issues that emerged from the research were: the purposes of reading; language and cultural awareness; background content knowledge; and self-efficacy. The conceptual framework, as mentioned previously, provides insights into the changing nature of the educational and socio-cultural influences, influences from the home countries added to, and integrated with, differing influences and expectations from Australia and how they impacted on the reading processes of the selected student participants. The data, as interpreted by the researcher, pointed to levels of change (see Figure 8.2) and these levels differed between components.
Figure 8.2 Educational and socio-cultural influences on reading practices by third semester

The purposes of reading

Many reading strategies are utilised for different purposes (Paris et al., 1991) and the success of these strategies depend on the task, the demands of the task and the readers' knowledge of the task (Hacker, 1998). During the undergraduate days of our participants in their home countries, whether Thailand or India/Bangladesh, their main purpose for reading was, according to their accounts, to pass examinations and to learn the fundamentals. For these purposes they reported that they read, therefore, text books which provided the appropriate information. In addition, as observed by the researcher on her Thai and Indian field trips, students
were provided with notes and handouts and lectures were very structured. It was implied in their educational systems that further reading was not necessary. The educational priorities, though, were not the only limiting factor for extensive reading. Lack of resources was another important factor mentioned by some of the Indian/Bangladeshi and Thai participants. Texts, they reported, were often unavailable or required considerable travel and time to access. In addition, journal articles, an important source for academic learning, were often unavailable. A few of the Indian/Bangladeshi participants mentioned that some journal articles were available at their place of work but that they did not have time to read them as they were focussed on practical work. As textbooks and academic journal articles require ‘very different realities in teaching and learning contexts and require very different reading and analytical strategies’ (Bhatia, 2002: 33) on the part of readers, it is clear that our participants would have been utilising strategies appropriate to the purposes and texts that they were using in their home countries but not necessarily appropriate for the kinds of academic texts they had to read in Australia.

Adjustments, therefore, had to be made by all the participants early in their study in Australia. Once they realised that the reading expectations and purposes were different to those they were used to, they made adaptations to, not only their reading practices, but also, they reported, the way in which they searched for credible sources of information.
Language and cultural awareness

While students arrive with the expectation that the reading task will be similar to that of their undergraduate days, they also have the expectation that their linguistic abilities, discipline-related knowledge and prior reading will be sufficient to meet the requirements of postgraduate study. During first semester, all the participants in this study went through a self-awareness raising process, discussed next.

English language competency

Students on arrival at an Australian university generally assume that they have the necessary linguistic competency for their study as they have sat an IELTS test and been accepted into the university. Only when they begin their studies do they realise that a) Australian English is different to the English they have learnt in their home countries and, as discussed in chapter one, the variety of English language they use is more appropriate for intranational use in their own countries (Moag, 1982; Pride, 1982) and b) the academic English expected by their Australian lecturers, uses different conventions from those they were used to (Clyne, 1981, 1987; Hinds, 1998; Holm and Dodd, 1996; Swales, 1990) and is specific to the particular discipline in which they are studying (Becher, 1989; Kirby, Woodhouse and Ma, 1996). Highlighted in this study, in particular, were the different conventions used in the journal article genre to which none of the students had been accustomed. Although all our postgraduate students had to achieve an IELTS 6.5 level before admission to university, the findings of this study suggest that raising the level of this test would not necessarily facilitate students’ academic adjustment. The Indian participant, A2, the weakest student
linguistically and the most anxious, demonstrated remarkable resourcefulness in coming to terms with the demands of his study.

Overall, the 16 participants, whether from Thai or Indian/Bangladeshi backgrounds, found the range and amount of texts that they were required to read for postgraduate study, challenging. The study showed how they negotiated meaning from texts which were often structured differently from those they were used to. The students' accounts revealed how they also had to contend with unfamiliar vocabulary items, discipline-specific terminology and even general non-academic language. Both the Thai and Indian/Bangladeshi participants mentioned experiencing considerable confusion when reading texts which lacked explanation, which had too many statistics and in which the graphs or pictures were not connected to the text.

English language use in home countries.

While all the Thai and Indian/Bangladeshi participants, except one, had attended English medium universities in their home countries, their accounts showed that much of the discussion related to their undergraduate study was in their own languages. The English language, moreover, was seldom taught by a native English speaker in either Thailand or India/Bangladesh and hence the participants used a modern indigenised variety of English. As a result they reported their unfamiliarity with general English vocabulary and, in the case of the Thai participants, with word order in texts. This impacted on their ability in first semester to confidently discuss their research with their supervisors or with other students. The participants' accounts indicated, however, that there was a greater
degree of tentativeness felt by the Thai students when reading academic text than by the Indian/Bangladeshi students. This could reflect the fact that, using Moag’s (1982) taxonomy (see chapter one) India and Bangladesh are moving more towards being ESL societies rather than being designated EFL societies as Thailand is. Observations by the researcher at educational institutions in Thailand and India point to the designations being a matter of degree. Even in India, there were many postgraduate students who did not appear at ease with the English language and who frequently resorted to Hindi for explanation from their lecturers/supervisors.

Cultural characteristics

Students come from their home countries with certain language skills and cultural differences (Nagata, 1999) both of which impact on their study at an Australian university. It was clear from the study that cultural-educational background influenced, for example, the preferred styles of learning. All the participants indicated that they were used to a more structured, step-by-step style of learning. The Thai lecturers in particular, it was reported, provided resources in the form of handouts and notes to guide the learning of their students. These handouts had often been translated into Thai by their lecturers. The very step-by-step style of lecturing was observed by the researcher at an Indian university, too.

If we refer to Hofstede’s (1986) work, described in chapter one, it can be seen to what extent cultural characteristics can influence students’ reading practices. All the participants, for example, seemed to come from societies where there is larger power distance than in Australia. Hence most of the participants were tentative in
the first semester, and some even in third semester, about choosing their own texts. It was thought that supervisors knew more and there was the expectation, in any case, that there would be the same level of support as there had been in their own countries. In line with research by Flowerdew (2000) and Reid et al. (1998) with students from non-English speaking backgrounds, the participants in this study seemed to display little reading criticality in first semester although it is acknowledged that their reading criticality may only differ in nature (Biggs 1996a). It would be useful, nevertheless, if these students understood how Australian supervisors view their ways of thinking and reading. The extent to which the participants in this study engaged with a text, demonstrating an independent approach, seemed to depend on the degree to which other reading was carried out. There had been little reading in their undergraduate studies and during first semester, generally; only reading that was necessary to fulfil the requirements of first semester was undertaken. As greater amounts of discipline-specific reading took place between first and third semester all the participants were able to display more intertextual framing; they sought to understand the arguments presented in different texts, to see the relationships and to evaluate them with a more critical eye. A significant skill resulting from the greater amounts of reading, was the ability to reference. Many of the participants mentioned that they had not been required to in-text reference during their undergraduate studies in their home countries. By acquiring this skill they can ‘construct factual reliability (Hyland, 2002: 115) and ‘define a specific context of knowledge or problem to which the current work is a contribution’ (p. 115).
In addition, many of the participants stated their preference for group work and discussion, something they were not able to indulge in initially because of their lack of confidence with the language and content knowledge. They overcame this by seeking out other students from their own linguistic and cultural backgrounds either on campus in Australia or via the email with friends in their home countries. This is in line with a study by Volet and Ang (1998) with South East Asian students that showed that these students preferred to work with peers from similar cultural backgrounds.

Strong family ties may well have been the reason the participants persevered with their studies despite what may well have seemed overwhelming difficulties in first semester; when they become qualified they help the next sibling to achieve an academic qualification. The participant from the Punjab, it may be recalled, received considerable encouragement from his elder brother and without this encouragement he would have given up his studies.

With regard to the Feminine and Masculine attributes mentioned by Hofstede in his model, these can be related to the differing approaches to the task of reading. The Thai participants, for example, seemed to adopt a more gentle approach whereas the Indian/Bangladeshi participants appeared to be more assertive and opinionated about the content of the readings. One Thai participant illustrated the difference when she said she did not wish to feel ‘unsafe’. Only when she was sure, after much reading and discussion, that she was setting up experiments correctly did she wish to go ahead. Being aware of uncertainty is part of the self-monitoring process (Otero, 1998) and subsequent problem solving and therefore
students should not be deemed inadequate because they voice their uncertainties. In Hofstede's (1986) Masculinity/femininity component of his four dimensional model of cultural characteristics he showed India as having more masculine characteristics e.g. being more competitive, and Thailand as having more feminine characteristics e.g. deferring to others. These cultural characteristics were observed during the pair think-alouds.

The Uncertainty Avoidance component of Hofstede's model was illustrated clearly during first semester. Most of the participants only read the kind of texts which were familiar to them or which were specifically chosen by their supervisors. Most, too, actively sought out texts which were clear and simply written, not wishing to be confronted by long, complex texts, especially in their first semester. Although Indians as a cultural group are shown on the Hofstede model as having weak uncertainty avoidance, the Bangladeshi participants in this study displayed anxiety over their reading as did some of the Indian participants. It seems then that Hofstede's model, while it demonstrates some relationships between cultural characteristics and reading processes, does not fully account for the way international postgraduate students approach their reading.

**Background knowledge**

Another factor affecting reading, the relationship between background knowledge and reading is well known (Carrell, 1983b; Otero 1998; Reid et al. 1998). It seemed from the research that supervisors had the expectation that these international students would have relevant academic background knowledge and would have read discipline-specific texts. If students did not have sufficient
background, the participants' accounts showed that it was presumed that they could access the library or the Internet and fill the gaps in their knowledge. The results have shown that many students had difficulty accessing information during their first semester. There were several reasons offered by the participants for this situation. Some of the participants, for example, were moving into different fields for which they only had general academic knowledge, perhaps a general science background. Most of the participants came from a background where seeking assistance from a supervisor was frowned upon; at the same time, they had been used to carefully structured lectures with many handouts and hence they had, at the same time as trying to meet their study requirements, to acculturate to a new teaching/learning system which required them to be more self-regulated.

There was, moreover, the additional problem of incongruent background knowledge and the research revealed several instances of misinterpretation due to cultural background knowledge which did not 'fit'. For example, the Indian student, A2, because of his knowledge of malaria, incorrectly tried to make it fit his reading of the general-interest text *Deadly worm may be turning drug resistant*. Students, therefore, may need to re-conceptualise their knowledge; in other words, they may need to re-structure and re-think their knowledge to make it match current contexts. Volet and Ang (1998) indeed suggest that tertiary institutions need to be proactive, too, by designing learning and teaching environments which 'foster students' development of intercultural adaptability' (p. 21).
Previous reading of academic texts

Another influence on reading practices was the amount and kind of prior reading that had been carried out before taking up study in Australia. Prior reading as demonstrated in the study depended largely on encouragement from family. Not one of the participants had been accustomed to being read to as a child and, although some of the participants lived in homes with books, there was little emphasis on reading for pleasure. Even during undergraduate study, many of the participants stated they read minimally; in fact they had no need to read large amounts as reading was for the purpose of passing examinations. Besides, library books did not appear to be readily or consistently accessible in our participant’s home countries, something which we in Australia take for granted. Most of the participants, moreover, were unfamiliar with the journal article genre; they seemed to be accustomed to epistemological traditions where textbooks were the preferred genre in order to gain knowledge of the fundamentals. Even the Indian student, A1, who had had access to research reports in his work place in India, said he realised he would have benefited from more journal article reading while still working in India. Giving students access to academic reading materials, however, as has been mentioned by Hynd (1998), is not necessarily the full answer. Several students mentioned that experiential learning, a supervised project in their new field, prior to beginning their main studies, would have been useful.

The influences which impacted on the participants’ reading practices, discussed above, may be viewed as a combination of cultural and linguistic knowledge which can be adapted and built upon to meet the expectations of a different
academic environment. The following brief discussion highlights the synergies which can emerge when students are motivated to succeed in their studies.

**Self-efficacy and reading strategies**

While the attributes mentioned above, linguistic competence, educational background and knowledge of academic discourses are necessary for academic study, another influence on reading practices, briefly mentioned in chapter two, and generally considered part of the Self knowledge component of metacognition, self-efficacy (Paris and Winograd, 1990), came to the fore through the participants’ accounts. Indeed their accounts revealed, more specifically, the significance and congruence between self-efficacy and strategy use. The more the participants developed a ‘can do’ attitude, the more they demonstrated that they could develop strategies which enabled them to read within texts and between texts. The research also showed that the ability to read other texts in their academic field led to increased questioning and evaluation, necessary attributes for postgraduate study. A major factor, reported by several of the participants as contributing to the feelings of self-efficacy, was a safe, non-threatening environment. This included having an encouraging, supportive supervisor. This is in line with a research study by Kiley (1999) at the postgraduate level that showed that receiving positive feedback on work proved to be ‘a crucial factor in students’ sense of well-being and self-esteem’ (p. 218) and research studies by MacCallum (2001) and MacCallum and Beltman (1999) at the secondary school level that demonstrated that teacher classroom behaviours were critical to students’ positive perceptions of the level of support being offered to them. Moreover, students who had the support and encouragement of a mentor for one
hour per week reported increased feelings of self confidence and displayed increased engagement with learning (MacCallum and Beltman, 1999).

Changing reading practices in Australia

The participants in this study arrived from their home countries with reading practices which were appropriate to the tasks they had to carry out in their own academic environments. The study showed that a variety of influences from the Australian environment, both academic and general, had impacted on their reading practices. The participants indicated that these influences had helped them to accommodate their reading practices to the Australian academic environment. These included their increased awareness of what was required of them with regard to reading tasks; an increased awareness of differing text structures and where to find important information in a text; increased vocabulary acquisition; increased awareness of the teaching style at an Australian university and the notion of independent learning; being able to access the library and the Internet; increased knowledge of strategies and their effectiveness; and being able to question and share knowledge with others of the same nationality (see Figure 8.2). In other words, reading can be viewed as an amalgam of various skills and as such reading cannot be viewed or indeed discussed without reference to cultural background, context (which defines purposes for reading) and linguistic competence.

All the participants, despite some mismatches in expectations between their home country universities and the Australian universities, proved without a doubt that they could demonstrate, in a relatively short time, considerable resourcefulness.
All of them, in fact, made considerable adjustments to become more self-regulated in their learning by the end of first semester. This could relate to their bilingualism (Cook, 1992; Jimenez et al., 1996); being able to communicate in two or more languages, may have resulted in enhanced cognitive and metacognitive developments in a relatively short space of time. A bilingual strategic activity, for example, was the use of translation. From translation, the participants developed knowledge of differing structures, word order and the variety of meanings attached to the same vocabulary item in English. Another important strategy was discussion with peers in their own language. In this way, shared background knowledge helped in the interpretation of new concepts. The participants in this study also demonstrated that they could invoke their bilingualism through transference of reading skills learnt in their own countries.

However, even in third semester there were still substantial difficulties for some of the participants. This means that a Masters student could be more than half way through his/her study and still experiencing reading difficulties. The questions that one might ask here are, ‘How much more quickly could students change/adapt their reading practices given the appropriate assistance and encouragement?’ and ‘What would represent “appropriate” assistance and encouragement?’

Overall, analyses of the reading practices of the Thai and Indian/Bangladeshi postgraduate students at an Australian university, as well as those participants on overseas campuses, produced two major outcomes:
A conceptual framework for understanding reading practices that combines metacognitive concepts and framing theory. The framework has dynamic, multi-dimensional and developmental aspects.

A holistic yet detailed ‘picture’ of the synergies involved in the reading practices of two distinct groups of postgraduate students from Thailand and India/Bangladesh and the changes that took place over their first three semesters of study at an Australian university.

**Strengths and limitations of the study**

Much of the ESL reading research has compared first language readers with second language readers (Cook, 1992) or has used Asian participants without differentiating their ethnic backgrounds or has been about what readers do rather than how they do it (Fitzgerald, 1995). It was, therefore, considered useful to develop a framework for viewing the reading practices of non-English speaking postgraduate students holistically and yet providing detail of the practices as they related to two particular cohorts of students, Thai and Indian/Bangladeshi. This framework and the methodologies allowed the identification of the reasons which underlay the practices and the influences which changed the reading practices across the first three semesters of study. By using interviews, pair think-alouds followed by retrospective interviews and observations, much detailed data were provided. Triangulation of multiple sources of data enabled validation of the responses; triangulation also occurred through the combination of retrospective interview and pair think-aloud when participants could confirm or deny the researcher’s interpretations. The use of general-interest text and academic texts
provided the means for comparison of reading practices between the two genres and identification of the reasons for the use of different reading strategies. For example, when a student has prior knowledge as the Indian student, B2, had for the general-interest text *Deadly worm may be turning drug resistant* from his pharmacy studies, he/she can invoke that knowledge and generate inferences when reading. It was clear that if students had had relevant background knowledge when reading their academic texts, they could have framed extratextually to a much greater degree.

While the research has provided useful insights into the reading practices of Thai and Indian/Bangladeshi postgraduate students, it is conceded that the study had some limitations related to the design and methodology. These concern the issues of second language use, generalisability of results and problems inherent in longitudinal studies.

In studies with students from a language background other than English, there is always the problem of students’ capacity for articulating what they are really thinking. The researcher has to take care in the interpretation of the results (in this case, the researcher had fifteen years’ experience in the field of language and second language instruction and research to draw on). In addition, the participants were asked to verify the interpretation of results and to confirm/deny or add to their accounts through the reflective interviews after the pair think-alouds. While these participant reflections provided the researcher with the opportunity of understanding the reading practices of the participants from their own
perspectives, there is always the possibility that the participants did not necessarily articulate what they really meant.

Another limitation involves the use of ethnographic methods, in particular, the generalisability of results. Flowerdew (2002) states, ‘it is for others to decide to what extent the findings of a given ethnographic study might apply to situations with which they themselves are familiar (p. 239). Hence, because the study focussed on a specific situation, international postgraduate students and their reading practices at an Australian university, it is not possible to generalise from the findings. Nevertheless, the insights which emerged from the study can be applied to similar situations, i.e. other international postgraduate students studying at other universities, if note is taken of their specific language and cultural backgrounds. At the same time, one has to be aware that it cannot be assumed, as shown by this research, that members of any particular ethnic group practise reading in a uniform manner or that those perceptions of certain ethnic groups are correct. For example, it is often thought that, if students study at an ‘English-medium’ university, they will not experience difficulties with language when studying in Australia. Despite the limitations, an overarching ethnographic approach was considered well suited to exploring the participants’ reading practices in context as it takes ‘a broader, more contextual view of discourse than do other approaches’ (Flowerdew, 2002: 235). Through the use of in-depth individual interviews and pair think-alouds the study could ‘focus upon the context of production and reception of texts, not just upon the texts themselves’ (p. 237). While the methodologies produced much rich data, however, they could not quantify on a statistical basis the usage of the various reading components.
Further research using quantitative methodologies, in conjunction with qualitative methodologies, could provide the basis for acquiring this kind of data.

In order to explore the changing nature of the participants’ reading practices, the study used a longitudinal approach. A limitation of longitudinal studies, however, using student participants, is that students often leave a university for another or return to their home countries. The researcher of this study was careful to find substitutes who had been studying the appropriate length of time in Australia in order to keep as much consistency as possible and to ensure that the general trends displayed were reliable. At the same time, individual differences were described in detail. The researcher could not compare, unfortunately, the progress of a particular participant if a substitute was brought in for the second round of interviews and pair think-alouds in third semester.

Originally, the researcher had wished to track students through their final year of undergraduate study in their home countries and then through the first year of postgraduate study at an Australian university. Unfortunately, it was not possible for the International Office to identify students who were likely to enrol at universities in Western Australia early enough for such a study to be undertaken. It may be possible in future research to conduct case studies with a few students in this way to produce more individual, consistent accounts of reading practices in their home countries and track the changes through to third semester in the host countries.
Major pedagogical inferences

Despite the limitations of the study, from the participants’ accounts of their reading practices in first and third semester, can be drawn two major pedagogical inferences. These inferences were:

- Inaccurate assumptions of students’ knowledge and expertise on the part of supervisors and frequent mismatch of expectations of academic reading requirements on the part of the students;

- Postgraduate students’ reading practices can be adapted or changed to accommodate to their new academic environment through increased metacognitive awareness.

These two inferences highlighted by the study lead to three major implications which are discussed next.

Implications for international education at Australian universities

Specifically, the findings from this study indicate that Thai and Indian/Bangladeshi students may experience significant mismatches with regard to reading requirements which impact on the form and variety of reading strategies they use when first arriving at an Australian university. These findings lead to three main pedagogical implications, suggested in part by the participants themselves. These are pre-semester support, curriculum design and supervisory support.
**Pre-semester support**

Some of the participants’ reflections alluded to the fact that pre-semester experiential training might well be valuable. As well as including a supervisor-guided project, pre-semester training could also include guidance on library resourcing and Internet use. In addition, there could be discussion of study expectations, the Western academic conventions, Western text structures, academic discourse and discipline-related technical terms. Discussion of varying interpretations would also be important as students are often unaware of competing discourses and hence find it difficult to understand that there may be alternative interpretations to a text they are studying (Smith, 1999). Through group discussion, students are hence given the opportunity to ‘rebuild theories’, to share their cultural background knowledge and to make sense of new information (Hacker, 1998; Morris and Stewart-Dore, 1989).

**Curriculum development**

There are implications also for curriculum refinement. Curriculum can be defined as both content and process (Mansell, 1989). With regard to content, many of the courses offered to international students are those offered to local Australian students (Mansell, 1989). It may be that more culturally appropriate content or at least familiar content inserted into courses would help international students to develop a greater interest. As Volet (1996) states, the benefits of including an intercultural dimension to the curriculum should not be underestimated as ‘it may be one of the most crucial factors of success in the internationalisation of higher education’ (p. 4). Wade, Buxton and Kelly (1999) found that international
undergraduate students demonstrated more interest and motivation when content related to their prior knowledge. The issue of relevance should also be considered. Curriculum designers need to "balance considerations of what is "relevant" to overseas students against arguments for providing opportunities for them to develop the widest possible perspectives" (Brash, 1989: 71). Examples of support programmes already in operation at Adelaide university (see Cargill, 1996) and at Curtin university (see Bell, 1994; 1998) for postgraduate students from a non-English speaking background have integrated discipline-specific language and academic skills into students' main discipline areas. This research suggests that a greater focus on reading practices and perspectives would be worthwhile.

While the findings from this study demonstrated similarities between the Thai and Indian/Bangladeshi students with regard to their reading practices, there were subtle differences related to their differing backgrounds that could be addressed in programmes such as those just discussed previously. These differences include, for example, the degree of tentativeness, the need for group work and discussion and the need for more initial structured learning support.

Curriculum processes, as mentioned above, could include more discussion of texts with peer groups and/or supervisor. It has been noted by Hofstede (1986) and Cheng (1995) that students from collectivist societies enjoy working in groups. Moreover, students may feel they have interpreted a text in the only way possible and it is only through sharing their interpretations with a group of students that
they can ‘expand on their individual understandings of the text by merging their understandings with others’ (Hacker 1998: 186).

Reading/writing connections

Reading, as has been shown, does not occur in isolation. It is a synergy of background knowledge, content knowledge, linguistic knowledge and cultural knowledge. Several of the participants, for example, demonstrating the relationship between two academic skills, reading and writing, reported that increased reading led to better understanding of academic writing conventions. Differing discoursal patterns across language and patterns, according to Ostler (2002), affect reading as they affect writing. Tribble (2002) contends that effective writers need four kinds of knowledge: ‘content knowledge, writing process knowledge, context knowledge, and language system knowledge’ (p.145). In order to accrue language system knowledge, he advocates analysis of texts similar to those students are required to write. Paradoxically, perhaps more writing using academic conventions of the journal article, could lead to greater ease and understanding when reading this genre, the least understood genre as reported by all the participants.

Supervisory role

The research has been informative in that it has highlighted some of the influences affecting the participants’ reading practices. Highlighted, in particular, was the importance for supervisors working with international students to have a good understanding of the teaching systems and socio-cultural backgrounds of the students. Hofstede (1986) and others have noted the relationship between cultural characteristics and preferred teaching/learning modes. With regard to reading, the
supervisor may have to take on a more supportive role, at least initially until the
students have made the transition to a more independent style of learning. This
could include sending discipline-related texts to the students before they arrive at
university in Australia, discussing readings with students and guiding a critical
approach to their readings through helping them identify differences in argument
and theoretical positions displayed in other texts, highlighting some of the
academic writing conventions to be found in English authored, discipline-related
texts, adding home country references to their suggested reading lists, and
stimulating group examination and interpretation of a variety of discipline-related
texts from differing cultural backgrounds. At the same time, consideration could
be given to the fact that international students, like local students, are individuals
(Moses, 1985). The findings indicated that, while, for example, all the
participants used the strategy of translation, there were small differences in the
extent to which this strategy was used in first semester even within a national
grouping and there were more distinct differences in the extent to which
translation was used by third semester. It is, therefore, important to somehow or
other accommodate individual differences such as these.
Conclusion

In conclusion, the conceptual framework used in this study, by integrating metacognitive concepts and framing theory, helped to address a significant gap in the research on reading by highlighting the reading practices and the thinking preceding these practices by selected Thai and Indian/Bangladeshi postgraduate students. The framework, moreover, helped in the understanding of how and why these two cohorts of students framed their reading the way they did. Their accounts on the influences on their reading practices after attending one semester of study at an Australian university and the changes they made by third semester extended our understandings of reading and highlighted the participants’ expectations of the place of reading for postgraduate study and how they dealt with any mismatches in their expectations. Their accounts highlighted the areas in which universities can help to bridge the gap in expectations, knowledge, language and culture. Raised awareness of these areas by staff and students followed by a willingness to understand and find out more about the different academic cultural environments is very important in order to help these students to perform more successfully earlier in their studies. Finally, adaptations to curriculum content and processes and supervisory teaching style will help to enhance the international postgraduate student’s learning experience in Australia.
Bibliography


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Appendix 1

Individual Interview Questions

Introductory questions
1. Why did you choose this text?
2. How did you find it?
3. Was the text suggested to you?
4. How do you generally locate articles?
5. Please give a brief summary of the text

Circumtextual
6. In which order do you read the text?
7. Why do you read the text in this way?
8. How do you find the main ideas?
9. Is there anything you do not read?
10. Do you look at the references?

Intertextual
11. Does this text remind you of other books/articles in India/Thailand?
12. Is this book/article structured in the same way and English Indian/Thai authored text would be?
13. Do you follow up the references?
14. Why/Why not?

Extratextual
15. Were you encouraged to follow up references at undergraduate level in your country?
16. Does this article remind you of any event in your country?
17. What do you think the author’s opinion is?
18. Do you agree/disagree with it?
19. How much reading do you do each day?
20. What kind of reading do you do apart from academic reading?
21. Why?
22. What kind of reading did you do in your own country?
23. Could you find a text such as this in your own country?
24.

Intratextual
21. How did you find the introduction?
25. Was the conclusion as you would expect?
26. Why/why not?
27. What did you think of the pictures/graphs/tables etc?
28. What does the line signify? (if there is one between title and text)
29. What did you think of the headings and subheadings?
30. Were there any words/phrases you did not understand?
31. How did you find a meaning for those which were difficult to understand?
32. Did you discuss the text with anyone?
33. What do you think of the language and structures used in this text?
34. Do you think the text was logically presented?
35. Why/why not
36. What in the text assisted you to read it?
37. Was there anything in the text which surprised you?
38. If an article is difficult why would that be?

Interview Two
Additional questions
39. How much academic reading do you do now per day?
40. What differences do you find in your reading now?
41. Have you adopted different reading strategies?
42. If so, what are they?
43. What other reading do you do now?
Deadly worm may be turning drug-resistant

Phyllida Brown

CLAIMS that a common human parasite could have begun to outwit its main drug enemies have triggered a heated argument between scientists. Biologists in Britain say that there is evidence that the parasite Schistosoma mansoni, which causes schistosomiasis, can develop resistance to the drug praziquantel. The WHO and other researchers hotly contest their claims.

Schistosomiasis affects around 200 million people. Unchecked, the disease causes the liver and spleen to enlarge and damages the intestines and blood vessels in the abdomen. Up to 200,000 people die of the disease each year.

Drug-resistant schistosomiasis is unheard of but scientists fear it is possible, given the spread of strains of malaria that are drug-resistant. The stakes are high: more than 70 countries affected by schistosomiasis rely heavily on praziquantel, which usually works after just one dose and against all species of schistosome worms. There is only one other alternative drug.

No one has yet found evidence of widespread resistance to praziquantel. The British scientists base their claims on laboratory experiments and admit that more work needs to be done. But their findings come at a time when an epidemic of schistosomiasis in Senegal has proved difficult to treat. Some scientists believe that praziquantel is less effective there.

The claims have infuriated scientists at the WHO. They are convinced that the problem has been exaggerated and fear that bad publicity could set back their treatment programmes. "There is just no evidence that there is a problem," says Kenneth Mott, head of the WHO's programme of schistosomiasis control.

Peadra Fallon and Michael Doenhoff at the University of Wales, Bangor, found that S. mansoni in laboratory mice could develop resistance to praziquantel when the animals were given regular low doses of the drug. They have just published their results in the American Journal of Tropical Medicine and Hygiene.

The biologists' latest findings, which have not yet been published, have raised hackles high. They are working with Andre Capron at the Pasteur Institute in Lille, France, and colleagues in Senegal and London. Fallon and Doenhoff compared different strains of S. mansoni in the laboratory. A strain from Senegal — where there is a massive epidemic of schistosomiasis — was found to be less sensitive to praziquantel than two strains from Puerto Rico and Kenya.

The epidemic in Senegal, which began in the late 1980s, has proved difficult to treat for several years. A team led by Bruno Gryseels, an epidemiologist from the University of Leiden in the Netherlands, reported poor results with praziquantel in 1992. After treatment, he said, "only 20 per cent of a group of more than 350 people were found to be free of S. mansoni eggs."

But his findings have not impressed the WHO or other researchers, who have argued for two years with his definition of what counts as a "cure" of infection. The WHO says the number of eggs should fall by 90 per cent but need not be eliminated altogether. Most treatments are considered "satisfactory" if 40 per cent of patients are free of eggs after a year.

James Bennett, at the University of Michigan, studied schistosomes in Egypt where praziquantel has been used more heavily than anywhere else in the world. He believes resistance to the drug would have developed there if anywhere. He and his colleagues have found one Egyptian strain of S. mansoni, called MO1, that is less susceptible to the drug in the laboratory than other strains. There are also early signs that up to four more strains might be "tolerant" of the drug. "But this is a very small number and insignificant in public health terms," says Bennett. Of 1800 people treated in one area in the Nile delta, only 89 needed three doses of the drug and only 23 of them were not cured.

"This is not overwhelming," he says.

Bennett also questions Doenhoff's laboratory results. He points out that Doenhoff treated his mice only six weeks after infection, when some parasites would still have been immature. Praziquantel does not kill immature worms.

There are several possible explanations for the poor results of treatment in Senegal. One is the extremely high level of infection in the population around Richard Toll, a town on the Senegal River. One estimate suggests that as many as 90 per cent of people in the villages around the town are infected. Because the drug works only on the mature form of the parasite, it is possible that people are being reinfected so fast that they always have immature forms of the parasite in their bodies.

Another possibility is that the drug works less well in this population. It is not clear exactly how praziquantel disables schistosomes, but some scientists believe the drug may work in concert with the body's natural immunity to the parasite. Schistosomiasis is a new disease to Senegal and people may lack natural immunity.

Senegal's outbreak of schistosomiasis has been blamed on several development projects in the basin of the Senegal River, including the building of two dams and the construction of irrigation schemes. Scientists believe the development has encouraged the spread of Biomphalaria snails, which harbour S. mansoni. Freshwater is now available all year round to the snails, whereas previously saltwater used to flow upriver during the dry season.

Achim Harder, head of anthropo-malaria research at Bayer, the German company that makes praziquantel, says it is not clear why the drug is less effective in Senegal. Resistance is one possibility, he says.
French officials on poisoning charge

Charlene Calcutt, Paris

FRANCE is reeling from another public health scandal that could see senior officials sent to jail. Two former officials at the Central Pharmacy of Hospitals in Paris were last week charged with poisoning. It is alleged that they released doses of growth hormone that had not been treated to inactive the rogue "prion" protein that is thought to cause Creutzfeldt-Jakob disease.

After examining the pharmacy's records, an investigating magistrate in Paris, Marie-Odile Bertella-Geffroy, brought the charges against Henri Cerecato, who was formerly the Central Pharmacy's director, and a senior pharmacist, Marc Mollet. The documents allegedly indicate that between June 1985 and February 1986 about 20,000 ampules of potentially contaminated hormone were distributed to hospitals treating children for dwarfism.

Cerecato is one of five officials who have already been charged with the involuntary manslaughter of children who contracted CJD after being injected with growth hormone extracted from corpses. The others are: Jean-Claude Job, a pediatrician who in 1985 headed France-Hypoprophylaxie, a non-profit organisation that ran the growth hormone programme; Fernand Dray, who ran the unit at the Pasteur Institute in Paris where the hormone was extracted from the pituitary glands of corpses; Jacques Dangoumane, former director of pharmacy and medicine at the Ministry of Health; and Elisabeth Münzner, a doctor who oversaw the collection of the pituitary glands from morgues.

The poisoning charge is even more serious, as it includes the allegation that Cerecato and Mollet were aware of the possible consequences of their actions. The case echoes the scandal over tainted blood, in which three French health officials were convicted for their failure in the mid-1980s to stop the distribution to haemophiliacs of clotting factors contaminated with HIV (This Week, 31 October 1992, p 6). Two of the doctors were jailed.

Human growth hormone extracted from cadavers was used from the 1960s onwards to treat certain forms of dwarfism.

After 1985, when the first reports of a link with CJD surfaced, most countries—including Britain, Canada and the US—banned the natural hormone and began using a synthetic version. However, France and some other countries opted to continue using hormone from corpses, after subjecting it to an additional purification procedure using the chemical urea.

On 14 May 1985, France-Hypoprophylaxie told the Central Pharmacy that 30 grams of growth hormone awaiting packaging should be reprocessed using urea. But France-Hypoprophylaxie did not specify what should be done with hormone that had already been packaged. Pharmacy records suggest that some 15,000 ampules of untreated hormone were sent to hospitals between June and October 1985.

In addition, documents held by Bertella-Geffroy suggest that on the same day that France-Hypoprophylaxie notified the Central Pharmacy of the new purification procedures, the pharmacy sent 30 grams of human growth hormone extract in loose powder form to the Pasteur Institute. For unknown reasons, 5 grams of untreated hormone were sent from the institute to the pharmacy later that day. Pharmacy records indicate that this was later packaged into about 5000 ampules that were distributed between October 1985 and February 1986. Whether Mollet and Cerecato were aware that these doses had not been reprocessed remains unclear. The batches that had been treated with urea did not come into use until after February 1996; records suggest Cerecato's lawyer, Charles Korman, could not be reached for comment last week. But his office confirmed reports that Cerecato was aware that some untreated hormone was distributed in the second half of 1985.

However, Korman's office put the figure at only 10,000 ampules.

France's health minister, Hervé Gaymard, said last week that families of children injected with the suspect batches would be notified. According to the Pasteur Institute, 50 of the 90-plus people worldwide who have contracted CJD from growth hormone are French. But whether the untreated batches released after 14 May 1985 were to blame for any of these cases is unknown, as all the affected children began their treatment before this date.

Experts from other countries are argued at the time that the hormone would not be safe even after treatment with urea. At a meeting in Baltimore, Maryland, in the summer of 1985, French officials were "heavily criticised", says Michael Preece of the Institute of Child Health in London. "Things got heated and quite unpleasant," he says. "The general feeling was that no pituitary hormone should continue to be used." Experiments have since shown that urea cannot completely remove the CJD agent from a heavily contaminated sample.
BOBBY'S DREAM

Bobby was a dear little boy who loved almost everything. He was very fond indeed of dogs, birds, and ponies, and he enjoyed playing with them. One day he said, "I hope I can always stay at home with my pets. I should not like to leave them even to go to school."

The more he thought about it the less he thought he would like to go to school. He decided that each morning he would have a new excuse. Perhaps he wouldn't feel able to go. Maybe the day would be too hot or too cold. It might be raining. He loved to be out in the rain but not on a school day.

He well knew that when the time came he would go, for he always did what his mother wished him to do. Well, if he really must go to school he wouldn't go skipping along. He would go dragging his feet, looking very sad. Perhaps his mother would be sorry and call him back. Dear! Dear! Why did little boys have to go to school?
BOBBY'S DREAM

Father said, that in school children were trained to grow into good business people. But Bobby knew very well that even if he never went to school, he could keep a candy shop. That was what he had planned to do. So why should he bother about going to school?

On his birthday Bobby's father gave him a bright shining rake. He loved it and, of course, wanted to use it at once. It was autumn and the ground was covered with leaves.

"Bobby," said Mother, "you may rake the leaves. I'll pay you a quarter an hour."

Bobby's eyes shone. That was good pay for a little boy. So he went to work. He found it great fun. The leaves were such bright colors. He loved to rake them into mounds.

Presently out came Mother to see how he was getting along.

"Oh!" she cried, "how pretty they are! Let's make a house."

"A house? How?" asked Bobby.

"Why," said Mother, "did we never do that? You'll love it. See!"

She took the little rake and in a few moments had
one square room with a fence of leaves. This she divided into four parts.

"There are four rooms," she gayly cried, "parlor, sitting-room, bedroom, and kitchen. Now we will make a bed."

Soon she had a pile of leaves in a corner of one room.

"That's a nice soft bed," she said. "I hear the telephone. Lie down and rest until I come back; then we will play house."

Bobby lay on the bed of gay colors looking up at the sky. How pretty it was, shining so blue through the branches of the trees. He listened to the wind singing a drowsy tune, while the leaves seemed to be clapping their hands. Then—why, what was that?

A sudden swirl of leaves came scurrying toward him and he saw that each curly brown leaf enfolded a Brownie.*

"It's a regiment of Brownies," he thought as the captain marched them straight up in front of him where they stood very still in one long row. Then the captain cried, "Attention!"

For a moment, not a sound was to be heard. Then they all talked at once.

*A good-natured goblin that performs helpful services.
BOBBY'S DREAM

Bobby tried to hear what they said and after a while the captain silenced them and said: "You want to earn some money? Here's a fine chance for one of you. The captain of a big ship wants some one to go on a long trip with him. A ship is great fun,—especially when it sails to places where oranges, bananas, nuts, spices, raisins, and all sorts of goodies grow. The one who goes must know geography very well. Who wishes to go?"

For a moment there was no reply. Then came a sad little voice: "I'd love it, only I don't know my geography very well. I didn't like to go to school."

"Well," said the captain. "How's this? A man who sells prize dogs needs some one to write letters for him. The one who does this work may play with the dogs and may have one of the puppies for his own. He may have his choice of them. Who will take this place?"

"Oh! Oh!" cried the whole row. "We'd love it, but we didn't like to go to school and we can't write very well."

"I am sorry," said the captain. "Those puppies are beauties. Well, here's a man who wants some one to
work in a toy shop. He has wonderful toys from all over the world. There are talking dolls, toy ships, toy automobiles, toy farms with all kinds of animals, toy trains that run on tracks! A wonderful place is this toy shop. Who wishes this place? The one who takes it must be a very good reader and read to the man when he isn't busy."

"Oh," cried one, "I wish I could, but I can't read very well. I didn't like to go to school."

"That's too bad," said the captain. "Well, here is one more and it is the finest chance of all. A man has a pony farm. He wants a bookkeeper who knows arithmetic very well. The one who goes may use any pony he chooses. One special pet is as black as a raven's wing, with white feet and a white star on its forehead. It is named Silver Heels. It prances around in the meadow with hundreds of other ponies. Who would like to go to the pony farm?"

"Silver Heels!" Bobby cried—"I'd like to go! But I don't know arithmetic very well. I can add, but it doesn't always come out right. I didn't like to go to school."

Then Bobby heard shouts of laughter.
BOBBY'S DREAM

He opened his eyes to see his mother seated beside him.

"What did you dream, dear?" she asked. "You spoke right out loud and said you didn't like to go to school."

Bobby sat up and rubbed his eyes.

"Well," he said, "I dreamed I didn't, but I'm sure I shall love to go, Mother."

"Of course you will, Bobby, dear," said his mother.

Then Bobby slowly rose from his bed and finished raking the leaves.
Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers

By Michael C. Jensen*

Corporate managers are the agents of shareholders, a relationship fraught with conflicting interests. Agency theory, the analysis of such conflicts, is now a major part of the economics literature. The payout of cash to shareholders creates major conflicts that have received little attention.¹ Payouts to shareholders reduce the resources under managers' control, thereby reducing managers' power, and making it more likely they will incur the monitoring of the capital markets which occurs when the firm must obtain new capital (see M. Roth, 1982; J. H. Easterbrook, 1984). Financing projects internally avoids this monitoring and the possibility the funds will be unavailable or available only at high explicit prices.

Managers have incentives to cause their firms to grow beyond the optimal size. Growth increases managers' power by increasing the resources under their control. It is also associated with increases in managers' compensation, because changes in compensation are positively related to the growth in sales (see Kevin Murphy, 1985). The tendency of firms to reward middle managers through promotion rather than year-to-year bonuses also creates a strong organizational bias toward growth to supply the new positions that such promotion-based reward systems require (see George Baker, 1986).

Competition in the product and factor markets tends to drive prices towards minimum average cost in an activity. Managers must therefore motivate their organizations to increase efficiency to enhance the probability of survival. However, product and factor market disciplinary forces are often weaker in new activities and activities that involve substantial economic rents or quasi rents.² In these cases, monitoring by the firm's internal control system and the market for corporate control are more important. Activities generating substantial economic rents or quasi rents are the types of activities that generate substantial amounts of free cash flow.

Free cash flow is cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital. Conflicts of interest between shareholders and managers over payout policies are especially severe when the organization generates substantial free cash flow. The problem is how to motivate managers to disgorge the cash rather than investing it at below the cost of capital or wasting it on organization inefficiencies.

The theory developed here explains 1) the benefits of debt in reducing agency costs of free cash flows, 2) how debt can substitute

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²Rents are returns in excess of the opportunity cost of the resources to the activity. Quasi rents are returns in excess of the short-run opportunity cost of the resources to the activity.

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the top 200 firms in Dun's Business Month survey. Consistent with the agency costs of free cash flow, management did not pay out the excess resources to shareholders. Instead, the industry continued to spend heavily on E&D activity even though average returns were below the cost of capital.

Oil industry managers also launched diversification programs to invest funds outside the industry. The programs involved purchases of companies in retailing (Marscor by Mobil), manufacturing (Reliance Electric by Exxon), office equipment (Vydec by Exxon), and mining (Kennecott by Sohio, Anaconda Minerals by Arco, Cyprus Mines by Amoco). These acquisitions turned out to be among the least successful of the last decade, partly because of bad luck (for example, the collapse of the minerals industry) and partly because of a lack of managerial expertise outside the oil industry. Although acquiring firm shareholders lost on these acquisitions, the purchases generated social benefits to the extent they diverted cash to shareholders (albeit to target shareholders) that otherwise would have been wasted on unprofitable real investment projects.

Two studies indicate that oil industry exploration and development expenditures had been too high since the late 1970's. John McConnell and Chris Muscarella (1986) find that announcements of increases in E&D expenditures by oil companies in the period 1975–81 were associated with systematic decreases in the announcing firm's stock price, and vice versa. These results are striking in comparison with their evidence that the opposite market reaction occurs to changes in investment expenditures by industrial firms, and similar SEC evidence on increases in R&D expenditures. (See Office of the Chief Economist, SEC, 1985.) B. Pichichi's study of returns on E&D expenditures for 30 large oil firms indicates on average the industry did not earn "...even a 10% return on its pretax outlays" (1985, p. 5) in the period 1982–84. Estimates of the average ratio of the present value of future net cash flows of discoveries, extensions, and enhanced recovery to E&D expenditures for the industry ranged from less than 60 to 90 cents on every dollar invested in these activities.

V. Takeovers in the Oil Industry

Retrenchment requires cancellation or delay of many ongoing and planned projects. This threatens the careers of the people involved, and the resulting resistance means such changes frequently do not get made in the absence of a crisis. Takeover attempts can generate crises that bring about action where none would otherwise occur.

Partly as a result of Mesa Petroleum's efforts to extend the use of royalty trusts which reduce taxes and pass cash flows directly through to shareholders, firms in the oil industry were led to merge, and in the merging process they incurred large increases in debt, paid out large amounts of capital to shareholders, reduced excess expenditures on E&D and reduced excess capacity in refining and distribution. The result has been large gains in efficiency and in value. Total gains to shareholders in the Gulf/Chevron, Getty/Texaco, and Dupont/Conoco mergers, for example, were over $17 billion. More is possible. Allen Jacobs (1986) estimates total potential gains of about $200 billion from eliminating inefficiencies in 98 firms with significant oil reserves as of December 1984.

Actual takeover is not necessary to induce the required retrenchment and return of resources to shareholders. The restructuring of Phillips and Unocal (brought about by threat of takeover) and the voluntary Arco restructuring resulted in stockholder gains ranging from 20 to 35 percent of market value (totaling $6.6 billion). The restructuring involved repurchase of from 25 to 53 percent of equity (for over $4 billion in each case), substantially increased cash dividends, sales of assets, and major cutbacks in capital spending (including E&D expenditures). Diamond-Shamrock's reorganization is further support for the theory because its market value fell 2 percent on the announcement day. Its restructuring involved, among other things, reducing cash dividends by 43 percent, repurchasing 6 percent of its shares for $200 million, selling 12 percent of a newly created
Establishing and Maintaining a Multicultural Focus

Professional organizations such as ACEI have led in a call for renewed emphasis on preparing teachers by developing the skills and attitudes that will foster understanding and respect among children. Recognition of the varied facets of multiculturalism is one such skill that allows us to function more fully as individuals. In order to extend children's ability to respond to a diverse cultural group, broad-based, systematic teaching is required.

We should recognize that many cultures arise from common concerns or developmental tasks. Persons who are deaf or blind, homeless persons in urban settings, and migrant workers who move as a unit across transportation routes follow the crops all form a "culture." Age groups also represent separate cultures. Increasingly, we are aware of the special needs and concerns of the elderly, adolescents and preschoolers. New parents, single parents and parents of children with exceptional needs often develop specific attitudes and survival skills. Social class makes other cultures. Every group has specific concerns that influence their attitudes and behaviors in subtle and complex ways.

In a recent New York Times article, "A Puerto Rican Stew" (Santiago, 1994), the author examines how one's specific "stew" is determined.

Whatever I was, Puerto Rican or not, had been orchestrated by Mama. When I was 13, she moved us from rural Puerto Rico to Brooklyn. We went on to college English, to graduate from high school, to find jobs in clean offices. No facts. We were to assimilate into American society. To that end was the poverty she was forced to endure for lack of an education.

Santiago concludes:

I stayed behind, immersed in the American culture she feared. I never considered myself any less Puerto Rican. I was born there, spoke its language, identified with its culture. But to Puerto Rican society, I was a different creature altogether. I was too assertive, men said I was too feisty; my cousin suggested I had no background preparation, I had no celebration as a local point of discussion and subsequent projects. Extensive library holdings enabled the students to examine a range of reading levels and formats for two celebrations, Hanukkah and Kwanzaa.

I chose these two celebrations partly because of their similarities. The Menorah, the nine-candle lamp used for Hanukkah, is similar to the Kinara, the seven-candle holder used to celebrate Kwanzaa. One black candle is placed in the center of the Kinara and one, the Shapers, rests in the center of the Menorah and is used to light the other Hanukkah candles.

Synthia Saint James' book, The Gifts of Kwanzaa, employs vivid design to portray African Americans reaffirming their culture and values. It could be read by young children, but can be easily read by children in 2nd and 3rd grade and up.

These celebrations provide beginning points for exploration and appreciation of cultures. By involving members from the school community in the program of studies, additional research opportunities can be found.

—Mary McKnight Taylor, VI, Later Childhood/Early Adolescence

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Multimedia Systems: An Overview

Borko Furht
Florida Atlantic University

Multimedia systems combine a variety of information sources, such as voice, graphics, animation, images, audio, and full-motion video, into a wide range of applications. The big picture shows multimedia as the merging of three industries: computing, communication, and broadcasting.

Research and development efforts in multimedia computing fall into two groups. One group centers its efforts on the stand-alone multimedia workstation and associated software systems and tools, such as music composition, computer-aided learning, and interactive video. The other combines multimedia computing with distributed systems. This offers even greater promise. Potential new applications based on distributed multimedia systems include multimedia information systems, collaboration and conferencing systems, on-demand multimedia services, and distance learning.

The defining characteristic of multimedia systems is the incorporation of continuous media such as voice, video, and animation. Distributed multimedia systems require continuous data transfer over relatively long periods of time (for example, playback of a video stream from a remote camera), media synchronization, very large storage, and special indexing and retrieval techniques adapted to multimedia data types. The sidebar lists a number of acronyms relevant to multimedia systems.

Technical demands

A multimedia system can either store audio and video information and use it later in an application such as training, or transmit it live in real time. Live audio and video can be interactive, such as multimedia conferencing, or noninteractive, as in TV broadcasting. Similarly, stored still images can be used in an interactive mode (browsing and retrieval) or in a noninteractive mode (slide show).

The complexity of multimedia applications stresses all the components of a computer system. Multimedia requires great processing power, to implement software codecs, multimedia file systems, and corresponding file formats. The architecture must provide high bus bandwidth and efficient I/O. A multimedia operating system should support new data types, real-time scheduling, and fast interrupts processing. Storage and memory requirements include very high capacity, fast access times, and high transfer rates. New networks and protocols are necessary to provide the high bandwidth, low latency, and low jitter required for multimedia. We also need new object-oriented, user-friendly software development tools, as well as tools for retrieval and data management—important for large, heterogeneous, networked and distributed multimedia systems.

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A guided tour of multimedia systems and applications (adapted by)  
Borko Furht, Milan Mislenkovic

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Multimedia compression

Compression techniques can play a crucial role in digital multimedia applications. Audio-visual compression techniques are important in many multimedia applications, such as video compression, which is used in personal computing, videoconferencing, and entertainment systems. The development of these techniques is often driven by the need for efficient storage and transmission of multimedia data.

Table 1 illustrates the requirements for multimedia applications.

<table>
<thead>
<tr>
<th>Storage requirements</th>
<th>Typical multimedia requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 MB</td>
<td>2 GB/hour for video, 1 GB/hour for audio</td>
</tr>
<tr>
<td>50 MB</td>
<td>1 GB/hour for video, 0.5 GB/hour for audio</td>
</tr>
<tr>
<td>20 MB</td>
<td>0.5 GB/hour for video, 0.25 GB/hour for audio</td>
</tr>
<tr>
<td>10 MB</td>
<td>0.25 GB/hour for video, 0.125 GB/hour for audio</td>
</tr>
</tbody>
</table>

Table 1: Multimedia Storage Requirements

Even if we had enough storage available, we wouldn't be able to store the video in real-time, since a typical video file requires about 10 GB per hour of storage capacity.

To compress a typical video file using lossless compression, we would need to reduce the data rate to about 1 GB per hour. This would require about 50 GB of storage for a typical video file.
Composition = area + space

Space is the interval between areas. Both area and space make up a composition. The term composition is by no means confined to the visual arts. It can mean: the act of putting together; the formation, construction; the formation of words into a compound word; the construction of sentences, the art of literary production; the act, art, of composing music, a piece of music or writing; the setting up of type; the arrangement of the parts of a picture, etc.; the thing composed, mixture.

The most obviously different types of composition in art are those that are symmetrical and those that are asymmetrical – but is a truly symmetrical composition really possible and aesthetically satisfactory? Has it got enough dynamic quality to stir the senses of the spectator? Even the most traditional art which appears symmetrical is often not entirely so. In this respect traditional art is just as modern as contemporary art. Although it is difficult to generalize, even in a classical composition great attention is paid to obtaining the right measure of symmetry and asymmetry. Consider Leonardo’s Last Supper, painted between 1495 and 1497. The structure of the composition, i.e. the architectural properties of the interior and the position are entirely symmetrical, obeying proudly the recently discovered laws of perspective; but in contrast, the language of hands swings above this symmetry to form a rhythm of never-ending ‘togetherness’, and this not only by the language of hands, but also by the direction of view, the treatment of figures and even of the drapery which are all depicted in forceful asymmetry. Analysing the
composition into basic areas and spaces will demonstrate this point fully: in fact, it will make Leonardo's work look like a modern composition. An analysis of Raphael's Cartoons of 1509-11 will result in the same kind of observation. In fact, this work has no static, symmetrical background but a dynamic, asymmetrical structure and composition.
Solutions and Solubility

A solution is a homogeneous mixture of two or more substances; it may be gaseous, liquid or solid, and its constituents are usually called solvents and solutes. There is no particular reason why any one component of a solution should be termed the solvent, but it is conventional to give this name to the component present in excess. Many cases exist, however, where considerable confusion can arise. For example, a salt such as potassium nitrate fuses in the presence of small amounts of water at a much lower temperature than the pure salt does. The term 'solvent' for water can hardly be justified in such cases. It may seem strange to refer to 'a solution of water in potassium nitrate', yet this would be the correct description. It has been suggested that fusion is nothing more than an extreme case of liquefaction by solution, so it may be said that when a salt dissolves in water, the salt does, in fact, melt. Owing to the widespread and often indiscriminate use of the word 'melt', it is difficult to give a precise definition of the term. Strictly speaking, a melt is the liquid phase of a pure substance that is solid at normal temperatures. In its general application the term also includes homogeneous liquid mixtures of two or more substances that solidify on cooling. Thus 2-naphthol (mp 96°C) in the liquid state is a melt. Homogeneous liquid mixtures consisting of, say, 2-naphthol and β-naphthol (mp 122°C), or α-naphthol, β-naphthol and naphtalene (mp 80°C), would also be considered to be melts, whereas liquid mixtures containing, say, 2-naphthol and benzene, or 2-naphthol, β-naphthol and ethyl alcohol could be classified as solutions. It must be pointed out, however, that no rigid definition is possible; the KNO3-H2O system quoted above, and the many well-known cases of hydrated salts dissolving in their own water of crystallisation at elevated temperatures, would in all probability be considered to be melts.

SOLUBILITY DIAGRAMS

The composition of a solution can be expressed in a number of ways. One is to state the weight of solute present in a given volume of solution, for example, the concentration of a certain salt solution may be quoted as 20 g/l. Although this sort of expression may be convenient for the analytical laboratory, it can be most inconvenient in industrial practice, since it is necessary to know the density of the solution before the relative weights of solute and solvent can be determined. Volume measures can be rather misleading, as they are dependent upon temperature. Another method is to state the weight of solute present in a given weight of solution, but here again the volume weights of solute and solvent are not expressed precisely.

The solubility of a solute is most conveniently stated as the parts by weight present (of 100 parts) by weight of solvent. To avoid confusion in the case of a salt that dissolves in water, the solute concentration should always be given in the anhydrous salt. No difficulty will then arise as long as several hydrated forms can exist over the temperature range considered.

All the above methods of solubility expression can lead to the use of the term 'percentage concentration', and unless precisely defined this term can be very misleading. For instance, a 10 per cent aqueous solution of sodium sulphate could, without further definition, be taken to mean any one of the following:

10 g of Na2SO4 (anhyd.) in 100 g of water
10 g of Na2SO4 (anhyd.) in 100 g of solution
10 g of Na2SO4·10H2O in 100 g of water
10 g of Na2SO4·10H2O in 100 g of solution

To show how misleading this loose form of expression can be let 10 g of Na2SO4 (anhyd.) in 100 g of water be the correct description of the solution concentration. This would then be equivalent to

9.1 g of Na2SO4·10H2O in 100 g of solution
206 g of Na2SO4·10H2O in 100 g of solution
260 g of Na2SO4·10H2O in 100 g of water

Solubility data may also be recorded in terms of equivalent, molar or molal quantities; a normal solution (n) contains one g-equivalent of the solute per litre of solution, and a molar solution (m) contains one mole per litre. These expressions are particularly useful in laboratory practice, but both are temperature-dependent; the normality and molarity of a given solution decreases as an increase in temperature. A molal solution (m) contains one mole of solute per kg of solvent, and concentrations are often expressed in terms of molality when phase changes occur in the solute solvent system over a great temperature range.

Concentrations expressed as moles of solute per mole of mixture are frequently used in industrial practice especially for multicomponent liquid mixtures. The mole fraction \( x \) of a particular component \( m \) in a mixture of several substances is given by

\[ x = \frac{m_1}{m_1 + m_2 + m_3 + \ldots} \]

where \( m \) is the mass of a particular component, and \( M \) is molecular weight.

For any mixture the sum of all the mole fractions is unity. The term 'mole percentage' (100 \( x \)) is also used.

The mean molecular weight \( \bar{M} \) of a mixture is given by

\[ \bar{M} = \frac{m_1 + m_2 + m_3 + \ldots}{m_1 + m_2 + m_3 + \ldots} \]

(2.1)

(2.2)
Managing Portfolio Concentrations through Diversification

by Janice M. Weiland

Managing portfolio diversification has become more important in recent years as the financial industry has grown and the demand for financial products and services has increased. Many banks and other financial institutions have implemented diversification strategies to limit business risk, reduce losses, and stabilize profits.

Past Practices

In the past, banks have often focused on marketing their services to a specific audience, characterized by geographic region, income level, or other factors. This strategy has allowed banks to build strong relationships with certain customer segments, but it has also led to overexposure in certain industries or geographic areas. For example, a bank that specializes in loans to restaurants in a particular city might see its business greatly affected if the city's economy experiences a downturn.

Benefits of Diversification

Diversification can help banks manage risk and improve their financial performance. By spreading their investments across different industries and regions, banks can reduce their exposure to potential losses in any one area. This can help stabilize profits and reduce the impact of economic downturns.

Current Strategies

Today, banks are using a variety of strategies to diversify their portfolios, including investing in new markets, building relationships with new customers, and developing new products and services. These strategies can help banks adapt to changing economic conditions and remain competitive in a rapidly evolving financial landscape.

Conclusion

In conclusion, diversification is a critical strategy for banks and other financial institutions. By managing their investments carefully and actively seeking out new opportunities, banks can reduce their exposure to risk and improve their overall financial performance.
Consumer and Business Credit Diversification

Consumer credit can be analyzed and managed by customer, product type, and location. In most cases, the customer is an individual consumer, products are specifically defined without negotiation, and the consumer lives at one principal location.

Identifying the concentrators in the business loan portfolio can be a complex and more complex commercial credit is complicated by diversification of corporate organizations and relationships. In addition, credit products are not standardized and are subject to negotiation. Commercial credit is also subject to the potential of a concentrated balance in a single institution.

Information Gathering for Management Reports

Some banks interested in market analysis use portfolio analysis to identify and measure the risk associated with credit exposure. This process is critical in the evaluation of the credit portfolio. It involves setting up a systematic approach to the identification of risk factors and the development of a comprehensive risk management strategy.

Risk Grading

The current risk characteristics of the loan and the obligor must be determined. This can be accomplished through a periodic loan review process and its assignment to an individual loan. The process involves the determination of the loan's risk characteristics and its classification into one of several risk categories based on a systematic and consistent approach.

Sorting credits within the business loan portfolio by industry and risk rating provides the bank with the necessary information to manage the loan's exposure and the associated risks. In the auto retail loan, the bank may learn that a business loan portfolio is significantly impacted by the increasing reporting, it would be useful, to identify the loan as one related to both real estate and auto retail.

Secondary income flows, including the auto retail, might include the sale of real estate and additional income generated by the loan. This information is critical in determining the risk associated with the loan and the appropriate mitigation strategies.
located in a certain geographic area is risk rated below average, which indicates there is some concern about the eventual repayment in full of some of these loans. After gathering more information, the bank may learn that aggressive price competition among repair shops has significantly weakened profitability because of the influx of several similar new businesses into the region. From a strategic viewpoint, the bank may determine that until the risk characteristics improve, additional loans to similar businesses in that general location will be limited.

Of course, this example is only meaningful if the bank has a reporting system that allows it to look at more than one variable in a single report. To reach the conclusion that additional loans should be limited, senior management would need to see the relationship between the industry, the location, and the risk rating.

Establishing Limits
Limiting credit exposure to certain concentration segments has become an active part of sound portfolio management. Limits allow a bank to manage exposures effectively and communicate portfolio goals to lenders. Setting limits may reflect a desire on the part of the bank to reduce exposure to existing segments, or it may indicate the level to which the bank is willing to increase exposure. Some banks may set limits less definitively. These institutions may extend to some of their lenders to consider limits as guidelines rather than as settings above which credit will never be granted. In either case, when limits have been established, concentration reports can include the limit and any variance.

Setting portfolio limits is not a new concept, but it is an important discipline in the process of portfolio management. Today, many banks have chosen to view their respective loan portfolios in their entirety and set limits for all exposures, not simply those that raise concern. In addition, other credit exposures are being aggregated with traditional loan exposure to determine risk more comprehensively.

Conclusion
To some degree, all banks, no matter what size or level of sophistication, should be able to manage portfolio concentrations and focus risk diversification strategies. As an example, the managers of a small community bank may have some concern that there is a significant exposure to local architects, building supply retailers, or accountants within the loan portfolio. As a result, procedures can be implemented to gather additional data at the time of approval and booking, including SIC code, collateral type, and the assigned credit risk rating. This information will allow for detailed information reporting to management. Using such reports, the bank is better able to monitor exposures, determine appropriate limits, and prepare a marketing strategy regarding participation in specific business lines.

By focusing additional attention on the issues of portfolio concentration,
Dynamic Critical-Path Scheduling: An Effective Technique for Allocating Task Graphs to Multiprocessors

Yu-Kwong Kwok, Member, IEEE Computer Society and Ishfaq Ahmad, Member, IEEE Computer Society

Abstract—In this paper, we propose a static scheduling algorithm for allocating task graphs to fully connected multiprocessors. We discuss six recently reported scheduling algorithms and show that they possess one drawback or the other which can lead to poor performance. The proposed algorithm, which is called the Dynamic Critical-Path (DCP) scheduling algorithm, is different from the previously proposed algorithms in a number of ways. First, it determines the critical path of the task graph and selects the next node to be scheduled in a dynamic fashion. Second, it rearranges the schedule on each processor dynamically in the sense that the positions of the nodes in the part of schedules not fixed until all nodes have been considered. Third, it selects a suitable processor for a node by looking ahead the potential start times of the remaining nodes on that processor, and schedules relatively less important nodes to the processors already in use. A global as well as a pair-wise competition is carried out for all seven algorithms under various scheduling conditions. The DCP algorithm outperforms the previous algorithms by a considerable margin. Despite having a number of new features, the DCP algorithm has admissible time complexity, is economical in terms of the number of processors used and is suitable for a wide range of graph structures.

Index Terms—Algorithms, clustering, list scheduling, multiprocessors, processor allocation, parallel scheduling, task graphs.

1 INTRODUCTION

An efficient scheduling of a parallel program onto the processors is vital for achieving a high performance from a parallel computer system. When the structure of the parallel program in terms of its task execution times, task dependencies, task communications and synchronization, is known a priori, scheduling can be accomplished statically at compile time. The objective is to minimize the schedule length. It is well known, however, that multiprocessor scheduling for most precedence-constrained task graphs is an NP-complete problem in its general form [12], [21]. To tackle the problem, simplifying assumptions have been made regarding the task graph structure representing the program and the model for the parallel processor systems [7], [14]. However, the problem is NP-complete even in two simple cases: 1) scheduling unit-time tasks to an arbitrary number of processors [13]; 2) scheduling one or two time unit tasks to two processors [9]. There are only two special cases for which optimal polynomial-time algorithms exist. These cases are scheduling tree-structured task graphs with identical computation costs on an arbitrary number of processors and scheduling arbitrary task graphs with identical computation costs on two processors [18], [33]. However, even in these cases, no communication is assumed among the tasks of the parallel program. It has been shown that scheduling an arbitrary task graph with intertask communication onto two processors is NP-complete and scheduling a tree-structured task graph with intertask communication onto a system with an arbitrary number of processors is also NP-complete [25].

For more realistic cases, a scheduling algorithm needs to address a number of issues. It should exploit the parallelism by identifying the task graph structure, and take into consideration task granularity, arbitrary computation and communication costs. Moreover, in order to be of practical use, a scheduling algorithm should have low complexity and should be economical in terms of the number of processors used [3], [11]. Because of its vital importance, the scheduling problem continues to be a focus of attention from the research community [4], [9], [15], [16], [17], [19], [22], [25], [29], [31], [34].

In this paper, we propose a new static scheduling algorithm. The proposed algorithm, which is called the Dynamic Critical Path (DCP) algorithm, schedules task graphs with arbitrary computation and communication costs to a multiprocessor system with unlimited number of fully-connected identical processors. The DCP algorithm tackles the drawbacks of previous approaches and outperforms them by a considerable margin. The algorithm has admissible time complexity. It is also economical in terms of the number of processors used and is suitable for different types of graph structures.

The remainder of this paper is organized as follows. In the next section, we describe the background of the scheduling problem including some of the major issues involved. In Section 3, we describe six recently reported scheduling algorithms. The merits and limitations of these algorithms are discussed briefly. In Section 4, we describe our DCP sched-
6.4 Number of Processors

Another quality of measure for a scheduling algorithm is the number of processors used because each algorithm "spends" a processor in a different way. Figure 17 shows the average number of processors used by each algorithm for different graph sizes. These averages were taken across all types of task graphs and values of CCR. We observe that DSC used considerably large number of processors compared to the other algorithms while DLS and MCP used approximately the same number of processors. Here, MD outperformed all other algorithms while DCP used slightly more processors than MD. However, this is due to the deficiency of MD because it tries to cluster tasks on lower processors. As a result, the schedules generated by MD are not very well load balanced. On the other hand, DCP overcomes this deficiency of MD and produces better schedule lengths by performing some load balancing at the expense of a few more processors.

Fig. 17. Average number of processors used by each algorithm: algorithm ranking, MD, DOP, MCP, ETP, DLS, EZ, DSC.

6.5 Comparison of Running Times

Finally, we compare the running times of these algorithms which are given in Fig. 18. From this figure, we can immediately notice that DLS is slower than the other algorithms. It should be noted that the version of DLS used by us was the one that generates the best solution but has a higher complexity. Both DSC and MCP are low complexity algorithms. However, they do not always produce short schedule lengths. The running times of DCP were comparable to MD but more than DSC and MCP. However, the running times of DCP were admirable. Note that the algorithm ranking shown in Fig. 18 is consistent with the given complexities of these algorithms.

Fig. 18. Average running time for each algorithm: algorithm ranking, DSC, ETP, MCP, EZ, DCP, MD, DLS.

2. Although MCP, DLS, and ETP assume a limited number of processors, they are given a very large number of processors in our experiments so that this is not a limiting factor on their performance.

7 CONCLUSIONS

In this paper, we have presented a new scheduling algorithm which outperforms six other algorithms. The difference between the performance of our algorithm and the other algorithms is also much higher than the difference between the performance of other algorithms when compared against each other. The proposed algorithm works better on various types of graph structures. The number of processors used and the running time of the proposed algorithm makes it a viable choice for static compile-time scheduling of macro-data flow graphs and other task graphs onto multiprocessors. The proposed algorithm in its present form assumes a network of fully connected processors but can be generalized to other networks such as hypercube, mesh, etc. In order to accomplish that, the procedure for computing the start times of nodes on the processors will need to be modified and it will need to take into account the hop distances of the processors holding the parent nodes.

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REFERENCES

CRYSTAL HABIT MODIFIERS

1. THE RELATIONSHIP BETWEEN THE STRUCTURE OF THE ADDITIVE AND THE CRYSTAL LATTICE

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The crystal habits of NaCl and KCl are significantly modified by nitritroacetamide (NTAA) and nitro-
trisopropionamide (NTPA) as shown by scanning electron microscope photomicrographs. The various
effects are correlated with the tie between the molecular structure of the additives and the lattice of the
crystals.

1. Introduction

Certain substances, which act as "inhibitors" of crystal growth and as anti-caking agents, are also effective
crystal habit modifiers. A most striking example is potassium, or sodium, ferrocyanide added in trace
amounts to reduce the caking tendencies of sodium chloride during storage; these ferrocyanides also have a
strong effect on the crystallization habit of sodium chloride. In the presence of the ferrocyanide star-like
NaCl crystals are formed. Actually, they are eight-sided cubes as may be seen from scanning electron
microscope photomicrographs

Phoenix tested many organic substances and found that nitritroacetamide (designated NTAA) was a very
effective anti-caking agent for NaCl. It is interesting to note that related compounds such as nitritonitroac-
etamide or nitroacetic acid have no effect at all on the growth habit of NaCl. On the other hand, NTAA has
no effect on the anti-caking properties of KCl. Other known crystal habit modifiers, such as the ferrocyanides
or lead ions, significantly affect both KCl and NaCl, though not to the same extent

This study was undertaken in order to find reasons for the very special selectivity between NaCl and NTAA.
Any information concerning this phenomenon may also help to advance the understanding of the interfering
mechanism of crystal habit modification. For this purpose the habit modifying effect of NTAA and of nitro-
trisopropionamide (NTPA) on NaCl and KCl were compared.

2. Experimental

The organic compounds were dissolved in water and added to saturated solutions of NaCl and KCl so as to
make the concentration of the additive 50 ppm, i.e. 50 µg/ml solution. The volumes employed were: 9 ml
of saturated salt solution mixed with 1 ml of 500 ppm additive solutions.

Four solutions were thus prepared:

(A) NaCl + NTAA,
(B) KCl + NTAA,
(C) KCl + NTPA,
(D) NaCl + NTPA.

A few drops of each unsaturated solution were placed on a microscope slide and observed under an
optical microscope. While the water was evaporating crystals spontaneously formed in the solution. They
were allowed to grow to an appreciable size, washed in acetone, carefully dried mounted on stubs, gold-coated
in vacuum and examined by a Cambridge S-100 Scan-
ning Electron Microscope.
Models of the organic molecules were constructed from Buchi Dreiding Stereomodels and the (100) faces of NaCl and KCl were drawn to match the same scale.

3. Results and discussion

Sodium chloride crystals grown in the presence of NTAA, from solution A, have the external appearance of well-developed cubes with sharp edges, but each cube is partly hollowed (fig. 1). The contours of the holes have the shapes of inverted pyramids with clearly visible steps descending from four sides to a common center. The “block” structure of the steps in these skeleton-type cubes can be seen in fig. 2. Thus, the effect of NTAA on NaCl crystallizing from a super-
ART
THE SPIRITUAL
EARTHLY POWERS
ON LETTING OLD STONES SING

Charles Pickwick investigates our inability in the twentieth century to fathom a holy site.

VUE SPLENDIDE boasted the cafe in large capital letters on an adjacent wall. But the vast acres of sand and marsh its patrons were invited to admire were awesomely romantic.

This was at Mont St Michel, that town on a rock on the border of Normandy and Brittany that boasts of being the West's most visited tourist spot after Disneyland.

In a rather superior way we had been amusing ourselves watching the flashing of a thousand bulbs, an cameras of all those other tourists who were trying desperately to capture the mysterious essence of this extraordinary place. We had just been to mass in the Abbey church, it was September 29, the feast of St Michael, patron deity of the Mount, as of so many other sites of pilgrimage in remote and inhospitable places. Moreover, we had previously acquired a tide table which assured us that at 6:25pm the tide would be high enough for the sea to make one of its rare sorties across the sands coming in, legend has it faster than a horse can gallop to cut off the unwary and lay at the very rock on which Mont St Michel is built.

But there was a hollow ring to our experience, so that neither the symbolic majesty nor the mystery of earth's natural rhythms expressed as in our tide table could quite do justice to the extraordinary voids in other words will do of this outpost of civilisation, where the fantastical, amorphous forces of sea and swamp come up against the hard particularity of rock, walls and abbey. The isolation and unfeeling nature of this rock surrounded by mudflats, the frequency of lightning strikes, the treacherous irregularity of the tides, and a century and more legends have given the place a resonance that perpetually evokes the millions of tourists a year who visit us, ourselves included.

The problem is simply that the modern world has no vocabulary in which to view the palpable aura of a sacred place, one of those thin spots on the earth's crust where ordinary and quite rational people enter the realm of the unknown. In the Middle Ages vast numbers of pilgrims would have lit candles here at the shrine of the Archangel Michael — as today's tourists flash their cameras — but they at least had the advantage of knowing what they were doing: worshipping at the shrine of a powerful saint, and asking his prayers and protection. Today's tourists are not so fortunate. You can see the frustration on their faces as they try to express their feelings with a single word: "Quaint", especially in an American accent, hardly does justice to such profound unease.

From Wagner onwards it has been a truism of European thought that the arts must come to the aid of beleaguered religion, and so perhaps it is to the arts that we should look for and better to articulate our response to the sacred. By far the most impressive and daring attempt in recent times to grapple with the meaning of Mont St Michel took place in 1988, when Laurent Maget secured funding for a grandiose project on a scale unequaled by the average patron. The French army were drafted in to erect 350 one metre square reflective aluminium plates on scaffolding bases, to form the shapes of Roman numerals marching in a straight line across the sands at the foot of the Mount. For the two weeks of the autumn equinox, these figures, twenty feet tall, were swept by the shadow of the 150 foot spire of the abbey atop the Mount, which thus became the pointer of a sundial on the shadow of those quarters of a minute long.

The effect — to judge from the aerial photos — was phenomenal. The row of figures, standing off to infinity amid eddying patterns of wind and wave, a straight line where no straight line should be, came to represent the powers of reason of the intellect, of that timeless sense of rationality which saves human evaluation from descending into chaos — just as for Victorian England the thin red line of soldiers holding their own against a mass of advancing troopers spelt reason and discipline triumphing over chaos through time.

The sweep of the shadow of the yard long figures across the artificial Aluminium Roman numerals juxtaposed at the top of a natural telluric rhythms of spring tide and spring tide, equinox and solstice these deeper
Thomas Dewey, Entering the Wood, 1991, oil on board, 48 2 x 60 9 cm. Paintings reproduced here were on show in Art in Worship, at Worcester Cathedral.

and darker cycles from which urbanised, industrialised, fatigued man and woman are alienated. The viewer was reminded of the different levels of the abbey site, each corresponding to a different period of European civilisation, levels reaching down to the Celtic shrine of Lug-Belinos, god of light, and probably beyond that to the very birth of consciousness.

In an interview, Laurent Maget said that he had sought "a faire renaître le temps" - to make the place resonate. It sounded rather as if, sharing the twentieth century's frustration with the Holy, he had actually been intending to get the place by the scuff of the neck and shake it until it sang! Certainly, he succeeded in evoking the genius of the place, even if he left it more mysterious than before.

So much for France, a country where they take Art seriously. What of England? A recent exhibition in Worcester cathedral, 'Art in Worship: modern paintings as altar-pieces' prompted the hope that even here something similar might be going on. Organised by the Worcester Diocesan Advocacy Committee with help from Sister Wendy Beckett, the well-known contemplative and art critic, it featured fourteen works by some of the best known of mainly the younger generation of British painters and sculptors.

The star of the show was an ex-catalogue item. The cathedral is being restored at present, with large areas closed off. One of the great nave piers is entirely wrapped in large blue and grey sheets of builders' polystyrene. These slightly torn sheets, applied horizontally across the tall scaffolding poles they are meant to hide, are magnificent. Christo himself could not have done it better. The eye is drawn irresistibly upwards all the way to the roof. The sheeting emphasises the massive bulk of the great column and the loftiness of the roof. Even the colours blend in well with the cathedral stonework, while the presence of plastic sheeting in the stone nave gives a sense of delight at such irreverence.

By contrast, the pictures in the show itself had to strive hard to compete with the awe-inspiring vibrations of the cathedral! Not many people's favourite cathedral, Worcester has yet a darkness and heaviness which evoke powerful chromatic rhythms. The artists, by choosing to exhibit here rather than in the neutral space of a gallery, were deliberately exposing themselves to this interference. Like some great beast, the cathedral devoured the tiny egos of most of the artists exhibited, whose works were drowned like children's voices in the wind. These artists fortunate enough to be displayed in the beautifully restored crypt had a better time of it. In that intimate space, anything would have looked good. But of those works upstairs attempting monumentality, only one seemed to have taken the pulse of the cathedral correctly. This was Eucharistic Screen by Edwin Leppman, simply a large blue-brown colour field in colour rather similar to that of the plastic sheeting, with regular, horizontal striations like tidal ripples on sand. In a gallery as in reproduction, the piece would, I imagine, look merely drab, but here the setting of the cathedral provided, as it were, the resonant frequency that enabled it to sing.

Its waves spoke of endless time, of history, of sacred space, of generations of pilgrims, of - if one might be so bold - the depths of the soul.

What then of our theologians, those who are paid precisely to give words to the divine in our midst, to lift our unseeing?

The major catalogue essay for the exhibition was written by Don 'Sea-of-Faith's' Cupitt, the distinguished Cambridge theologian, who has done so much to try to bring theology into dialogue with the twentieth century. He places great emphasis on the arts in his books, because they give an example to theology of how to construct an imaginative language to deal with life's profundities. So far so good. But in practice, Cupitt's wonderful, ethereal theology is as delicate and passionate as the Japanese art he admires. It cannot do justice to the earthliness of a sacred place. Perhaps the problem is that he has been for too long breathing in Cambridge's unpolluted, puritan air. If stay in Oxford he must, let him at least leave the bracing winds of Cambridge for the fetid smell of Catholic Oxford, the reddened, incense-laden air that might let his theology ferment, develop some must, some pourvaire noble. Or perhaps he might spend a few hours at Mont St Michel in the café with the view splendid, gazing over the mudflats, waiting for the Sea of Faith to unexpectedly rush in, or at least to imbibe the singing of old stones.
perspectives, absence of regular interpersonal forums of communication, ambivalence between authority and support roles of external agencies, and solutions that are worse than the original problems combine to erode the likelihood of implementation.

The difficulties in the relationship between external and internal groups are central to the problem and process of meaning. Not only is meaning hard to come by when two different worlds have limited interaction, but misinterpretation, attribution of motives, feelings of being misunderstood, and disillusionment on both sides are almost guaranteed.

Government agencies have become increasingly aware of the importance and difficulty of implementation and are allocating resources to establishing implementation units, to assessing the quality of potential changes, to supporting staff development, to monitoring implementation of policies, and to addressing other factors discussed in this chapter. Whether they will be successful is a relative matter, related partly to the resources required to address problems and partly to the capacity of local school systems to use these resources effectively.

The offer by governments of additional resources for educational reform is embedded in the U.S. educational system, even with recent major cutbacks in federal expenditures. These resources provide the margin required for implementation support in many school districts. As one might predict, whether they are used for better implementation depends on the characteristics of local systems. The larger issue of compliance with federal and state policies raises a host of questions, which are taken up in Chapter 13 (See Emore, 1980, for an excellent brief account of the problem).

Technical assistance for implementation (materials, consultany, staff development, etc.) is frequently available in federal- or state-sponsored innovative programs. We have learned a great deal in the past few years about the conditions under which external help is needed and effective (see Chapter 11; also Louis & Rosenblum, 1981; Crandall et al., 1982).

The unrelenting observation at this juncture is that outside assistance or stimulation can influence implementation greatly, provided that it is integrated with the factors at the local level described above.

To conclude the discussion of external factors, the multiplicity of post-decisional decisions after educational legislation or new programs involves several layers of agencies. That success is achieved in many instances is a reflection that some people "out there" know what they are doing. Sharing and developing the know-how should be a major goal of those interested in educational change.

KEY THEMES IN THE IMPLEMENTATION PROCESS

Innovations have become increasingly more holistic in scope as reformers have realized that introducing single curriculum changes amounts to tinkering. As these changes have become more organic and multidimensional, it has been necessary to rethink the change process. Discussing individual roles and lists of factors, while helpful to a point, seems no longer adequate. Researchers and initiators of change have reconceptualized and studied change projects by identifying key themes in successful improvement efforts. This has resulted in a much more dynamic and vivid picture of the change process.

Miles (1987) captures this new approach as he summarizes findings from a study of successful urban high schools:

The need for a vision of what the school should look like is affected by two conditions: the principal must exercise leadership in promoting a vision, but the staff must also be cohesive enough to be willing to buy some shared set of goals. Having a vision leads indirectly to good implementation by creating an enthusiasm that increases willingness and initiative, but also by creating an environment in which a long-term vision of the future permits program evolution that is always progressive, but reflects growth of activities rather than limiting implementation. (p. 7)

There are a number of recent studies that provide clear descriptions of the main themes in successful change at the school level (Louis & Miles, 1990; Marsh, 1986; Wilson & Corcoran, 1988). The message is consistent and in this research that a small number of powerful themes in combination make a difference.

The most fully developed conceptualization of this new approach is contained in Louis and Miles (1990) study of how urban high schools improve. They identify five major themes: vision-building, evolutionary planning and development, initiative-taking and empowerment, resource and assistance mobilization, and problem-solving. I used Louis and Miles' scheme as the starting point for developing figure 5.2. I see six themes as paramount. Five are contained in Louis and Miles' study (I have relabeled resource and assistance mobilization as staff development and resource assistance, and problem-solving as monitoring/problem-solving). I have added a sixth theme, namely, restructuring, because it is clear that altering the organizational arrangements and roles in schools is essential to reform.

Vision-Building

Vision-building feeds into and is led by all other themes in this section. It permeates the organization with values, purpose, and integrative for both the what and how of improvement. It is not an easy concept to
FIGURE 5.2. Key Themes in Improvement

Vision-Building

Initiative-Taking & Empowerment

Classroom
School Improvement

Evolutionary Planning

Staff Development / Resource Assistance

Monitoring / Problem-Coping

Restructuring

work with, largely because its formation, implementation, shaping, and reshaping in specific organizations is a constant process. Renz and Narius (1985) make it clear that vision formation is a dynamic interactive process.

All of the leaders to whom we spoke seemed to have been masters at selecting, synthesizing, and assimilating an appropriate vision of the future. If there is a spark of genius in the leadership function at all, it must be in this transcendent ability, a kind of magic, to assemble—out of all the variety of images, signals, forecasts and alternatives—a clearly articulated vision of the future that is at once single, clearly understood, clearly desirable, and energizing (p. 101).

Miles (1987) stresses that vision involves two dimensions: “the first is a sharable, and shared vision of what the school could look like; it provides direction and driving power for change, and criteria for steering and focusing; the second type is a shared vision of the change process—what will be the general game plan or strategy for getting there?” (p. 122; their emphasis). Note the emphasis on shared sense of purpose concerning both the content and the process of change.

As reforms become more complex and directed to transforming the educational system, strategies for building a shared vision have to reflect a broader agenda. Anderson and Cox (1987, pp. 8, 9) suggest the following: be open to different views and perspectives, maintain a core of well-regarded and capable people to keep synthesizing and articulating the evolving view of the system, as much as possible allow for direct experiences with elements of the change idon’t let people become passive ob-

Evolutionary Planning

Once implementation was underway toward a desirable direction, the most successful schools in Louis and Miles (1990) study adapted their plans as they went along to improve the fit between the change and conditions in the school to take advantage of unexpected developments and opportunities. Blending top-down initiatives and bottom-up participation is often a characteristic of successful multilevel reforms that use amounts to evolutionary planning approaches (March, 1998).

For major change, says Miles (1987), “right forward scenarios are undesirable: ‘those steering school improvement need good data on what is happening, and the capacity to take advantage of unexpected developments in the service of vision’” (p. 13). Have a plan, but learn by doing is the message, one strongly echoed in the business literature (Kanter, 1989). As Tom Peters (1987) advises, “Invest in applications-oriented small starts,” pursue immediate development of innovations; “encourage piloting of everything,” “practice creative swiping, “practice purposeful impatience,” “support fast failures.” All of these are designed to foster an atmosphere of calculated risk-taking and constant multifaceted evolutionary development. (See also Chapter 6 on planning.)

Initiative-Taking and Empowerment

Since implementation is doing, getting and supporting people who are acting and interacting in purposeful directions is a major part of change. Louis and Miles (1990) found that initiative can come from different sources. In their study, leaders in successful schools supported and stim-
Appendix 15

Mining Association Rules with Item Constraints

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Abstract
The problem of discovering association rules has received considerable research attention and several fast algorithms for mining association rules have been developed. In practice, users are often interested in a subset of association rules. For example, they may only want rules that contain a specific item or rules that contain children of a specific item in a hierarchy. While such constraints can be applied as a post-processing step, integrating them into the mining algorithm can dramatically reduce the execution time. We consider the problem of integrating constraints that are boolean expressions over the presence or absence of items into the association discovery algorithm. We present three integrated algorithms for mining association rules with item constraints and discuss their tradeoffs.

1. Introduction
The problem of discovering association rules was introduced in (Agrawal, Imielinski, & Swami 1993). Given a set of transactions, where each transaction is a set of literals (called items), an association rule is an expression of the form \( X \Rightarrow Y \), where \( X \) and \( Y \) are sets of items. The intuitive meaning of such a rule is that transactions of the database which contain \( X \) tend to contain \( Y \). An example of an association rule is “30% of transactions that contain beer also contain diapers; 2% of all transactions contain both these items”. Here 30% is called the confidence of the rule, and 2% the support of the rule. Both the left hand side and right hand side of the rule can be sets of items. The problem is to find all association rules that satisfy user-specified minimum support and minimum confidence constraints. Applications include discovering affinities for market basket analysis and cross-marketing, catalog design, loss-leader analysis, store layout and customer segmentation based on buying patterns. See (Nerhus, Rothman, & Viveros 1996) for a case study of an application in health insurance, and (Ali, Mangasarian, & Srikant 1997) for case studies of applications in predicting telecommunications order failures and medical test results. There has been considerable work on developing fast algorithms for mining association rules, including (Agrawal et al. 1996) (Savase, Oniecinski, & Navathe 1995) (Toivonen 1996) (Agrawal & Shastri 1996) (Han, Karypis, & Kumar 1997).

Taxonomies (as hierarchies) over the items are often available. An example of a taxonomy is shown in Figure 1. This taxonomy says that Jackets are a Outerwear, Ski Pants are a Outerwear, Outerwear is a Clothes etc. When taxonomies are present, users are usually interested in generating rules that span different levels of the taxonomy. For example, we may infer a rule that people who buy Outerwear tend to buy Hiking Boots from the fact that people bought Jackets with Hiking Boots and Ski Pants with Hiking Boots. This generalization of association rules and algorithms for finding such rules are described in (Srikant & Agrawal 1995) (Han & Fu 1985).

In practice, users are often interested only in a subset of associations, for instance, those containing at least one item from a user-defined subset of items. When taxonomies are present, this set of items may be specified using the taxonomy, e.g. all descendants of a given item. While the output of current algorithms can be filtered out in a post-processing step, it is much more efficient to incorporate such constraints into the associations discovery algorithm. In this paper, we consider constraints that are boolean expressions over the presence or absence of items in the rules. When taxonomies are present, we allow the elements of the boolean expression to be of the form ancestor(item) or descendant(item).

\[ \text{Clothes} \]

\[ \text{Footwear} \]

\[ \text{Outerwear} \quad \text{Shirt} \quad \text{Shoes} \quad \text{Hiking Boots} \]

\[ \text{Jackets} \quad \text{Ski Pants} \]

Figure 1: Example of a Taxonomy
candidates(item) rather than just a single item. For example,
\[(\text{Jacket} \lor \text{Shoes}) \lor \text{descendants(Clothes)} \land \neg \text{ancestors(Hiking Boots)}\]
expresses the constraint that we want any rules that either (a) contain both Jackets and Shoes, or (b) contain Clothes or any descendants of clothes and do not contain Hiking Boots or Footwear.

Paper Organization We give a formal description of the problem in Section 2. Next, we review the Apri-
or algorithm (Agrawal et al. 1996) for mining association rules in Section 3. We use this algorithm as the basis for presenting the three integrated algorithms for mining associations with item constraints in Section 4. However, our techniques apply to other algorithms that use apriori candidate generation, including the recently published (Toivonen 1996). We discuss the tradeoffs between the algorithms in Section 5, and conclude with a summary in Section 6.

2. Problem Statement
Let \(L = \{l_1, l_2, \ldots, l_m\}\) be a set of literals, called items. Let \(G\) be a directed acyclic graph on the literals. An edge in \(G\) represents a \(\sim\)-x relationship, and \(G\) represents a set of taxonomies. If there is an edge in \(G\) from \(p\) to \(c\), we call \(p\) a parent of \(c\) and \(c\) a child of \(p\) (\(p\) represents a generalisation of \(c\)). We call \(x\) an ancestor of \(y\) (and \(y\) a descendant of \(x\)) if there is a directed path from \(x\) to \(y\) in \(G\).

Let \(D\) be a set of transactions, where each transaction \(T\) is a set of items such that \(T \subseteq L\). We say that a transaction \(T\) supports an item \(x \in L\) if \(x\) is in \(T\) or \(x\) is an ancestor of some item in \(T\). We say that a transaction \(T\) supports an itemset \(X \subseteq L\) if \(T\) supports every item in the set \(X\).

A generalized association rule is an implication of the form \(X \Rightarrow Y\), where \(X \subseteq \mathcal{L}\), \(Y \subseteq \mathcal{L}\), and \(X \cap Y = \emptyset\). The rule \(X \Rightarrow Y\) holds in the transaction set \(D\) with confidence \(c\) if \(\%\) of transactions in \(D\) that support \(X\) also support \(Y\). The rule \(X \Rightarrow Y\) has support \(s\) in the transaction set \(D\) if \(s\%\) of transactions in \(D\) support \(X \cup Y\).

Let \(B\) be a boolean expression over \(\mathcal{L}\). We assume without loss of generality that \(B\) is in disjunctive normal form (DNF). That is, \(B\) is of the form \(D_1 \lor D_2 \lor \cdots \lor D_m\), where each \(D_i\) is of the form \(\alpha_1 \land \alpha_2 \land \cdots \land \alpha_n\). When there are no taxonomies present, each element \(\alpha_i\) is either \(l_j\) or \(\neg l_j\) for some \(l_j \in L\). When a taxonomy \(G\) is present, \(\alpha_i\) can also be \(\text{ancestor}(l_j), \text{descendant}(l_j), \neg \text{ancestor}(l_j), \text{or} \neg \text{descendant}(l_j)\).

3. Review of Apriori Algorithm
The problem of mining association rules can be decomposed into two subproblems:
- Find all combinations of items whose support is greater than or equal to the user-specified minimum support.
- Find all combinations of items whose confidence is greater than or equal to the user-specified minimum confidence.

Given a set of transactions \(D\), a set of taxonomies \(\mathcal{G}\) and a boolean expression \(B\), the problem of mining association rules with item constraints is to discover all rules that satisfy \(B\) and have support and confidence greater than or equal to the user-specified minimum support and minimum confidence respectively.

Candidate Generation: Given \(L_k\), the set of all frequent \(k\)-itemsets, the candidate generation procedure returns a superset of the set of all frequent \((k+1)\)-itemsets. We assume that the items in an itemset are lexicographically ordered. The intuition behind this procedure is that all subsets of a frequent itemset are also frequent. The function works as follows: First, in the \(k\)-th step, \(L_k\) is joined with itself.
Reed-Solomon Error Correction

A fast software implementation in assembly language and C

Hugo Lyppens

Transmission media, such as telephone lines, wide-area networks, and satellite links, or storage media, like optical/magnetic disk and tape, are usually imperfect. To make digital data transmission and storage reliable, error-correcting codes are indispensable. The efficient Reed-Solomon class of error-correcting codes is highly popular in many applications, including CD, DAT (digital audio tape) players, tape-backup systems, and similar devices. These all use a hardware implementation of Reed-Solomon. However, because microprocessor speeds have increased considerably, software implementations are also feasible in some applications.

In this article, I’ll present a highly optimized software implementation of Reed-Solomon error correction, which I implemented while developing the “Video Backup System” for the Commodore Amiga. This product lets users connect a VCR to the Amiga via a hardware interface to use the VCR as a file-backup device. I developed the software that encodes computer data in a video signal and performs error correction on information read back from the VCR to compensate for drop-outs on the video tape. Even though the original Amiga implementation was written in C and 68000 assembly language, the version I’ll discuss here is implemented in 32-bit Intel x86 assembly language using Borland C++ 4.2 and TASM 4.0.

Reed-Solomon Codes

A codeword of a Reed-Solomon (RS) code consists of a sequence of \( N \) symbols over the Galois field \( GF(q) \). \( GF(q) \) is a finite field with \( q \) elements, where \( q = p^m \) for some prime number \( p \). For an introduction to Galois fields, see “Error-Correction Codes.” by Bart de Canne. DJH, December 1994.) Reed-Solomon codes have, by definition, \( N = q - 1 \). Out of \( N \), let \( K \) be the number of actual information symbols. The other \( N - K \) are redundancy symbols. The amount of redundancy in each codeword defines the maximum number of symbol errors that can be corrected. The necessary and sufficient condition for the correctness capability of the code can be determined from the quality of the remainder (raw error rate) and the desired reliability of the application. Let \( T \) be the number of symbol errors that can be corrected in each code word. Because Reed-Solomon codes are maximum-distance separable, the necessary and sufficient condition to correct up to \( T \) symbol errors is that the 

![Error.png](attachment:Error.png)

Each codeword can be identified by a polynomial over \( GF(q) \) in the form

\[ c(x) = c_0 + c_{1}x + c_{2}x^2 + \cdots + c_{N-1}x^{N-1} \]

Reed-Solomon codes are cyclic. For a codeword \( \{c_0, c_1, \ldots, c_{N-1}\} \) in a RS code, \( \{c_{N-1}, c_0, c_1, \ldots, c_{N-2}\} \) is also in \( C \). Using linear codes as polynomials, the aforementioned statement can be written as

\[ c(x)c(-x) = c(x)c(\alpha^{-1}x) \]

A 7-error-correcting RS code \( C \) can be described by a single unique polynomial \( g(x) \), its generator polynomial, \( g(x) \) is a polynomial of degree \( 2T \) and the coefficient of \( x^T \) in \( g(x) \) is 1 by definition. \( c(x) \) is a codeword in \( C \) only if \( c(x) \) is divisible by \( g(x) \). Let \( \alpha \) be a primitive element of \( GF(q) \). This means that every nonzero element of \( GF(q) \) can be written as a power of \( \alpha \) and \( \alpha^1 = 1 \). For a code, \( g(x) = (x-\alpha)(x-\alpha^2)(x-\alpha^2)(x-\alpha^2) \) =

Dr. Dobb’s Journal, January 94
The continuum of eating disorders from anorexia and bulimia nervosa to obesity carries with it many undesirable and harmful physical and psychological consequences. Although treatment of these disorders has attracted considerable attention, the area of prevention has been relatively neglected. This paper addresses the dangers of preoccupation with excessive weight and proposes early intervention as an essential preventative strategy.

The prevalence of eating disturbances among adolescent girls and adult women living in many Western societies has reached alarming proportions. The term “eating disturbances” is used to encompass a wide spectrum of eating and weight concerns, with severe eating disorders such as anorexia and bulimia nervosa at one end of the spectrum and obesity at the other extreme (Figure 1). In the middle of the spectrum, a number of less serious but much more common eating disturbances are found, including anorexic and bulimic behaviors, excessive and unhealthy dieting, uncontrolled eating, and the excessive consumption of high-fat/sugar foods. These eating disturbances differ greatly from one another with regard to their etiologies, symptoms, and consequences, and as such cannot be treated as one condition. However, it is important to understand how they are associated with each other and to avoid concentrating only on extreme conditions.

Excessive weight preoccupation is a public health concern in its own right, as excessive and unhealthy dieting have been shown to be associated with a number of harmful physiological, physical, and psychological consequences. In addition to a number of direct consequences, excessive dieting...
Excessive preoccupation with body weight is a public health concern in its own right.

and weight preoccupation may lead to the development of a partial eating disorder (e.g., bulimic behaviors), and vulnerable adolescents may develop serious full-blown eating disorders (e.g., bulimia nervosa). Thus, in the prevention of eating disorders, it is important to prevent the onset of unhealthy and excessive weight loss practices by addressing factors influencing the onset of these practices. While much work regarding the treatment of eating disturbances has been published, the area of prevention has been somewhat neglected. In this paper, the dangers of excessive weight preoccupation will be discussed as will methods for its prevention.

Epidemiology of Eating Disturbances

The professional and lay literature abounds with information regarding the prevalence of eating disturbances. Among adolescent females and young women, estimates of anorexia nervosa range from 0.2% to 1.0% (Nylander, 1971; Lucas et al., 1991), reliable estimates of bulimia nervosa from 1% to 3% (Stein, 1991), while prevalence rates for anorexia and bulimic behaviors are much higher (Kilien et al., 1986). Dieting and body dissatisfaction have been labeled as "normative" (Rodin et al., 1984), and in one study, 72% of a group of adolescent girls reported recent weight loss attempts (Moses et al., 1989). In spite of all this dieting, obesity seems to be increasing, with prevalence rates reaching 25% among adolescent girls in the United States (Gortmaker et al., 1987).

Dieting and Body Dissatisfaction as Risk Factors for Developing a Partial or Serious Eating Disorder

Hill (1990) has stated that the diagnosis of bulimia nervosa at the age of 20 may represent the end-point of years of episodic dieting. Dieting during early adolescence may produce an undesirable pattern of eating behavior and may disturb food intake regulatory mechanisms. A number of prospective studies examining the association between dieting behaviors and the later development of an eating disorder support the notion of a continuum of eating disturbances in which there appears to be movement between the various eating problems. Patton et al. (1980) found that the relative risk for dieters to develop an eating disorder was eight times higher than that for non-dieters after a 1-year period. On the basis of these findings, the researchers concluded that dieting could be viewed as a major pathway to an eating disorder. Marci and Cohen (1990) traced 800 children longitudinally and found that reducing efforts in early adolescence were strongly associated (r = 0.67) with the development of extreme bulimia nervosa symptoms during later adolescence. The authors also indicated that diagnosable levels of anorexia and bulimia nervosa were preceded by elevated symptoms of these disorders 2 years earlier, suggesting an insidious onset and an opportunity for secondary prevention.

Although these results indicate that dieters are at increased risk of developing certain eating disorders, the question remains as to whether common factors are playing an etiological role in the onset of dieting behaviors and the development of eating disorders and which factors predict which dieters will progress to develop more serious eating disorders. Variables found to be predictors of weight loss attempts among adolescent girls include body dissatisfaction, high body weight, depression, and social anxiety (Rosen et al., 1987).

Predictors of attempts at weight loss include body dissatisfaction, high body weight, depression, and social anxiety.

Rosen et al. suggest that adolescent girls who hold negative self-perceptions may be among those who are most vulnerable to social pressures to be thin. Attie and Brooks-Gunn (1989) found that girls who early in adolescence (grades 7-10) had eating problems and felt most negatively about their bodies were more likely to develop eating problems 2 years later. A comparison of weight-preoccupied women and those with anorexia nervosa revealed similarities in body dissatisfaction, drive for thinness, and perfectionism scores on the Eating Disorders Inventory. However, women with anorexia nervosa displayed higher levels of ineffectiveness, interpersonal distrust, and lack of interpersonal awareness. (Carner et al., 1984). Patton et al. (1990) found that many of the predictive risk factors for anorexia nervosa were found to be associated with attempts at weight control. These risk factors include premorbid personality, premorbid obesity, and perceived family weight pathology. The only factors found to distinguish between simple dieters and individuals with eating disorders were perceived maternal lack of confidence and past psychiatric history, which were both higher among the latter group. These results indicate that dieting is certainly a risk factor for the develop-
ment of eating disorders, and that similar factors may lead to the development of eating behaviors and more serious eating disorders. However, the results also suggest that an eating disorder is only likely to develop if non-weight-related psychopathological symptoms are also present.

**CONSEQUENCES OF WEIGHT LOSS PRACTICES**

In addition to the association between dieting behaviors and the later development of an eating disorder, attempts at weight loss may have a number of other harmful consequences. Consequences reported to be associated with weight loss attempts include physical and psychological symptoms, poorer eating habits and nutritional intake, difficulties in future weight loss and maintenance as a result of weight cycling, and increased binge eating following restrained eating. The importance of these possible consequences is magnified in light of the facts that the long-term effectiveness of dieting in the treatment of obesity is questionable and most individuals will regain the weight that they have lost after 4 or 5 years (Garner and Woolley, 1991).

Nylander (1971) found that several physical and mental symptoms developed in connection with dieting. Approximately 30% of the dieters he studied reported at least three of the following symptoms in connection with attempts at weight loss: fatigue, anxiety, depression, anxiety associated with meals, increased interest in food and food preparation, chilliness, constipation, amenorrhea for at least 3 months, mental sluggishness, impaired performance in school, or decreased zest and interest in areas that had previously interested them. Among 201 children presented to a hospital division of pediatric endocrinology for short stature and/or delayed puberty, 14 (7.5%) fit a pattern of growth failure due to malnutrition, which was the result of a self-imposed restriction of caloric intake arising from a fear of becoming obese (Pugliese et al., 1985). The authors warn that fear of obesity may result in excessive dieting that may adversely affect one’s growth and development.

A number of studies have shown that overweight girls who diet more than their counterparts tend to have low nutrient intakes and poor eating patterns such as meal skipping (MacDonald et al., 1983; Katz and Riedman, 1991; Woodard, 1991). Calcium and iron, nutrients of particular importance to adolescents because of their rapid growth, have been reported to be low among dieters (Bull, 1988; Woodard, 1991). Low intakes of calcium during this critical period of mineralization of the skeleton may play a role in the later development of osteoporosis (Anderson, 1990). In a comprehensive review of studies on adolescent nutrition, Bull (1988) reported that iron is the nutrient most likely to be lacking in the diets of young people and that female adolescents, especially those dieting to lose weight, seem to be the most vulnerable.

In light of the high relapse rates of weight gain following a weight loss, and the questionable negative consequences of mild obesity, a number of researchers have become concerned with the possible effect of weight cycling (weight loss-gain cycles) on both future attempts at weight loss and subsequent health consequences (Polivy and Herman, 1985; Brownell et al., 1986). It seems that "yo-yo" or intermittent dieting may make weight reduction and maintenance harder over time. Metabolic efficiency may be enhanced by repeated cycles of weight loss followed by weight gain; returning to the initial weight often does not completely reverse this ability to store more energy with less energy intake (Garner and Woolley, 1991).

This means that an individual may need to consume fewer calories than before the weight loss-gain to maintain the same body weight. Rats have been shown to become more efficient in their utilization of energy with less energy intake. It took obese rats 21 days to lose their excess weight during the first cycle; however, after regaining this weight, it took 46 days to lose it again, despite the same caloric intake in both cycles (Brownell et al., 1986). A small study on 57 adult humans showed similar findings, albeit less drastic, with slower velocity of weight loss and a smaller amount of weight loss, during the second cycle of treatment than during the first cycle (Blackburn et al., 1994). Other studies on female rats have indicated that repeated weight cycling not only produced a four-fold increase in metabolic efficiency but also led to increased dietary fat selection, larger adipose deposits, and greater plasma insulin values (Reed et al., 1988). The consequences of weight cycling have particular relevance for adolescent dieters who may be at the beginning of a "dieting career."

Although it was originally believed that overeating and binging lead to dieting, Polivy and Herman (1985) have suggested that the order is reversed and that dieting causes one to overeat and binge. Greenberg (1986) showed that, in a population of female bulimic and nonbulimic college students, restraint scale scores predicted severity of binge-eating behavior. We found that unhealthy dieting predicted binge eating among a nonclinical sample of adolescent girls, in particular for girls with a high-risk psychological profile (Neu-}

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**Unhealthy dieting among girls with a high-risk psychological profile predicted binge eating.**

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mark Szatmari et al., in press [a]). A number of laboratory studies have shown that dieters exhibit counter-regulation. This is a pattern in which dieters eat little ad lib food (thus maintaining their diets) after no preload or a small forced pre-load, but eat a great deal of food ad lib after being forced to consume large, high-calorie preload. Non-dieters, by contrast, exhibit normal regulation in that they eat much more ad lib food after no preload or a small forced preload than after a large forced preload (Polivy and Herman, 1985; Wardle and Beales, 1985). Explanations for the causal
primary prevention of eating disturbances has been reported. The evaluation of educational programs in the prevention of excessive and unhealthy dieting, and in their long-term effects on more serious eating disorders, is essential.

REFERENCES


SUMMARY

A recent study by the CSIRO Division of Coal and Energy Technology has characterised a representative range of Australian export thermal coals against other internationally traded thermal coals for trace elements of environmental concern. Representative export coals from the United States of America, South Africa, Indonesia, China, Poland, Colombia and Venezuela were obtained. Both the Australian and international coals were analysed for key environmental trace elements using accurate and reliable methods developed by the CSIRO.

This study has provided the most reliable database yet available on the levels of trace elements of environmental concern in representative Australian and internationally traded thermal coals.

Australian thermal coals were found to generally contain significantly lower levels of arsenic, selenium and mercury. The levels of other trace elements of environmental concern differed both within and between the Australian and international coals. The significance of these differences can only be assessed in terms of the ultimate residence of the trace elements in waste products.

The radioactivity of all coals was low compared to that of the earth's crust and the levels of radionuclides which are directly related to the uranium and thorium contents were considered to be of minimal environmental concern.

The potential environmental impact of the utilisation of the coals was assessed using a ranking procedure based on the combined effect of the most environmentally significant trace elements.

INTRODUCTION

The levels of trace elements in thermal coals are becoming of increasing importance in the assessment of environmental impact of electricity generation from coal-fired power stations. The concerns about trace element levels relate to the emission of air toxics and the disposal and utilisation of waste ash. In many countries legislation has been introduced limiting the discharge of environmental trace elements (Clarke and Sloos, 1992).

These concerns are focusing more attention on the levels of trace elements in power station feedstocks and are likely to have a significant impact on the world thermal coal export market.

Previous work has shown that Australian thermal coals contain low levels of environmentally sensitive trace elements compared to overseas coals. However, data available in the literature on the levels of trace elements in widely traded thermal
In order to make a valid comparison of the levels of trace elements in Australian export thermal coals and those supplied to the international market by its competitors, it was necessary to characterise representative samples of local and foreign coals in the one laboratory using reliable and validated analytical methods.

<table>
<thead>
<tr>
<th>Coal Description</th>
<th>Elements of Major Concern (mg kg⁻¹)</th>
<th>Elements of Moderate Concern (mg kg⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AS</td>
<td>B</td>
</tr>
<tr>
<td>USA 1</td>
<td>9.8</td>
<td>0.19</td>
</tr>
<tr>
<td>USA 2</td>
<td>5.8</td>
<td>0.12</td>
</tr>
<tr>
<td>USA</td>
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</tr>
<tr>
<td>S. Africa 1A</td>
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</tr>
<tr>
<td>S. Africa 1B</td>
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</tr>
<tr>
<td>S. Africa 2A</td>
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</tr>
<tr>
<td>S. Africa 2B</td>
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<td>0.34</td>
</tr>
<tr>
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<td>1.8</td>
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</tr>
<tr>
<td>S. Africa 4</td>
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<tr>
<td>Indonesia B</td>
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<tr>
<td>Colombia A</td>
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</tr>
<tr>
<td>Colombia B</td>
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<tr>
<td>China A</td>
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<td>China B</td>
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<td>Venezuela 1</td>
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<td>Poland Blend A</td>
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<tr>
<td>Poland Blend B</td>
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<tr>
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<tr>
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<tr>
<td>Australia 10</td>
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Table 1: Concentrations of Trace Elements in Australian Export Thermal Coals and Other Internationally Traded Coals
Computer science is still a young field. The first computers were built in the mid 1940s, since when the field has developed tremendously.

Applications from the early years of computerization can be characterized somewhat as follows: the programs were in general quite small, certainly when compared to those that are currently being constructed. They were written by one person. They were written and used by experts in the application area concerned. The problems to be solved were mostly of a technical nature, and the emphasis was on expressing known algorithms efficiently in some programming language. Input typically consisted of numerical data, read from such media as punched tape or punched cards. The output, also numeric, was printed on paper. Programs were run off-line. If the program contained errors, one studied an octal or hexadecimal dump of memory. Sometimes, the execution of the program would be followed by binary reading machine registers at the console.

Present day applications are rather different in many respects. Present day programs are often very large and are being developed by teams that collaborate over periods spanning several years. The programmers are not the future users of the system they develop, and they have no expert knowledge of the application area in question. The problems that are being tackled increasingly concern everyday life: automatic bank tellers, airline reservation via a terminal connected to some host machine, salary administration, etc. Putting man on the moon was not conceivable without computers.

We may get an impression of the scale of current software development projects from the following examples:

- the Dutch KLM airline reservation system contains two million lines of (assembler) code;
Introduction

- the UNIX operating system comprises over 3700 000 lines of source code (System V release 4.0, including Xnews and the X11 window system);
- the NASA Space Shuttle software counts 40 million lines of object code (this is 30 times as much as the software for the Saturn V project from the 1960s) [Boehm81];
- The IBM OS360 operating system took 5000 man years of development effort [Brooks75].

And this is by no means the end; neither with respect to the degree to which computerization penetrates other disciplines—it is a real possibility that by the year 2000, cows will be milked by a robot—nor with respect to size—one need only think of the US SDI (StarWars) efforts.

Programming techniques have lagged behind the developments in software both in size and complexity. To many people, programming is still an art, and has never become a craft. An additional problem is that many programmers have not been formally educated in the field. They have learned by doing. On the organizational side, solutions to problems are often attempted by adding more and more programmers to the project, the so-called "million-monkey" approach.

As a result, software is often delivered too late, programs do not behave as the user expects, programs are rarely adaptable to changed circumstances, and many errors are detected only after the software has been delivered to the customer. This is commonly referred to as the ‘software crisis’.

This type of problem became really manifest in the 1960s. Under the auspices of NATO, two conferences were devoted to the topic in 1968 [Naur68] and 1969, [Buxton69]. Here, the term ‘software engineering’ was coined in a somewhat provocative sense. Shouldn’t it be possible to build software in the way one builds bridges and houses, starting from a theoretical basis and using sound and proven design and construction techniques, as in other engineering fields?

Software serves some organizational purpose. The reasons for embarking on a software development project vary. Sometimes, a solution to a problem is not feasible without the aid of computers, such as weather forecasting, or automated bank tellers. Sometimes, software can be used as a vehicle for new technologies, such as typesetting, the production of chips, or manned spacecraft. In yet other cases software may increase user service (as in library automation), or simply save money (as in automated stock control).

In many cases though, the expected economic gain will be a major driving force. It may, however, not always be easy to prove that automation saves money (just think of office automation) because apart from direct cost savings, the economic gain may also manifest itself in such things as a more flexible production or a faster or better user service.

In [Boehm81], the total expenditure on software in the US was estimated to be $40 billion in 1980. This is approximately 2% of the GNP. In 1985, the total expenditure had risen to $70 billion in the US and $140 billion worldwide [Boehm87a].
Introduction

So the cost of software is of crucial importance. This concerns not only the cost of developing the software, but also the cost of keeping the software operational once it has been delivered to the customer. In the course of time, hardware costs have decreased dramatically. Hardware costs now typically comprise less than 20% of total expenditure (figure 1.1). The remaining 80% comprise all non-hardware costs: the cost of programmers, analysts, management, user training, secretarial help, etc. Note that the curve depicted in figure 1.1 need not have the same dramatic shape in every organization [Cragon82, Frank83].

![Diagram showing relative distribution of hardware/software costs](image)

**Figure 1.1:** Relative distribution of hardware/software costs. (Source: B.W. Boehm, *Software Engineering*, IEEE Transactions on Computers, © 1976 IEEE.)

If automation saves money, this usually means a loss of jobs. In many cases, automation also entails a rise in the labor force in other jobs, with more interesting tasks, but the net effect still often is negative. We cannot and should not close our eyes to these effects of automation on society.

An aspect closely linked with cost is *productivity.* The quest for data processing personnel increases by 12% per year, while the population of people working in data processing and the productivity of those people each grow by approximately 4% per year [Boehm87a]. The net effect is a growing gap between demand and supply. The result is both a backlog with respect to the maintenance of existing software and a slowing down in the development of new applications. Eventually, the combined effect hereof will have repercussions as regards the competitive edge of an organization.

The problems of cost and productivity are large, and deserve our serious attention. However, this is not the complete story. Society is increasingly
Appendix 20

Fluvial models of the Lower Permian coal measures of Son-Mahanadi and Koel-Damodar Valley basins, India

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ABSTRACT

The early Permian fluvialite Karharbari and Barakar coal measures are widely exposed in the Son-Mahanadi and Koel-Damodar Valley basins of central and eastern India. An attempt is made to compare the evolution of the fluvial style in the two basin belts on the basis of relative abundance and vertical association of litho-facies, palaeocurrents and palaeochannel morphology, and its bearing on the geometry and quality of interbedded coal seams.

The integrated sedimentological evidence suggests distinct differences in the evolution of fluvialite coal measures in the two basin belts. The low sinuous anastomosed rivers which deposited the bulk of Karharbari and Barakar in the proximal (SE) parts of the Mahanadi basin, became moderately sinuous in the distal parts (NW) of the Son Valley. In the Koel-Damodar Valley, which represents the distal part of a separate river system, the low sinuous bedload streams became more sinuous further downstream towards the west and NW and also through time, depositing greater amounts of fine clastics. The difference in stream channel patterns of the two basins is attributed to the original difference in basin profile, rate of sediment supply and rate of burial.

It is suggested that the stream channel morphology and sedimentation, among other factors, greatly controlled the thickness, geometry and dimensions of associated coal seams, and also influenced their quality.

INTRODUCTION

The past 20 years have seen considerable improvement in our understanding of the sedimentation patterns and palaeogeography of the Gondwana rocks of peninsular India, particularly with respect to the coal-bearing Karharbari and Barakar formations (see Casshyap, 1973, 1977). Indeed, there are interesting similarities and differences in the stratigraphy, lithic-fill, sedimentation trends, geomorphic and tectonic settings of the Lower Gondwana basins of eastern and central India, as suggested by several critical reviews (Robinson, 1969; Ghosh & Mitra, 1972; Casshyap, 1977, 1981; Mitra, Bose & Dutta, 1979). The Son-Mahanadi and Koel-Damodar Valley basins provide excellent examples for comparing lithic-fill and sedimentation trends, particularly in the two lower coal measures of Karharbari and Barakar which occur widely in these areas and which have been studied by the authors over the past 5 years.

This study compares the sedimentary fill and internal organization, palaeodrainage, and palaeochannel morphology in the Karharbari and Barakar coal measures of the Son-Mahanadi and Koel-Damodar Valley Gondwana basin belts. The aim of this contribution is to identify the differences in fluvial style and sedimentation trends including those relating to coal formation.

REGIONAL GONDWANA GEOLOGY

Stratigraphic setting

The Gondwana Supergroup of the Indian peninsula, commonly referred to in the literature as Lower (Permian) and Upper (Triassic–Lower Cretaceous)
Fig. 6. (A) Cross-bedded coarse grained channel sandstone bodies in a multistorey sandstone sequence. Thickness of channel body in the upper left is 2 m. Barakar Formation, Gurgari section about 1 km south of the road bridge, Chirimiri coalfield.

(B) Vetre thick coarse grained multistorey sandstone bodies showing scooped base and separated by thin layers of shale. Barakar Formation, Hasdo river section about 300 m south of the rail bridge, Korba coalfield.
REVERSED-PHASE HIGH-PERFORMANCE LIQUID CHROMATOGRAPHIC DETERMINATION OF ARTEMISITENE IN ARTEMISININ

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ABSTRACT

A new, simple and selective reversed-phase HPLC assay is developed for the determination of the clinically undesirable artemisinine in the antimalarial agent artemisinin (qinghaosu). It involves the use of an internal standard (santonin) and the determination time is less than 5 minutes. Detection was accomplished using a UV detector set at 216 nm and limits were as low as 15 ng for a 10 µl injection. Being simple and selective this method is particularly useful for the routine analysis of artemisinin to check its purity. In addition, the method can be used for preparative scale purification of these compounds. It has been applied for the evaluation of crystalline samples of artemisinin without prior preparation.
INTRODUCTION

Artemisinin (also called artemisinin or arteannuin) and is often referred to as artemisinin, is a sesquiterpene lactone with an unusual endoocarboxylic group. It is the clinically active antimalarial constituent isolated from the Chinese traditional herb Qinhua or Artemisia annua L. (family Compositae) [1].

Several thousand malaria cases in China have been successfully treated with artemisinin, including those caused by both chloroquine-sensitive and chloroquine resistant strains of Plasmodium falciparum. Interest in the antimalarial potential of artemisinin as well as its derivatives and analogs is currently the subject of numerous investigations [2,3].

In addition to artemisinin, several reports describe the dehydron analog artemisitene [4], which is similar to artemisinin [5]. This compound was found to be less active as an antimalarial agent than artemisinin in vivo. In addition, the presence of an unsaturated endocarboxyl in this compound might confer upon it certain undesirable biological activities such as mutagenicity or cytotoxicity [6]. Even after repeated crystallization of artemisinin, artemisitene co-crystallized with it and share melting samples of artemisinin were claimed to contain as much as 10% of artemisitene [4].

Several HPLC methods have been employed for the determination of artemisinin in biological fluids such as plasma, urine, and bile. The only method at this time available for the determination of artemisinine and other endocyclic lactones in biological fluids is the detection of artemisinine by HPLC [7]. The method is based on several steps and can take a long time to obtain the desired results. But the method does not need to be repeated for routine analysis of artemisinine found in clinical samples. Therefore, it was necessary to develop a method which is simple, fast, and sensitive enough to detect the drug concentration in biological samples and be able to determine the drug concentration in biological samples before the drug is excreted into the urine. In this paper, we describe a new method for determination of artemisinine and other endocyclic lactones in biological fluids such as plasma, urine, and bile. The method is based on HPLC and can be adapted to other tissues and other biological fluids such as saliva, cerebrospinal fluid, and semen.
INTERNATIONAL STUDENTS AND FOREIGN TRAVEL

A Longitudinal Health Care Study: International versus Domestic Students

ALLAN J. EBBIN, M.D., M.P.H., and EDWARD S. BLANKENSHIP, Ph.D.

The authors reviewed 96,804 diagnoses from student visits to the University of Southern California Student Health Center during a three-year period. The diagnoses coded for international students were compared to those for domestic students. More than 50 disease entities were found to be significantly increased while 30 were significantly decreased in international students when compared to domestic students. Further analysis of the diagnoses that may be stress related revealed a greater proportion of these problems among international students.

INTRODUCTION

There has been a marked increase in the number of international students entering the United States; in 1981–82, for example, there were 326,000. This change represents a 4.6% increase over the past year and a tenfold increase over the past 30 years. During 1980–83, the University of Southern California (USC) had between 3,600 and 4,000 international students, comprising approximately 13% of the student body—the largest number of foreign students at a university in the United States. The greatest concentrations of these students are in the physical sciences and engineering. In the fall of 1983, there were 113 countries represented. Countries with significant enrollments, in decreasing order, were: Taiwan, Indonesia, Iran, Hong Kong, South Korea, Saudi Arabia, Japan, India, Kuwait, and Malaysia.

It has been established that international students use the college health center frequently. In 1964, Maha's study at the University of Illinois showed that foreign students averaged 3.7 visits per year while domestic students averaged 2.8.1 Maha's research: on the differences in frequency of usage of the health center was being conducted at the same time other studies were comparing the differences in types of complaints. As early as 1962, Ward had established the "foreign student syndrome" to explain the increase in visits to health centers.2 Ward believed that foreign students had more somatic complaints: Akka thought these were due to increased stress.3

Recent studies have focused on mental health and the stress factors influencing foreign students. In a special report from the World Health Organization Mental Health Division, numerous "unavoidable problems" for foreign students are outlined.4 Also, in this report an attempt is made to describe the "uprooting disorder" seen in many international students. The disorder is uprooting when, for example, after a significant change, the special separation of a student from his primary milieu and affective reference objects, his normal psychosocial, physiological, and cognitive functions remain persistently disturbed.

Other studies of the delivery of health care to foreign students have examined the barriers to effective treatment. Williamson recently outlined four features of the international student which may influence diagnosis and treatment.5 They are.

1. A health background which may include practices and beliefs that differ greatly from those of the typical domestic student.

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2. An illness not commonly seen in the area surrounding the health center. This finding is especially true of parasites.

3. A language barrier that may present difficulty in describing the student's condition. There is often the inability to discuss concepts such as stress or depression.

4. Culture shock, described as a feeling of helplessness, discomfort, and a state of disorientation.

These features must certainly affect the frequency of the use of the health center as well as being the chief complaint by the student.

In this report, the authors examined 96,804 diagnoses from student visits to the University of Southern California Student Health Center over a three-year period, between July 1980 and June 1983. They compared and analyzed the frequency of use of the Student Health Center (SHC) by foreign students and domestic students. Further, the authors examined differences in diagnoses, and they isolated those diagnoses which may have been associated with stress.

METHOD

In an urban setting, the SHC each year serves the needs of approximately 27,000 graduate and undergraduate students, about 13% of whom are international students. All full-time students pay a mandatory fee each semester which allows them to use the services of the SHC. Approximately one-third of the students live within walking distance or nearby the university.

For each visit, the student completes a demographic sheet which includes citizenship. When the examination is completed, the practitioner codes from one to three diagnostic impressions using the diagnostic codes developed for this program (available on request). After excluding permanent residents, the authors examined the data to find association between the presence of a disease and national status using the chi-square analysis. In an effort to isolate those diseases which may have been associated with stress, the authors gave a group of six practitioners from this SHC an unlabeled list of diagnoses and asked them to determine which ones they thought were likely to be associated with stress. The consensus of opinion was that, while most illnesses have a component of stress, some diagnoses stress comprises a major factor, and these were listed accordingly. A line listing of the most frequent visits to the SHC by each group was also developed.

RESULTS

Information regarding the patient volume at the SHC is summarized in two ways: by total visits and by the number of students seen (Table 1). Approximately 13% of the students are from outside the United States; they compose 18% of the visits to the SHC and 21% of the individuals using the services.

Those diagnoses that showed a statistically significant increase in foreign students are listed in Figure 1. Conversely, those diagnoses with a statistically significant decrease are in Figure 2. In both figures, the difference is significant at a p level of .01 or greater, except those variables noted with an asterisk, which are between .01 and .05 p level. Of those illnesses in Figure 1 showing significant increase in international students, 20 were identified to be stress related (Figure 3).

DISCUSSION

The finding that international students use the SHC more frequently than domestic students confirmed an impression by SHC staff. This finding is in opposition to a survey of 88 international students from the University of Toledo, which revealed that they do not utilize the health services very much. The USC SHC may receive more visits by international students because most of the domestic students are not in residence at the university, and some have well-established health care systems supporting them in the Los Angeles area. The newly arrived international students have a need for nearby health care and do not have the choice of going to someone they have known over the years.

TABLE 1
Visits to the student health center
1980-1983

<table>
<thead>
<tr>
<th></th>
<th>Total number of visits</th>
<th>Number of individuals seen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic students</td>
<td>75,648 (78%)</td>
<td>21,962 (75%)</td>
</tr>
<tr>
<td>Foreign students</td>
<td>17,741 (18%)</td>
<td>5,960 (21%)</td>
</tr>
<tr>
<td>Permanent residents</td>
<td>3,131 (4%)</td>
<td>1,191 (4%)</td>
</tr>
<tr>
<td>Total</td>
<td>96,804</td>
<td>29,113</td>
</tr>
</tbody>
</table>
Ethics and the Computer World: A New Challenge for Philosophers

John Ladd

Harvard University, Philosophy, Cambridge, Mass. 02138. 1979

The philosopher as godaddy

It is sometimes said that a moral philosopher thinks of himself as an omniscient advocate for the interests of justice and freedom, and so, in his role as a moral philosopher, is able to ignore certain ethical principles. The philosopher is thus exonerated by his own moral philosophy. This is not true. The philosopher is not omniscient, but rather he is a moral critic, a proponent of ethical principles. A philosopher is not a moral godaddy, but rather he is a moral philosopher, a proponent of ethical principles.

Micro-ethics and macro-ethics

The philosopher is not an omniscient godaddy, but rather a moral philosopher, a proponent of ethical principles. A philosopher is not a moral godaddy, but rather a moral philosopher, a proponent of ethical principles. A philosopher is not an omniscient godaddy, but rather a moral philosopher, a proponent of ethical principles. A philosopher is not an omniscient godaddy, but rather a moral philosopher, a proponent of ethical principles.

New technology and new ethics

Radically new technologies, such as cloning, steam engines, railroads, electricity, telephones, automobiles, nuclear power, new medical and surgical techniques, new forms of communication, and new forms of social interaction, are changing the way we live and the way we think about the world. These changes are not only affecting the way we live and the way we think about the world, but they are also affecting the way we think about the world.

The computer world as a basis of corruption

Computers are wonderful, exciting and even somewhat mysterious. Our society and all of our lives have been enhanced by them. As a scholar I continue to marvel at what they have done for scholarship. I have been using computers for all work since 1974 and shall continue to do so as long as I can. New possibilities for long opening up. I have little sympathy for a Luddite attitude towards computers. Like the great new technologies, computers are here to stay and we must make the best of them.
At last, we are past the point of no return. The world is changing, but we are still in the beginning. The beginning of the end. The end of the beginning.

Computers should be a public resource, not a bonanza for entrepreneurs.

As we know, the computer is not a thing that can be used to make money. It is a tool for thought. A tool for exploration. A tool for creativity. A tool for learning.

But as we know, the computer is also a tool for destruction. A tool for manipulation. A tool for control. A tool for war.

So what should we do? Should we continue to let the computer be a tool for the few, or should we use it to benefit the many?

We must be cautious. We must be vigilant. But we must also be creative. We must use the computer to build a better world.

For the computer is a powerful tool. It can be used for good or evil. But it is up to us to decide which.

And so, let us use the computer to build a better world. Let us use it to create a world of peace, prosperity, and justice. Let us use it to build a world where all people are equal.

For the computer is a powerful tool. And we must use it wisely.

Let us use the computer to build a better world.
There are a few more to be said about the ethics of information control and that is after all what the intellectual property companies are designed to do. The first thing that comes to mind is that...
Appendix 24

An evolution toward three large groups of applications and services

Wireless Personal Communications: What Is It?

DONALD C. COX

Wireless Personal Communications has captured the attention of the media, and with it, the imagination of the public. Hardly a week goes by without one seeing an article on the subject appearing in a popular U.S. newspaper or magazine. Articles ranging from a short paragraph to many pages regularly appear in local newspapers, as well as in nationwide print media, e.g., The Wall Street Journal, The New York Times, Business Week, and U.S. News and World Report. Countless marketing surveys continue to project enormous demand, often projecting that at least half of the households, or half of the people, want wireless personal communications. Trade magazines, newsletters, conferences, and seminars on the subject by many different names have become too numerous to keep track of, and technical journals, magazines, conferences and symposia continue to proliferate and to have ever increasing attendance and numbers of papers presented. It is clear that wireless personal communications is, by any measure, the fastest growing segment of telecommunications.

However, if you look carefully at the seemingly endless discussions of the topic, you cannot help but note that they are often describing different "things". i.e., different versions of wireless personal communications [1, 2]. Some discuss pagers, or messaging, or data systems, or access to the National Information Infrastructure, while others emphasize cellular radio, or cordless telephones, or dense systems of satellites. Many make reference to popular fiction entities like Dick Tracy, Maxwell Smart, or Star Trek.

Thus, it appears that almost everyone wants Wireless Personal Communications, but, What Is It?? There are many different ways to segment the complex topic into different communications applications, modes, functions, extent of coverage, or mobility [1, 2]. The complexity of the issues has resulted in considerable confusion in the industry, as evidenced by the many different wireless systems technologies, and services being offered, planned, or proposed. Many different industry groups and regulatory entities are becoming involved.

The confusion is a natural consequence of the massive distortions that are occurring, and will continue to occur, as we progress along this large change in the paradigm of the way we communicate. Among the different changes that are occurring in our communications paradigm, perhaps the major ingredient in the change from wired fixed place-to-place communications to wireless mobile person-to-person communications. Within this major change are also many other changes, e.g., an increase in the significance of data and message communications, a perception of possible changes in video applications, and changes in the regulatory and political climates.

This article attempts to identify different issues and to put many of the activities in wireless into a framework that can provide perspective on what is driving them, and perhaps even yield some indication of where they appear to be going in the future. However, like any attempt to categorize many complex interrelated issues, there are some that don't quite fit into neat categories, so there will remain some dancing loose ends. Like any major paradigm shift, there will continue to be considerable confusion as many entities attempt to interpret the different needs and expectations associated with the new paradigm.

Background and Issues

Mobility and Freedom from Tethers

Perhaps the clearest ingredients in all of the wireless personal communications activity are the desire for mobility in communications, and the companion desire to be free from tethers, i.e., from physical connections to communications networks. These desires are clear from the very rapid growth of mobile technologies that provide primarily two-way voice services, even though economical wireless voice services are readily available. For example, cellular mobile radio has experienced rapid growth. Growth rates have been between 35 and 60 percent per year in the United States for a decade, with the total number of subscribers reaching 70 million by year-end 1994. The often neglected wireless companions to cellular radio, i.e., cordless telephones, have experienced even more rapid, but harder to quantify, growth with sales rates often exceeding 10 million units a year in the United States, and with an estimated usage significantly exceeding 50 million in 1994. Telephones in airplanes, and also become commonplace, similar, or even greater growth in these wireless technologies has been experienced throughout the world.

Paging and associated messaging, while not providing two-way voice, do provide a form of tetherless mobile communications to many subscribers worldwide. These services have also experienced significant growth. There is even a glimpse of a market in the many different specialized wireless data applications evident in the many wireless local area network (WLAN) products on the market, the several wide area data services being offered, and the specialized satellite-based message services being provided to trucks on highways.
still be only $140 per unit, which is still much less than the per-circuit cost of high-tier.

Example 2 – In the second example (see text), the overall system capacity is held constant, and the number of channels per port, i.e., channels/base station, is varied. In this example, less than 1/2 channel per port is regarded as indicating the tremendous capacity that can be produced with close-spaced low-complexity base stations.

Example 3 – Since the first two examples are somewhat extreme, the third example (see text), uses a more moderate, intermediate approach. In this example, some of the cellular high-tier channel capacity, i.e., channels/base station, are traded off to yield higher quality low-tier PCS as in the previous subsection. This reduces the channel per port to 11.5, with an accompanying increase in cost/circuit up to $222/circuit, which is still much more than the $5.55/circuit for the high-tier system. Note also, that the low-tier system still has 35% of the capacity of the high-tier system.

Low-tier base station (PORT) cost would have to exceed $62,500 for the low-tier per-circuit cost to exceed that of the high-tier cellular system. Such a high port cost far exceeds any existing realistic estimate of low-tier system costs.

It can be seen from these examples, and particularly Example 3, that the circuit economies of low-tier PCS are significantly better than for high-tier PCS. If the user demand is sufficient to make use of the large system capacity, considering the high penetration of cordless telephones, the rapid growth of cellular handsets, and the enormous market projections for “wireless PCS” noted earlier in this paper, filling such high capacity in the future would appear to be certain. The major problem is providing rapidly the widespread coverage (buildout) required by the FCC in the United States. If the unrealistic regulatory demand for initial deployments, there is increasing concern throughout the industry as to whether CDMA is a viable technology for high capacity cellular applications.

New Technology

New technology, e.g., spread spectrum or CDMA, is sometimes offered as a solution to both the high-tier cell site capacity and transmitter power issues. However, as these new technologies are pursued vigorously, it becomes increasingly evident that the early projections were considerably over-optimistic, that the utilization capacity will be about the same as other technologies [1], and that the high complexity will result in, not less, power consumption. With the continuing problems and delays in initial deployments, there is increasing concern throughout the industry as to whether CDMA is a viable technology for high capacity cellular applications. Without question, the use of spread spectrum for commercial communications [35]. Thus, it is clear that new high-complexity high-tier technology will not be a substitute for low-complexity, low-power low-tier PCS.

People Only Want One Handset

This issue is often raised in support of high-tier cellular handsets over low-tier handsets. While the statement is likely true, the assumption that the handset must work with high-tier cellular is not. Such a statement follows from the current large usage of cellular handsets, but such usage results because that is the only form of widespread wireless service currently available, not because it is what people want. The statement assumes inadequate coverage of a region by low-tier PCS, and that high-tier handsets will not work in vehicles. The only way that high-tier handsets could serve the desires of people discussed earlier would be for an unlikely “breakthrough” in battery technology to occur [7]. However, a low-tier system can cover economically any large region having some people in it. (It will not cover rural or isolated areas by definition, there is essentially no one there to want communications anyway).

Low-tier handsets will work in smaller cities on village and city streets at speeds up to 20 or 40 miles per hour, and the required handoff of make use of computer technology, a rapidly becoming inexpensive. Highways between populated areas, and also streets within them, will need to be covered by high-tier cellular PCS but users are likely
SUMMARY OF PHILOSOPHY AND PRACTICE

How the vagina assists bladder opening and closure. This is a simplified diagram of the vagina, bladder, uterus, and rectum, with you in the standing position. Note how the urethra lies on top of the vaginal hammock, and how the vagina is suspended from the pelvic girdle by the anterior and posterior ligaments. The forward forces (arrows) stretch the vagina to close off the urethra. The backward forces (arrow) stretch the vagina to close off bladder neck.

How a lax vagina may cause stress and urge incontinence. The vagina acts like an elastic membrane. With age and childbirth, this tissue may become lax. If the vagina is lax, the muscles attached to either side (thin arrows) cannot close off the urethral tube. When the patient coughs, urine is lost (stress incontinence). The same laxity fails to support the filling bladder. The nerve endings (N) are stimulated prematurely, and overcome the brain's inhibition at a lower bladder volume ('bladder instability'). This may be expressed as urge, frequency, and waking at night to pass urine.

The importance of conserving vaginal tissue during surgery. The vagina is an organ. Excessive removal of vaginal tissue may cause pain with intercourse, and bladder problems at a later date because scar tissue contracts with age. It is clear that adequate vaginal elasticity is required to prevent the more powerful backward force (arrow) from overcoming the (forward) forces closing the urethra. Scar tissue below N may 'tether' these forces; the backward force overcomes the forward force, the bladder may be pulled open when given the signal to close. A similar condition may occur with excessive upward stretching of vagina during incontinence surgery.

The importance of conserving the uterus where possible. Within the architecture of the pelvic floor, the uterus acts much like the keystone of an arch, being an important insertion point for the posterior ligaments, and, therefore, the downward muscle force (arrow). Removal of the uterus may cause...
weakness in the posterior ligaments, predisposing to prolapse of the vagina. This in turn, may cause bladder instability, emptying problems and pelvic pain. Hysterectomy may cause bladder problems in 18% of patients.

**SUMMARY**

Basic concepts: This course is essentially about connective tissue. How the same anatomical defects of connective tissue may cause uroavaginal prolapse and urinary dysfunction, and how repair of the same connective tissue defects may cure both problems. The Integral Theory (1, 2) explains how laxity in the vagina or its supporting ligaments may cause stress, urge and abnormal emptying symptoms by inactivation of pelvic muscle forces. Because the control mechanisms are non-linear, symptoms may vary from day to day, and may not be associated with specific anatomical defects. Even a 1st degree herniation may cause symptoms.

Pathogenesis: The dotted circles 1-4, represent zones of connective tissue damage (laxity) caused by the foetal head as it descends through the birth canal. Overdistension may damage the vagina and its attached ligaments, causing damage to the front, middle, or posterior parts of the vagina. This, in turn, may cause urogential prolapse, and urinary dysfunction. Laxity in the ligamentous insertion points of the vagina may inactivate the opening and closure forces of the pelvic floor. The patient may experience abnormal opening or closure symptoms, such as stress, urge incontinence to empty properly, etc.

![Diagram](image)

- **Damage to vagina at childbirth**
  1. hymen and pubourethral ligament laxity
  2. cystocele and arcus tendineus fascia pelvis defect
  3. uterine prolapse, enterocoele
  4. rectocoele

**Diagnosis:** Symptoms and damaged structures are linked by the pictorial algorithm. This identifies 3 zones of anatomical damage, anterior, middle, and posterior. The algorithm gives an instantaneous guide as to which zone of the vagina needs reconstruction. The algorithm provides a reasonable working guide as to which defect to repair. Simply tick each parameter. Diagnosis is then apparent.
SUMMARY (continued)

Simplified Clinical Version of the Pictorial Algorithm

ANTERIOR DEFECT

(MIDDLE DEFECT)

POSTERIOR DEFECT

(xs laxity)

Principal symptoms
SI (severe)
Uk loss on standing
post-stress instability
‘always damp’
faecal incontinence (FI)
noct enuresis /cured
at puberty or ‘wet since
childhood’
Principal signs
lux hammock
+ve pad test (SI)
+ve midurethral Bonney
‘tunneling’ on U/S
UVJ prolapse (strain)

(xs laxity)

Principal symptoms
emptying
FI persisting after IVS
Principal signs
cystocele
ATFP defect

(xs laxity)

Principal symptoms
incontinence worse
1 week before period
pain – low back
- low sacral
-deep dyspareunia
emptying
nocturia
Principal signs
excitation pain
cervical
vaginal
prolapse
uterus
vagina
enterocele

NOTE 1) FNU (frequency, nocturia, urgency) may occur with all defects
2) not all criteria may be present in a particular defect