ARE STUDENTS' WORLD VIEWS AFFECTED BY SCHOOL VIEWS:
A SOCIOCULTURAL PERSPECTIVE

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Background and Rationale

At times the teaching and learning strategies adopted in the high school classroom can be perceived as being in conflict with the natural learning strategies of the learner. Teachers can use practices that may inadvertently conflict with students' previous learning patterns, home environment, mores and values. High school classrooms are increasingly reflecting a greater range of students with different cultural backgrounds. Many teachers have failed to realise that a number of their students may come from communities with widely differing cultural practices. Many fail to realise that even within an ethnic grouping there are different cultural practices and beliefs. Just as there are differences between families in how they train their children, so there can be differences between regions within an ethnic or tribal grouping. Consequently, there can be a complete lack of sensitivity to the important cultural milieu into which the teaching and learning are to be placed. We accept Geertz's (1973, p. 5) definition of culture as:

man is an animal suspended in webs of significance he himself has spun. I take culture to be those webs, and the analysis of it is not an experimental science in search of law but an interpretative one in search of meaning.

It follows that unless students can relate the application of what is taught to their own cultural background, then the teaching strategies are likely to be less than effective in enhancing their learning. For some time now, it has been argued that one of the main sources of students' learning difficulties is the lack of optimisation between teaching strategies utilised by the teacher and the natural learning styles of the learner (Hofstein, Giddings & Waldrip, 1994; Kempa & Matin-Diaz, 1990a; 1990b). Trueba (1988) argues that while sociologists have made considerable progress in explaining the relationship between instructional strategies and the learning process in their examination of the differential achievement of minorities, they have often ignored the critical role of culture in this relationship.

Walberg's (1981) model of 'educational productivity' suggests that nine factors require optimisation in order to increase affective, behavioural and cognitive learning. These causal influences on student learning include a set of aptitude variables (Ability, Development and Motivation), a set of instructional variables (Quantity and Quality) and a set of environmental variables (Home, Classroom, Peers and Media). Waldrip and Giddings (1994) argued that a fourth set of variables (Culture) should be included for the optimisation of the learning process. This study will build on this theoretical base. As Zaharlick (1992) implies, educational productivity can only be optimised when the context is accounted for. We argue that learning can only be optimised when the cultural context of the learners is accounted for. We agree with Trueba (1988, p. 282) that "the conditions for effective learning are created when the role of culture is recognised and used in the activity settings during the actual learning process".

For example, while working in a developing country (as defined by the World Bank), even though we view all countries as developing, a professor of geology from the local university once informed one of us that he believed in both evolution and special creation as viable explanations of origins. In response to the suggestion that there was a disparity between these two explanations, he explained that he believed in evolution when he was at work and in special creation at church. After some discussion, he saw no disparity between the two viewpoints. We believe that this example typifies the assertion that many learners hold simultaneously two different viewpoints that provide disparate explanations of naturally occurring phenomena: a 'world view' and a 'school view'.

In relation to science education, we define 'school view' as the canonical scientific conceptions and methods of inquiry that science teachers endeavour to enable students to develop in order to understand the physical world. Cobern (1991, p. 7) defines 'world view' as the foundational beliefs about the world that support both commonsense and scientific theories. We have adopted a restricted version of Cobern's definition, namely, that the 'world view' refers to the totality of experiences and explanations that have been built up prior to any experience of school instruction and that comprise students' preconceptions of natural phenomena. We are concerned that a disparity exists between students' world views and the official school view, especially in school science where Western explanations of natural phenomena can be very different from traditional explanations. In our experience of science teaching in developing countries, many teachers try to enforce the school view while failing to recognise the existence of students' world views. In cases where major disparities exist between students' world views and school views, we believe that students' learning becomes fragmented and lacks cohesiveness and personal meaningfulness. An examination of this disparity was one of the goals of the study reported in this paper.

In many developing countries, the official school view is a product of Western culture inasmuch as the local education system remains tied to its original source (Kahn, 1990). In particular, science programs often are taken directly, with little or no adaptation, from Western nations' science programs (Ingle & Turner, 1981; Ogawa, 1986). We believe that, in developing countries, school science instruction that is based faithfully on imported curricula is likely to result in a disparity between students' world views and their school views. In these contexts, culture and traditions tend to be largely 'people-based', whereas science is based largely on 'things' (Ogunniyi, 1988). When learning science, this difference in emphasis can produce tensions which result in students developing two different sets of values and attitudes (Kay, 1975) leading to a conflict concerning which set of values and attitudes should be adopted. A consequence of this conflict is 'compartmentalisation', that is, students adopt two, sometimes conflicting, explanations of a particular phenomenon. One of these explanations is based on traditional village explanations or experiences and the other is based on what is taught in school.

We feel that it is important to examine the relationship between students' world views and school views because, as Gilbert, Watts and Osborne (1982, p. 64) argue, the "dominance of the students' prior understanding . . . [can] often lead to quite unintended interpretations of what is being taught". The epistemological framework of Gilbert et al. concerning 'prior understanding' was based on Schutz and Luckmann's (1973) foundational theory which argues that the learner tends to typify experiences in order to create meaning structure. Assimilation of these typical experiences forms a 'life-world knowledge' that is both acceptable and persistent. Berger and Luckmann (1966) argue that this intuitive life-world knowledge is constructed during students' early childhood socialisation and enculturation by 'significant others' (e.g., parents and peers). However, in the context of science education, the secondary socialisation process of school science involves less subjective inevitability, and may be experienced as being less compelling (Solomon, 1987). As Banks (1993) argues, "the ethnic and cultural experiences of the knower are also epistemologically significant because these factors also influence knowledge construction, use, and interpretation" (p. 6).

The cultural background of the learner may have a greater effect on education than does the subject content, especially in relation to students making observations in science classes (Jegede & Okebukola, 1991; Okebukola, 1986). Based on experience, however, we believe that while students may be somewhat selective about making observations, the real issue is that students are selective about the relationships between their observations, rather than the observations per se. This assertion reflects the contention of Falgout and Levin (1992) that, for developing country students, the importance of knowledge lies in its application, results and products, whereas Western schools tend to regard as a virtue the learning of knowledge for knowledge sake. From an epistemological perspective, therefore, it is important that teachers have an "understanding of traditional modes of belief about the natural world" (Ingle & Turner, 1981, p. 362). We argue, that unless students can relate the school view of the natural world to their own well-established world views then teaching
strategies are likely to be less than effective in enhancing the permeability of students' world views to their school views.

Purpose(s) of the Study

Comparatively little research has been conducted into the state of multicultural high school classrooms which contain students with a diverse range of cultural backgrounds. The paper attempts to explore some of this gap in the research by briefly describing an ethnographic-interpretive study based in Melanesia which examines the permeability of students' world-views to the official Western school view. Melanesia is composed of many sub-cultures, some of which are inherently different even though the region has some ethnic commonalities. In an integrative review of research on the effect of culture on the learning of science in non-Western countries, Baker and Taylor (in press) concluded that attempts to nationalise Western science curricula are likely to be ineffective because of the disconnectedness of students' world views and school views. Whereas that study focussed on the influence on learning school science of students' cultural backgrounds, including their language and traditional beliefs, this study reversed the focus and examined the prospects of school science making a significant contribution to local cultural practices. We set out to examine empirically the permeability of the world views of students of school science in a developing country in relation to their school views.

Design and Procedures

Because of the extensive first-hand experiences of the first author within a range of Melanesian cultures, we planned to conduct an interpretive-ethnographic study (Erickson, 1986; Hammersley & Martin, 1983) that involved field work in a developing Melanesian country. We chose an island located in a small South Pacific Melanesian country that we call 'Kantri' (a pseudonym is used because of the political sensitivity of the study). Because the first author had previously lived and worked in Melanesia for 10 years he was well-known and, therefore, was readily able to gain access to key people both within the school system and at a local level.

By means of interviews conducted over a two-week period, we had planned to learn about: (1) traditional world view explanations of selected natural phenomena held by local Melanesian school students and their parents; (2) students' school view explanations of these phenomena, and (3) students' and parents' perceptions of the viability of the school view within the context of the daily lives. On the basis of this understanding, we hoped to be able to determine the extent to which traditional world views are influenced by school views. In keeping with the interpretive-ethnographic tradition, as we became more sensitive to the local culture we learned that our research design needed to be modified. Within a short time after arrival in Kantri, field work enabled us to learn more about the nature of the local Melanesian culture and, consequently, we refocussed our research questions.

We had intended to seek explanations of a range of natural phenomena which, from our experience, form an important focus for traditional stories in many Melanesian cultures. However, the distinctiveness of the local culture of Kantri caused us to reconsider the focus of our questions. Some expressions describing natural phenomena had no local equivalent translation and some phenomena did not have a place in the local lore and traditions.

Village Elders

Parents of students were not interviewed as initially planned because the villagers desired to show respect by making available village elders for interview. Village elders are perceived to be the source of all wisdom and are the recognised authority on tribal knowledge. Contact with three elders was made through a respected local high school principal who was related to two of them, Laki and Karsoon, who viewed themselves primarily as fishermen. A third elder, Lapun, is known throughout the island for his knowledge of folklore, and was recommended by the national cultural heritage curator. This elder viewed himself primarily as a gardener.

Each of the three elders was interviewed separately in a local dialect, Pijin, except in the case of the gardener, Karsoon, who felt more comfortable using a mixture of Pijin and a very localised dialect that was quite dissimilar to Pijin. Whenever Pijin was not used a
fellow villager served as a translator. During the interview a large gathering of villagers served as an attentive audience.

In order to ensure that the elders perceived the interview process as meaningful, initial questions focussed on the context of their chief occupations, that is, the ocean or land environment. Each elder was asked to explain how they would know when it was the best time for fishing or how they knew when or where they could plant their gardens. The elders were asked for their views on the extent to which schooling helps students to understand better the gardening or fishing process that was practised in their villages. Each of the elders seemed to be genuinely interested in participating in the interviews to an extent that, at times, they asked whether they had answered satisfactorily the questions. A local high school principal who was present during the interviews claimed that the elders were frank and candid. Their critical attitudes towards the value of schooling bears testimony to their frankness.

Local Students

Within Kantri, less than 10% of students are given the opportunity to receive further education after completing high school. Consequently, most students return to their villages while the privileged few obtain employment in some of the few towns. The majority of the islands within Kantri have no towns, but each has a small store that sells trade goods such as salt, clothing material, fishing or gardening tools, and fuel. Nevertheless, most students envisage themselves as obtaining well-paid employment when they graduate from high school.

In this study, we interviewed a group of Melanesian students who were attending a local high school on one of the main islands. This particular school was chosen because of its accessibility. Because there are very few high schools in Kantri, each high school contains a student population that is fairly representative of students across the whole country. This school was particularly so as it was a boarding school and housed students from a number of remote and rural villages.

In this school, the science curriculum had been imported directly from a nearby Western country. Its classroom implementation had been observed by the first author during a recent study of South Pacific science teachers (Giddings & Waldrip, 1993). That study reported that, in general, South Pacific science teachers have very didactic approaches to teaching which allow very little variation in approaches to learning science beyond passive reception and rote recall. Evidence from other studies supports our contention that South Pacific teachers implement curricula with very little adaptation to the local cultural contexts (Thaman, 1993).

There are twice as many male students as there are female students in the high schools of Kantri. This is due to the patriarchal nature of the culture that places a high value on school education for male adolescents and a high value on traditional domestic education for female adolescents. In this study, we interviewed 11 male and 4 female students, most of whom were aged in their mid to late teens (see Table 1). Students were interviewed in English by the first author. The interviews were recorded on audio-tape and transcribed for analysis. It was explained that their responses would be treated confidentially and that their identities would remain anonymous. Nevertheless, we soon found that most students could not, or would not, provide traditional explanations of natural phenomena that had been discussed successfully with the village elders. All students, except two, seemed to feel that the village stories were foolish and, when pressed for an explanation of natural phenomena, tended to laugh and claim not to know them.

Table 1

<table>
<thead>
<tr>
<th>Age of Student</th>
<th>Gender</th>
<th>Number of Students</th>
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<tbody>
<tr>
<td>mid-teens</td>
<td>male</td>
<td>6</td>
</tr>
<tr>
<td>mid-teens</td>
<td>female</td>
<td>2</td>
</tr>
<tr>
<td>late teens</td>
<td>male</td>
<td>4</td>
</tr>
<tr>
<td>late teens</td>
<td>female</td>
<td>2</td>
</tr>
<tr>
<td>mature age</td>
<td>male</td>
<td>1</td>
</tr>
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Because this line of questioning proved to be relatively fruitless, we decided to focus on students' explanations of traditional methods of gardening or fishing in which they participated when living in their villages. We asked them for their parents' explanations about gardening or fishing practices and asked how they perceived their parents' explanations. The students were asked about the usefulness of what they learn at school for village life. They were asked how well schooling prepared them for village life. They were asked questions concerning what would happen if they tried to implement what they had learnt at school within their village lifestyles. Finally, they were asked for their opinion as to which type of learning – school subjects or village lore – best prepared them for life in the village.

Revised Research Focus

Our revised research focus sought to establish the extent to which the school view was perceived, in a general sense, as being relevant to important traditional village lifestyle practices. The focus of our study shifted from an examination of the influence of the school view on traditional explanations of natural phenomena to an examination of perceptions of the usefulness of the school view in the context of key aspects of daily life in the village.

Results and Discussion

The study suggested that (1) the process of enculturation into a Western school view involves an implicit devaluation of students' traditional world views which govern their village lifestyles; and (2) a Western school view is of limited viability in relation to traditional values and practices. If the schooling process is not meeting cultural expectations, it is likely that the resultant learning will be less than effective. This may be one factor why constructivism is less than effectively implemented in some classrooms. In this case, it may be of value to negotiate acceptable methods of learning for that classroom. Any introduction of alternative learning methods may need to be carefully crafted and negotiated.

When we designed the study, we were concerned about the role of school science in shaping the future lives of peoples of non-Western cultures. Our experience of living and teaching in largely non-Western countries suggested that science curricula that are imported directly from Western industrialised countries might be less than relevant to the traditional world views held by members of the local culture. We were aware of research that indicated that the cultural background of the non-Western learner has a strong influence on their learning of school science, and we wondered whether the reverse might also be true. That is, we wanted to investigate the extent to which the school view of science permeates the world views of students in non-Western cultures.

We conducted an interpretive-ethnographic study that investigated the relationship between the world view and school view of a group of high school students in one Melanesian culture. In fact, a number of subcultures existed amongst these participants. Even though all were Melanesian, some had a culture that is very similar to Polynesia. Besides sharing some Polynesian cultural expectations, they spoke a Polynesian-based language. They were viewed by the local inhabitants as Melanesian. Other participants had Micronesian cultural linkages. The rest had different ethnic backgrounds. All participants live in the same country and are viewed as Melanesians by the other participants. The students had left temporarily their traditional village lifestyles while they attended a residential high school in a rural area where they were studying a Western-oriented school science curriculum. We were able to gain insights into the traditional world views of villagers by interviewing several respected elders who told stories about their traditional ways of gardening and about their early experiences of Western schooling. We focussed our investigation on the perceived influence of school views on traditional village beliefs and practices.

Because of the limited employment prospects on the island, most students would resume village life on completion of high school. It seemed obvious to us that the science education they were receiving at school should serve an important role in their future lives, whether they sought employment in towns or returned to their villages. We were disappointed to learn, however, that schooling currently disconnects young people from their own cultural beliefs and practices, and attempts to enculturate them into a largely irrelevant
Western school view. At school, a preoccupation with teaching with high fidelity an imported Western-oriented curriculum seems to have blinded teachers to their unwitting promotion of a cultural cringe amongst their students. At school, students embrace the legitimised rationality of school science while developing negative attitudes toward their traditional world views. Back in the village, however, young high school graduates experience difficulties fitting back in to a world view that they have learned to eschew.

Generally speaking, the village elders and high school students whom we interviewed did not perceive the school view as useful for improving the knowledge and skills needed for survival in the village. For example, school science was regarded as providing methods of agriculture that were either inferior to or no better than traditional agricultural practices. Indeed, there was a general perception that the school view conflicted with traditional values and practices, and served to undermine young people's respect for traditional lifestyles. The main perceived benefit of formal education for young people was its improvement of their prospects of earning a monetary income that could be shared with their extended families if they were able to obtain scarce employment in a town.

In this brief study of traditional Melanesian culture, we obtained disturbingly little evidence of the positive influence of the school view of science on young people's traditional world views. We were left with the distinct impression that much of what goes on in the high school science classroom in rural Kantri is of little relevance to the future lives of most young Melanesians. Of course, we did not observe the science classes attended by students in this study and, therefore, cannot judge the extent to which the teachers were attempting to adapt their Western science curricula to local needs. Nevertheless, whatever may be going in these classes (and other research indicates that very little adaptation to local needs is occurring), the outcome is less than impressive from the points of view of local people.

We believe that the educational challenge for developing countries such as Kantri, which currently import science curricula from Western countries, is one of curriculum adaptation to the local culture. This can be achieved only through a rich understanding of the prevailing (albeit changing) cultural values and practices of the local people. Above all else, it is imperative to avoid a neo-colonialist policy that legitimises young people's relinquishment of their cultural heritage in favour of an inappropriate Western scientistic school view that creates a false dawn of expectations for the 'well-qualified' high school graduate. Further research needs to be conducted in Kantri, and in other non-Western cultures, to document the world views of local indigenous people and to suggest ways that the power of Western science may be harnessed in their interests.

This study reversed the focus of a previous study (Baker & Taylor, in press) by examining the prospects of school science making a significant contribution to local cultural practices. Similarly, the discussion presented here reversed the focus of much educational research in non-Western countries which shows how little transference of learning occurs when trying to impose a Western curricula on non-Western countries. This paper seeks to conclude with what can be learnt from a non-Western setting which is applicable to Western high schools which are containing an increasing diversity of different cultures. This study indicates that the need to adapt to local cultural learning practices. It also stressed that much schooling tends to devalue traditional views and consequently schooling can have limited viability in relation to traditional values and practices.

Just as this study had to adapt to the local culture, any study within a typical Australian (or Western) high school needs to address the concerns of multicultural classrooms. This paper supports Coben's (in press) rejection of cultural deficiency being a major cause of the unsuitability of the adoption of Western learning processes in a non-Western educational system, and argues that understanding the local cultural context is essential in the learning process. True constructivists will not merely look for a technical 'alternative pathway' of learning but rather focus on culturally acceptable learning processes. This paper suggests that teachers need to relate students' learning to meaningful past experiences. Eventually this will involve students' personal constructions. Rather than being an obstacle to learning, we perceive the understanding and effective utilisation of cultural expectations as an essential aspect of the learning process. Even so, as we communicate, we make and remake our own cultures (Bhola, 1990). Hence, involving culture in the learning process is a dynamic, not static process. That is, a constant state of reflection and negotiation is essential for effective
learning to occur in Australian multicultural classrooms. Our next line of research plans to examine this interaction of students' perceptions of the learning process and their cultural expectations. It is envisaged that this examination will help teachers to be more aware of the cultural effects in the learning process.

References


