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Staying Up-to-Date with Changes in IT

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INTRODUCTION

Information and communications technology (ICT) has been changing rapidly over a long period, and this rate of change is likely to continue or increase (Benamati & Lederer, 2001a; Fordham, 2001). This rapid rate of change has produced many opportunities for organizations but has also brought with it many challenges (Benamati & Lederer, 2001b; Lederer & Mendelow, 1990). Among these challenges is the struggle for organizations to obtain personnel with the appropriate knowledge and skills in order to meet their ICT needs (Byrd & Turner, 2001; Doke, 1999). This is mirrored by the continual requirement for information technology (IT) professionals to keep up-to-date with the skills required by organizations (Benamati & Lederer, 2001a; Klobas & McGill, 1993).

Previous research has investigated the importance employers place on various skills and perceived deficiencies in these skills (e.g., Doke, 1999; Leitheiser, 1992; Nelson, 1991). While the call for improved communication and social skills has been consistent, the technical skills in demand have varied dramatically over time (Van Slyke, Kittner, & Cheney, 1998). Less has been written about students' perceptions of the importance of various ICT skills, though this was addressed in a study that compared Australian and American students' perceptions of ICT job skills (von Hellens, Van Slyke, & Kittner, 2000). This chapter provides an overview of a project that investigated the channels of information that ICT students use to keep up-to-date with employers' needs.

BACKGROUND

Given that the skills required by IT professionals change over time, IT professionals need effective methods to keep up-to-date. The methods used by IT professionals to keep up-to-date were studied by Klobas and McGill (1993). They identified the existence of a variety of information-gathering strategies and noted that while IT professionals tended to be diligent in their efforts to keep up-to-date, a majority found it difficult to do so. In a more

recent study, Benamati and Lederer (2001a) investigated the coping mechanisms adopted by IT professionals and noted that many mechanisms were not successful.

If it is difficult for experienced IT professionals to keep up-to-date, it is likely that it is even more difficult for ICT students to do so. New graduates require marketable skills in order to gain good employment, but the skills most in demand change regularly. Little is known about how ICT students keep informed of employers' requirements or about how they ensure that they can meet those requirements. Yet, this knowledge would be of use to both educational institutions aiming to facilitate this process and to potential employers hoping to recruit students with the required skills.

Information about ICT skill requirements is available from a variety of sources in a variety of formats. Information sources include ICT suppliers, publishing companies, and universities. Formats include different types of publications, presentations, and personal contacts. The term "information channel" can be used to describe the various combinations of sources and formats of information.

HOW DO STUDENTS KEEP UP-TO-DATE?

Eighty-five information technology students at an Australian university were surveyed to investigate the channels of information that they use to keep up-to-date with employers' needs. Participants were recruited during class and completed a questionnaire on the spot.

The questionnaire listed information channels that may be used to keep up-to-date and asked participants whether they had used each channel within the last 3 months, and also asked them to rate the importance of each channel to them as a means of knowing what skills are in demand. Importance was measured on a 5-point scale ranging from (1) "Not important" to (5) "Vital." The initial list of channels of information was drawn from Klobas and McGill's (1993) report of the methods used by IT professionals to keep up-to-date with developments in

ICT. Several additional channels were included after consultation with industry contacts. Table 1 lists the information channels included in the questionnaire.

Overall, the students appeared to be diligent in their efforts to keep up-to-date with employers' skill requirements. The average number of channels used by the students during the previous 3 months was 3.8 (and the most common number used was 5). Thirteen students (15.3%) had not made any attempt to keep up-to-date during this period, and four (4.7%) had made use of all nine listed channels.

The information channels are ranked by frequency of use in Table 1. The most frequently consulted channels were newspaper employment and IT sections and Internet sources. University instructors had been consulted by about half of the participants during the previous 3 months. Other students had also been used as sources of information by a number of students (40%). This high level of use of other students to provide information about employers' skill requirements is understandable given the easy accessibility of other students (Klobas & McGill, 1993). Work colleagues were ranked seventh overall, but as only around a third of the participants had ICT work experience, this means that most of those with prior experience had consulted their colleagues (75% of those with prior ICT work experience had consulted their colleagues). The least used channels were books and vendor presentations. It is likely that students were conscious that information about employer skill requirements derived from books was not going to be sufficiently up-to-date to meet their needs.

Table 2 shows the importance rankings of the individual information channels. The most highly ranked information channel was Internet sources, such as the Cisco and Lucent sites. As well as being frequently used,

newspaper ICT sections and employment pages were also considered very important (ranked two and three). University instructors were ranked fourth in importance, which was consistent with their frequency of consultation by students. Although other students were consulted by many students, they were not considered an important channel of information (ranked seventh). This suggests that students recognize that although other students are easily accessible sources of information, they are not necessarily accurate or reliable sources. Both books and vendor presentations were considered of low importance. In future research, it would be interesting to determine how well student perceptions match those of employers.

In addition to the items about methods used to keep up-to-date, participants were also asked several questions that addressed whether they believed they were, in fact, obtaining the skills employers required. A majority of participants believed that their degree would provide the skills employers require (67.1% "yes," 5.9% "no," and 27.1% "not sure"). This high level of confidence suggests that although only around 50% of students had consulted their instructors about employer skill requirements during the previous 3 months (and instructors were only given a medium ranking of importance), students implicitly accept that instructors know what skills students require. Industry certification was also seen as a very important means to ensure that students obtain the necessary skills (mean importance score was 4.18/5 for those students not yet working in the ICT industry). This is consistent with the results of a recent study on IT certification that found that students undertaking certification believe that the most important benefit of certification is that it provides "real-world" experience (McGill & Dixon, 2004).

Table 1. Information channels ranked by frequency of use

Rank	Information channel	Number	Percentage
1	Newspaper employment pages	56	65.9
2	Newspaper ICT sections	52	61.2
3	Internet sources (e.g., Cisco, Lucent)	47	55.3
4	University instructors	43	50.6
5	Other students	34	40.0
6	ICT magazines (e.g., <i>Packet Magazine</i>)	29	34.1
7	Work colleagues	24	28.2
8	Books	20	23.5
9	Vendor presentations	17	20.0



Table 2. Information channels ranked by importance

Rank	Information channel	Mean	Standard deviation
1	Internet sources (e.g., Cisco, Lucent)	3.55	1.40
2	Newspaper IT sections	3.38	1.44
3	Newspaper employment pages	3.30	1.30
4	University instructors	2.88	1.42
5	ICT magazines	2.62	1.43
6	Work colleagues	2.54	1.43
7	Other students	2.41	1.13
8	Books	2.24	1.34
9	Vendor presentations	2.13	1.32

Are There Demographic Differences in Use and Importance?

Patterns of use and perceptions of importance were further examined to determine whether gender, level of study, or previous ICT work experience had influence. Differences in use were explored using χ^2 tests, and differences in importance were explored using independent sample t -tests. These factors had surprisingly little influence on patterns of use and perceived importance of information channels.

The first demographic factor considered was gender. No significant difference was found between the number of information channels used by male and female students. The only significant gender difference was for the levels of use and perceived importance of Internet sources. Male students used Internet sources more frequently and perceived them to be more important for keeping up-to-date with the skill requirements of employers.

The possible impact of previous ICT work experience was considered next. No significant difference was found between the number of information channels used by those with and those without previous ICT work experience. The only significant difference in usage of information channels was related to consultation with work colleagues and with other students. Those with previous work experience, not surprisingly, consulted with work colleagues more frequently, and they appeared to consider work colleagues a more important channel of information. Presumably, those with previous ICT experience would have received better quality information from their work colleagues than would those without ICT work experience who would have been receiving information from a pool of people with perhaps limited direct ICT experience.

Those without ICT work experience consulted other students more frequently, but there was no difference in perceptions of the importance of other students between those with and those without previous ICT work experience. As previously mentioned, this suggests that other students are consulted because of their accessibility rather than their credibility as sources of information. Those with previous ICT experience have other accessible sources of more credible information and, hence, do not rely so heavily upon other students.

The differences between undergraduate and postgraduate students were similar to those between students with previous ICT work experience and those without. This is consistent with postgraduate students being more likely to have previous ICT work experience than are undergraduates. (A total of 54.5% of postgraduates versus 22% of undergraduates had previous ICT work experience.) Undergraduate students consulted other students more frequently but did not value their information more highly. Postgraduate students also consulted work colleagues more frequently, but they did not value their input more highly. This finding differs from the added importance given to work colleagues by those with previous ICT experience, but the means are in the same direction, and the result may reflect the fact that 45.5% of the postgraduates did not have previous ICT work experience.

FUTURE TRENDS

The rapid rate of change in ICT is likely to continue (Benamati & Lederer, 2001b), and in fact, some authors believe that the rate of change is accelerating (Horn,

1999). This means that ICT students will continue to require access to up-to-date information about employers' ICT skill requirements. Given the increased role of electronic means of information dissemination (Bertot, 2003; Williams & Nicholas, 2001), it is likely that Internet sources of information will continue to be seen as the most important sources, and that their frequency of use will increase rapidly so that Internet sources will soon be the most frequently used. Greater broadband access will enable delivery of richer content and greater interactivity. Convergence of information technologies, such as notebooks, phones, and television, and the development of pervasive computing will provide even greater flexibility to students who wish to keep up-to-date with employer skill requirements.

CONCLUSION

New graduates require marketable skills in order to gain good employment, but as the ICT industry is subject to rapid change, the skills most in demand change regularly. The study described in this chapter investigated the approaches that a group of ICT students used to keep up-to-date with employers' skill needs. Overall, they appeared to be diligent in their efforts to keep up-to-date with skill requirements. The most commonly used channels were newspaper employment and IT sections and Internet sources. The same three channels were also rated most highly in terms of importance, with Internet sources being seen as most important.

Instructors were ranked relatively high in terms of both frequency of consultation and importance, and the results suggest an implicit confidence that the knowledge of instructors is up-to-date. While students have a wide variety of information channels available to them and do make use of them, instructors have a major role to play in providing up-to-date information about employers' needs. They need to be highly accessible and to ensure that their knowledge of employers' skill requirements remains current. Instructors should use studies of employers' requirements to assess their course offerings and to help guide their students.

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KEY TERMS

Industry Certification: Certification involves passing a recognized standardized test (or set of tests) within particular subject areas. It intends to establish a standard of competency in defined areas. ICT industry certifications are designed to provide targeted skills that have immediate applicability in the workplace.

Information Channel: A term used to describe the various combinations of sources and formats of information.

Information Format: The arrangement and appearance of information. Format includes both the media used and the style of presentation.

Information-Gathering Strategies: The approaches and processes used by information seekers. Information-

seeking behavior is influenced by previous experience, mental models, and preferences of information seekers.

Information Source: An organization or person from which information is obtained.

Information Technology Professionals: This is a term used to describe people for whom development and support of IT systems and related activities is their primary employment. The group includes people who design hardware, who develop and support information systems, and who train end users. It does not include people who use ICT in the course of pursuing other professions.

Information Technology Skills: All IT professionals require some computer skills; these may include particular programming languages or database skills or networking skills.

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