Mentoring as a Career Guidance Activity: Fostering Non-traditional Career Exploration for Girls

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Abstract

This paper reports on a short term mentoring project conducted in the Australian state of Queensland to foster non-traditional career exploration for girls in the communications/informa - tion technology industry. The aim of the study was to evaluate the possibilities of a short term mentoring program to foster girls' interest in a non-traditional industry. In addition it sought to exam - ine the viability of mentoring as a career guidance activity in schools. The findings indicate that mentoring could be a worthy addition to the repertoire of career guidance activities offered by schools and that it is a valuable process in promoting non-traditional career exploration for girls.

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This paper reports on a short term mentoring program conducted for girls to foster their exploration into non-traditional careers specifically in the communications/information technology (IT) industry. The findings of the study are presented and discussed. A case is presented for the consideration of mentoring as a viable career guidance activity in schools.

The program reported here is part of a larger research project (McMahon, Limerick & Gillies, 2002) funded by the Queensland Department of Training, Employment and Industrial Relations (DETIR) as a result of a previous study, conducted in the Australian state of Queensland, which had identified a need for career guidance and mentoring activities in emerging industries such as the Communications/ Information Technology industry (Queensland Working Women's Service, 1999). The women who participated in that study stated a preference for processes such as mentoring relationships, facilitated networking with relevant groups, and the gathering of relevant industry information within supportive environments (Queensland Working Women's Service Inc., 1999). This information was taken into consideration in developing the present project.

Mentoring as a Career Guidance Activity

Mentoring has frequently been used in business and industry to enhance the career development of individuals. Indeed it has been described as one of the oldest forms of human development and has been used to promote self-development, career development and skills development (Lewis, 1996; Limerick, Heywood, & Daws, 1994; Theobald, Nancarrow & McCowan, 1999). Mentoring has been defined as "a developmental, caring, sharing, and helping relationship where one person invests time, know-how, and effort in enhancing another person's growth, knowledge, and skills … in ways that prepare the individual for greater achievement in the future" (Shea, 1994, p. 13). In essence, mentoring promotes learning and development as the mentor, usually a person experienced in a field or industry, acts as a "wise guide" (Levinson, Darrow, Klein, Levinson, & McKee, 1978; Queensland University of Technology (QUT) Career Mentor Scheme, 2001) and shares his/her experience and knowledge with a less experienced mentee who thus engages in a process of self-learning, world of work learning, and career decision making. "Effective mentoring

- is a relationship that focuses on the needs of the mentee
- fosters caring and supportive relationships
- encourages all mentees to develop to their fullest potential and
- is a strategy to develop active community partnerships" (Tobin, 2000a, p. 1).

As Limerick et al. (1994) argue it is the reciprocity in a mentoring relationship which makes it successful. Effective mentoring then is essentially a two-way process with expectations on both the mentor and mentee to contribute and meet their responsibilities to each other and to the mentoring program. For example, mentors could reasonably be expected to act as a source

of information and/or insight to the occupational field, assist with goal setting and planning, encourage professional behaviour, listen with an open mind, challenge and encourage exploration of ideas, facilitate self-directed learning, and build confidence (Limerick & Mellish, 2001; Theobald et al., 1999). Responsibilities for mentees include making time to contact the mentor, being willing to disclose goals and ideas, communicating expectations needs and feelings, and embracing learning and exploration with commitment and enthusiasm (Simonsen, 1997).

Findings from previous mentoring programs suggest that both mentors and mentees perceive benefits from their mentoring experience (Maresca, 1999; QUT Career Mentor Scheme, 2000). For example, in a program conducted for students from a university setting mentees benefited from their contact with a positive role model, by developing networking skills, gaining confidence, and learning about workplace culture (QUT Career Mentor Scheme, 2000). Mentors benefited through enhanced self-esteem, contributing to an educational program, and feeling their experience was valued. As evidenced by these findings, mentoring is essentially a "learning partnership" (Theobald et al., 1999; Limerick & Mellish, 2001) that is facilitative of the career development of mentees (Daws, 1995).

The benefits of mentoring as outlined here are consistent with the advantages of career guidance as proposed by McCowan and McKenzie (1997, p. 13). They contend that the potential advantages of career guidance to students include:

- enhanced self-understanding;
- enhanced understanding of the work environment in which they live;
- assistance in identifying pathways to future education and training;
- assistance in feeling better equipped to have control over their futures; and
- enhanced ability to retrieve and evaluate appropriate and relevant career and course information in a deliberate manner.

There is a great deal of evidence that argues for the benefits of mentoring among adults. Hansford, Tennant and

Ehrich (2000) for example, reviewed 159 articles written since 1986 relating to educational mentoring but made no mention of mentoring as a career enhancing process for school students. It would seem that in Australia there is a lack of resources and perhaps relative inexperience in utilising mentoring as a career guidance activity for school students (Tobin, 2000b).

This project therefore aimed to evaluate the benefits of mentoring against the advantages of career guidance as outlined by McCowan and McKenzie (1997) and also to evaluate the potential usefulness of mentoring as a career enhancing activity in relation to non-traditional work.

Why Girls and Information Technology?

As outlined earlier this project targeted girls and the Communications/IT industry. Concerns have consistently been expressed in Australia over the low proportion of female students in IT higher education courses. Newmarch, Taylor-Steele and Cumpston (2000) point out that the figure has remained at 19% nationally over a five-year period. These authors cite research commissioned by the Department of Education and Training and Youth Affairs (DETYA) that highlighted the following key issues:

- the numbers of girls studying computing in school and using the internet and email are increasing, yet this interest is not translating into post-secondary IT courses or careers in significant numbers
- sex-role stereotyping and culture are major barriers for women in Australia – not all countries experience the same under-representation
- the image of the industry – seen by girls as 'blokey' and 'nerdy' – is a major problem and is 'putting girls off'
- the impact of how IT subjects are taught in schools is a major barrier – many students find IT 'boring'
- lack of information and understanding of what a career in IT means and poor teacher knowledge of the industry impact on students' choices.

In Queensland, the number of females taking up computer studies in

year 12 (the final year of secondary schooling) has doubled between 1992 and 1997 but there are still twice as many males as females in computer studies classes (Office of Women's Policy, 1999, p. 23). Gilbert (2001) argues that computer studies is becoming marked as a boys' subject in schools. Similar findings have been reported in the United States where it has been claimed that computer science is becoming "the new boys' club" and that women are in danger of becoming "bystanders in the technological 21st century" (American Association of University Women Educational Foundation, 2000a, p. 4). A contributing factor to this situation is a lack of female role models portrayed in the classroom, media and the home (Anderson, 2000). It has been suggested that school programs should be developed to foster non-traditional career exploration (American Association of University Women Educational Foundation, 2000a, b). Mentoring has also been suggested as a mechanism for encouraging girls to see themselves as capable of careers in information technology (American Association of University Women Educational Foundation, 2000c). There is some evidence that mentoring, at least at the higher education level, has been successful in assisting female students succeed in information technology courses (Anderson, 2000).

With this as background information and the concern expressed locally at the low numbers of girls training and moving into the Communications/IT industry this research project was undertaken trialing mentoring as a possible process to be used in schools to increase career interest of girls in the Communications/IT industry. The program was conducted over a period of six weeks with girls from a large metropolitan secondary school. The aim of the study was to evaluate the possibilities of a short term mentoring program to foster girls' interest in a non-traditional industry. In addition it sought to examine the viability of mentoring as a career guidance activity in schools against the advantages of career guidance outlined by McCowan and McKenzie (1997).

An Overview of the Study

As this mentoring project was set up for a defined and relatively short period of time, that is six weeks, the concept of mentoring that underpinned the project was that of "contract mentoring." Monaghan (1992, p. 253) defines "contract mentoring" as emphasising the "short term, specific nature of the mentor's functions". The project was conducted in three phases. During the first phase resource materials were developed, potential mentors and student participants were identified, parent and student permissions sought, and the pre-test administered. The second phase consisted of the mentoring program itself that began with a brunch where mentors and mentees were introduced. During this six week phase, mentees were required to make contact with their mentors at least three times. The third and final phase comprised a debriefing workshop for student participants and a presentation ceremony to all mentors and mentees. A workbook with specific information to be gathered was developed for mentees and their mentors. In terms of the outcomes there was an understanding that the mentors were engaged in an altruistic activity and were not expected to gain personally from the activity. We return to this point in the results section.

Participants

The participants were ten girls from a large metropolitan secondary school, the teacher involved in the project, the mentors who were all working in the IT industry and the three researchers.

The girls' ages ranged from 13 - 15 years of age. This age group was targeted as it meant that they would be involved in this mentoring experience before they made important subject choices for their senior schooling years. All of the girls were volunteers who expressed interest in participating in the project after it was explained to their classes by the teacher. From the pre-test questionnaire that the girls completed the following information was garnered. Generally the girls who volunteered to be involved in the project did have some background in computing as it was listed as a favourite subject by eight of the girls. Computer studies

were also listed by six of the girls as their best subject. All except two of the girls were taking an advanced level of mathematics. Other subjects listed as favourites were Japanese and mathematics with subjects nominated as best subjects including geography, Japanese, mathematics, and English. They also understood the IT industry to be a possible place of employment. Six of the girls indicated that both of their parents were in paid employment. Only one of the parents had a job related to information technology as a computer and photocopier technician. Five of the other parents were employed in professions including teaching, medicine and nursing, and one was a manager. Three were employed in trades including electrician and chef. Other parents had a range of jobs including secretary, sales representative, cleaner, factory worker, and truck driver. Five parents were not in paid employment.

The researchers contacted a support group for women working in the information technology industry and female academics in the area at a local university to identify and develop a list of prospective mentors. From this initial list, prospective mentors were then contacted individually and invited to participate. The nature of the project, particularly the time commitment, and their potential role was clearly outlined to them. The support from these women already working in the industry was outstanding and there was no shortage of possible mentors. Mentoring is at its best voluntary; you have to want to be a mentor (Limerick & Mellish, 2001), and these mentors certainly filled this criterion. The mentors came from a variety of organisations including government departments, private businesses, large organisations, and universities and were involved in a wide range of jobs in the IT industry. Each girl was allocated one of these women as a mentor.

Procedure

The project was set up as a six-week short term mentoring program. The program (McMahon, Limerick & Gillies, 2003) was designed in accordance with the "quality checklist for mentoring programs" (Mentoring Australia, 2000). A contact teacher was

recruited who was willing to support the girls throughout the program in addition to the women working in the IT industry who would act as mentors. Information on the program was provided to the girls and their parents and parental permission was sought prior to the study. Also prior to the conduct of the program, the pre-test questionnaire was administered by the contact teacher.

The program began with a brunch, held at a local university, where the program aims and objectives were overviewed by the researchers, and the girls and mentors were introduced to each other. As the time line was tight, each of the girls was provided with a structured workbook to be completed during the program. Once the girls and mentors had introduced themselves to each other, they planned how and when they would meet over the six week period of the mentoring program. They were required by the researchers to communicate at least three times, either in person, by telephone or by email and document these communications in their workbooks. During the program, the contact teacher monitored the girls' progress, and the researchers followed up with the mentors and the teacher to ensure that the program was running smoothly.

At the conclusion of the program, all of the girls participated in a debriefing workshop facilitated by the researchers and completed the post-test questionnaire. The mentors and teacher also completed a qualitative evaluation of the program, that is, they wrote a brief report on their views on the success or otherwise of the program and included any suggestions for improvement. It is the findings of the pre- and post-test questionnaires and the structured workbooks from the students that are reported on here. Comments from the mentors and the teacher are also reported.

Instrumentation

Data were collected from the girls through the pre-test and post-test questionnaires and the structured diary designed by the researchers to ascertain the effectiveness of the program. The questionnaire contained 17 items, 12 of which required open-ended responses

that sought demographic information and information on the participant's self-awareness, knowledge of careers in the industry, knowledge of pathways into the industry, advantages and disadvantages for women in the industry, and what they hoped to learn from participating in the project. Five of the items required the girls to tick their response on a four point Likert type scale using terminology that it was felt that the girls would be comfortable with, specifically "none", "a bit", "a lot", and "unsure". These items sought information on the participants' interest in careers in the industry, knowledge about careers in the industry, current interest and enjoyment in computing, interest in taking computing subjects during their senior schooling, and knowledge about senior school computing subjects.

The structured diary was designed in accordance with the goals of the program and guided the girls through a series of questions to gather information on the mentor's role and career development pathway, engage in a process of self-reflection, and develop a personal action plan. It was suggested to the girls that they speak to their mentors about the education and training pathways that the mentors had used to enter the information technology industry, the qualities needed to be successful in the industry, and the issues related to working in a non-traditional field. In addition, the girls were required to reflect on their own personal qualities that might enhance their success in the industry and identify school subjects, university courses and other training pathways that could lead to jobs in the industry that appealed to them. The diary was used then by the girls to document their interactions with their mentors and included any other relevant material that they had researched and collected.

Results

The results are presented here in three parts. First, a summary of the findings from the questionnaires is given under four headings based on the advantages of career guidance (McCowan & McKenzie, 1997) specifically, understanding of the work environment, ability to identify pathways to

further education and training, enhanced self-understanding, and feeling better equipped to have control over their futures. Second, two case studies illustrative of learnings derived from the project by the participants are included. The case studies were compiled using information from the participants' workbooks and their pre- and post-involvement questionnaires. Finally, a summary of the findings from the mentors and teacher evaluation reports will be presented.

Summary of Findings

Descriptive statistics, in particular frequency counts, were used to analyse the data from the questionnaires. In general the participants' interest in the communications/IT industry came as a result of their interest in and enjoyment of computing studies at school, rather than an extensive knowledge of the industry or their perceived suitability for the industry. In particular, all 10 girls indicated that they had "a lot of" interest in the industry while at the same time nine of the 10 indicated that they had "a little" or "no knowledge" about it. Most of the girls were using the mentoring program to find out more about the industry. This was reflected in comments written by the girls such as: "to know what kind of jobs there are for girls once they finish school", "insight on what it would be like to have an occupation in the computer and technology industry", "what it is like to work there", and "to learn more about the IT industry, the jobs that are available". Some were using the mentoring program to assist them with their career decision making as reflected in comments such as: "to decide whether I want to do IT or not", "an idea of what I would like to do in the future" and "what I will have to do to get a job in the IT industry". Only one girl indicated that she was unsure about what she wanted to get out of the project.

Understanding of the work environment.

Prior to participating in the program, the girls had a very limited understanding as to the range of work available in the communications/IT industry. Eight of the 10 girls indicated that they did not know or that they were

unsure of the sorts of jobs available, one suggested computer programmer, and another tentatively wrote, "creating programs?" However by the end of the project the girls could name a wide range of specific jobs or types of work in the industry including multimedia, graphic designing, programming, and designing and creating web pages.

Ability to identify pathways to further education and training.

Prior to the program, all of the girls indicated that they wanted to find out more about what year 11/12 subjects might help them in relation to the industry and what education and training might be needed after Year 12, the final year of secondary school in Queensland, if they were to pursue a career in the IT industry. At the conclusion of the program all of the girls were able to name specific subjects that they could take that would be helpful to them if they pursued careers in the industry. In addition, most were aware that further study at universities or colleges of technical and further education would be needed after Year 12 in order to get work in the industry and they had personally researched these courses and included the information in their diaries.

Enhanced self-understanding.

Prior to participating in the mentoring program, four of the girls were unsure of any special talents or qualities they had that would assist them in having a successful career in the industry. Three indicated that to "like working with computers" would make them successful. Another two indicated that "pretty good marks" and "enjoying maths and designing" would make them successful. One girl thought "communicating well" would make her successful. At the conclusion of the project all of the girls were able to list special talents or qualities that would make them successful in the industry. In addition, they listed a greater range of talents than they had in the pre-test and many of the girls listed more than one talent or quality. Communication skills were listed by four girls, confidence and reliability by three girls and creativity by two girls. Other talents and qualities listed included pride,

being able to work in a team, a sense of humour, being responsible, being hard-working and being motivated.

Feeling better equipped to have control over their futures.

All of the girls indicated that they benefited from the program. In general, they were pleased that they had participated and had learned more about the industry. As a result of their involvement in the program, most girls confirmed their interest in pursuing a career in the communications/IT industry. However, two of the girls were unsure about pursuing a career in the industry as a result of their involvement in the program. One summed up her experience of the program by explaining that: "this project has been very beneficial for me and has allowed me to be sure of what directions I would like to head in".

Case Studies

The following case studies are presented as illustrative of the girls' experience in the mentoring program. The first focuses on discovering new areas in IT while the second case addresses the concern of how few women there are in IT. Further the case studies reflect the advantages of career guidance proposed by McCowan and McKenzie (1997) specifically, assistance in identifying pathways to further education and training, and enhanced ability to retrieve and evaluate appropriate and relevant career and course information in a deliberate manner.

"I never knew there were so many jobs and people".

One of the participants identified computer studies as her favourite subject at school because it is all "hands on" and "I can be creative". At the beginning of the project, she was interested in following a career in the Communications/IT industry and believed that she had a lot of knowledge about careers in the industry. However, she was unsure about the qualities and talents she possessed that would make her successful in the industry and wanted to learn more about the type of jobs available in the IT industry and the work conditions. She also want-ed to know more about Year 11 and 12 subjects that might help her and about the study options after Year 12.

At the completion of the project, she listed a range of jobs she had found out about, such as computer engineer, systems manager, electronics service person, graphic designer and programmer. In addition, she expressed interest in the very specialised fields of robotics and animatronics and had found out about a job she had not previously heard of, that of IT picturers. She was also aware of websites that she could use to find out additional information on these jobs. After discussion with her mentor, she had identified that her creativity and communication skills were qualities that could help her become successful in the area of animatronics. During the project she researched year 11 and 12 subjects that would be beneficial if she wanted to move into the industry. In addition, she documented university, technical and further education courses and on the job training opportunities that were available.

"There aren't many women in the industry".

This statement was recorded as the most worrying learning of one of the participants. However after discussions with her mentor she decided that this was not a barrier to her planning a career in the IT industry. At the beginning of the project she had "a little" interest in following a career in the Communications/IT industry and no knowledge about careers in the industry. In addition, she was unaware of the qualities and talents she possessed that would make her successful in the industry. She wanted to learn more about the type of jobs available in the IT industry, the work conditions, and advantages and disadvantages for women in the industry.

By the end of the project, she had written a paragraph about each of nine jobs in the IT industry including multi-media developer, programmer, broad-casting technician, systems designer, and computer systems auditor. In addition, she was able to distinguish between those in which she was very interested, somewhat interested or not at all interested. She had also collected a list of web sites that could give her information on the IT industry, and had downloaded information on jobs, Internet sites for job seekers, graduate recruitment, ANTA (Australian National Training Authority), and the industry.

In addition to information on the industry, she was much more aware of the qualities and talents that would enable her to be successful in the industry. She was aware of the need for creativity, good communication skills, and innovation, and decided she would like to develop the ability to adapt quickly to changing environments. While she found it worrying that there "aren't many women in the industry", she felt encouraged that her mentor's company had a policy of employing women and people of non-English speaking backgrounds.

Summary of Mentors and Teacher Evaluation Reports

Overall the reports from the teacher involved and the mentors were positive and suggested that further mentoring projects should be conducted. All the mentors offered to be involved in another such program. However in some form or other most of them mentioned the three issues discussed below, that is, the issue of reciprocity, the issue of time constraints and the issue of structure.

Issue of reciprocity.

While it was clear that there had been considerable gains for the mentees in terms of self-awareness and knowledge of the industry, it was of interest that the mentors also stated that they had gained from the project in terms of networking and communication "between school and industry" and "between potential employees and employers". The mentors valued the opportunity to work with the girls to help them learn about "the real situation" of the industry and to assist them to "get ahead in a male dominated area". They felt that their interactions with the girls gave them a better understanding of the young people coming into the industry and insight into work with computers occurring at the school level, all information which helped them in their own work. All of the mentors offered to be involved in future

such projects and a further unexpected outcome of this project is that the local university is now involved with the school in an on-going research project linked to IT in the school.

Issue of time.

Opinions related to time were expressed in relation to both the timing of the project in the school year and the duration of the project. The project was carried out in the third of four school terms and some mentors felt that it would have been easier for the girls to be involved earlier in the year prior to the pressure of other end of year school activities. Others felt that six weeks was not long enough for mentor and mentee to develop an easy relationship although no mentor stated that their mentee had not got enough information.

Issue of structure.

Due to the short time span of this project the relationship was very formally structured through the workbook, the requirement to meet at least three times with a specific focus for each meeting and the back up of the teacher discussing the information and encouraging the students to document their discussions. The highly structured mentoring process of the project, particularly through the workbooks, was commented on as a positive aspect of this project. It ensured that the mentees garnered the information that they needed from their mentors.

Discussion

As evidenced by the findings, the mentoring program was a valuable learning experience for all of the participants. As Limerick & Mellish (2001) found in their work, at its best mentoring is reciprocal. However due to the specific nature of this project, the age difference and the difference in expertise the researchers did not expect any benefit to accrue to the mentors. This mentoring experience was then a "learning partnership" where both mentors and mentees benefited (Theobald et al., 1999; Limerick & Mellish, 2000).

The issue of formal and informal mentoring relationships and the amount of structure that it is necessary to impose has also long been debated in

the mentoring literature (Limerick et al., 1994). With too little structure initial enthusiasm wanes and with too much structure the relationship is contrived and stifled, but in this case the program was a deliberately structured, planned and strategic program with specific objectives in mind to ensure no time was wasted.

Time constraints are always problematic in all mentoring relationships (Limerick et al., 1994) which was why the researchers decided to adopt a "contract" mentoring approach. Despite our careful attention to this factor time still was an issue for both mentors and mentees. However we would argue that our "contract" mentoring approach was successful in that none of the mentors complained about their time being wasted or that the project took up too much of their time. These are the common complaints in mentoring programs. Although some of the mentors felt that the project should have been longer we would argue that it was the short focussed nature of the project that made it successful.

Having a teacher involved to ensure the students stay focussed we would argue is a key ingredient to the success of such a project. For example, the teacher involved in this project monitored the girl's progress in the project, addressed their concerns, and allocated time in their computing lessons for them to complete the workbooks.

The findings strongly suggest that mentoring is an effective career guidance activity to promote girls' interest in a non-traditional industry. The mentees gained a better understanding of themselves in relation to possible career options in the communications/ IT industry, they gained a realistic understanding of the work environment of a number of different careers in communicationsIT and shared these with each other during the final session.

Gaining first hand knowledge about the industry, taking some control of their career paths and working one to one with an experienced mentor were beneficial experiences for the girls. In addition to finding out more about the industry, the girls were also able to make greater links between their own personal talents and qualities that

would make them successful in the industry. The benefits experienced by the girls in the program were similar to those experienced by tertiary students as reported in the QUT Career Mentor Scheme (2000). Participation in the mentoring project facilitated the girls' career decision making in an industry where women traditionally are not well represented. While not all of the girls in the project remained committed to pursuing a career in the communications/ IT industry, their decision making was more informed, and perhaps more importantly they were willing to share the information they had gained with other girls.

These findings suggest that mentoring can offer participants advantages similar to those of career guidance as outlined by McCowan & McKenzie (1997). Specifically the participants gained greater self-understanding and understanding of their own talents and qualities in relation to the industry. Further, they developed greater understanding of the industry and most were more certain of the educational pathways they needed to follow to get into the industry. In addition, as evidenced in the case studies they had been resourceful in accessing information about the industry. The knowledge that the girls gained about the communications/IT industry assisted them in feeling better equipped to have control over their futures and enabled them to retrieve and evaluate appropriate and relevant career and course information in a deliberate manner.

Limitations of the present study include the small number of participants, its short-term nature, and its focus on a specific non-traditional industry. Future studies could examine the effectiveness of mentoring programs for school students conducted over a longer period of time and in a greater range of industries. In addition future studies could include greater numbers of participants and different age ranges.

Conclusion

As a career guidance activity, the short term mentoring program was particularly successful in promoting girls' interest in a non-traditional career. It is hoped that the findings of this study

will stimulate interest in the use of mentoring as a career guidance activity in schools. Clearly mentoring has the potential to assist students make informed decisions related to their career. Further, it is hoped that this study will stimulate interest in mentoring as a mechanism for promoting career exploration by students in non-traditional industries. On the basis of this study, the indications are that mentoring programs would be a worthy addition to the repertoire of career guidance activities already available to secondary school students.

References

American Association of University Women Educational Foundation. (2000a). *Gender gaps: Where schools still fail our children: Executive summary*. Retrieved July 23, 2002 from http://www.aauw.org

American Association of University Women Educational Foundation. (2000b). *Tech-Savvy: Educating girls in the new computer age.* Retrieved July 23, 2002 from http://www.aauw.org/2000/tech-savvybd.html

American Association of University Women Educational Foundation. (2000c). *Tech-Savvy: Tech-Savvy: Educating girls in the new comput - er age: Executive summary.* Retrieved July 23, 2002 from http://www.aauw.org/2000/techsex-ecsum.html

Anderson, N. (2000). *Why aren't Australian girls getting into IT?* Retrieved July 23, 2002 from http://www.schools.ash.org.au/litweb/gender/html

Daws, L. (1995) To fields of tall poppies: The mentored pathway. In Limerick, B., & Lingard, B. *Gender and Changing Educational Management* (pp.95-105), NSW: Hodder Education.

Gilbert, P. (2001). Redefining gender issues for the twenty-first century: Putting girls'education back on the agenda. *Curriculum Perspectives, 21*(1), 1-7.

Hansford, B., Tennent, L., & Ehrich, L. (2000). *Mentoring in educational contexts*, Paper presented at AARE Conference in Tasmania, Australia.

Levinson, D., Darrow, C., Klein, E., Levinson, M., & McKee, B. (1978). *The seasons of a man's life.* New York: Ballantine Books.

Lewis, G. (1996*). Mentoring Managers – Strategies for fostering talent and spreading knowledge*. Edinburgh: Prentice Hall

Limerick, B., Heywood, E., & Daws, L. (1994). *Mentoring: Beyond the sta - tus quo? Mentoring, networking and women in management in Queensland.* Brisbane: Department of Business, Industry and Regional Development.

Limerick, B., & Mellish, E. (2001) Mentoring and appreciative inquiry. *Appreciative inquiry on-line.* Retrieved July 23, 2002 from http://www.aileadership.com

Maresca, M. (1999). Mentoring as a career development tool. *Australian Journal of Career Development, 8*(2), 8-10.

McCowan, C., & McKenzie, M. (1997). *The guide to career educa - tion.* Sydney: New Hobsons Press.

McMahon, M., Limerick, B., & Gillies, J. (2002). Structured mentoring: A career and transition support serv-ice for girls. *Australian Journal of Career Development*, 11(2), 7-12.

McMahon, M., Limerick, B., & Gillies, J. (2003). Structured mentoring: A career guidance activity for school students. In M. McMahon, & W. Patton (Eds.), *Ideas for career practitioners: Celebrating excel - lence in Australian career practice* (pp. 122-129). Brisbane: Australian Academic Press.

Mentoring Australia. (2000). *Mentoring: Benchmarks for effec - tive and responsible mentoring programs.* Retrieved July 23, 2002 from http://www.mentoring-aus-tralia.com

Monaghan, J. (1992) Mentoring: Person, process, practice and prob-lems. *British Journal of Educational Studies, XXXX* (3), 248-263.

Newmarch, E., Taylor-Steele, S., & Cumpston, A. (2000). *Women in IT – what are the barriers?* Paper pre-sented at the Network of Women in Further Education Conference Showcase of Strategies for Women in Education on Information Technology conference. March.

Office of Women's Policy. (1999). *A social and economic profile of women in Queensland 1999.* Queensland Government.

Queensland University of Technology Career Mentor Scheme, Careers and Employment. (2000). *Career mentor scheme information sheet* (Brochure). McCowan, C: Author.

Queensland Working Women's Service Inc. (1999). *Women, jobs and training: A stepping stones project.* Submitted to DETIR. August.

Shea, G. F. (1994). *Mentoring: Helping employees reach their full poten - tial.* New York: American Management Association, Memberships Publications Division.

Simonsen, P. (1997). *Promoting a development culture in your organ - isation: Using career development as a change agent.* California: Davies-Black.

Theobald, K., Nancarrow, E., & McCowan, C. (1999). Career men-toring: A career development-enhancing strategy for university students in transition to employ-ment. *Australian Journal of Career Development, 8*(2), 3 – 7.

Tobin, L. (2000a). *Mentoring: Benchmarks for effective and responsible mentoring programs.* Retrieved July 23, 2002 from http://www.dsf.org.au/projects/pro

Tobin, L. (2000b). What makes a great mentoring program? Highlights of USA study tour November 1999. (On-line). Available: www.dsf.org.au