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Empowering international and culturally diverse honours and project students through mentoring activities

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ABSTRACT

This paper reports on an initiative to develop a successful school based student mentoring program in the context of a Computer Science based school which has a high proportion of international and culturally diverse student population. A review of literature was made of three areas of research related to mentoring and peer support. This provided evidence for the role of mentoring and peer support in empowering student learning, with particular emphasis on how mentoring can provide both social and academic support; on the role of mentoring in different contexts; within the Computer Science field and within an international and culturally diverse education perspective and finally on the role of and qualities required by the mentor in the mentoring process.

The paper examines the findings from an email based survey of current and former members of student mentor group which has existed since 2003. The questionnaire was categorized into five sections including demographic information, factors influencing choice of the group, reflections on the mentoring experience (joining the group, project activities), on commitments and skills development (commitments, interpersonal/interaction, improving skills) and additional support services. The overarching finding from the research was that the mentoring experience was a positive one for both mentor and mentees. The mentor group provided a supportive respectful environment which could offer both academic and technical skills development and provide social support. Students also identified the most important qualities and obligations that the mentor group leader should provide to include, subject knowledge and technical expertise, and quality traits of trustworthiness, intercultural understanding and friendliness. From the research findings a framework was proposed to support the implementation of a school based mentor group program. This is seen as beneficial to project and research students especially in an international and culturally diverse student population.

INTRODUCTION

The recent downturn in the IT industry has demanded that Computer Science (CS) graduates be provided with all avenues to develop industry relevant skills in order to gain a competitive edge when obtaining employment. To address this need, many CS based courses provide an opportunity for students to undertake Industry based authentic projects. These projects can facilitate students to gain valuable experience in both technical and project skills. In part, these projects are undertaken by the academically high achieving students. Top students are also encouraged to continue their studies by completing an additional honours year. Participation in either special industry based projects or honours projects provide the student with an opportunity to develop a close mentor relationship with their academic supervisor and other research staff.

Improving the skills of students undertaking project and research studies may aid in the career prospects of these CS students. Despite many project students having adequate technical skills

they lack other vital skills. For example, there is considerable need to develop student's generic and academic and technical writing skills. These strategies are further needed in the light of the large international student population within Australian higher education at present. These students face greater challenges to develop the necessary skills and coping with the additional demands of project and research studies. There is need to respond to these challenges. One way to address this within the context of highly practical based programs may be to provide additional support mechanisms. Mentoring programs where students can interact with both mentors and peers develop an atmosphere of support and discussion which can be used to address these problems. The inclusion of such interventions and skills training in the supportive environment of a student mentoring program is considered a valid strategy but needs further investigation to explore the wider benefits of adoption within the local CS teaching and learning environment.

This paper explores a number of themes relating to the student mentoring experience in the context of a culturally diverse CS course context. These issues relate to improving the transition of students to project and research study, peer and mentor support, development of relevant skills and the role of the mentor group and leader to facilitate typical project and research activities they are likely to encounter in a potential work environment. In the context of the reported study; the student population is diverse in respect to mode of study, degree, length of membership of the mentoring group, fee paying vs government supported international and domestic students. The cohort is also culturally diverse with students from over 10 different countries of origin. Although the present study is limited to only one mentor group, the group provides a representative sample of students enrolled in various CS courses.

Contingent with the issues of addressing ways to support these project and research students; there are several issues which are influencing the realities these students face. A large proportion of the student population are international students with culturally diverse backgrounds. These students have greater problems with technical and academic writing because they are studying in a language medium that is not their first language (Cruickshank et al. 2003). In addition; many students have different priorities in respect to their university time, they are less engaged in university life in general and with study and now more than ever have flexibility in choice (McInnis, 2001). In reality; these conflicts must be acknowledged and accommodated in the context of project and research students. Mentoring provides one mechanism to assist and support students to engage in the academic community and improve the necessary professional and social skills which will improve their career development (Lucas and Robinson 2002). The paper aims to gain an understanding of what benefits and disadvantages such programs have in the context of the increasing demands placed on students through work commitments or due to cultural and academically diverse backgrounds.

This paper reports on an ongoing study investigating the perceptions of the student members of a CS based mentor group which is both culturally and educationally diverse as it is comprised of members from various degree programs (Bachelor, Honours and Masters). This study was carried out with a view to the use of such mentor groups in improving the support of novice project and research student's professional and social skills. The discussion begins by sketching a background to the context and then provides a review of relevant literature. The methods and findings of a preliminary survey investigating mentor group members experiences and reflections of the student mentor are then discussed and conclusions presented.

BACKGROUND

This study was conducted in the School of Computer and Information Science (SCIS) in the Faculty of Computer and Information Science (CHS) where a variety of degree programs ranging from Bachelors, Honours and coursework Masters, Postgraduate diplomas and professional doctorates are offered. The School has a large proportion of international students and offshore teaching programs. Students are encouraged to focus on the development of technical skills in the bachelors program. In order to gain professional experience students undertake semester and one year duration information technology (IT) development projects either within an established CEED

program or within an informal mentor based program were they are assigned to a lecturer with expertise in the subject area to guide their progress and successful completion of the project.
For the last three years, the principal author has supervised and mentored a number of 3rd year Bachelor, honours, course work and research masters students. These project students are culturally diverse, originating from the sub continent, Africa, Asia, Europe, the Middle East and Australia. The students participate in collaborative projects with different industry colleagues of the principal author. The supervision and mentoring of students is achieved through both student group meetings and individual assistance.

The mentoring group program is carried out weekly throughout the semester. As part of the student obligations within this mentor group environment, students must attend weekly meetings which are scheduled at time which is convenient to both part-time and full-time students. Through the last three years the mentor group has had up to10 students from the various degree programs at any one time. New students are introduced to the group at the start of the semester. At any time during the semester mentor group membership has ranged from those that have recently joined the group to those that have been members for more than 18 months.

The group meetings are conducted as round table discussions. The lecturer acts as the mentor group leader and informally chairs the meeting. The meetings provide scope for students to discuss the progress on their individual projects, demonstrate their software applications or any other important matter related to their studies. The mentor leader uses the meeting to track all the students' progress. Other activities that are carried out during the meeting include discussions on technical writing, editing of research proposals and theses, discussions and advice on research methods, administrative matters related to the projects, dissemination of information on workshops, talks and conferences. The mentor group meeting may also be attended by other collaborating lecturers, the faculty learning advisor and research assistants also supervised by the group leader (lecturer). Some group members are asked to participate in remedial group sessions when deemed necessary by the group. All members of the student group are encouraged to make formal and informal presentations to the group. Students may bring to the attention of others new developments in the research and technology field. The research leader does not always direct the flow of the meeting and there are frequently discussions that are initiated by more experienced students. Some students exchange information related to research articles and sample writings however this is only encouraged and not compulsory. Regular meetings may run for up to 90 minutes in duration; however the majority of meetings are completed within one hour.

In addition to the mentor group meetings; each student has regular individual meetings with the lecturer to discuss any matters pertaining to their project. The members of the mentor student group also participate in regular social activities such as morning teas and dinners. Mentor students are also encouraged to use a dedicated student group room maintained exclusively for the principal author's research and project students. To facilitate additional interaction between group members an email list is maintained of all mentor students including students that have completed their studies. This email list is used to distribute information to the student group members, including information on workshops, conferences, career opportunities, postgraduate and competition events, seminars or other pertinent information.

LITERATURE REVIEW

This literature review draws on three areas of research related to mentoring and peer support. The first is related to the role of mentoring in empowering student learning, with particular emphasis on how mentoring can provide both social and academic support. The second research area will focus on the role of mentoring in different contexts; within the CS field and within an international and culturally diverse education perspective. Finally; an examination will be made of research focussing on the role and what qualities are required by the mentor in the mentoring process.

In linking these three research areas we extend previous literature to enrich our understanding of the issues and strategies specifically related to the use of mentoring to enhance the student experience within a culturally diverse and specific context (Computer Science/ Engineering) . The

general proposition of reported literature is that mentoring and peer support programs are effective support management strategies at institutional and Faculty/School levels. In addition, these programs are critical to empowering students and cultivating a positive student experience especially for culturally diverse and disadvantaged students. The provision of these initiatives may be invaluable to such students who are confronted with academic, social and cultural challenges as they adjust to their educational environment. In addition to the benefits that mentoring plays for the mentee, such programs also are invaluable to the professional development of the mentor.

A number of research studies have reported on the role that mentoring can play in improving student support. The strategy of mentoring has been defined by Murray (1991) as 'a deliberate pairing of a more skilled or experienced person with a lesser skilled or experienced one, with the agreed upon goals or having the lesser skilled person grow and develop specific competencies.' Bloch (1993) in Val and Stead (1994) has suggested that for students 'mentoring is considered as a positive and effective means of maximising performance potential'. Programs that provide support from peers and mentors can empower students as they build the confidence and academic skills and in turn their ability to succeed (Lucas and Robinson 2002). While the mentoring experience could be considered as a recently developed phenomenon in academia, the goals of many mentoring programs parallel those of many trade apprenticeships. This comparison has been noted by education researchers. For example, mentoring has been suggested by Cruse (2006) to be 'an apprenticeship all dressed up'; offering many of the same services such as guidance and wisdom of experience to the mentee.

Mentoring programs have been initiated in a number of contexts; within industry and academic domains. Within these different contexts have emerged different interpretations of mentoring initiatives. The best known variant is found in a business context and has a central aim of the 'grooming of high flyers for senior roles' (Val and Stead 1994). Other variants also used in business contexts are for the purpose of the induction of new recruits with an emphasis on fledging'; a variation of this model is that of assisting trainees to gain professional qualifications. Val and Stead (1994) conclude that this model has benefits for learner mentees and the profession itself. A third model has been applied in an academic context and has an 'emphasis squarely on the individual.' This variant has been reported to be beneficial when applied to disadvantaged groups, such as members of ethnic minorities by providing the learners with a role model (Val and Stead 1994).

Studies reporting on the role of mentoring and peer support in the context of technology based courses such as CS and engineering have suggested that it can play a vital role developing academic skills and in encouraging students to pursue further research studies. For example, Abdel-Qader (2004) reported on an undergraduate research mentoring program for CS and engineering students to promote students to pursue further postgraduate research in Image Processing. Students exposed to this mentoring process learnt to work independently and conduct research through hands-on experience and were encouraged to pursue research area further. Another study by Amenkhienan and Kogan (2004) on engineering students' perceptions of how various support services can influence their academic performance found that peer interaction and contacts with their supervisor/mentor were strategies that had a positive impact on their performance. This study supports other research by Boud and Lee (2005) which concluded that peer learning is an important component of university research education. Another benefit is the role that mentoring can play in improving retention rates and academic success of students in science courses (Hedges and Mania-Farnell, 2002).

International and culturally diverse students face added challenges during their university studies. Lucas and Robinson (2002) have reported on an initiative within a United States context to introduce a peer support program of undergraduate teachers of colour with a view to providing a supportive community in their transition from high school to university. This study highlighted the role that developing a sense of community can play in supporting such students. Students indicated that by being a member of a peer student group a sense of community or common experience with a group of peers emerged which assisted in their transition. Other benefits to emerge were in relation to supporting their adjustment, building confidence in their academic skills, socializing them with their profession and helping them in coping with competing pressures from

home, peers and school (Lucas and Robinson 2005) . This study is commensurate with the issues faced by international and students of different ethnic backgrounds in a culturally diverse Australian higher education context; as described in this current study. While Lucus and Robinson (2002) reported that their peer support program helped students become acclimatized to the university environment; it also suggested that other benefits included empowerment through developing confidence in their academic skills and improving their confidence in their ability to succeed at university. Some academic benefits to be perceived by the students were improvements in their writing ability, critical thinking, and communication skills (Lucas and Robisnson 2002).

Other studies carried out within an international education perspective support and extend the findings of Lucas and Robinson (2005). In a program to improve the English language skills of international students in a technology based course reported by Cruickshank et al. (2003) it was suggested that mentoring was one strategy that was successful. Cruickshank et al. (2003) explored what constituted effective English language support for student overseas trained teachers from non English speaking backgrounds. They reported that the best strategies involved an integrated and flexible model of English language support involving context based units, tutoring/mentoring programmes and self directed study. Interestingly, Cruickshank et al (2003) suggested that the best result emerged with the embedding of such language support services within the course structure itself. The findings to emerge from this study may have similar consequences in an Australian university context in the light of the increasing internationalization of the Australian education sector.

In a similar study by Watkins and Green (2003) an elective, long term program to support graduate students from International Engineering students from non English speaking origin show similar levels of success. This study provided insight into the needs of international graduate students who were working toward English proficiency. These strategies included mentoring and peer involvement at meetings of a large mixed international and American background group. Its success was measured by the good retention rate of students and students' perceptions of improvements in their English skills. One important aspect to emerge from this study was the importance of meetings in the process of mentoring. Watkins and Green (2003) concluded that meetings promoted strong social interaction between the students. This was further developed by the pairing of experienced members with new members to guide them in the orientation process and additional mentoring of students by faculty and staff advisors.

One other successful mentoring program to be reported in the literature suggests that mentoring can work both within a single course structure as well as within a broader university context. Ford (1996) reported on a student support programme from a McKnight Doctoral fellowship programme which provided African American doctorate students opportunities for bonding, networking, interacting with peers and building people skills. This study suggests that wider scale mentoring programs may be beneficial in some contexts.

While the focus of mentoring programs is substantially directed towards the benefits to the mentee; its significance in shaping the mentor's experience is a vital component. Mentoring has been found to benefit the mentor in a number of studies (Allen et al. 1997a, Green and Bauer 1995). Cruse (2006) indicated for the successful implementation of any mentoring program there needs to be 'Equal ownership' by the mentor relationship. This has been further asserted by Clutterbuck (1991) in Val and Stead (1994) as mentoring is an efficient form of developing talent, not only by the mentee but the mentor. A number of factors play a role in whether a mentor can adequately contribute to this relationship. These include the mentor's perception of their role, personal characteristics and compatibility of the mentor and their mentoring skills.

Kwan and Lopez-Real (2005) found that success of the mentoring was determined by perception of the mentor's role. This study reported that novice mentors had a perception that the role should be of 'provider of feedback' which stressed the need for them to provide pragmatic advice (Kwan and Lopez-Real 2005). Perception of some mentors changed over time towards roles such as counsellor, equal partner and critical friend which emphasize a more relational aspect of working together with the student to achieve professional development (Kwan and Lopez-Real 2005)

This highlights the conflicts that may emerge in the mentoring relationship when the mentor cannot distinguish between their roles as mentor or manager. For example, Val and Stead (1994) reported on an initiative to introduce mentoring into five faculties including an Information and Engineering Systems faculty which were examining mentoring in the context of traditional work placements where undergraduates spend a period of time in industry under the supervision or mentorship of a manager in the host organization. Val and Stead (1994) found that for traditional work placements of students that although students are supervised, supervisors rarely acknowledge themselves as participating in mentoring or have an understanding of the mentoring process or relationship (Val and Stead 1994). This may not be the case for other programs for example in nursing or community work, where 'mentoring is formally recognized and has been viewed as an essential support mechanism to facilitate and enhance student's learning and encourage greater integration of theory and practice' (Val and Stead 1994).

These issues of the conflicts in roles between a manager and mentor are important issues for further analysis. Cruickshank et al., (2003) support this by concluding that the role of the mentor needs to be determined and suggest that negotiating goals and outcomes with mentors and student be developed early in the relationship.

While Cruickshank et al., (2003) have also reported that mentoring was beneficial to the mentee and mentor; they concluded that the level of skills training and support for the mentors is another important approach to improve the mentoring process. The role the mentor is to impart expertise, together with knowledge and skills in the field. However this does not necessarily ensure they have the necessary mentoring skills. This deficiency has been investigated in some circumstances. For example, Val and Stead (1994) reported on an attempt to provide generic training for mentors in three components including theoretical frameworks, process of mentoring and notions of the competent mentor. The study concluded that it was possible to successfully train mentors without reference to a professional context.

The personality of the mentor has some importance to the mentoring relationship. For example a study by Neihoff (2006) concluded that personality traits such as extroversion, conscientiousness and openness to experience were positively correlated with participation as a mentor. Other personality characteristics which may have been attributed to being necessary for the mentors is a controlling nature (Allen et al 1997a) or upward striving (Allen et al. 1997b). The reason for this may be that mentoring requires active engagement in an environment requiring social, task and idea related capabilities. Such personality characteristics would allow these individuals to adapt easily to such situations (Neihoff 2006).

In addition to the role of mentors in shaping the professional skills of the mentee; their role in social support has equal importance (Kram 1985 in Neihoff 2006). A prosocial personality can facilitate this and has been suggested to be predictive in the willingness of the mentor to volunteer for a mentoring program (Allen 2003; Allen et al 1997a).

In the context of an international student experience, cultural understanding may play a dominant part in the success of peer support and mentoring programs. For example, Lucas and Robinson (2005) reported that mentors with the same ethnicity, or cultural background, or life experiences empathise with their mentees. It is proposed that such an ability of the mentor to be able to empathise or to show cultural understanding may be one of the most important qualities of a mentor. This is especially relevant in the context of the current study.

RESEARCH METHODS

Data was gathered using an email based questionnaire containing both fixed alternative and open ended questions. The survey was emailed to all current and former members of the principal author's student mentor group. A total of 26 students were identified as current and past members of the student group and email addresses were collated. The survey was sent to each mentor group member as an attachment. Participation was voluntary and anonymous. Group members

were asked to complete and return via email to an independent email address. A total of 18 completed questionnaires were completed and returned within 2 days of posting the email.
The purpose of the survey to gain an understanding of the perceptions of members and former members of this culturally diverse group in relation the support provided for project and research activities.

The survey instrument was based on questions with check boxes and short answer questions. The questionnaire was categorized into five sections including 15 questions on demographic information, 6 questions on factors influencing choice of the group, 12 questions on reflections on the mentoring experience (joining the group, project activities) 14 questions on commitments and skills development (commitments, interpersonal/interaction, improving skills) and one open question on additional support services. A five point Likert-style scale (strongly agree, agree, disagree, strongly disagree, not applicable) was used in 2 categories. Neutral response categories were deliberately omitted because the questions were designed to discover leanings rather than convictions (Payne, 1951 cited in Kalton, Roberts, & Holt, 1980). Further support for omitting the neutral scale is drawn from Frary (1990) who suggests that there is no assurance whatsoever that subjects choosing the middle scale position harbour a neutral opinion, adding that it could in fact indicate ignorance, uncooperativeness, inapplicability, unconformity, etc. Hence, providing a 'not applicable' response category potentially alleviated such a problem.

Results were collated and a quantitative assessment made in terms of the number and percentage of respondents. The percentage of respondents from the potential cohort of current and former members was 70% which was expected given that survey responses were sought from past members and the short time frame required completing the survey.

RESULTS AND DISCUSSION

Demographics

The student mentor group was diverse in respect to a number of factors including, degree, semester of study, period of group membership, units enrolment, mode of study, funding, age, sex, country of origin, citizenship status, education qualifications, whether English is first language and the number of hours of spent on paid work. The results of demographic assessment suggested that this group was representative of the CS students from the School of Computer and Information Science. The membership of the group was dominated by males (94%) with majority of students in the 20-24 age range; however a substantial membership from students older than 40 years of age was noted.

The survey respondents were found to be principally Bachelor project students (44%) and Bachelor Honours students (44%). The majority of respondents were in their 2nd or 3rd semester of study (17% respectively). In addition, the majority of respondents have been members of the group for less than 6 months, however a substantial number were members for 13 to 18 months. In terms of the mode of study, 39% of students were enrolled in 3 units (considered a standard full time load); 50% of students were past members of the group and as such were not enrolled in any units. It was found that the majority of survey respondents (56%) were current members.

A considerable number of international students or recent permanent resident students who were privately funded (73%) when compared to HECS government funded students. In terms of other external commitments (such as part-time work); the majority of respondents (72%) worked more than 10 hours per week with 40% of these working more than 20 hours.

Assessments of the cultural diversity of the group found that majority of students were not born in Australia (83%). In terms of citizenship; 44% of respondents were Australian citizens, 11% permanent residents and 44% were international students. These project students were culturally diverse, originating from the sub continent (India, Bangladesh, Sri Lanka), Africa (Seychelles, South Africa, Mauritius, and Kenya), Asia (Hong Kong), Europe (Bosnia and Croatia), the Middle East (Palestine) and Australia. One important aspect of the group was that for the majority of respondents (61%); English was either their 2nd or 3rd language. The group were fluent in a

number of languages including Crotian, Gujarati, Creole, Cantonese, Mandarin, Singalese, Bosnian, Bengali, Hindi, Arabic, Swaheli, Hindi, German, Kanada and French.

Choice of Group

Respondents were asked their reasons for wanting to participate in individual projects or mentor program. By far the majority of respondents indicated a preference for undertaking an individual project compared with School based group projects. While students in the last year of their CS Bachelor course, must complete a practical software development project; the majority of students undertake this activity as a group project. The higher achieving students are often required to contribute the majority of input in these projects. Preference for an individual project may be a result of this, with some members indicating this to be the case (17%). Other reasons for choosing individual or mentor group membership included positive feedback from current (22%) and past students (17%). Only a small percentage of students chose to be a member of the mentor group because they believed the project to be interesting. The need for social interaction and intellectual stimulation was also suggested as another reason.

Respondents suggested there were a number of reasons for joining the principal author's mentor group. The majority of respondents (56%) listed that their reason for joining this particular mentor group was the subject area. A previous relationship with the supervisor such as being enrolled in a unit was listed as another reason by 50% of the respondents. Other popular reasons were recommendations by other students (39% of respondents).

Obligations and Peer Support within the Mentor Group

When respondents were asked what their obligations were to the mentor group the majority (83%) suggested that regular attendance at group meeting was important. A substantial majority of the members reported that they didn't skip regular meetings (78%) and found the meetings useful (83%). The majority suggested that they were aware of their obligations to the group (89%) and did not find it difficult to fulfil them (78%).

The majority of respondents also suggested that helping other members such as providing motivation and encouragement, assisting other group members with research and project activities were also important. The members of the group also suggested that another important obligation was sharing and presenting research ideas with other group members. Within the context of the group, 94 % of members believed that the group provided a supportive friendly atmosphere when they had first joined and that they had been introduced to all members of mentor group. In addition; 78% of members indicated that they often contributed to mentoring group discussions; that other members of the group were respectful of their contribution to the group and that mentoring had helped them gain confidence to interact with others (77% respectively). This supports findings by Watkins and Green (2003) that highlighted the importance of meetings in promoting strong social interaction between the students.

Obligations and Relationship with Group Leader

An assessment of the perceptions of group members to the obligations and the characteristics that the group leader must provide to the group could be categorized into 4 broad themes including quality of leadership, technical and research capability, approachability, and personal character. The majority of respondents (61%) suggested that the mentor leader needs to be a motivator and provide leadership (44%). They must also have a high level of knowledge and expertise (subject knowledge (50%), technical (56%) and research (50%)) and industry contacts (44%). This was indicative of the 78% of members who believed that they had received useful feedback from the mentor group leader.

The survey results indicated that the mentor also needs to also be approachable (72%) and available (67%) to the members of the mentor group. Within the mentor group, 66 % of members regularly sought the advice and assistance of the group leader. In terms of personal character of the research leader it was evident that this was considered to be an important aspect of what the members of the group regarded as being an important aspect of the mentor. Qualities of a mentor considered as being important by mentees included trustworthiness (67%), respectfulness (67%),

friendliness (61%), degree of sociability (44%) and intercultural understanding (50%) were considered to be important by the majority of respondents. These findings are similar to those reported by Neihoff (2006) and Kram (1985) and would suggest that there are two aspects to the role of the mentor; providing skills support and social support. These issues need further analysis.

Project Activities

Group members perceived that the peer support and mentoring activities stimulated their interest in the subject area (78%), were well motivated and found the intellectual challenge of their projects enjoyable. The majority of students did not find it difficult to adjust to their new project or research activity (72%) or to understanding the project material (83%); however this was not the case with all group members with some finding this difficult (17%). The degree of satisfaction with project progress was also mixed within the group; 61% of members were satisfied, while 17% were not satisfied.

Despite the increased rigours of being enrolled in individual project or research degree, the majority of the members of the group had a perception that they were coping with the volume of work (89%). However, a substantial number of members of the group indicated that they did not work consistently on their project (39%). This is not surprising given the conflicts with other work commitments and is supported by findings reported by Lucas and Robinson (2002) which indicated that students needed to integrate other commitments within their study program

Skills Development

While 84% of mentor group members felt that they were academically prepared to meet the demands of their project work and enjoyed a sense of empowerment (61%); a number of students (17%) indicated that they felt academically unprepared for their project. In an assessment of whether the student mentor group facilitated the development of important skills, the majority of students believed that it improved their social skills (67%), generic skills (78%), critical thinking skills and presentation skills (61%) respectively. This would suggest that the peer support and mentoring group activities had to some extent fulfilled its role in providing an alternative strategy to assist and empower these students. This supports a similar study by Amenkhienan and Kogan (2004) who concluded that mentoring is one avenue to improve student skills. However despite the results emerging from this study, only 50 % of group members believed that there were effective academic transition support services available to assist international students. This would suggest that despite the additional support provided by the mentor group environment; further skills training may be required.

Benefits of membership of mentor group

Of the perceived benefits which could be attributed to being a group member, a supportive atmosphere was considered to be important by the majority of respondents (72%). Other benefits highlighted included peer support (50%), regular contact with more experienced students (50%), regular contact with the group leader (44%), professional engagement and reflecting on project activities (44%). A minority of respondents also suggested that the mentor group could provide means for interacting with other students. They suggested that the mentor group could act as a forum for regular student contact and to mediate learning experiences and social interaction. Respondents also suggested that the group provided a means to gain information about professional conferences and workshops, access to industry professionals and the opportunity to receive information and assistance on career development and opportunities.

Difficulties with being a member of Mentor Group

When asked whether membership of the mentor group lead to any difficulties; respondents indicated that time obligations was one issue that was difficult to manage, A significant percentage of respondents (39%) suggested that the meetings were too time consuming and or difficult to schedule (11%). Another reason for difficulty was the concern of a minority of members; however these included a number of issues that may need addressing. This included the environment being competitive, disagreements or bullying from some members of the group (11%, 6% and 6% respectively. Other reasons nominated also related to a potential negative atmosphere in the group caused by a lack of focus and attention to the speaker (6%).

Reflections as a Group Leader

With the establishment of a student mentor group came a number of responsibilities and challenges paralleled by a degree of satisfaction. As a previous member of an informal professional discipline group, the principal author was aware of the potential benefits that could occur from its membership. It was evident in the context of SCIS, that limited support was forthcoming to gifted students in within the scope of formal group projects the formal group projects. This was also the case for coursework masters and for novice honours students trying to achieve success in their individual projects. Anecdotal evidence suggests that an atmosphere of isolation existed amongst these students; both in terms of their project activities and for those with added difficulties such as being an international student, where they were isolated from their family support.

The principal author devised a novel strategy which would both aid these students to excel in their projects and provide a mechanism to develop a peer support network for those students under her supervision. There has been a constant evolution of the goals and the running of the peer support and mentor program from its initiation to its present iteration. The experiences of the principal author support similar studies by Kwan and Lopez-Real (2005). This change had been driven both by the constant changing of student membership; but more specifically through a development in the mentoring experiences of the group leader. In the initial stages of the group; the process was strictly defined with specific meeting agendas with specific outcomes and formalised activities. This largely resulted in the members of the group regarding me a manager/supervisor rather than mentor. With more mentoring experience came knowledge of what aspects of the group processes were successful.

A number of benefits were gained by the principal author. These were achieved by running the mentoring group including an avenue for regular contact with all students, a forum for feedback to students and an opportunity for promising bachelor students to experience a smooth transition into postgraduate studies. By arranging regular weekly meetings; it was easier to keep track of student progress and ensure students are provided with regular feedback. In turn it provided benefits by dealing with common student problems and issues. The scheduling of one common meeting was also time effective as many of the project students did not require extensive support during the entire semester. The overwhelming benefit from establishing a mentor group from the perspective of the mentor group leader was to groom promising students from their individual 3rd year project and if they maintain their academic promise be able to encourage and support them to pursue further studies in honours or postgraduate courses. Such a benefit has also been reported in a similar CS context by Abdel-Qader (2004).

A number of issues have emerged as problems in the running to the mentor group. With a tight teaching schedule and the student academic and work commitments, scheduling of meetings was difficult. Other issues related the group dynamics and the need to ensure that all group members; especially those less extroverted were provided with an opportunity to contribute. A number of disputes have also occurred between group members in respect to comments made within meetings. These have in large been dealt with amicably. Other problems have occurred when more opinionated senior students have provided guidance that may be inappropriate. By far the greatest problems have occurred with students that once completed their studies; believe that that they have reached a degree of expertise which is not commensurate with their actual experience. Occasional problems have occurred with students who have not acknowledged the considerable efforts of the principal supervisor. These problems have been balanced by the majority of members who have provided a supportive atmosphere to both the leader and other members of the group.

It was clear that there were two aspects to this program that needed to be exploited; one the role of myself as a mentor to the student members of the group; and second the role that other members of the group played in supporting their fellow students. The distinction is some respects was difficult to make. With the evolution of the group I believe that my role has shifted from a controlling dominating influence on the group, to an overseer. As the group has evolved a number of more experienced students have developed their social skills and critical thinking to a point where they

may lead discussions and initiate lines of inquiry. The principal author believes that this mentee empowerment is achieved by an atmosphere of respect and friendship towards all mentees.

With the great cultural diversity of the group comes the mentor group leader's responsibility to ensure a degree of cultural awareness and to ensure members are provided the necessary social and academic support mechanisms to succeed in an English based academic environment despite the majority being from a non English speaking background. This by far is the most challenging but by far the most rewarding aspect in facilitating the mentor group. With such diversity, comes a feeling that the principal author is leading a group that echoes the diversity of the United Nations.

CONCLUSION

The findings to emerge from this study have suggested that the use of student mentor groups can provide valuable support for university students and can empower students to succeed by providing a supportive and constructive atmosphere. This is especially important is a context of a culturally diverse student group where for the majority of students, English is either their 2nd or 3rd spoken language. Three aspects dictate the successful implementation of mentor groups within this environment; supporting project activities, the development of the student's relevant skills and the role that the mentor group leader, together they play a part in the success of the overall mentoring process.

This study has reported on an initiative to develop a framework for a wider school based mentoring program based on the successful implementation of individual mentor groups within a CS school environment with international and culturally diverse students. From the research findings a proposed framework can be suggested for such mentoring groups. Mentoring groups are most effective when they meet regularly; contain students from a range of degree programs and functions in a climate of mutual respect and peer support; implements practices to provide both social and peer support; and implements mechanisms to develop students technical/academic skills. The mentor group leader is most effective when not controlling and when empowering students to lead discussions and initiate lines of inquiry. The authors propose that in order for such a school or faculty based program to be effective it must be embraced by the relevant faculty members. It may also be necessary to employ generic mentor training for some less experienced faculty staff.

The overarching finding to emerge from this research is that the mentoring experience was a positive one for students and provided a means for them to improve their research and projects skills. The students felt empowered by their experience and believed they had improved their technical, generic, critical thinking and presentation skills. The role of the mentor could not be underestimated with the mentored students indicating that they believe the mentor should have a high level of knowledge and expertise of the area, be responsive and available to the student and display respect, cultural understanding and friendship. These findings suggest that there is a need especially in international student contexts to provide social support within a framework of mentoring.

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