



*International Journal of Gender, Science and Technology*

<http://genderandset.open.ac.uk>

## **Evolution of a Cross-Year Mentoring Scheme**

***Cornelia Boldyreff and Elizabeth M. Massey***

***School of Computer Science, University of Lincoln, UK***

### **ABSTRACT**

In a university department where less than seven percent of the students and staff are women, a sense of isolation can have a detrimental effect on the progression and retention of those female students. To address issues of isolation, progression, and retention the University of Lincoln's Department of Computing and Informatics (DCI)<sup>1</sup> began a cross-year mentoring scheme in 2005 and has tracked the progress and the changes that this scheme has brought about over the past two years. Key issues addressed include better support for women students to ensure they successfully complete their studies and progress to successful careers in Computing; raising awareness of the predominantly male staff in the department regarding the impacts on female student retention; raising awareness university-wide about the support provided to female students and transferring the knowledge gained across the university to other departments. The cross-year mentoring scheme for DCI women students has resulted in a dramatic increase in female student retention. A 2004 census of students showed that only 25% of female students progressed into their 3<sup>rd</sup> academic year. However, in 2006 100% of female students advanced into their 3<sup>rd</sup> year class. The mentoring scheme initially focused on students from the year above mentoring students in the year below, and now continues by promoting post-graduate students as mentors.

### **KEYWORDS**

Mentoring; social networks; lessons learned.



This journal uses Open Journal Systems 2.2.2.0, which is open source journal management and publishing software developed, supported, and freely distributed by the [Public Knowledge Project](#) under the GNU General Public License.

# Evolution of a Cross-year Mentoring Scheme

## BACKGROUND

The University of Lincoln is a medium-sized university and its Department of Computing and Informatics (DCI), which was formed in 2004, has just fewer than 500 undergraduate students in total. The department has developed from two divisions: Creative Technologies located in the city of Hull and Computing located in the city of Lincoln. On formation, less than seven percent of the undergraduate students were women. The majority of undergraduates studying Computing at Lincoln are men where Games Computing is the most popular degree course. Lectures and textbooks in computer science are traditionally male-oriented, especially in the games curriculum. Violent, graphic male protagonists are portrayed as courageous heroes or invincible entities, whilst their female counterparts' greatest attraction is not their ability to perform in the game, but their anatomical abundance. In textbooks, the pronoun 'he' is used automatically. A major concern of the Computing department has been the progression and retention of students over the three years of their studies. Retention and progression of female students studying computing is particularly poor. This is most likely a result of the isolation of female students on courses where the students are predominantly male, and addressing this issue has been a major motivation for this project.

In order to begin to address the issue of isolation, a 'Women in Computing' group (WiC) was established in 2005, modelled in part on the Cambridge [Women@CL](#) (2003). The group was open to all women students, undergraduates and postgraduates; all women staff within the department; and, women employed in the university's Computing Services as computing professionals. Activities organized by the WiC group included:

- informal networking meetings,
- a group mailing list and website, and
- presentations by prominent women working in computing locally and nationally, which were designed to provide inspiration for students in planning their own careers in computing.

One of the key aims of WiC was to better support women students within DCI to ensure that they successfully complete their studies and progress to successful careers in computing. Mentoring was identified as one way in which this support might be achieved. Although the DCI has established a system of academic tutors to replace its earlier system of academic advocates who had a more general role in supporting students academically, the ratio of students to staff tutor was, and still is, quite high. To supplement this tutorial support, a cross-year mentoring scheme was proposed whereby first year students would be mentored by student volunteers from the second year, who in turn would be mentored by third year students. Postgraduate students might act as mentors for undergraduates in their final year. Initially

it was decided to develop this mentoring programme exclusively with the women students; and if successful, consideration could be given to establishing such a mentoring scheme for all students.

### **CROSS-YEAR MENTORING**

The concept of student mentoring schemes has a long tradition within the university sector in the USA. In the late 1980s this concept was developed in the UK by the pioneering work of Dr Sally Richardson at Kingston University (Richardson, 1994). Such schemes provide valuable supplements to the traditional forms of instruction within universities in the form of peer assisted learning. One of Dr Richardson's pilot schemes involved Computer Science students; and today the School of Computer Systems at Kingston continues to use peer assisted learning. One aspect of the Kingston scheme was that student leaders were paid for their work and to attend training sessions (Richardson, 1994). While many schemes are run on a voluntary basis, paying students for their time has the attraction of putting this work on a professional footing and places a clear value upon it. Makins (1991) reports one of the unexpected spin-offs from the programme at Kingston was on the equal opportunities front. Two first year women students, who gravitated to a group led by the only female group leader on a course where women were in the minority, felt that it was easier for them to discuss their problems in a group led by another woman.

The older universities in the UK have long had established personal tutor systems, usually within their associated colleges. Some of the colleges at the University of Durham, for example, supplement this with a scheme of 'college parents'. College parents are more senior students often, but not always, from the same department as the first year students, whom they befriend before their arrival and provide informal support in introducing the new students to college and the university.

The students and staff in the DCI at the University of Lincoln have little experience in running such mentoring schemes. Recently, academic tutors have been introduced within the DCI to provide students with supplementary academic support. The cross-year mentoring scheme complements this support as it is less formal in nature and driven by students. Nevertheless, staff effort has been required to devise an appropriate scheme and organize training for all the staff and student mentors involved. Prior to commencement of the project in September 2005, studies of existing mentoring schemes at other comparable university departments were made and a training programme was developed for all staff and initial student mentors participating in the mentoring scheme. Experienced staff from the UK Resource Centre for Women in SET's (UKRC) *SETforWork* programme (SETforWork, 2004) provided the initial training materials on mentoring. As the funding obtained from the UKRC was earmarked specifically for women, we restricted cross-year mentoring to women students in the department in the first instance. There were a number of other reasons, however, for

restricting the cross-year mentoring to women. Recruiting women onto our computing degrees was and still is difficult; and retaining them on our courses was also problematic. Implementing cross-year mentoring exclusively for women students has allowed a more-focused study of the effects of the scheme. It was also easier for the scheme to be promoted within a small cohort of woman students. Initial costs for training materials and social events were minimal. Time given by staff was on a volunteer basis; and around one day per month was spent coordinating the initial mentoring programme.

### **WOMEN IN COMPUTING BECOMES WOMEN IN SET (WSET)**

The initial aim of the project was the development of cross-year mentoring for women students within the DCI at the University of Lincoln. This included women students from both the DCI at the Brayford Pool campus in Lincoln and Creative Technologies in Hull; together these comprise the new department. In addition, we broadened the project to include all women staff and women students studying New Media in the Hull School of Art & Design. The initial project successfully established co-mentoring among women students in the DCI on the Lincoln Campus during the academic year of 2005-2006, with an associated e-group and web site for all women students.

Following the mentoring training for all women students in the department in October 2005, the main activities were mentoring meetings between students as informal drop-ins. These provided additional back-up to the scheduled meetings between mentors and their mentees which proceeded on an 'as-needed' basis. As the mentoring scheme became more well-known to undergraduate women and established within DCI mentors and mentees focused more on specific needs of each member, rather than on general framework issues, and the use of email and on-line chat streamlined these discussions.

In the year prior to the scheme being developed, only 33% of 2<sup>nd</sup> year female students continued their studies into the 3<sup>rd</sup> year. In 2005-06 retention improved dramatically and 100% of 2<sup>nd</sup> year female students successfully passed their year-end examinations and carried on with their studies. The number of 1<sup>st</sup> year female students progressing to the 2<sup>nd</sup> year increased as well. All of the first and second year female students who participated in the co-mentoring were keen to carry on participating in the next academic year. While the numbers of female students recruited remains low, the women who come into DCI benefit from the now established mentoring scheme, as the department records 100% retention of female students on our courses.

This was a very small scale project. Nevertheless, the project did raise awareness of the special needs of women students on our courses and greatly increased the confidence of the students who participated. The project also raised the awareness of male staff to the specific support needs

of women students in a predominantly male department and in the wider university community.

One of the challenges in the initial year of the project was the difficulty of promoting the mentoring scheme across both University sites (Hull and Lincoln). Department restructuring and co-location of department personnel has helped to mitigate this problem in subsequent years.

One of the women who took part in the scheme in 2005-06 has gone on to pursue an active role in the professional society for Computing in the UK and has volunteered to act as the local British Computer Society (BCS) sub-branch Schools Liaison Officer. Although many student assisted mentoring schemes are run on a voluntary basis, the ability to reward students (e.g. with a BCS membership) enabled us to clearly show to students participating that the department valued their contributions.

Over the summer of 2006, WSET prepared a newsletter to use as publicity for new and prospective students. The newsletter allowed women students to display their successes in an academic format and was well received by both male and female staff and students. The newsletter was distributed by WSET at Fresher's Fayre and at regularly scheduled open days throughout the year. The newsletter primarily featured women in Computing and showcased the work of the WSET over the year and, as such, new recruits were encouraged to join from their early days at university. This provided them with immediate access to a pre-established academic and social network.

### **WOMEN IN SET BECOMES UNIVERSITY-WIDE**

In 2006 further funding was obtained in a second round of the UKRC's *SETforWork* programme to extend the WSET to include women from the department of Forensics and Biomedical Sciences (FBS) and, more broadly, any women staff and students in the SET fields at the university. The women students who participated in the scheme during 2005-06 were keen to see it continue and were a tremendous resource. Directly employing post-graduate women students as project staff to help run the project and maintain the website was a key factor to its success in the second year.

The main focus of the project in the second year continued to be progression and retention of women students on SET courses, but the focus was extended to support the students in their first steps toward their careers as SET professionals. Our research has shown that the retention of female students within a normally male-oriented curriculum area, such as computer science, is improved if the students can find a group to belong to both socially and academically. SET-related social networks include not only the physical association but also on-line relationships with academic cohorts. As described in Liccardi, et al., (2007) belonging to a social network mitigates the isolation issues. The social network can become a vehicle through which

professional connections are made. Thus, by encouraging women students to join the relevant SET social and professional groups, the foundations are laid for networking in their professional career.

Another goal of the project in round two was to transfer the successes from the DCI into another department. Forensic and Biomedical Sciences (FBS) was chosen in part due to its scientific kinship with Computing, but also for the relatively large population of women students. It was felt that bringing in a larger population of women students would provide a higher profile to the project. Making this transition has not been easy as what worked in Computing has not always been relevant or workable in FBS. For example, within the DCI involving post-graduate women students as staff on the project was a key factor in carrying on with the project in the second year. However, this did not prove workable in FBS. Building on relationships already established through working jointly on research projects, we have also started to include women students and staff from the Psychology Department in our activities and in the wider e-group WSET@lincoln.ac.uk, which is now hosted on Facebook.

Over the summer of 2007, we had another newsletter professionally produced highlighting the achievements of our women students in Computing and other SET departments at the University of Lincoln. This project with its second round of funding has enabled us to establish a basis for building up WSET as a self-sustaining group within the University of Lincoln. The cost to have the newsletter professionally printed was approximately £750. Articles were written by the various women members of Lincoln WSET, both staff and students, and their work on the newsletter was purely on a volunteer basis.

### **CONCLUSIONS AND PLANS FOR THE FUTURE**

Since the Department of Computing and Informatics (DCI) was formed at University of Lincoln in 2004, recruitment and retention of women students has been a recognised problem. The drop-out rate among the women students was higher than their male counterparts. An e-group for the women computing students was formed and support obtained from the UKRC under their "SET for Work" scheme, which enabled the development of cross-year mentoring for women in Computing. The project's success is reflected in the fact that the drop-out rate for women students in DCI has decreased considerably, although the number of women studying within the department is still small. Subsequent funding from the second year of the project enabled WSET to be established for all women staff and students in the SET fields at Lincoln.

Sustainability of WSET has been ensured by the following activities:

- student members volunteering to work on the annual newsletter and provide news stories and photographs highlighting achievements of women in SET, and
- WSET members raising funds for internal scholarships and visiting local

schools to raise awareness of the opportunities for girls in the sciences, engineering and technology fields.

In addition, producing our own newsletter, rather than having it produced professionally, has lowered the cost to WSET. We were also successful in obtaining a "Pass-it-on" award for this purpose (Pass-it-On Grant Award, 2008). A big advantage of producing the newsletter by the members of WSET has been that it increases their sense of ownership in the newsletter as well as providing a great experience and building community spirit as well as a sense of achievement.

The University of Lincoln is committed to increasing the participation of women on its undergraduate and postgraduate SET programmes. The university's equality and diversity webpage now contains a link to the WSET website. The university has recently demonstrated its commitment to professional women in SET by signing up for the Athena-Swan Charter (Athena Swan Charter, 1999). The department provides a table at Open Days so that WSET members can help promote our degree programmes and distribute our newsletter. Potential women students and their parents and other family members have commented positively on the WSET presence. Our retention of women students in Computing has continued to improve over the two years that WSET has been running. Aspects of the existing scheme, i.e. its e-group with discussion groups and student mentoring, have already been rolled out to our wider DCI student population. We have recently developed student based mentoring in programming and worked on developing a 'student buddy' scheme in 2008-09. Broadening the remit from women in Computing more generally to women in SET at the University of Lincoln has fostered collaboration amongst women staff in different departments within SET, and we expect this to continue.

The WSET networking group includes both women students and staff working in SET and its example has been followed by another recently established network at the University of Lincoln, the Women into Research (WiR) Network, for all women engaged in research at the university. One of this network's key aims is to help women, through mentoring, to establish their careers in academic research. Our mentoring experience within the WSET project has proven useful in the formation of the WiR network.

## **REFERENCES**

Athena Swan Charter (1999) Available from <http://www.athenaswan.org.uk/> (Accessed 2 October 2009)

Liccardi, I., Ounnas, A., Pau, R., Massey, E., Kinnunen, P., Lewthwaite, S., Midy, M. A. and Sakar, C. (2007). 'The role of social networks in students' learning experiences.' *ACM SIGCSE Bulletin* (December Issue) pp. 224-237.

Makins, V. (1991). 'Passing on a year's experience: How peer tutors at Kingston Polytechnic help students combat isolation.' *The Times, London*, 5th July, p. 23.

Pass-it-On Grant Award (2008) Available from [http://www.anitaborg.org/initiatives/systers/pass-it-on-grants-program/2008\\_april\\_pio\\_winners/](http://www.anitaborg.org/initiatives/systers/pass-it-on-grants-program/2008_april_pio_winners/) (Accessed 2 October 2009)

Richardson, S. (1994). 'How Supplemental Instruction came to Britain.' In C. Rust, & J. Wallace (Eds.), *Helping students to learn from each other: Supplemental Instruction*. Birmingham: Staff and Educational Development Association, pp. 15-16)

SETforWork (2004) Available from <http://www.ukrc4setwomen.org/> (Accessed 2 October 2009)

Women@CL (2003) Available from <http://www.cl.cam.ac.uk/women/> (Accessed 2 October 2009)

---

<sup>1</sup> From 2009 the Department of Computing and Informatics will be known as the School of Computer Science.