European Women in Mathematics Web Based Mentoring Scheme

OXFORD BROOKES UNIVERSITY

Oxford Brookes University won the British Computer Society prize in the 2003 Royal Society Athena Awards, for the best use of information technology in the achievement of Athena's aim – the advancement of women's careers in science, engineering and technology in higher education and research. Their mentoring scheme matched European women in mathematics, from undergraduate through to junior academic staff level, with more experienced mathematicians. The scheme made use of technology to connect geographically isolated people. It provided mentees with the opportunity to communicate with role models and to get impartial advice on careers, balancing family and career and gender issues in the workplace.

The web portal for the scheme provided information and guidelines on mentoring, information on careers and education, links to resources, some short profiles of women in mathematics, a discussion forum and a section for feedback as well as the location for potential mentors and mentees to sign up to the scheme using online forms. Since the launch in November 2002, around 50 mentors and mentees have signed up, and 25 pairs have been matched.

The scheme met a need in the community and was the result of careful research and planning. An initial survey of potential participants gauged demand and identified the issues of greatest concern. Research into existing mentoring schemes established what was good practice. Evaluation was planned from the beginning and continued throughout the project.

This project was a learning process for all involved. There were few web-based mentoring schemes in existence when it started, all of them of recent origin and most in the USA. What was learnt was that the technology could be used very effectively to reach a target group, who are isolated geographically but are experienced users of the web.

The scheme was initiated with the support of Oxford Brookes University under the auspices of European Women in Mathematics (EWM), a pan-European network of women working in academic mathematics, whose aims are to encourage and support women with or wanting a career in research mathematics. Mentoring was discussed by EWM at a conference in 1999, and the initiative to set up the web-based scheme arose from this discussion.

Oxford Brookes University

Oxford Brookes University is a leading new university which has been involved in activities to support women in academia for some time. The university has supported a number of women in science events, such as local exhibitions featuring women doing science. At undergraduate level the university does well in recruiting women, in mathematics the proportion of women is usually around 60%, however, the proportion of women at higher levels is much lower.

Further Information

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Background

As in many science disciplines, women are under-represented in academic mathematics, particularly at the higher levels. In the UK in 2000/01 only 22% of lecturers and 2% of professors of mathematics were female. These figures have been relatively constant for the past decade, despite larger proportions of women at PhD and postdoctoral level (on average, around 40% of undergraduates and 27% of postgraduates).

Interestingly, comparisons of the proportions of women in academic mathematics across Europe show that this is not everywhere the case. In the south of Europe - Portugal, Spain and Italy, the proportion of women in mathematics is higher. The problem of the under-representation of women in mathematics is more acute in the north, particularly in Scandinavia, the UK and Germany. These statistics suggest that ability in mathematics is not gender-related, but that what is needed is for the north in some way to emulate southern Europe and thus release a considerable pool of talent.

In southern Europe the higher number of women in mathematics is a positive reinforcement for women at the start of their careers. They have role models around them all the time, to whom they can turn for advice. In the north these role models may not be available. It is quite common to find mathematics departments in the UK with one or no female lecturers. Women at PhD and post-doc level may be isolated. A mentoring scheme, which linked such isolated women with role models/mentors in other locations, was seen as useful and a good way to reach women at the important decision-making stages in their lives and to help give them the confidence to continue.

The Mentoring Scheme

The project was funded by the European Union for two years from August 2001, with support from Oxford Brookes. The aims of the scheme were a good fit with the University's aims and it was supported by the Deputy Vice-Chancellor and the Dean of the School of Technology, where the project was based.

An initial survey was carried out to gauge demand and to identify the issues most relevant to women starting their careers in mathematics. Just over half the respondents were not concerned about the gender of the mentor, but the majority expressed a preference for a mentor from their home country. The scheme learnt from existing mentoring schemes, including women in science schemes supported by Athena, and schemes using the internet. From the internet schemes it was learnt that what a successful web-based mentoring scheme needed was:

- clear aims and measurable outcomes
- a means of encouraging regular contact between mentors and mentees
- feedback mechanisms for the scheme organisers, mentors and mentees
- effective guidelines available for both mentors and mentees
- an easily navigated website
- discussion space for mentors and mentees
- careful protection of the personal data collected (eg not available online to casual visitors)

From Athena's earlier schemes they learnt:

- time was a limited resource for all involved
- both mentee and mentor can benefit from a mentoring relationship
- male mentors can be very helpful, especially for helping a mentee to develop strategies for success in a male-dominated profession
- successful matching is difficult but essential
- evaluation should be planned from the start of the project

The matching process

When mentors and mentees sign up on the website their details are entered into a database and they receive an automated e-mail reply thanking them for signing up. The personal information collected includes, for example for the mentees, the issues that they feel are most important for them - help in choosing a research topic, job searching, applying for grants, balancing family and career, and for the mentors the issues on which they feel able to offer advice.

When a potential match is found, the mentee is informed first and is given the power of veto. If the mentee wishes to go ahead, full contact details are passed to them and the mentor is also informed. The pair are then free to communicate as they see fit (guidelines are provided). Most mentor/mentee pairs communicated by e-mail(75%) although some used the telephone or met in person. If problems are encountered (e.g. the matching turns out not to be successful), the administrator can be contacted by e-mail.

Evaluation

Evaluation was planned from the start of the project. The statistics collected included the number of visitors to the website and the number signed up as mentors and mentees. Questionnaires were e-mailed to mentors and mentees in March and August 2003. Feedback showed overwhelming support from both mentors and mentees. The majority of respondents gave positive answers on the operation of the scheme and the results to date. Almost all respondents felt the matching process was clear and most found the communications from the mentoring scheme helpful. All mentors and mentees were content with the choice of mentee/mentor made for them.

Respondents found the site easy to navigate, the guidelines useful, the biographies valuable, the form easy to fill in and the right number of questions asked, although one mentee would have liked the mentor to indicate whether they had a family. Most felt no need for more structured procedures, although one mentor suggested it would be useful to send out discussion tips regularly to give mentors and mentees something to help move things on, and another suggested a quarterly email newsletter.

Most mentees felt no need for formal training, but some said they might be interested at a later stage. All mentors had agreed frequency of contact times with their mentees and most had kept their contacts up on a regular basis. Only one mentor reported a 'fizzling out' of the agreement.

Scheme Impact

Around two thirds of mentors thought the scheme had benefited them in some way and over half the mentees felt having a mentor had made a difference to their career plan, even after such a short time. Many reported gaining opportunities to study / work through contacts made, and an increase in confidence. This is key for many women who often lack confidence in their own abilities. One mentee commented *I feel more confident to pursue a purely academic career, not having a single female maths lecturer at my university got me doubting those plans, I have to admit.* Another stressed the importance of the mentoring for those who did not have much money to travel/ attend conferences and make contacts.

There was also an impact on the host institution Oxford Brookes, which is now considering setting up a mentoring scheme for all staff. An unexpected result was the interest from other organisations thinking about setting up mentoring schemes. Advice was given to the Association for Women in Science and Engineering, the Womens' Engineering Society, the British Council and to Oxford Brookes University itself. The scheme will contribute to a European conference on gender in higher education in Oxford in 2005 with a particular emphasis on its practical aspects.

Transferable Learning

The number of matched pairs is smaller than the potential number of mentees. It became clear that a large pool of mentors is necessary in order to find suitable pairings and considerable effort was needed to recruit suitable mentors as the project progressed. Other learning included:

- publicity is essential to reach potential mentors and mentees
- recruitment of mentors needs to take place early in the project
- good matching is worthwhile but time-consuming
- the internet provides a very good way of linking up isolated people in need of mentors
- a website can be used effectively to provide other information as well as mentoring links
- care is needed in the design of forms – enough information has to be collected to make good matches but too much information is difficult to handle effectively
- data protection requirements have to be considered - data must be collected and held securely and those who give it must be aware of the implications of their data being held
- technical expertise is needed to set up such a scheme
- back-ups of the site and the database have to be regularly maintained
- feedback is important, to find out what the users think of the service in order to improve it and to let them know what is going on

A web-based mentoring scheme is highly transferable to other situations and advice has already been given to others planning such schemes, this advice includes:

- plan carefully and budget for ongoing technical work as technology changes
- if a scheme is relatively small, it is possible to carry out matching mainly by hand but it is time-consuming and say around 3-4 hours every 2 weeks should be allowed for this
- recruiting good mentors is the key to success – mentors have to be prepared to give sufficient time and to feel strongly enough about the aims of the scheme to keep going
- publicity is important to let mentees know that the service is available - where the target group is often isolated individuals, reaching them can be difficult
- provide opportunities for feedback to all concerned

The Future

The Women in Maths mentoring scheme is now well-established and it is planned to continue it for at least another year, although the major EU funding has now ended. With the technology in place only minor ongoing maintenance work is required, and the BCS prize will be used to help fund this in 2004. It is hoped that the publicity surrounding the award and prize can be used to look for sponsors to carry the project further into the future. The publicity will also be useful to reach potential mentees and mentors.

Building on the success of the maths mentoring scheme work is in progress to set up a sister site for women in computing. It is very appropriate that the BCS prize will enable this work to continue.