

Girls & Gadgets: The Future

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Introduction

The shortage of girls opting for computing in education and as a career choice is a well recognised and documented problem both nationally and internationally. However, definitive root causes and solutions have yet to be established. It appears that many girls switch off to computing as an academic subject to some extent towards the end of their primary education. It is recognised that they have different motivations for using technologies to boys but there seems to be less categorical evidence for the decision (conscious or otherwise) to not engage with computing fully. This shortage of girls in computing education is reflected in a shortage of women in the industry. In an article in *Management Today*, Emma de Vita (1/2/2008) provides some stark statistics on the lack of women in computing. She goes on to describe how, despite government initiatives and drives by the private sector, the situation has not only stagnated but has worsened.

Evidence suggests that this trend is likely to worsen over coming years. The report on the attitudes of graduates to IT as a career by the Careers Research and Advisory Centre (CRAC) (2008) states that the percentage of female applicants for computing related subjects fell from “18% to 15% between 2001 and 2007”. Possibly more worrying the report goes on to say the percentage of females studying computing A-level in the same period dropped by 4%, though the number of females studying ICT has increased.

Significantly the report states that despite being under-represented female students do generally out-perform their male counterparts in terms of results.

The lack of diversity in the field of computing has an impact on both educators and employers. It influences the dynamics in the classroom, particularly in the later years of education where choice means that classes have very few girls and women. It also has an impact for employers, whatever field of computing they operate in. In the field of technical support and management employers are now placing high value on both technical, inter-personal and business awareness skills and recognise that women have a lot to contribute to this area.

Background to Girls & Gadgets

As an educator in fields of computing covering Computer Science, Computer Games, Animation, Media and Digital music, the School of Computing at the University of Teesside has experienced this imbalance in diversity in its student body as much as any organisation. As part of a University which aims to widen participation the School has begun work on a series of events aimed specifically at girls in an attempt to both engage them in the subjects and to demonstrate to them the range of opportunities available to them as real career choices.

In addition to the lack of diversity in the student body, Computing Schools and industry are facing a skills shortage. The number of students applying for computing courses is reducing as is the number of graduates seeking work in the industry. An article in Computing (2/5/2008) suggests that the “skills crisis should be driving the industry to encourage new entrants, particularly women”.

The Girls & Gadgets events began in a direct response to the disparity in numbers between male and female students studying in the School of Computing at the University of Teesside. The University hosts many events for local schools and colleges which have two main aims:–

- To complement the curriculum taught by the schools; working with schools enables the University to gain a greater understanding of the school and college curriculum.
- For marketing and recruitment purposes including developing lasting relationships with schools.

It was obvious from these events that by the time pupils reach the last year of school girls have already switched off to pursuing computing in education. The lack of gender diversity in the groups attending the computing events reflected that found in the classrooms with undergraduates.

It became apparent from these experiences that to influence the perception girls have of computing related subjects any activities or events aimed at addressing the lack of diversity would have to start at a younger age.

Girls & Gadgets Subject Events

The aim of these events is to demonstrate the breadth of subjects computing has to offer and to raise awareness and interest within the field of computing. These events are also an attempt to break the 'geeky' image associated with computing and show girls that they can not only do these things but enjoy them too.

The School decided initially to target young girls between the age of thirteen and fourteen years. The activities conducted during the events were specifically designed for year 9 girls as this is a pivotal year for choosing options for GCSE. The initial events were to provide a hands-on experience of computing. The all girl environment ensured that they could engage with activities without social pressures and preconceptions.

The events so far have consisted of one full day based at the University, immersing girls in a variety of computing related areas. The day was based in the Networks Studio, a teaching resource that allows students to physically construct computer networks. The girls learned how to build a network from the beginning and used applications such as chat and file sharing across their networks. This gave them the opportunity to understand

the technologies that support the applications they use on a regular basis, and to see that they have the ability to construct and control these technologies themselves. The session involved technical aspects including hardware and protocol configuration with the overall approach of providing a fun and rewarding experience. The girls built their own networks enabling them to communicate with each other as well as sharing resources such as images and music.

A second session introduced the concept of social networking. This gave the girls the opportunity of a hands-on experience, for example meeting in a social networking group set up on site for this session. This was followed up with a session on Internet Security, involving girls in an exploration of risk and security implications of social networks and how they could protect themselves online. It was felt that it was important to have good role models present at the events from both industry and education. A female guest speaker from North Yorkshire Police Computing was in each of the events all day, and assisted with supporting and talking to the girls during the first two sessions. For the final session she spoke to the groups about her own career path and personal experiences working within the computing sector. A female student also attended the events and proved invaluable both in the support provided but also in giving the girls the opportunity to see someone not unlike themselves working and studying in the field.

The first session received extremely positive feedback from both the girls and the schools involved and led to a further four consecutive one day events with a total of 65 girls attending. Having the opportunity to work in a single sex group proved to be a large part of the success of the event. The girls engaged fully with the technical aspects in what they perceived as a non-judgemental environment. They immediately forged friendships with one another through the use of the networks and technologies they had constructed. The girls demonstrated an ability to pick up technical concepts rapidly and effectively.

Girls & Gadgets Conference

The resounding success of the first events has led the School to consider other events that would provide an effective means of engaging girls in computing. The next event is

scheduled for December 2008 and is an all girls conference, aiming to have 200 delegates from the local area. The reasons for opting for a conference include being able to reach 200 girls in a single event, giving the girls the experience of a full-blown conference and providing a wider range of subjects and material in a shorter time.

The Conference is a one day event which includes keynote speakers, from both industry and education, and workshops in a range of subjects including animation, computer science, games, music and mobile computing. The Conference will address a wider age range, from 13 to 16 years; where appropriate girls will be separated in age specific groups.

The aim of the Conference is to encourage the girls to see and understand the vast array of opportunities available to them in the field and to help to empower them, through experience, knowledge and role models to take advantage of these opportunities.

The event will provide a full, professional conference experience to fully engage and involve the girls as delegates and to respect their contribution, as well as demonstrate the great diversity of subjects and careers available to them.

Initial contact with local schools has indicated an intense interest in the event. There has also been considerable interest externally including staff from Microsoft, the NHS and Local Government keen to become actively involved. It is hoped that the Conference will become an annual event giving the girls the opportunity to return each year and so maintain a continued link with both the subject and the University. Links are also be established between this and Animex the annual International Festival of Animation and Computer Games held at the University of Teesside.

Research

Other than feedback forms for the sessions no research was undertaken at the first events. The Conference offers an opportunity to conduct research with 200 girls of varying ages.

This research is currently being designed by a team in the School, involving data collection and methodology.

Partnerships

The School is registered as a partner with the e-Skills Council's Computer Club for Girls (CC4G). While the School does not get involved directly with the school clubs run by CC4G many of the girls attending the events at the University are also members of their school CC4G clubs. The partnership involved the University informing CC4G of the events being planned and organised, it also gives access to the material used by CC4G so that any planned events can contribute or add to the experience girls are already gaining from their school clubs.

Planning, Scheduling and Resourcing Events

Limitations of the sessions that have been run to date include the requirement of resources and the relatively small numbers of girls that can be involved with each event. With any event involving schools and pupils careful consideration has to be put in to the planning and scheduling. Most schools cannot allow children out of timetabled classes during normal teaching periods. Within the School of Computing there is a small team that work closely with local schools and colleges and so could advise on timings for the event. The most appropriate times in this case were the first week of teaching in the academic year or the week just before the Christmas or Summer break. In addition to this the requirement for resources within the University meant the periods when the resources were not required for teaching had to be identified. Fortunately most schools start before the Higher Education academic year and finish slightly later, this gave a window in which the sessions could be scheduled. Planning and scheduling for the Conference poses different issues though the dates are still dictated by the schools and the availability of resources within the University.

The geographical area that can be reached is also limited. For the University this has meant that efforts are concentrated on the local catchment area, i.e. the Tees Valley and

surrounding areas such as North Yorkshire. Demand from schools and colleges far exceeds the capacity available for the event even within this constrained area.

Another issue is funding for events, to date the events in the School of Computing have been run very much on good will. Relying on staff who have a keen interest and see a need for such events. The Girls Conference is being funded in the main by the School, with additional funding and support still being sought. As the intention is for this to be an annual conference on-going funding will need to be secured. One problem with this type of event is that some organisations may face an issue with funding events that have such a long term return on investment and may not be able to justify the cost.

Conclusions

The experiences of the events run to date have been extremely rewarding and successful. There is not only a need for this type of event, there is now a real desire from the girls and the schools to be involved in events such as this. There are already initiatives to support women in the industry. There are also national initiatives aimed at engaging girls in computing such as CC4G, but there is an opportunity to build on the work started by these. As a University, Teesside has extensive, up-to-date facilities far exceeding those of our local schools, and in addition there is a wealth of expertise and excellent role models available within the School. Links with industrial and commercial partners extend this expertise further.

Tech Savvy, a report by the AAUW Educational Foundation (2000), discusses getting “more girls into the ‘pipeline’ to computer-related careers and to participate in these disciplines”. The concept of a “pipeline” could be helpful in planning future activities aimed at engaging girls. This concept gives a sense of some form of continuity, maintaining the pipeline and keeping girls within it through a series of contiguous events that will progressively excite and encourage girls over a period of time.

The real issues are the localised nature of the events and the lack of a co-ordinated national effort at this level. Universities and the industry by their nature often have a

wider range of up-to-date technologies to support their businesses. The skills and resources available in these organisations could be employed effectively to excite and fire the imaginations of girls with regards to technology based careers.

According to the CRAC report there “now seems to be a consensus that the future UK economy will rely more rather than less on knowledge-intensive industries and other technology based enterprises”. Women have a significant role to play in leading this future economy and can only do that if they are fully embedded in the industries that are driving it. To achieve this more girls need to be encouraged to see these fields as valid career options that can provide rewarding and meaningful futures for them. The contributions that the women, who are encouraged to take up these careers, make will benefit all of society.

References

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