

# LEARNING FOR LIFE: IN PURSUIT OF THINKING

Judy Wilson  
Middlesex University  
School of Computing Science  
Hendon, London NW4 4BT  
j.wilson@mdx.ac.uk

Carl Reynolds  
Middlesex University  
School of Computing Science  
Hendon, London NW4 4BT  
c.reynolds@mdx.ac.uk

Pirkko Harvey  
Middlesex University  
School of Computing Science  
Hendon, London NW4 4BT

Joanne Masters  
Middlesex University  
School of Computing Science  
Hendon, London NW4 4BT

Julie Marshall  
Middlesex University  
School of Computing Science  
Hendon, London NW4 4BT

---

## ABSTRACT

*This paper reports on a study considering the impact of promoting extended transferable skills to a small group of second year computing students. This has led to the identification of a number of important issues that are likely to have a significant impact on curriculum structure and delivery. Evaluation of the qualitative data received to date, shows that whilst all students participating in the study recognize that they benefit significantly and enjoy the additional support, the benefits as perceived by tutors, appear to be greatest in students who are already high achievers. The monitoring of the project indicates that some of the material has more relevance to the students later in their studies and is therefore received with more enthusiasm. The cohesion within the group and the view that a "community of practice" has been created may have longer-term implications that will be monitored.*

### Keywords

*Transferable Skills, Community of Practice,*

## 1. INTRODUCTION

Employers are continually pressing for graduates who display strengths in a broad range of generic achievements. According to Digby [1] "A degree alone is not enough. Employers are looking for more than just technical skills and knowledge of a degree discipline. They particularly value skills such as communication, teamworking and problem solving.

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, to republish, to post on servers or to redistribute to lists, requires prior specific permission.

© 2006 Higher Education Academy

Subject Centre for Information and Computer Sciences

Job applicants who can demonstrate that they have developed these skills will have a real advantage." The Association of Graduate Recruiters [2] stated "as well as academic achievement employers want good team-workers who can communicate properly and have cultural awareness", and that "over half of the employers polled said many graduates lacked skills".

Are students developing the skills required by the employers during their undergraduate degrees? Many universities have taken the approach of embedding the skills within the curriculum; others have chosen to run specific, compulsory skills modules (e.g. Middlesex University).

Studies have taken place to establish which skills are valued by students themselves e.g. by Burke, Jones and Doherty [3] which focused on students perceptions of knowledge and skills, and the findings showed that there were significant differences in terms of perceived skills acquisition within and between cohorts studied.

Study by Durkin and Main [4] examined whether transferable skills – and 'intellect' skills can be further developed through specific study skills support, compared with a generic study skills course. The study concluded that 'discipline based peer mentoring and workshop approaches had distinctive benefits to offer'.

The concept of transferable skills, key skills, core skills or career management skills is part of a long-standing debate as to what these skills should do or encompass, see for example, Noble [5]. However loosely framed, universities are increasingly including work preparation in the curricula. Noble states that it is "generally accepted that developing

students learning skills is central", e.g. the Dearing Report [6] placed learning to learn as one of the four identifiable key skills. This is more than just encouraging skills development and involves addressing attributes and attitudes of mind.

The Graduate Project [7] identified three distinct kinds of graduate achievement, field specific (subject knowledge), shared (general attributes contributing to a particular degree) and generic (common to all or most graduates) in an attempt to define "graduateness".

At Middlesex University specific teaching slots are currently provided, to address study skills development in the School of Computing Science. This curriculum is based on various reports from HEQC on the requirements for graduateness. The teaching focus for study skills is generally at the start of the degree programme where students are given access to a wide range of tools and skills development processes. Further study skills development is embedded into the subject curricula.

The drive for widening participation has resulted in a culturally and internationally extended range of students especially within the School of Computing Science. The University's learning and teaching strategy explicitly states that we support open and flexible approaches to learning and assessment; support the development of learning autonomy; enhance the quality of student experience of learning, teaching and assessment and in particular highlights the need to promote lifelong learning.

Evidence from previous research undertaken within the School of Computing Science [8] shows that many students do not have a clear idea of what a computing degree entails. They lack basic life skills – time-management, self motivation and effective learning strategies. Students do however recognise the importance of such skills and would welcome support in facilitating development of such capabilities.

According to the same study, the percentage of students working ranged from 44% in Year One, 53% in Year Two and a staggering 67% in Year Three and the average working hours were 17 per week. Interestingly, some of those students who work longer hours often progressed well in their studies and this implies that there is a real need for life skills development for all students in their studies.

In response to these demands, this project was initiated with the aim of absorbing students into a shared community of practice which will address their current concerns, for example, plagiarism, how to study effectively and how to plan workloads. One objective was to take up the challenges of placing information literacy development into the curriculum of the project which Webber & Johnston [9] imply is avoided by academic tutors. In this study we have a context for transferable skills development where a group of 14 students worked closely with staff, were given access to expert external speakers looking at shared and generic topics and encouraged to work collectively and also individually with a personal reflective component.

In meeting the demands of the students themselves, the employers and the underlying philosophy of the university, we have tried to guard against an approach too focused on teaching methods that promote learning rather than thinking. We wish to encourage student thought and their faith in their own abilities to think both individually and as part of a group.

To date the reflective accounts from students pinpoint evidence of outcomes that directly address required transferable skills as well as shifting a focus on to thinking about learning. Examples include working well in groups, time-management, confidence, in some cases improved ability to express themselves through writing, awareness of own adoption of learning strategies and increased appreciation and understanding of a reflective approach in general.

There is also evidence that change in strategies have come from peers as a result of discussion stimulated by the speakers. There has been a shift from considering what the university provides for them to what they can provide and enable for themselves. Further evidence for the success of the project comes from student activity such as volunteering and support for each other outside of the context of the seminars themselves. This very general statement however, hides some detail such as significantly less improvement in terms of reflective output as seen by tutors with regards to those students who have lower grades and who were initially seen as those who might benefit the most.

Currently we have not completed our quantitative data collection or completed the interviews in order to explore findings to date, this will be subsequently available.

## 2. METHODOLOGY

A series of focused seminars were provided by internal and external speakers covering; group-work, time-management, project planning, reflection, computer science and the wider world and success factors in the wider world. We formulated a resource package for supporting the students' self-reflection including, log books/paper journals, material for mind mapping, time-management, and on-line provision for a virtual community.

Students have been monitored over the period through observation, submitted reflections and use of the on-line discussion board. This paper considers these qualitative aspects.

At the end of the project students will be interviewed individually and questionnaires completed at the start and end of the project will be analysed. The analysis of this will give rise to qualitative and quantitative data. Evaluation metrics have been devised and will be applied to this group and a control group who have not volunteered to be part of this project. The metrics will measure attendance where collected, plagiarism statistics, individual performance and performance against that of their cohort and individual progression. In addition, a phenomenological approach will look at the impact of the seminars on the students understanding of their own learning and professional development.

## 3. RESULTS

The results to date are indicated in two ways. Firstly, the perceived value from the student viewpoint will be ascertained by looking at reflective accounts and extracting themes that run across them. Secondly by looking at changes in a longitudinal manner and looking at the impact on individuals. There are some other results that were not considered in the planned evaluation but have emerged as a result of the project.

The students have enjoyed and valued their learning experience and this is indicated by comments. The focus on reflection and encouraging written responses to seminars and activities was clearly beneficial:

*"Prompted me to think deeply"*

*"Reflecting...has improved my learning skills"*

*"Even when I went home I was trying to understand..."*

Furthermore there was a desire to extend learning away from the immediate learning context and curricula and usefully adapt and develop their personal understanding for their own needs:

*"I have started thinking about..."*

*"Even when I went home I was trying to understand"*

*"I am trying to be more systematic now"*

20 *"...practice giving myself deadlines"*

*"...the ideas just kept coming".*

There were also pointers that indicated both more self-awareness and an increasing awareness of others.

*"I am a motivator"*

*"boosted my confidence in interacting with peers".*

*"I now realize how hard I have to work"*

*"I realised that I am much more confident than I thought I was"*

*"I was surprised to find some people never used this concept"*

This study also illuminated the positive aspects of working together as a team:

*"...you all share ideas and work as one"*

*"...individuals with different ideas contributing to achieve a common goal prove how efficient teamwork can be."*

*"the group cohesion was good"*

*"quite a lot of fun"*

All students who have attended 75% or more of the sessions have similar points to make. These do not appear to be related to performance.

On a longitudinal scale we have found that although the students appear to have similar levels of motivation and are all active participants in the workshops, there is a marked difference in style. Those who started with a more reflective approach and generally have significantly higher grades have made the greatest changes over the course of the semester. Those who started with brief factual descriptions of seminars have continued to do so. However, there may still be improvements in their transferable skills. One hardworking student has carefully described the sessions and their reflections from the start were interesting but superficial:

*"The exercise was quite interesting and educational, the group activity was set out in a way where*

*individual students contribute ideas to reach a common goal... what I have learnt can be applied to my academic learning in my choosing module group work and also through to my future career and beyond as reports show that team work is one of the desirable qualities employers look for in a potential employee". (Seminar 1: Introduction and group activity).*

This is particularly interesting as it shows that students believe they know what employers are looking for and see this as important. By the third seminar this participant is obviously keen to utilise and build on these sessions in a practical way:

*"I found that since this discussion I religiously write every activity in my diary...this has greatly helped in organising my study time. However, I am still struggling to stick to the time allocated for each task but, with more practice I will get better at it". (Seminar 3: Project management).*

There is further explicit comment on how these sessions are enhancing this student's interpersonal relations with their peers:

*"In terms of emotional reflection the extensive group exercises has helped me build a professional good relationship with my peers. I feel much more comfortable to discuss any difficulties related not only in this project but also on other modules; this has boosted my confidence in interacting with peers" (Seminar 3: Project management).*

After seminar 4 on reflective writing they admit:

*"My ability to question things is very poor" and they still do not really grasp what they need to do to overcome this: "The steps that I will take to achieve this would be, to be confident and become actively involved in class discussions" (Seminar 4: Reflective Learning Workshop)*

However whilst this student's reflections remain limited they are able to clearly outline the benefits to themselves of these sessions in broad terms – essentially how these sessions have affected their study skills and there are elements of self-discovery:

*"I found that I appear to work well in the early hours in the morning...I prefer a quiet place...before I settle down to study, I gather all the material that I need....I read the lecture notes before the lecture sessions" (Extra reflection towards the final sessions)*

This participant has indeed taken on and benefited from incorporating new procedures into their study

route and clearly recognizes their personal needs and is keen to address them. This suggests a level of internal reflection which they simply cannot articulate as yet. For those who already portrayed high levels of personal critical and reflective ability these were enhanced. For example, another student was clearly interested in developing their thought processes at the start:

*"I do reward myself as a form of motivation. For instance when I am really feeling like playing a game but at the same time when I have to study for an exam, I usually make a deal to myself that if I complete studying till chapter 4, I get to play for half an hour. This method is quite effective as at least I tend to do the things I have to do because of the reward. But I usually don't do my work with my best effort although I do finish the work. What happen is that you are thinking of playing the game at the back of your mind so you can't fully concentrate on your studies and you would want to finish it as quickly as you can so that you get to play. I was surprised to find that some people have never used this concept!!". (Seminar 2: Time management)!*

By week 5 the facility for reflection allows this participant to consider the seminar in terms of paradoxes that they have already poised for themselves:

*"Most part of the lecture he talked about helping paralyzed people and about binary search algorithm. But the best point he made during the lecture must be that, we as a designers should make sure that our system is actually helping our target customer and not actually making their life difficult. Therefore information gathering before designing a system is very important. This made me think about the dilemma that I always had, has computers actually made our life better or worse? Since due to computer many people are suffering from back aches, eye strains, miscarriage and other repetitive strain injury due to excessive use of computers. Yes, word processing is definitively efficient and easier to edit than writing but people tend to waste lots of their precious time by engaging in layout design e.g. borders, line alignment etc or working out how to draw chart or make table etc. Well I think we should rely less on computer, but I agree with [the speaker] that we need to analyse our system from different angle before developing it since usually programmers are computer enthusiast and ignore the fact that people might not be able to use their system due to lack of computer knowledge or enthusiasm." (Seminar 5: Computers and the wider world).*

One specific result that seems to have emerged is that the students who are taking part in the project

are taking part in volunteering for the first time and are enjoying the experience.

#### 4. CONCLUSIONS

The small group work contributed to big gains in the development of a community of practice and this combined with focused seminar material gave rise to individual personal reflection and intrinsic motivation. This was evidenced from the students' own accounts. The embedding of transferable skills has to be at appropriate times in the curriculum and although the first year students get access to a wide range of ideas and the ability to reflect, it seems that they may not yet have the experience to value it. This has implications for curriculum development from the perspectives of: future employers, professional bodies, e.g. the British Computer Society, academic staff and the students themselves as to when, where and how personal skills development should be provided for.

Academic planning needs to balance the requirement for extensive, technical subject coverage with the student and employer requirements for articulate, self-directed and confident students who can direct their own learning appropriately in a given context. This seems to indicate that those students who started with a clear ability to articulate themselves and who have a reflective approach to learning are the highest achievers. This may make it particularly important to foster these skills in order to support those students who have not developed this approach, but who seem to be equally motivated.

Despite the fact that there is a tremendous pressure on academics to deliver the curriculum there is an abstract ideal of 'honourness', graduates who have confidence in their subject matter. They will strive for continuing professional development, be able to be flexible in their learning and have good problem solving skills. Weber and Johnston "the subject {marketing} is in focal awareness; the role of

teaching information literacy may be explicitly rejected" [9]. Although there may be disagreement in defining what these qualities are and how they may be classified, it does seem that they are not just important to employers and tutors, but that they are mostly important to the students themselves.

#### 5. REFERENCES

- [1] Digby Jones, *Prospects Directory 2004/5*.  
Prospects web site. <http://www.prospects.ac.uk>
- [2] Association of Graduate Recruiters [2 (AGR Winter report 2006)]
- [3] Veronica Burke, Ian Jones and Mike Doherty, *Active Learning in Higher Education*, vol.6, number 2, July 2005
- [4] Kathy Durkin & Andrew Main, *Active Learning in Higher Education*, vol. 3, number 1, March 2002
- [5] Noble, Margaret. (2000). Teaching and Learning for Employability in Fry, H. et al, *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, 120-133 Kogan Page Limited, London.
- [6] NCIHE (Dearing Report) Higher Education in the Learning Society, *National Committee of Inquiry into Higher Education*, HMSO, London. (1997).
- [7] HEQC Higher Education Quality Council, *What Are Graduates? Clarifying The Attributes Of Graduateness*, HEQC: Quality Enhancement Group, (1996).
- [8] Harvey, P., Reynolds, C. & Adams, R. An investigation of factors which influence the retention and success of undergraduate students in computing science, *Proceedings of the 2004 12<sup>th</sup> International Symposium: Improving Student Learning, Diversity and Inclusivity 452-459* (2005).
- [9] Weber and Johnston, Information literacy in the curriculum: selected findings from a phenomenological study of UK conceptions of, and pedagogy for, information literacy. *Proceedings of the 2004 12<sup>th</sup> International Symposium: Improving Student Learning, Diversity and Inclusivity 212-224* (2005).