Student Centered Learning in a Studio Classroom Environment

Elaine Maher, Orla Lahart

`elmaher@ncirl.ie olahart@ncirl.ie`

School of Informatics, National College of Ireland, Dublin

Abstract. Arising from recent changes in Irish third-level education there has been a new paradigm in the provision of IT education at the National College of Ireland. Owing to the importance of student development a need has been identified and satisfied for a dynamic learning environment, which aims to facilitate the students' maximum learning potential. This student-centered learning space is achieved through the employment of state-of-the-art Studio Classrooms. This progressive learning environment encompasses aspects of the traditional classroom along with a computer laboratory, which allows students to interact via a Local Area Network. It also supports a lecturer Workstation, shared printer as well as access to the college intranet. Multimedia capabilities are also catered for. The benefits of this learning space are twofold. Benefits for the student include active experimentation, increased motivation, collaborative learning and the potential for maximum participation. In terms of the lecturer, benefits include higher retention and attendance rates, increased enthusiasm and student participation as well as a noticeable improvement in student assessment grades achieved. We will discuss our efforts at integration of modules within this unique learning space and identify other factors that contribute to the success of our teaching.

1 Background

At the National College of Ireland(NCI) the Informatics department offer two fulltime courses, namely a BSc in Software Systems and a National Certificate in Computing. The majority of modules on both courses are technical e.g. Software Development and Hardware. However, to produce well-rounded students for an increasingly demanding work environment our students are also exposed to applicable Business modules e.g. Business Communications. From first year to final year all modules are taught in the Studio Classroom environment. Teaching methods include lectures, tutorials and laboratory practicals. Classes typically contain 35-40 students.

2   Studio Classroom Configuration

The Studio Classroom incorporates the best aspects of the traditional learning environment and the computer laboratory. Essentially, the aforementioned learning environment has been revitalised using educational technology. The Studio Classroom is being used as a model of interactive learning. It emphasises a hands-on, learning- by- doing approach that focuses on what the student does rather than on what the lecturer does. The Studio Classroom has been designed specifically to meet the needs of our students. In class time each student has access to a computer. All computers are on the LAN. The lecturer's computer is also linked to this network and uses a data projector for demonstration purposes. Other capabilities include the student intranet, where students have access to all course materials. All machines are connected to the network printer in the classroom.

Each Studio Classroom can comfortably seat up to forty students. The Studio Classroom is outfitted with 40 high-speed computers, each with a plasma monitor. The room itself contains five rows of eight desks. Each desk has a computer to create both a cohesive and collaborative environment. This helps students to stay focussed on their activities. The desks are large enough to provide ample workspace for the students, and are arranged so that the lecturer can move freely about the classroom and between the rows. The lecturer's freedom of movement is further facilitated by the use of a roving microphone. Comfortable chairs allow students to focus on their work in a professional, but comfortable manner.

3   Studio Classroom in Practice

NCI's mission has long been to create and provide an environment for student-centered learning and collaboration. Long gone are the times of the "sage on the stage", where students undertake a passive role within the lecture. This new learning space encourages full participation where the lecturer's role is primarily as mentor and facilitator. Students are encouraged to work and think during class time. Teaching methods have been modified and adapted to suit this new learning space. No longer is it acceptable for lecturers to stand at the top of the lecture hall and dictate notes to the student. This method of teaching has been replaced with a more modern approach. This approach consists of theory explanation, instruction by the lecturer and application by the student. Some subjects, for example, Software Development are more suited to this approach. Where the module is practical by nature where students can really only learn by doing. However, other more abstract subjects have been modified so they include practical applications of the theory where possible. It is our experience that students prefer practical examples as opposed to abstract concepts. The Internet plays a key role in all classes. Lecturers can encourage self-motivated

learning by identifying a range of Internet resources such as Web sites, related resources and case studies. This allows students to learn by exploration. It is our experience that students learn best when they are in control of their learning. It is important to teach students how to learn by themselves.

4 Benefits

A major advantage of the Studio Classroom is that it allows for teamwork and group collaboration. It has been proven on many occasions that most students work better in groups. Typically groups consist of 2-4 students. Feedback from students has been very positive to date. The lecturer may set a problem for each group to work on. In trying to discover the solution students have a number of resources to hand, such as the student intranet, which will contain all lecture notes and other relevant information, the Internet as well as any previous stored work of theirs. This approach benefits each student as they can learn from each other as well as from the available resources.

Informatics programme statistics from the academic year 2002/2003 show an average 83% pass rate based on the first year results for the two full-time courses and an average 95% completion rate for the final year students of those courses. The Informatics department believe that there are a number of factors for this. Courses are adapted to meet the students' needs. We believe that active experimentation is very important in order to maximise learning. Many IT students fall into the category of active learners, therefore they learn best by doing. Also, because of the emphasis on group collaboration each student feels that they have an important role in the class and are less likely to feel isolated. Due to the dynamic nature of the classes students are motivated to attend and participate. Students acknowledge the fact that it is in their own interest to attend classes and they feel that they would miss out if they failed to attend. In addition, a large proportion (on average 50%) of students who successfully complete the National Certificate in Computing progress to the second year of the BSc course. It is believed that this is due to students' positive learning experiences during their time on the National Certificate course.

Initially the benefits for the lecturer seem insignificant. One should not however underestimate the modifications that need to be made to a syllabus in order to fully exploit the Studio Classroom. However, once these modifications have been put in place the rewards are incredible. The classroom takes on a life of its own. Students become enthusiastic about the work. Because students are working on problems during the lectures the lecturer can easily take a measure of the understanding within the class. Then they can increase the pace or decrease it where necessary. Also, it is inevitable that there will be a varying range of abilities within any given class. Our approach to teaching means that weaker students

can spend longer on the problem where stronger students are encouraged to try and solve trickier problems or to use the Internet to enhance their knowledge. This continuous cycle of theory, instruction and application gives rise to a productive learning environment. Additionally, because students are working within the lectures the lecturer is free to deal with individual student's needs.

5   Conclusion

The extensive application of Studio Classrooms has proven very beneficial for NCI's Informatics Department. More importantly it has enabled us to provide our students with an environment and atmosphere conducive to learning and continuous development. NCI is committed to the Studio Classroom concept and while the installation continues to run smoothly, areas for enhancement are continuously being identified and implemented, and faculty continue to experiment with different pedagogical approaches suitable for this type of learning environment.

Overall, the Studio Classroom promotes and encourages student-centered, discovery-based, group learning orchestrated via collaboration and teamwork. Additionally, it helps to increase the motivation and enthusiasm of lecturers and students by widening the traditional avenues of communication and encouraging participation.