Chapter 18
The Role of Technology in Mathematics Support: A Pilot Study

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ABSTRACT

In this chapter we will discuss the importance of using technology to enhance mathematics education and mathematics support. We present our initial steps in the use of technology in the National University of Ireland Maynooth as a pilot study. This essentially falls into two categories: the use of online courses to address mathematical issues faced by incoming at-risk students; and the development and use of additional resources such as pdfs (using touchscreen technology), podcasts and screencasts to complement existing services. We give a detailed description of the introduction, development, and implementation of these strategies including the advantages and disadvantages from both the teaching and learning perspectives. We also present the initial feedback concerning the use of these technologies with mathematics support services. This shows that students who made use of the help available reported that it had a significant impact on their learning experience. However, we will also discuss the major issue of getting students to actively engage with these extra supports. We also present the changes we are making to these services as a result of this pilot study and how they tie in with our long term strategy for a more complete mathematics support system for our students. We consider the implications for the future of mathematics education and mathematics support and give an overview of activities and resources already in existence.

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INTRODUCTION

The purpose of this chapter is to describe the first steps taken to implement the use of technology to supplement the mathematics support services in the National University of Ireland Maynooth (NUIM). We start by giving a brief overview of the development of mathematics support initiatives in the UK and Ireland in recent years; we discuss the use of technology and give a description of some research in this area. We then give an outline of mathematics at NUIM in order to provide context to our use of technology. Mathematics support services are a recent development at NUIM and technology was initially introduced as a pilot scheme to address certain issues that arose during reviews of the services. Using these supports as a case study, we look at the reasons why technology plays a role in providing students with a more complete and coherent support system. The student feedback and figures we present from the pilot study are mainly from the 2008-9 and 2009-10 academic years. The data reflects the pilot stage of implementation and mainly represents student usage and basic feedback on their experience. We focus on two areas: online mathematics courses; and supplementary electronic resources. In each section we look at the reasons behind these developments, the technologies involved, the development and implementation of the resources. We also discuss the feedback both from the teaching and the learning perspectives and we consider the issue of engagement with these resources. This is an area of major concern and something that should be seriously considered by anyone planning to develop additional electronic resources to support existing services. Finally we mention how we are using the data from the pilot study to provide a more coherent structure for the use and promotion of technology in mathematics support.

We see the use of technology as integral to the development of mathematics support but it should not be viewed as a replacement for one-to-one contact; rather it should be seen as a complement to this contact. This view is reinforced by the high levels of engagement of NUIM students with the drop-in sessions of the Mathematics Support Centre (MSC) and very low engagement with the online support courses. It is important to note that at present none of the mathematics support services in NUIM, whether electronic or face-to-face, are compulsory.

THE RECENT EXPANSION OF MATHEMATICS SUPPORT

There has been well documented growth in the area of mathematics support at third level in recent years in both Ireland (Gill et al., 2008) and the UK (Perkin & Croft, 2004). The reasons behind the establishment of mathematics support services are also well documented (Curriculum and Examinations Board, 1986; Lynch et al., 2003; Picker & Berry, 2001; Task Force on the Physical Sciences, 2002). These describe the situation at second level and some of the reasons for the increase in the numbers of students coming to study service mathematics at third level with high levels of mathematical deficiencies.

The mathematics support community offers a wide variety of services for students, particularly students who are deemed at-risk of failing. The effectiveness of these supports is widely researched (Mac an Bhaird et al., 2009). Croft (2008) has developed a website which contains reference to much of this research. This research allows for greater dissemination of services and the determination of best practice in mathematics support. This research can also be used to determine how best to deal with various student issues such as student anxieties, student engagement and student access to support services.

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