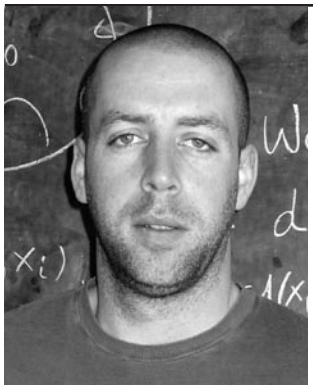
Ciarán Mac an Bhaird and Ann O'Shea

Is mathematics support worthwhile? An overview of the 3rd Irish Workshop on Mathematics Learning and Support Centres

Ciarán Mac an Bhaird
Department of Mathematics
National University of Ireland, Maynooth
ciaran.macanbhaird@nuim.ie



Ann O'Shea
Department of Mathematics
National University of Ireland, Maynooth
ann.oshea@nuim.ie

In this article we give a brief description of the 3rd Irish Workshop on Mathematics Learning and Support Centres which was hosted by the National University of Ireland, Maynooth (NUIM), in December 2008. We will mention the origins of the workshop along with the development of mathematics support in Ireland. We will look at the recent development of the Mathematics Support Centre (MSC) in NUIM and expand on why the theme 'Is Mathematics Support worthwhile?' was chosen. We will discuss the presentations and major issues relating to the theme which were addressed during the workshop. We close with a brief look at the conclusions of this very successful and well-attended event.

Introduction

The purpose of the workshop was to discuss issues to do with data collection and data analysis. Many of the speakers gave very detailed information and insights on the services that their institutions provide. All the talks are available at [1] and full details of the workshop are available at [2]. It is not the purpose of this paper to give a detailed analysis of each presentation. Rather we focus on the issues raised by the speakers in reference to the main theme.

The extent of mathematics support

The history and development of Mathematics Support Centres in Ireland is relatively short compared with that of the UK. A detailed report on the services provided by institutes in Ireland is available [3]. Similar publications are available on services available in the UK [4]. The reasons behind the establishment of mathematics support are also well-documented [5], [6], [7] and [8].

The origins of the workshop

With the widespread development of Mathematics Support Centres in Ireland it was inevitable that a medium for formal discussion amongst Irish centres would be established. The first Irish workshop was organized by Dr. Eabhnat Ní Fhloinn in the Dublin Institute of Technology in 2006. The second workshop was organized by Dr. Olivia Gill in the University of Limerick. These workshops have been a great opportunity for the mathematics support centre community in Ireland to meet colleagues, talk about their work and discuss new developments.

Why did NUIM host the workshop and why did they choose the theme 'Is Mathematics Support worthwhile?'

One of the authors attended the 2nd Irish workshop in 2007 and presented some of the facts and figures from the first few months of operation of the NUIM MSC. It was clear, even at that early stage, that the MSC was one of the busiest drop-in-centres in Ireland. The MSC is still in the early stages of development and has a lot to learn from both her Irish and UK colleagues. With this in mind, the authors agreed that hosting the workshop in NUIM would be the perfect opportunity to discuss common issues and topics. At the end of the first year of operation of the MSC we began to analyse our data. This came from three sources, the registration and attendance forms (which we cross-referenced with students' grades), anonymous student evaluation of the MSC and feedback forms that students completed on new teaching methods being employed by one of the authors in some of his classes. The amount of data and information was overwhelming. For example, 273 individual students attended the MSC, with a total of 2493 visits. A further 358 students completed the questionnaire (211 had attended the MSC and 147 had not). A complete description of our first year of operation and an analysis of our data is available [9]. The feedback appeared to be very positive but this was not a conclusive or definitive indicator of the impact of mathematics support. We checked for research on the issue, and though there were some papers [10], [11] and [12], it was clear that relatively little had been published. Thus we decided that the workshop theme should be directed towards discussions on the effectiveness of mathematics support.

The keynote speakers

Duncan Lawson (Coventry University, Director of sigma), 'Mathematics Support Centres: Who uses them and who doesn't? Why and why not?'

This entertaining and informative presentation looked at investigations into the usage of mathematics support services. The investigations focused on the Loughborough Mathematics Learning Support Centre and provided very revealing information from users and non-users of the services provided. The main reasons that non-users gave for non-attendance included 'lack of awareness of location, lack of awareness of facilities, lack of awareness of need for support, too many problems, and fear of embarrassment'. The speaker discussed these at length. Students who used the centre were asked a number of questions on their views of themselves and of mathematics. They were also asked why they attended and what their motivation was. They gave several reasons including: they were previously aware of difficulties, curiosity, somewhere to work, and they had encountered a problem in the first week. All these things point towards the fact that these students were engaged with mathematics from the outset, which is clearly a very important factor. The speaker discussed how the students actually used the centre. Students said that they regularly used it as a place of work, they considered it to be a learning space, it provided a conducive working environment, it provided an opportunity to monitor and direct their own learning, and it also provided emotional security and confidence. The deep learners who come use the service with the intention to understand. Positive attitudes towards mathematics enhances motivation and vice versa. The speaker closed with a description of the typical regular user and posed the following very important question ***'Are weaker students alienated by the working environment?'*** This is a relevant issue for all centres: are we getting to the students who need our help the most?

Tony Croft, (Loughborough University, Director of sigma), 'Towards a culture of data collection and analysis in Mathematics Support Centres'.

This speaker gave a very concise and informative description of the current state of data collection and analysis. He provided a website with a list of current papers that discuss the issues of the effectiveness of mathematics support. This website will be maintained and updated on a regular basis [13]. The speaker noted that in order to understand how the process of evaluating support centres is evolving, it is important to recognize the origins of these centres. He observed that originally the focus was specifically on helping students. However, as the centres evolved and demand increased, an increase in funding was necessary, and thus much more accurate records and analysis were required. He commented that this leads to the core of the issue. Is extra support worthwhile? How do we know this? What data do we collect, how do we analyse it and is it worth the effort? There was a discussion on the difficulties involved in acquiring and analysing the data collected. The speaker said that these problems should not stop our efforts; we should still try to measure our support. He divided evaluation into two main areas, which he referred to as soft measures and hard measures. **Soft measures** include attendance figures, the number of visits per student and the departments from which they came. This data is very easy to collect and can demonstrate demand for support. However, the data does not tell you anything about the quality of the service and what the students actually gain from the services. The speaker highlighted the importance of student feedback data but warned that it should not be overvalued and highlighted that external comments can be more beneficial when evaluating the role of the service. **Hard measures** usually involve much more extensive data collection and analysis. He quoted several studies, including comparisons of students' grades between those who accessed additional support and those who did not. When students who performed poorly on their initial diagnostic test were studied, it emerged that most of the students who accessed

support succeeded in their end of year exams, and those who did not generally failed. The speaker discussed studies which show that the proportions of failing students seeking mathematics support is less than those in passing grades. This would indicate that fail grade students, in addition to having ability problems, have attitudinal problems which we (they?) need to overcome as well. The main argument being made in [12] is that the mathematics support provision studied was used rather more by the better students who are seeking excellence than the less able looking to avoid failure. This suggests that the role of mathematics support has moved from one of remedial support to one of enhancement for all. The speaker concluded that we need to balance the time and resources we spend in supporting our students and the time and resources spent in measuring them (and us). ***'I would not want to give undue emphasis to the latter. Our primary concern should be the students.'***

Contributed talks

Diarmuid Ó Sé, Institute of Technology, Carlow, 'Providing Extra Academic Support in Mathematics to First Year Computing Students'.

This support specifically targets first year students from the Computing and Networking course. These students had very high failure rate and very weak mathematical backgrounds. There was continuous assessment of the students' academic performances during the year, immediately after assignment results and again before the next assignment. Students were contacted by phone and email to see why they were not availing of the service. The analysis showed an increase in overall exam pass rate and an increase in pass rate for mathematics. There was also analysis of second year students and a significant number (a range of 20% to 44%) claimed they would not be in the second year had the centre not supported them during their first year.

Máire Ní Riordáin and Olivia Gill, University of Limerick, 'The Evolving Role of Mathematics Learning Centres in Addressing Retention'.

The speakers referenced the significant number of students availing of the wide range of services provided. They also focused on Head Start Mathematics, a special program to help adult learners and their transition into third level education. They quoted students' comments, external department reviews and positive impacts on student retention and grades as evidence of the success of their projects. They also quoted the establishment of the *National Centre for Excellence - Mathematics and Statistics and Science Teaching and Learning* as an indicator of their success. Some of the initial services that it provided were described.

Nuala Curley, University College Dublin, 'Methods used to measure the impact and effectiveness of the Mathematics Support provided by the UCD Mathematics Support Centre'.

The speaker concentrated on a number of issues that their centre tackled to try and improve the service for the students. These included increasing the profile of their centre and giving the students the opportunity to evaluate the centre. As a result of these developments, they presented a significant increase in the numbers attending the centre, and the evaluations of the students who attended were in general very positive.

Ciarán O' Sullivan, Institute of Technology, Tallaght, 'Evolution of Mathematics Learning Supports at ITT Dublin'.

The effectiveness of extra support was presented in two ways. Initially, there was the measure of student support and development. Uptake was measured by the contacts with and attendances at the various services provided. There was also an analysis of the grades of students who attended compared to those who had not. Another measure of the effectiveness of the support was how it acted as a catalyst for change and development at the institute. This involved feedback to staff, an increase of support issues at third level and the flow of information on mathematics learning and teaching ideas back to second level education.

Eabhnat Ní Fhloinn, Dublin City University (DCU), 'Measuring Effectiveness of Mathematics Support through Student Feedback'.

The speaker commented that attendance and registration records for the centre allow the service to be monitored on a day-to-day basis. This prevents problems from becoming serious and allows for effective scheduling. The centre also uses the information to look at any impact on grades. Students fill out evaluation forms. The importance of accurate records was highlighted and it was noted that centres should also talk to students who have not attended and investigate why this is the case.

Conclusions

The workshop talks gave a good description of the current level of data analysis in use in Ireland and the UK. The overall picture was clear - measuring the effectiveness of support is not easy and there are many downfalls. However, the importance of carrying out data collection and analysis was highlighted, as long as it does not impact on our main concern, the mathematical welfare of the students. The workshop was a great success and gave everyone who attended new ideas on how to measure the effectiveness of support. It is clear that mathematics support is making a difference. The onus is on all people involved in mathematics support to ensure that the students who need the help most are actually getting it.

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