

CASE STUDY

The Role of a Full-time Mathematics Support Tutor

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Abstract

In September 2016, Maynooth University appointed a Mathematics Support Centre (MSC) University Tutor on a three-year contract, a unique position for an institution on the island of Ireland. In this paper, we briefly explore the important role of MSCs and their tutors. We describe the University Tutor's activities for the 2016-17 academic year and we discuss the benefits of establishing such a position. We also advocate for the establishment of more contract positions.

Keywords: Tutor, Full-time, Mathematics Support, Higher Education, student retention, STEM.

1. Introduction

The issue of student retention in science, technology, engineering and mathematics (STEM) and student mathematical difficulties in the transition from second to further or higher education have been widely publicised for many years (Lawson et al., 2012; HEA, 2017). In an effort to counteract this attrition at a local level, Maynooth University opened the Mathematics Support Centre (MSC) in September 2007. Since then, the MSC, which is based in the Department of Mathematics and Statistics has grown steadily, from 2,493 student visits in 2007-8 to 16,624 in 2016-17, and is one of busiest MSCs in Ireland or the UK. The range of services it provides has also grown, from 18 hours of drop-in per week in 2007-8, to now offering 27 drop-in hours per week, on-demand workshops, online courses and resources, and a drop-in service for local secondary school students (from ages 12 to 18 approximately). As a consequence of this rapid growth, staffing levels and demands on staff have also increased.

In Maynooth University, time and time again, either through feedback provided at the end of each MSC visit or through an annual anonymous survey of their MSC experience, students single out the MSC tutors for praise. This is not unique to Maynooth University, as identified by the Irish Mathematics Learning Support Network (IMLSN) report on a large multi-institutional student evaluation of Mathematics Learning Support (MLS) in Ireland (IMLSN, 2014). This report highlighted the key role that quality tutors play in students' experiences of MLS (IMLSN, 2014: p.30). The importance of tutors in MLS was also the central theme of the IMLSN's 2016 annual conference (Pfeiffer et al., 2016). However, for several reasons, including the precarious nature of the employment that many MSCs have to offer, it is of little surprise that tutors typically move on to other careers after working a few years in MLS. Furthermore, the majority of MSC tutors, at least in Maynooth University, work only a few hours each week, and these factors can negatively impact on the consistency of service that is provided to students.

This recurring problem was brought to the attention of Maynooth University's senior management through the MSC's annual reports and emphasised at various meetings. In 2016, Maynooth University took a very positive first step towards addressing this issue by creating the position of "MSC University Tutor".

In this paper, we begin by giving a brief description of the tutors who work in the MSC and their employment situation. The majority of the paper focusses on the first year of the Maynooth University MSC University Tutor (the first author), and we close with a discussion on the need for full-time MLS tutors.

2. The Tutors

When the MSC opened in 2007-8, the MSC Director (the second author) and one other tutor covered all 18 drop-in hours, along with trying to maintain records of student attendance and registration. As a result of the high number of attendees, additional funding for more staff was requested and received. In 2015-16 (the year before the appointment of the MSC University Tutor), all MSC teaching involved the Director and 22 tutors, who each covered between 2 and 16 hours per week. With the exception of the MSC Director, all other MSC staff, including an administrator, were employed on an hourly basis.

2.1 Who are they?

In Maynooth University, MSC tutors are often sourced from mathematics or statistics postgraduates and to a lesser extent, from final year undergraduate students. Due to the demanding nature of postgraduate or indeed undergraduate courses in mathematics and statistics, a tutor may only be available to work a few hours per week in the MSC. On occasion, the MSC has recruited graduate staff who may not have studied in Maynooth University at all. It is also common for some tutors, on completion of their studies, to commit to working in the MSC (while also giving tutorials for the Department) for an academic year (or more), in order to save money while deciding their career options. Individuals in this situation, often cover considerably more MSC hours than tutors who are studying.

2.2 The current employment situation.

The casual, per hour employment, which seems to be commonplace for MLS tutor positions, especially in universities in Ireland, if not elsewhere (IMLSN, 2016), has benefits for both tutors and the employer.

- Freedom to choose hours (to some degree).
- Can work around classes if studying in the university.
- No/little commitments for either party.

However, there are also many downsides for both the tutor and the employer. The sourcing and retention of suitable tutors is a major problem for MSCs. Lack of suitable staff can inhibit an MSC's ability to evaluate, review and extend the range of services they provide. The high turnover of staff can also mean the loss of senior tutors and the crucial experience and key skills that they have developed working in an MSC. This can have a negative impact on the quality and consistency of service for students. The tutor problem was recognised in an audit

of MLS provision on the island of Ireland in 2015 (IMLSN, 2016: p.12). One of their recommendations was

“Given the significant reliance on undergraduate and postgraduate students as tutors and the associated transience within MLS, institutions and the IMLSN should promote the role of a MLS tutor and explore the concept of longer-term contracts for tutors to ensure these positions are more secure.”

Maynooth University has been very lucky to have had 3-4 tutors (including the first author until his appointment as MSC University Tutor) who have worked on an ongoing basis in the MSC. However, without a proper contract, it is expected that such tutors will not stay working long term for the MSC. These tutors have no guaranteed or consistent income, no permanency/tenure (even though they may be working “full-time” hours indefinitely, no pay scale, sick pay or pension entitlements. Furthermore, these tutors can be on a low hourly rate of pay (compared to the hourly rate for a second level teacher) and often work very long hours to compensate for periods when there is no work available (holiday periods).

3. The MSC University Tutor

We will now provide some details of the MSC University Tutor role. We also briefly describe the (first author’s) experiences of working in this position for the first year of the contract.

3.1 The Role.

The three-year contract contained a variety of duties to be completed during an academic year, primarily:

- Tutor 20 hours per week in the MSC.
- Lecture the preparatory week of mathematics at the start of the Certificate in Science programme.
- Lecture the Summer Mathematics Course for mature students.
- Various administration tasks as assigned by the MSC Director.

The first author successfully applied for this position through a competitive public process in the summer of 2016 and commenced work in September 2016.

3.2 The First Year

Even though the first author had been tutoring in the MSC for many years, he was unaware of the extensive work required to prepare the MSC for each new academic year. Prior to his appointment, these responsibilities fell largely to the MSC Director (the second author). The main item to attend to, at the beginning, was assisting the MSC Director in drafting the MSC tutor timetable. With approximately 120 tutor hours per week to fill, this is not a straightforward task. While the MSC does have a dedicated space, which allows some degree of flexibility, the MSC timetable is heavily reliant on the university academic timetable to determine the best slots for the drop-in service. Also many of the tutors need the academic timetable to determine when their classes are. Furthermore, there is considerable negotiation with academic departments over the availability of some of the more experienced tutors. The countless e-mails and phone calls to source tutors, fill every slot on the MSC timetable, and accommodate subsequent changes, took three weeks from the first to the final draft. During this period there were, of course, more routine but important jobs, such as replenishing handouts and various forms in the MSC, putting up posters, organising MSC lecture announcements, payroll for the

tutors, updating the various MSC website pages and, where appropriate, signing up tutors to Moodle, the University's Virtual Learning Environment (VLE).

At the start of the second week, the focus quickly turned to teaching the preparatory week of mathematics for the Certificate in Science students. This Certificate in Science programme is aimed at mature students wishing to return to education. This course starts a week earlier than the standard university lectures in order to give the students a head start. Before securing the MSC University Tutor position, the first author had lectured the full mathematics component of this course, and therefore was familiar with its content.

Preliminary discussions with the MSC Director, prior to the opening of the MSC, highlighted that he was not content with the existing level of tutor training. It was decided to review the extensive tutoring training resources already available in both the UK (Croft and Grove, 2011, 2016) and Ireland (Fitzmaurice et al., 2016) and tailor these resources to meet the needs of the MSC in Maynooth University. A half day training session was held in late September and a follow up session was held later in the first semester. One of the main outcomes of these sessions was that tutors wanted to know about all feedback received from the students which mentioned them by name. As a result, on a weekly basis throughout the academic year, student comments were responded to by the first author and comments which mentioned specific tutors were relayed (anonymously) to tutors by the MSC Director. In previous years, due to time constraints, feedback was communicated in a general sense to the entire tutor team and the MSC Director only dealt with individual tutors on the rare occasion that there were negative comments.

By early October, the semester was well under way, the MSC was fully operational and weekly tasks were reasonably similar. While most of the time was taken up with teaching in the MSC, there were many other duties such as organising workshops (the MSC runs four different types of workshop per week), updating the MSC Facebook and Twitter accounts (social media is used to help publicise workshops and other MSC events), keeping track of tutor hours for payroll (monthly payment documents for each tutor), monitoring handout levels (the MSC have almost 100 handouts, some developed locally, most of which are available on the MSC website), as well as any other ad hoc tasks that occurred.

The rest of the academic year was reasonably routine, with the exception of organising drop-in sessions for midterm and exam study weeks. Towards the end of the academic year in May, the MSC launched a large paper based student survey of MSC services. The MSC issues a similar survey every year. During the month of June, this data was collated, coded and analysed using SPSS. This valuable information is used to review and evaluate the services that the MSC provides. This data was also used to assist in the writing of an annual report, which is circulated internally in Maynooth University to the relevant offices, departments and senior management.

Every year, during the last three weeks of July, Maynooth University Access Office provides a refresher course in mathematics for mature students that wish to study in Maynooth University. These students would typically have studied mathematics to the end of secondary school in Ireland (there are exceptions) but it may have been quite some time since they have studied any mathematics. While most of these students have ambitions to study a science based degree, many would also apply for courses such as business or accountancy. For the

past 6 years the first author has taught this course and from 2016-17 it is part of the duties of the MSC University Tutor. As this is a refresher course, the pace is quite fast and intensive. To give the students a break, tours of the National Science Museum and the University's Russell Library (where some beautiful old mathematics and science books are housed) were arranged. Guest speakers lectured on topics such as astrophysics and the history of mathematics.

MLS provision is guided in Maynooth University, and elsewhere, by evidence based research. It is essential that we constantly review, and update our approaches, techniques and resources to maintain best practice in meeting the diverse and ever-changing needs of our students. During the year, the MSC University tutor, with the assistance of the second author, completed a paper (Mulligan and Mac an Bhaird, 2017) on the first author's experiences of motivating mature students on the Certificate in Science programme. Further research is under way investigating the influence of the MSC on student attitudes towards mathematics, and the impact of the second level drop-in services. In January 2017, the first author was elected as the "Tutor Representative" on the committee of the IMLSN. Getting involved with this committee provides a platform to make contributions to MLS nationally and internationally. It also facilitates the networking of MLS practitioners and researchers throughout the country.

4. Conclusion

The appointment of a full-time MSC tutor has been an undoubted success at Maynooth University, and this is especially evident as preparations are underway (September 2017) for the next academic year. In previous years, the MSC Director would have organised and carried out most of the tasks himself and trained a new MSC tutor to take over some MSC set-up activities. Now, for the first time, no such duties need to be assigned and the MSC Director and MSC University Tutor can spend their time more efficiently by reviewing and updating existing practices. Furthermore, the MSC University Tutor can use his experience to offer insights to the Director on the day-to-day running and the strategic direction of the MSC.

Having a full-time MLS tutor, who is a familiar face in the MSC, can also offer considerable benefit for students. For most tutors, the most enjoyable part of their role is the time spent assisting and interacting with students in the MSC. It may appear, to those not involved in MLS, that tutors simply help students when they get stuck. However, the role of MSC tutor is much more besides, and just because someone is good at mathematics or statistics, does not mean they will be a good MSC tutor. In addition to having the mathematical and statistical content knowledge, MSC tutors need the people skills required to engage and interact with a diverse group of students with a wide range of needs. Full-time MLS tutors will have a clear advantage over other MLS tutors in such situations, with the added benefit of having an opportunity to develop good working relationships with students. It is well documented that students often have a fear of mathematics, or are afraid to ask for help (Grehan et al., 2016). In the MSC, students often need a tutor who has both a sympathetic ear and the skills to help them cope with their mathematical difficulties. Student evaluations of MLS frequently highlight the relaxed and friendly atmosphere of the MSC, where students feel that they can ask any question, and experienced MSC tutors are key to facilitating this social environment (Waldock et al., 2016). Without doubt, effective tutoring in a MLS environment requires a unique set of skills and tutors with such skills, are an invaluable asset to any MSC.

The advantages to the MSC, the MSC student and the MSC tutor, of having a full-time contract for an MSC tutor, have already been discussed in this paper. While it may appear on the surface that MLS provision costs an institution money through salary, equipment etc., MLS, if properly supported, can have a clear financial benefit to the institution. There is evidence, in Maynooth University (Mac an Bhaird et al., 2009; Berry et al., 2015) and elsewhere (Symonds et al., 2007), that strongly suggests that MLS positively impacts on student retention and progression. For example, in student surveys conducted at the end of 2016-17, 26 Maynooth University students said that they had considered dropping out of university due to mathematical difficulties but cited the MSC as influencing their decision to remain. Eleven second level students stated that they intended to study at Maynooth University based on their experiences at the second level drop-in. The financial benefit to Maynooth University of these 37 students exceeds, by far, the financial cost of MLS provision for that academic year.

We argue that having more full-time MSC tutors is one approach for an institution to publicly endorse and promote their dedication to the student learning experience. It would recognise the positive contribution that experienced tutors can have and as outlined in this paper, due to an improved quality of service for students, this could have an added positive impact on student retention and progression.

Over the next two years, in addition to the work outlined in this paper, the MSC University tutor intends to investigate and partake in different forms of continuous professional development. For example, they will sit in on certain modules to extend their mathematical and statistical background. Being a valued member of university staff, with the opportunity to upskill, allows the MSC tutor to take ownership of their work and develop a professional identity. As a result of the success of the appointment of the MSC University Tutor, it is hoped that senior management of Maynooth University will consider appointing further full-time MSC tutors and that other institutions may follow their lead.

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