**Training Mathematics Together**

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**Abstract**

This paper is a commentary of the development and delivery of the BSc (Hons) Mathematics with Secondary Education (QTS) course at the University of Wolverhampton. It will set out the background to the existence of this route into Initial Teacher Training and will explore a number of the factors in developing a course across two Faculties, with an assortment of Professional Bodies. In addition it will also look at the issues of supporting students who are engaging with modules based in two different areas if study, delivered on different campuses. The role of effective collaboration between mathematics and secondary education will be addressed.

The shortage of qualified specialist mathematics teachers in the secondary education sector in the UK has long been an issue as referred to in the recent report from the House of Commons Education Committee, *Recruitment and Retention of teachers* (2017) The impact of this, on the mathematical education pupils in school receive, has been highlighted on a number of occasions (Smith 2004, Vorderman et al 2011) and there have been links suggested between the quality of this experience, and progression to the study of mathematics beyond GCSE, and especially beyond A level. The recruitment of teachers to the expanding variety of training routes is one area which has been targeted by government initiatives for a number of years, particularly following the publication of the White Paper, *The importance of teaching* (HM Government 2010). This has included high profile marketing and rising bursaries, alongside regular intervention and changes in the allocation of training places across Initial Teacher Training (ITT) providers, linked to the ideas developed in the publication *Training our next generation of outstanding teachers* (DfE,2011)

There are a number of routes available to train as a teacher in the secondary sector in the UK. The majority are based on a traditional path through the education system, including A levels or equivalent, followed by progression through higher education to achieve a minimum of an Honours Degree. The traditional routes for secondary school mathematics teachers separate the subject specific input from the ITT components. Students may study for both qualifications within the same University, but without any link between the two departments, apart from a recruitment event during the final year of the degree course. This has been the case at the University of Wolverhampton, where students complete a BSc in Mathematics or similar and are then interviewed alongside external applicants for entry to the Post Graduate Certificate in Education (PGCE) or School Direct (SD) routes. There has been no active overlap between the School of Mathematics and the Institute of Education.

The subject of the degree has until recent years been an important decision in accepting students onto the PGCE and SD routes which include the recommendation for Qualified Teacher Status (QTS). This has now changed, with the expansion of Subject Knowledge Enhancement (SKE) courses providing a way of developing subject specific knowledge of an appropriate level, prior to engaging with ITT. On this basis it is feasible that a secondary teacher of mathematics may not have studied the subject beyond A level.

The University of Wolverhampton is developing an intergrated approach to the training of secondary mathematics teachers. This route links together the subject specific and pedagogic acquisition of learning. The recommendation of Qualified Teacher Status at the end of the course, alongside a BSc in Mathematics, places subject specialist mathematics teachers in the secondary classroom in three years. These courses have been carefully designed by subject specialists in the School of Mathematics and the Institute of Education. These are located within different faculties within the University and are also situated on separate campuses. The design of the course emphasises the need for both the subject specific and pedagogic course components to be delivered by specialists within the respective disciplines, whilst maintaining a collaborative overview, especially with regards to student recruitment, pastoral support, retention and progression.

As with all qualifications in Higher Education, the process of developing this route has required slow and careful development, working within specified University guidelines. At times the progression of the developments has been slower than anticipated. It has been interesting to recognise that whilst the academic year identified within the School of Education is linked to the way in which the professional bodies such as OfSTED and the NCTL involved work, this does not always integrate with the Semester arrangements observed by the School of Mathematics. In essence teacher training timetables must reflect the timetables set by placement settings (the secondary schools). This means that students are expected to begin their studies on Education modules before the traditional start of Semester 1 and these will continue beyond the end of Semester 2. In designing the schedule for the courses it has been possible to ensure that this only occurs in Year 2 and 3, allowing for some initially settling in to the university environment in Year 1, but even so, this has proved to be an additional challenge for some students both in terms of their experiences of time management, and also from a financial perspective. As the course has been developing, a bursary of £9000, available in Year 3, has been introduced as an initiative. This was not available for the first cohort, and all of these students transferred to the traditional route by Semester 2 of Year 2, recognising the additional costs and time commitments the new route required. They were also aware of the provision of a much larger bursary for the PGCE route and, having gained more confidence in their mathematical knowledge, understandably chose to reassess their original choice.

Care has been taken during the selection and interview process for students enrolling on the course to ensure that they are fully aware of the possible routes into teaching, including recognition of the financial and time commitments required for this ’faster’ route into teaching. As a result 80% of the second cohort has progressed successfully to the end of Year 2, having studied all of the required mathematical content at Level 4 and 5, and engaged with the education modules including the first placement in school. The reports from school placements have been particularly pleasing as it is clear that the extended period of pedagogical exploration has provided students with time to reflect, both on their own educational experiences and their vision of themselves as practitioners.

The professional requirements of ITT, including the need for DBS clearance, were not a factor that colleagues in the School of Mathematics needed to consider for students embarking on a traditional degree route. As the course is owned internally by the Faculty of Science and Engineering, it has been important to emphasise these professional requirements and for those involved to carefully monitor the compliance with the regulations.

The study of the mathematical modules, leading to the award of BSc in Mathematics, has been carefully spread across the three years of the course. It is intended that all subject specific modules will have been completed by the beginning of Semester 2 in Year 3, allowing for the students to assume the role of ‘trainee teacher’ in their final, longer placement. This has proved to be a challenge in terms of accreditation from the IMA, as although the three year course is two thirds subject based and one third education modules, this is not the case in the final year. Based on the alternative, of mathematics teachers with a non-subject specific degree and an SKE, it is our belief that the teachers trained via this route will have secure, recent knowledge of mathematics at a level beyond the pupils they are likely to teach in and 11-18 environment.

It has been essential for the two faculties involved to liaise on a regular basis, particularly in terms of the timetables for students and the positioning of modules at particular times in the week/year. As a University which is spread over a number of different campuses, recognition that travelling from one site to the other has been an important factor in scheduling. Where possible students remain on one site for studies on one day and if necessary staff will travel to engage with them. The integration of the Tutor role has also linked into this arrangement. University systems are designed to ensure that each student has an identified tutor for their course and we have ensured that although only one name can be recorded on the system, each student has both a subject specific tutor, and a tutor specific to the education modules. During the early development of the course it became clear that that regular communication between the two tutors is essential. This provides both faculties with an overview of the progression of students, and ensures that consistent messages regarding expectations are provided to the students.

The collaboration of two Faculties to develop this qualification is not unique within the University, but the work involved has highlighted the different requirements of ITT routes to those leading to degrees not including QTS. The challenges of designing a course have provided opportunities for the two Schools to develop a working partnership which can be used to further enhance the experiences of students. The two separate disciplines have worked together to develop and deliver a high-quality and rigorous programme where students are fully supported. The University now offers a suite of courses,that does not compromise on either the level of mathematics, nor the pedagogic exploration involved in training as a teacher. These courses are not merely an extension of SKE courses aligned to PGCE; the graduates are ‘proper’ mathematicians and will have Qualified Teacher status.

**References**

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