
The More Maths Grads HE Curriculum Team – Neil Challis, Mike Robinson and Mike Thomlinson

Student experiences of the transition to university

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Introduction

University is the best time in your life, time to spread your wings and find your true potential. Friends you meet at university will last a lifetime. Is this the reality of university life for some or all of our students? How do students settle in to university life, adjust to the unfamiliar and learn to cope with the range, pace and style of university mathematics?

We look here at student views of their experience of starting university in our partner institutions in the More Maths Grads project and in our own institution. We also report some views expressed by colleagues about how students cope during their first year. All the quotes are from interviews conducted at our own and partner institutions. It is worth remembering that mathematics students have the same general experiences on moving to university as all other students, and it is in this context that they are initially coping with university mathematics. The first section looks at this settling in process as experienced by mathematics students.

Settling in

In the sample of students from partner institutions who responded to our questionnaire, over 30% rated as important that they lived close enough to home to visit at weekends. For these students, homesickness may not be too much of an issue. For those from further afield, it can be different:

"I found that I'm really close to my mum, so I did miss her loads right at the beginning."

"it was hard as well to like... you were just moving to somewhere new as well and you had to do your work as well... I can't cook... I didn't know how to wash my clothes... I had to learn..."

"Well the first weeks I moved in... I'm from seventy miles south of here, so was moving in on my own. At first it's quite scary, 'cos new area, new people, new lifestyle, it's quite a change";

and even more so for international students:

"To get in and adapt in and doing things it is totally different you know."

Even after initially settling in homesickness can strike again unexpectedly:

"And then I was really fine and then like about, well can say, about three weeks ago was just like 'I want to go home. I don't want to be at university'."

Usually though students get through this, make friends and start to enjoy life.

"Then after you get settled in, you meet up with new people, it's good."

"It's great. I love it."

"social side... brilliant"

This process can be helped by what happens in the first weeks of the course:

"On the first week, we were put into our tutor groups and we did things together in our tutor groups. And that is how I met most of my friends."

Among the tribulations of moving away from home is managing money for the first time. Some learn by experience:

"Spent far too much money in the first four weeks, then you have to live on rice for the next..."

Others seem more careful from the start and temper their desire to have a good social life with prudence:

"I mean I've not been one to go out and get drunk every night for weeks on end, because I'm quite, I try to be quite good with my money. But we've had house parties and stuff like that. So we've still had the opportunity to do stuff."

As the quotes included here testify, the start of university life can often be an exciting and enjoyable time. It may be though that the students who participated in the interviews were not completely typical. One group described themselves as *"the loud ones that get told off"*. In the personal experience of most colleagues will also be examples of students whose pervading sense of loss of the familiar on leaving home has strengthened rather than decayed over time.

Expectations and reality

Open days, prospectuses, teachers, friends, family and the media have all helped form a picture of what to expect walking into the campus for the first time. It is difficult to go back into our own shoes at a time when university life and the contents of a university course were the cause of both apprehension and misapprehension. What range of experiences and mathematical content do our students expect, and how accurate is this expectation?

Whatever their previous experience, all students face new mathematical techniques, and also mathematics of an unfamiliar type. It comes as a surprise that mathematics is so diverse - and divided up into so many separate parts. Students are used to the A-level divisions of pure and applied. Arriving at university pure is something completely new, what was previously referred to as pure has become methods, and applications are far wider and may not include mechanics:

"the reality of what maths is like post A-level is a bit of a surprise";

"there is much more to it, and it is better than A-level";

"...the course is really different; there was a lot of application. I was just expecting it to be just general maths to begin with, and then go on to application. I think it's good, but I think it's quite a big jump. And I think, I don't know about everyone else, but I certainly wasn't expecting it. And I found it bizarre";

"I think application's quite a bit more different than just maths itself; maths itself is fine";

"I didn't expect maths to be as wide as it is... I thought it was all centred around the mathematical methods type stuff, but the, the problem solving, I really like problem solving, that's probably my favourite one";

"I didn't do further maths so like complex numbers, that's all new. At first I did find it a bit hard";

"...it was really different... more computers than I was expecting. I expected it to be a bit more like pure maths".

The majority of students we talked to did find university maths very different, as exemplified above. Opinions differ about which are the good bits and which cause more problems. Some had found a big change in level and had been surprised by the amount of computing and application. Others had clearly welcomed the challenge of new areas such as "problem solving". Students were not completely unanimous, however, in how new they found things:

"I did further maths A-level so a lot of work for me has just been going over that maybe in a bit more depth,... I know it's to get everyone to the same level then."

This last quote might say something about the level of prior knowledge that this course expects - namely that there is no expectation that students will have taken further maths. It might also say something about the stage of the course (end of the first term) or the student, or some combination of these.

It is interesting to see evidence of student's preconceptions coming out in some of their general responses about expectations at university. Clearly some hadn't thought that mathematicians could be much more extrovert than, as the old joke has it, "looking at the other person's shoes" when talking to them.

"The social side of maths really isn't like you'd expect."

"I didn't expect to meet so many lively people on a mathematics [course]."

"Went out with the lecturers and you expect to kind of like meet, I didn't expect I'd meet anyone who's quite as lively as I was."

Perhaps in hindsight the interview should have pursued further exactly what sort of person the last student did expect to meet! Thinking more generally about expectations of university life, there was a variety of opinion about how much university accorded with expectations from the positive:

"School was easier... but this is more interesting and better because it forces you to teach yourself";

"It's fairly what I expected. Enjoying it though...";

"Its pretty much fulfilled my expectations with the exception..... I would have chosen one different module";

through the practical:

"I like having Tuesday afternoons off";

to the neutral:

"...different in lots of ways, it's hard to try and remember what I was expecting it to be like";

"Been about what I expected I think. But I did the foundation year so... I had a different point of view I think";

and the negative:

"It's been a bit of a roller coaster";

"I think [it would have been] more enjoyable if it had been more what I was expecting. I think I was a bit shocked by the difference";

"I think I was somehow expecting it to turn out the way I was expecting, and it didn't. And I found it a bit difficult to adjust to."

The reactions to starting university highlight the non-uniformity of the student group and the variety of perceptions about the mathematics they encounter and the more general process of adjustment to university life. It is also evident that in general on arrival they have a very hazy picture of what university maths might be like. This shows up the need for the outreach work that is currently in progress by both the More Maths Grads project and other groups. It also possibly illustrates a need for a better explanation of university mathematics in layman's terms for those considering embarking on it.

Coping with university mathematics

The journey through the first year of university mathematics is, like a game of snakes and ladders, beset with pitfalls and moments of triumph. There is a wide range of students, from the able and confident:

"...there are some parts which I find it very easy and .. I can pick up the concepts very quickly And then other things which I find hard and challenging, I enjoy both aspects of that equally";

to the opposite end of the spectrum:

"I came in with nothing really. I failed my exams at A-level, everything. Came in just on the off chance I might actually get somewhere."

This means that the journey is perceived in many different ways. How it is perceived may not depend on the absolute ability of a student, but their ability relative to their peers. Someone with an A in mathematics at an institution where

the expectation is that students will have taken further mathematics may feel less confident than someone with a B in mathematics at an institution where many students have come with a C:

"I've not done Further MathsI was like what's that and they said 'oh didn't you do that in Further Maths?'"

While most students do eventually find their way through the first year with varying degrees of success, some have genuinely made the wrong choice or perhaps the right choice at the wrong time. As colleagues pointed out, it may be better to help them face this in a constructive way at this stage rather than to continually struggle throughout the course.

One difficulty to be overcome, a major one for some students, is the change in teaching methods and group size.

"I found it you know, strange to be in such big classes of people, because you know, last year I was in a Further Maths class of me and another girl."

"The first term it was weird not having the teacher's personal attention... being lectured to without having to do the work in the class."

"I just felt really stupid, asking for help in front of everyone."

"Hour long lectures without being able to test your understanding are difficult - much more down to a student to go and seek help."

"[At] A-level you sort of do get pages and pages of examples."

Students need to acquire a new way of working to cope with a continuous lecture for an hour without a break to try out a technique. The large group size also means that a student is reluctant to ask a question either because they don't want to interrupt the lecturer or because they feel intimidated by the presence of all the other students. The pace of study also presents a problem as the focus moves on to new areas when at school there would have been class time for attempting a large number of repeated examples of a particular technique. A new way of working requires greater self-discipline to keep up to date with the rate at which work accumulates:

"It's really easy to not do stuff, because you haven't aligned yourself. And if you're not the kind of person who's easily motivated, it's really difficult."

"It needs a lot of discipline and it's totally different. Sometimes you feel like when you're taking your notes you know you ask yourself is this for example what I expected and somehow you have to make adjustments within yourself if you realise things are not going your way."

"I feel I've a bit better idea of how to do, how to manage my own time and stuff now. But I think it's just really, really easy to let it slip kind of thing."

"I didn't realise quite how much work you had to do. And to be honest, I was quite lazy first term."

These students have clearly given some thought to their progress and their method of working. At one institution an on-line learning log is used to facilitate reflection, of which a colleague said:

"Reflection is really important because without that they, they're not seeing their advance along the path, all they're seeing is where they are now, and they don't realise that they're actually developing."

Students generally do not bend under the weight of the adjusting to their new situation, but instead are inventive in finding strategies to cope. A variety of snippets of friendly advice for new students emerged from students and colleagues.

- ***"Enjoy it - don't be afraid to be a geek."***
- Be part of a social group:
"there's so many social groups and within every social group there's always someone (who says) 'I'm stuck on a question', someone within my social group will help me." "those who are not part of the right social circle where that reassurance is, are at risk of dropping out."
- Try to keep up:
"At uni no one prompts you to do stuff, you just have to do it, that's the hardest."
- At least try and get to Christmas - as one colleague said:
"If they can survive and get to Christmas in one piece - do all the assignments, even if not particularly well - then most of them will be OK."
- Don't despair if things haven't gone smoothly at first. The student above who was bemoaning their laziness in the first term managed to rectify that later:
"Second term I've had to work a lot harder to practically catch up."
- Be careful to explain what you are doing when writing up your mathematics. As another colleague put it:
"You can always recognise those students who make an effort to explain what they are doing... they'll do well, they always do."
- Don't worry too much if you don't understand everything immediately:
"as long as everybody doesn't understand, that's okay and we'd speak to people in the years above and they'd be like, 'Oh it's okay, it all comes together in third term.'"

This raises the question as to how such advice could best be distilled and effectively passed on new students.

Among the many encouraging things we heard about students' progress was the simple statement from a colleague ***"they certainly get better at it"*** and the experience reported to us by another colleague of a student who was pleasantly surprised to discover that they actually quite liked mathematics, because they'd only done it at university as the ***"least bad of all the options"***.

Ideas

Generally, students are surprised by both the teaching method at university and the nature of university mathematics. They gain confidence as they learn more about the range of things that they are studying and find a successful method of working. They gain support from forming social groups and from hearing the experiences of later years of their course. Things which can be put in place to help these processes along can help students to settle in more quickly and generally have a better experience and these include:

- a guide available to A-level students and other prospective students about the diverse and applicable nature of university mathematics in "plain English";
- opportunities for students to hear about typical first year experiences and how difficulties have been overcome. This may be through a booklet and/or through organised contact with students in later years of their course. While it is probably useful to have something on this in induction week, it's inclusion could also be valuable as they proceed a little further into their course, perhaps in study skills sessions;
- support for forming social groups - as noted in our article on student support in a recent issue of *MSOR Connections* [1];
- a mechanism for students to reflect on how things are going through a paper or on-line learning log. (see further discussion from McAlinden and Waldock as featured in [2]).

Future work

In a forthcoming article, we will look more closely at staff opinions of the transition from school to university, and we would therefore particularly welcome any comments you may like to make about your experiences at your own institution.

References

1. Challis, N., Robinson, M. and Thomlinson, M. (2009) Student Support. *MSOR Connections* Feb 2009, Vol. 9 (No. 1):36-38. Available via: http://mathstore.ac.uk/headocs/9134_challis_n_et_al_mmg.pdf [Accessed 11 March 2009].
2. Hibberd, S. and Grove, M. (featuring contribution from: McAlinden, M. and Waldock, J. (2009) Personal Development Planning) Developing graduate and employability skills within a mathematical sciences programme. *MSOR Connections* May 2009, Vol. 9 (No. 2): 33-39