

University of Glasgow School of Mathematics and Statistics shares its award-winning approach to feedback

Moderator	Welcome to the Jisc podcast. Earlier this year the University of Glasgow School of Mathematics and Statistics won the Herald higher education award. These awards celebrate the best and brightest in higher education in Scotland with the school commended for its approach to continuous feedback to support students. We speak to some of the team behind the project.
Tara Brendle	Hi, I'm Tara Brendle. I'm a professor of mathematics here in the school of mathematics and statistics at the University of Glasgow where I serve as the deputy head of mathematics.
Ian Strachan	Hello I'm Professor Ian Strachan. I'm head of mathematics.
Andrew Wilson	Hi I'm Doctor Andrew Wilson, head of level one and a university teacher here at maths and stats.
Gemma Ellis	Can you please tell me about your user technology in the school and specifically the project that you won the Herald higher education award for?
Ian Strachan	Well perhaps I can start because the history goes back five years. Five years ago I was looking for ways to increase the amount of feedback we could give to our second year mathematics students and about that time I read a report from the American Mathematical Society on the use of software packages for assessment and about the same time a publisher approached

one of the lecturers for one of the second year courses with an offer of a free trial and we took the opportunity then to look at how we could introduce such software into our systems.

Tara Brendle So, at the same time I was serving as head of level two mathematics which is where we first introduced our new feedback and assessment procedures and we formed a working group to look into this at Ian's request and we looked at a number of different options and found a web assessment system that was the best fit for our purposes. And as we went into the trial phase of that we also realised that we could use some new scanning software technology that had been developed by the school of physics and astronomy and we incorporated that into our feedback and assessment procedures as well [inaudible 0:02:18.3] with the online assessment package that we were receiving from this publisher.

Ian Strachan To give some idea of the scale, we were looking at mechanisms across – well – the first and second year where we could process over a thousand pieces of work a week.

Andrew Wilson Yeah I suppose really the key piece of technology that glues together all the different approaches we've taken is a database that holds all our results and that really ties everything together and gives a base to innovate on.

Tara Brendle It also allows us to do things like just in time teaching which is something that Andrew has really pioneered and he can say a little bit more about that.

Andrew Wilson In the first year courses we give the students a quiz on ... which is due on Mondays. On Tuesday both tutors and the students themselves get some feedback on the progress on individual questions and the questions are designed for several different reasons – some to get students to think like mathematicians, some to probe their knowledge – their theoretical knowledge – and as a whole this allows us to refine our model of the knowledge that's in the students heads at any given time. So this is fed back to the tutors and the tutors and lecturers can use this to shape the student experience in tutorials and really just to maximise the contact time they have with the students.

Gemma Ellis So the approach that you took, was it very much based on the scale of large numbers of students that you were dealing with or were you trying to turn the feedback on its head?

Tara Brendle Well, as Ian was saying, we started out with a basic problem in level two mathematics. We have over 400 students taking various combinations of eight different modules and five years ago the only feedback we were able to give them before a degree exam was one class test which we had data that showed it really wasn't serving its intended purpose as giving students feedback on their strengths and weaknesses so that they could brush up on various skills going into the degree exam. So we wanted to do some truly continuous, continuous assessments. The new technology that we brought in enables us to do that. So our students turn in some assignments usually every week or every fortnight and they get it back within ... either immediately or within two or three days and this really enables us to use continuous assessment for its intended purpose while making it logistically feasible, on our end, to process these sheer numbers that Ian was talking about before.

- Andrew Wilson Perhaps I can explain how the scanning works. Some assessment is done online but other parts of the assessment ... the students write their mathematics on pieces of paper but there's a cover sheet which they put their names on so when these are marked by tutors the scanning technology scans the name, scans the student number, scans the mark and automatically records all that information and sends a PDF of their marked work back to the students. Early on we had a problem: how do you physically give a thousand pieces of work back to students? And with the scanning technology we've solved that problem. They get a PDF of their marked work.
- Gemma Ellis That immediate feedback, I can see how that would be incredibly helpful to students. What's the feedback been in implementing this sort of approach? And the feedback from staff to how have they found using it?
- Andrew Wilson The feedback has been mixed as you might imagine but on the whole very positive. Maybe I'll read you out some of the quotes that I've got in front of me: "It makes me go through the notes"; "It consolidated my learning"; "It was brilliant"; "It made me work and look into things more"; "Makes me sit there and ensure I understand the week's work". And one that I don't have written down but I'll give you the gist of it. One student wrote in course feedback: 'I'm sure I speak for everyone when I say we all have a love-hate relationship with the assessment platform'!
- Ian Strachan And we've analysed our exam marks from before and after introducing the system and it's ... what's most noticeable is the people who are failing the course but those numbers have gone down dramatically now so the students are engaging with the course a lot more than they did prior to the introduction of these systems.
- Andrew Wilson And this is something that's been stable since we introduced it over the last four years
[inaudible 0:07:17.6]
- Gemma Ellis So I understand, as you said, that this was a second year problem initially. Have you rolled it out elsewhere in the school?
- Andrew Wilson Yeah, we have rolled it out across level one I think – maybe Ian will say something about this but I think that was the plan right from the very beginning was always to continue to find a successful solution for level two and then to continue to roll it out across the school really. So we've been very successful in level one with the same approach. I think there's a lot of other places where we could maybe find solutions to introducing more continuous assessment because I think this is ... this is the real key thing, the technology is just facilitating what we've always wanted to do in school which is give our students lots of feedback, give them a really positive experience.
- Tara Brendle One thing to mention there is that, at student request, we have now introduced continuous assessment in our level three honours courses because they, apparently, were having a good experience with this and felt it was valuable in their non-honours course work and they asked

could they please have some continuous assessment in level threes so this is the first year that we've introduced that. Now when we get to honours we don't have quite the [multidisciplinary 0:08:35.2] problems or skills so we're not dependent on the technology in that case. The technology really comes into play when we're dealing with the 700-plus students we have at level one and the 400-plus students we have in level two but the practice of giving this continuous assessment in a truly continuous way I think made both staff and students able to envision how this might work in our honours coursework as well.

Gemma Ellis And I suppose at that stage that it's a system that they are fairly familiar with. Praise indeed that they've requested to repeat that in the honours work. I was just going to say if there's anything else that you particularly wanted to add about the work that you've done or how it's helping students?

Tara Brendle So I think one thing to emphasise is the database that we use which Andrew mentioned earlier. So when we're using the scanning software and the assessment package for the continuous assessment it automatically goes into a spreadsheet which is accessible to staff and we use this at all our examiners' meetings and it's really transformed the way we run examiners' meetings and it's won us praise from our external examiners for how we do that now. And we've rolled that out across the school. So even courses that aren't using this particular form of assessment are still using this spreadsheet and this system for running examiners' meetings, using this database and that's something I think that certainly could be used in just about any course you're running anywhere. It's certainly transformed our school practices.

Andrew Wilson And I think the other really nice thing about that database is that once you've got the marks of your course in front of you and you're scrolling through them you make interventions. You can realise that certain students haven't completed assessments for the last three weeks so you can intervene and you can try and reach out and try and re-engage them with the course. I think this is really powerful and I might add that everyone in our school – the academic staff – have access to these marks so they can look for their advisees and again try and make interventions. They can see how they're doing and this is really valuable and something we're looking to potentially automate, part of this system, so that we can send out alerts to students and to advisers.

Gemma Ellis That's really interesting so those potential automated alerts, is that the next step for you? Have you got any other plans?

Andrew Wilson We do have future plans. We have lot of future plans but I think it's important to point out this is really part of our daily lives in the school, thinking how we can best improve the student experience, how we can change our pedagogies, how we can change our provision. So I think looking forward we're very keen to keep developing and making sure that we get the best response.

- Gemma Ellis My final question was just about the Herald award itself. Obviously it wasn't just a technology win but the institution award that the University of Glasgow won. What does it mean to you to win these awards?
- Ian Strachan Perhaps I can just say something about the award. It is very much a team award. A huge number of people within the school have been involved with it. It's not just the academics, it's our IT staff who's developed the software, it's our receptionist, our teaching administrators in the teaching office. Everybody's worked together extremely well just to automate the system and get things running. So people are throwing in ideas from all over the place. So it's very much a team award.
- Tara Brendle You know we're well used to working closely with our IT staff and our administrative staff but I think we've never attempted quite something on this scale together before and it was wonderful how it all just came together and we were able to coordinate the contributions of so many people and we really have had to choreograph things very finely to accomplish all of this so that everybody knows exactly what they're doing and when. When the students are in their cycle of handing in homework and it's getting scanned and then getting marked and all this, we've developed a system where all of these many people who are involved know exactly what their role is and we can easily cover for somebody who's not in that day for whatever reason and that I think has evolved nicely over the last few years that we've done this.
- Ian Strachan And is now very much embedded into how the school works.
- Andrew Wilson To answer your question, I think we're all very humbled here by the recognition given to us by not only this award but by the university and our college university teaching excellence awards. But I think the real prize is the success that we've fought for and won for our students. They have an improved learning experience, their results are improved and they're going to leave with a degree that holds more meaning for them. They hold more knowledge and power going forward.
- Ian Strachan When we set it up it was of course a bit of an experiment – we didn't know how it was going to work and it was wonderful when we just put the data together for the first time, just to see how much better the students were engaging in the course after we'd introduced these new methods. When we analysed the thousands of bits of data we got and produced these graphs to show the number of students failing the course had gone down, numbers getting As and Bs had gone up. That was a wonderful moment. Perhaps I should end by saying thank you for sponsoring the award. The award is on display in the foyer.
- Gemma Ellis Oh fantastic!