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The Learning and Teaching Centre

The Open University

SST Enhancement Digest

Welcome to the second issue of the SST Enhancement Digest.

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The theme for this issue is 'meaningful dialogue and purposeful conversations'. That includes dialogue between students, between students and staff, and between staff working across organisational boundaries.

Many of the articles focus on how emails, forums and personal conversations are being used to benefit students' study as well as how they are being analysed to identify what works well. The more we can collect, mine and share the knowledge we are gaining from our work the better evidence base we can build up for our future practice.

When supporting students, there is always a dichotomy between our aim of encouraging independent learners and the danger of creating dependent learners through our desire to offer personal support and use personalised interventions. This is one of the important areas that we have to consider when we are shaping our students' learning and our student support services. Are we taking steps to build the necessary skills and a level of resilience that will see our students through their studies?

As ever, we would be pleased to hear your views and your ideas and articles for future issues of the Digest.

John Woodthorpe

Improving Student Attainment and Completion through Mid-Module Tutor Conversations

Many of the Faculty Leads for the Student Support Teams (SST) have multiple roles within the University. In my case I'm also the chair of a module (TU100 – My Digital Life) and an AL (also on TU100) as well the Faculty Lead for the Computing & IT SST. This range of roles gives me a broader perspective and more opportunities to try out ideas, which is something I value considerably. One of those ideas was proposed by two members of the TU100 module team, and one of the tutor moderators – Frances Chetwynd, Chris Dobbyn and Helen Jefferis – who had been working on several aspects of the assessment of this large, 60 credits, level one module.

Their idea was to use neural networks to identify students capable of passing the End of Module Assignment (the examinable component), but at risk of failing it, and then to do something to try to help them pass. A proposal was submitted to The OU centre for STEM pedagogy (eSTEeM) at the end of 2013, accepted, and work started shortly afterwards. The project title is 'An investigation into the use of Artificial Neural Networks to predict student failure, and the efficacy of sustainable additional support for those students and is exploring:

- The main factors that distinguish an 'at risk' student;
- Whether an Artificial Neural Network (ANN) can be trained to categorise 'at risk' students;
- What impact the associate lecturer can have on moving such a student from the 'at risk' category to the pass category.

An 'at risk' TU100 student is one for whom early warning signs indicate they are likely to score between 30% and 50% in the EMA (the pass mark being 40%).

Neural network modelling

The first step was to train the neural network on data from previous presentations. This made use of the ability of such networks to identify patterns connecting input data (TU100 student performance and demographics in this case) with the overall result (pass/fail) of those students. Two crucial steps in this are the selection and pre-processing of the student data, as different parts of the University hold different data in different formats which is calculated based on different criteria. Once the data has been obtained and fed into the neural network, the model is refined to determine which of the criteria chosen are most important. This iterative process of training and testing continues until the predictions and observed results from a previous known presentation match each other. The model can then be used as a predictive tool on a current presentation of the module.

Training and testing on data from the 12J presentation of TU100 showed that the most important criteria were:

- Demographic data – e.g. age, student sponsored or not; self-declared motivation for study;
- Assignment scores – scores in TMAs and iCMAs;
- Assignment timings – submission by cut off date or otherwise.

Updating this after the 14B presentation refined the criteria further to:

- Demographic data – student sponsored or not; self-declared motivation for study; student new to the OU; gender;
- Scores – TMA mean score; TMA score standard deviation; iCMA mean score; iCMA score standard deviation;
- Assignment timings – submission by cut off date or otherwise.

Using this mix of demographic and behavioural data now seems to give the best prediction of the likelihood of passing the EMA, and can be made after TMA 04 has been submitted just over half way through the module. The output of the model is split into predictions of clear pass (>50% EMA score), clear fail (<30% EMA score), and borderline (>30% and <50% EMA score). It's this last category that is of the most interest, as these students are the ones who can potentially be helped to pass. Those predicted to be in the clear fail category are much harder to save, and indeed many of them are likely to have already failed the continuous assessment criteria for the module.

Acting on the predictions

Right from the start of the project, the intention was always to do something with the results of the model to try to help the 'at risk' students pass in line with Doug Clow's complete learning analytics cycle. The project team was convinced by personal experience and literature searches that the best approach was for those students to have a personal conversation with their tutor. Consequently, two hours of tutor contact time previously allocated to a synchronous online activity were removed and tutors asked to use the time released to have a telephone or OU Live conversation with up to three students identified by the model. This has two aims:

- to motivate the student to continue with TU100 to the end, and
- to help the student to develop a strategy to pass the EMA at the first attempt.

This was run for the first time on the 13J presentation, despite the model not being sufficiently robust to trust the predictions. Instead tutors were asked to contact up to three students who met the following criteria:

- Bare pass scores for TMA 03 and TMA 04;
- Limited or no completion of iCMAs;
- Consistent problems with module assessment deadlines.

Post results analysis revealed:

- Of students who their tutor did manage to speak to, 65% passed (scored 40 or more for their EMA);
- Of students who their tutor did not manage to speak to, but had been selected as being a candidate for a phone call, 35% passed.

Tutors discussed the activity in the online tutor forum. The following quotes illustrate the issues that were raised:

'I'm usually very happy phoning students but the bit I'm not quite sure about is what is the excuse for the phone call. Usually it would be a late TMA or similar …. We can hardly go for the truth 'Hi I'm your tutor and you're one of my weakest students ….. I think I need to be a bit more subtle.'

'For me, the 3 choices are very obvious … For these students, my starting point will be the TMA04 marks, which are all heading downwards, for two of them into the danger zone.'

And after calling:

'Interestingly all three students were happy to talk about what they were going to do next and none of them suggested that they'd had enough of OU study which is what I was expecting from at least two of them. I pointed them to their StudentHome page and told them to contact their SST to discuss future studies.'

'An interesting exercise which wasn't as nerve wracking as I thought it might be.'

The 14B presentation was the first to make use of the predictions of students at risk of failing, and asked tutors to have the same conversation with up to three of their students. Overall, 96 students were predicted to be in the 'at risk' category, although these were not evenly spread across tutor groups. Thus, 84 tutors were provided with a list of two categories of student to contact:

- Primary – students falling in the 'at risk' category where they are predicted to score between 30% and 50% for the EMA;
- Secondary – students falling in the 'fail' category where they are predicted to score less than 30% for the EMA.

Tutors were asked to contact three students, starting with the 'at risk' classification if they had any, and moving on to students in the secondary classification or their own choice of candidate. As with the 13J activity, a number of tutors did not return a spreadsheet to the project team, resulting in reports on 83 out of the 96 at risk candidates.

Post results analysis revealed:

- Of 'at risk' students who their tutor did manage to speak to, 73% passed;
- Of 'at risk' students who their tutor did not manage to speak to, 55% passed.

In checking the predictions with Learner Support, the students don't fit into any of the usual categories regarded as putting them at risk on a module, and so the model is producing something new.

What does it all mean?

I take several lessons from this, and all but the first are immediately relevant to other modules.

Firstly, the neural network predictions work well for TU100 because the model has been trained on the data. Doing the same for other modules should be possible, but would require data on those modules and the time for someone to repeat the work described above. That isn't currently possible within the project team, so please don't ask us to do this for your module!

However, the tutor contact can be triggered by any predictive model, such as those used by OU Analyse, the Information Office, from the Student Support Tool categories, or from a manual selection of criteria applicable to a particular module. So other modules may like to develop that aspect of the project as the remaining points are all potentially relevant extensions to the role of the tutor. As a tutor myself, I'd stress the need for them to be funded in some way, and not merely added to the ever-growing tutor workload. But it does seem that personalised telephone guidance from their tutor improves the chances of 'at risk' students passing their module. So if they can be identified, something can be done to try to help them.

The tutor contact also has the extra benefit of encouraging tutors to do something that uses their knowledge of the module and of their students, and which many of us enjoy – even if we find the prospect nerve-wracking at first! Consequently, there is potential to extend this so that tutors and Learner Support staff work more closely in supporting 'at risk', 'fail' and 'cannot pass' students. We haven't had time to do that so far, but it's something we'd like to implement.

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Jane Jones

Elizabeth Mullett

The impact of tailored TMA interventions on student performance

The Law SST Leads give an insight into their work on TMA non-submission.

One area, of recent interest, to the Law SST, was the TMA submission rates of students on the current LLB which is offered in partnership with the University of Law. The current LLB has four compulsory modules

- W200: Understanding law
- W201: Law, the individual and the state
- W300: Law, agreements, rights and responsibilities
- W301: Law, ownership and trusteeship - rights and responsibilities

all of which contribute to the completion of a Qualifying Law degree.

Analysis of the percentage TMA submission rates for these modules for 13B showed a steady decline as indicated in the table below.

This was of concern as failure to submit TMAs is seen as an indicator of poor performance on the module and a risk factor in terms of retention and completion.

As part of the suite of interventions designed by the Law SST for all its modules and qualifications, the decision was taken to design specific tailored interventions aimed at those students who had not submitted a TMA and who did not have a TMA extension recorded.

Jane Jones and Elizabeth Mullett, SST Leads for Law commented,

> "It was our hypothesis that targeting such students, in 14B, with messages designed to reassure students it wasn't too late to get back on track and to encourage them to make contact if additional support was needed, might improve student engagement".

Tailored messages were designed for students who had submitted TMA 01 but not TMA 02 and for those who had not submitted either TMA 01 or TMA 02 to encourage them to contact their tutor for help, or to contact the SST for advice and guidance.

Following the interventions, the submission rates for 14B were then compared with those of 13B and suggest that the original hypothesis was correct in that the interventions appeared to show a positive impact on student engagement. An example is given in figure 1 and further data is available from the SST.

MODULE	TMA 01	TMA02	TMA03	TMA04	TMA05	TMA06
W200	91	81	79	70	68	64
W201	92	87	83	81	79	78
W300	99	96	91	89	87	86
W301	97	95	93	87	85	N/A

(Data taken from IET module profile 01/09/14)

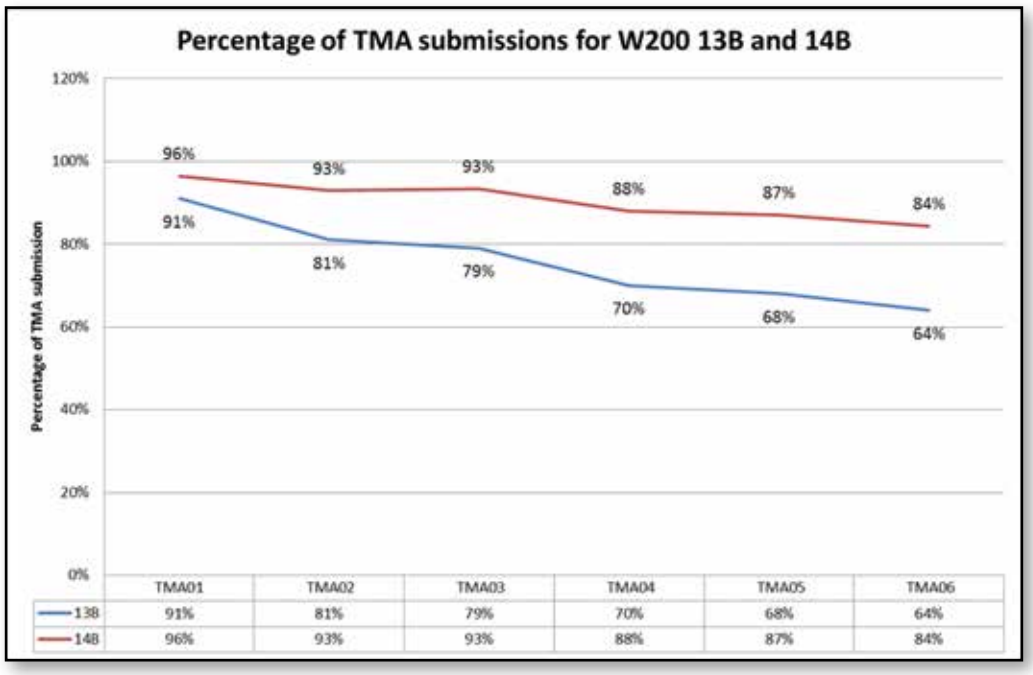

Figure 1: Graphical representation of TMA submission rates for W200 13B and 14B produced by Louise Dawkins, SST Assistant

Jane and Elizabeth are cautiously optimistic about these results.

'Clearly the early indications are positive though we will continue to monitor impact for 14J. We also recognise that more work is needed to support students preparing for the end of module assessments on these modules, and will be working closely with colleagues to identify which types of support might be most useful. In doing so, we will be drawing on learning analytics work as well as student feedback and IET data to inform our next steps.'

Law SST Facts

The Law SST has 21 modules and 6 qualifications

7,929 students are registered on Law qualifications

Around 300 students are awarded a Law degree each year

Further information about the Law programme is available at **http://www.open.ac.uk/law/main/**

Martin Higginson

What difference does a conversation make? (A DD102 case study)

Background

The Social Sciences Student Support Team (SST) based in Bristol, working with the DD102 (Introducing Social Sciences) module team prioritised level one as a key area for proactive work in the first 18 months of the SST.

DD102 was first presented in October 2014. It is the entry point for most students who take a range of Social Science qualifications. As with its predecessor (DD101), the student profile is diverse in terms of a range of socio economic indicators. Predicting success is far from easy and is considerably more complex than Michael Gove's prognosis that 'thick rich kids' do better 'than clever poor kids',[1] something that those working in the field of analytics are grappling with. See Table 1

The Proactive Student Support (PaSS) pre-module phone call

The premise is simple. A phone call before module start will improve completion rates. The reasons for improvement may be several, but include: answering any early concerns; identify readiness to start and make suggestions for action; set expectations of study; help students feel a sense of belonging and being 'cared for'; and clarify next steps. In short, a successful call will make the student both better prepared, more likely to ask and generally to be more resilient.

The PaSS call is not a new idea. A project over four years, between 2002-2005, found retention rates were between 4 and 5 percentage points higher for students who received a pre module phone call compared to a control group.[2]

The difference in the call for DD102 students is it is more bespoke to a curriculum area. The Social Sciences SST has a dedicated level one team comprising: module chair, module team, regional academic staff, AL (Associate Lecturer) input, and LSS (Learner Support Services) staff. The team designed an interview schedule with a semi structured conversation in mind. The partnership of expertise, combining academic input along with the experience and knowledge of front line staff, is the strength of the design and the implementation, a model that the team believes is the essence of how SSTs work best.

The calls were undertaken by LSS staff at different grades and an AL.

	14J% at module start (n=4406)	15B % at module start (n= 2951)
Age <25	26	30
Age >25	74	70
Gender -female	73	74
Gender -male	27	26
Ethnic origin		
White	89	86
Black	3	5
Asian	3	3
Mixed	3	3
Other, unknown	2	2
Disability- yes	20	20
Disability - No	80	80
Previous quals		
Less than 1 A level	42	41
Socio-Economic status - Low	22	21
Non low	78	79

Table 1: Selection of demographics for DD102 (14J and 15B)

Selecting and phoning students

DD102 has around forty percent of students who have low previous qualifications.[3] This presents a particular challenge in terms of retaining students who are less likely to have the academic skills and experience to succeed in a higher education setting.

Education background was chosen as the key indicator for selection for several reasons:

1) In itself, low education background has the attraction of being a knowledge related asset and an indicator of likely success, as shown by previous data on completion rates and other research in higher education.[4]

2) It is a useful proxy for other socio economic indicators, and is often used to operationalise measures such as low income, low IMD (Index of Multiple Deprivation), occupational status, and material wellbeing all of which present associations with higher education attainment.

3) It is an easy indicator to identify and, given education status, is less sensitive than other self-declared statuses (e.g. income, occupation, social class) false answers are less likely to be given.

4) Pragmatically, it is easy to select students as it can be identified within the Student Support Tool.

5) The use of previous education background means that a conversation with a student around 'learning' at higher education level can be framed in a straightforward way. A student is able to understand why they have been contacted and the staff undertaking the call have something meaningful to shape the conversation.

Education is still far from perfect as an indicator though, and some background qualifications may be difficult to compare, for example those attained outside the UK, and it also ignores other important factors relevant to OU study such as how long ago someone studied.

The socio demographic profile of DD102 using low education qualifications led to the target audience being greater than the team could meet, so a decision was made to randomly select students from the target group (although all students received an email with supporting bespoke material designed by the module team).

For both 14J and 15B, students were identified at regular intervals after registration by a member of the LSS team. The main difference between the two presentations is that for 14J the answers to four open ended questions were recorded to provide some data for subsequent analysis to feed into discussions for preparing students for 15J. Over 500 students had a two way phone conversation over the two presentations.

There were two attempts made to establish phone contact, after which, if possible, a message was left for the student to contact the SST. An email which included additional information was also sent. This material had been designed by the module team, including a timeline, what to expect, some 'light' material to look at if a student wished to, and a brief summary of key information.

The time of calls varied. Learner Support Services staff conducted the majority of calls in normal office hours. An AL varied the time of the calls outside office hours. The length of the call was typically between 15-20 minutes.

Findings

As expected there was a different contact rate for a two way conversation depending on time of call. In office hours, the success rate was around 35%, while the AL who undertook 15B PaSS calls out of office hours had a success rate of 68% in contacting students, with early Sunday evening being the best time, something she called the 'Downton Abbey' effect, with folk clearing the decks in anticipation of watching the programme.

There were very few students who said they did not want to talk, and the vast majority were clearly appreciative of such contact. For many, this was the first conversation with someone in the university, a factor we believe is important.

The evidence of success is based on TMA submissions. The data in the tables below will be updated to reflect later submission rates, and eventually pass and progression rates. The figures relate to the percentage of students at start date of module, not later cut-offs relating to fee liability, so care needs to be taken in comparing submission rates from other sources (i.e. values will be lower when using start date as the benchmark).

Tables 2 and 3 show the percentage of total students in three categories: Low quals (non) are students with low previous education qualifications and who had no two way conversation; Low quals (PaSS) are students with low previous qualifications who had a two way conversation (the PaSS call); and High quals are students who did not have the call but have higher qualifications.

For 14J, students who had the PaSS call have statistically significantly higher submission rates than students with similar previous education qualifications who did not have the conversation - between 6 and 9 percentage points. In short, students who have the call do better in terms of submitting TMAs.

The gap between students who had the conversation and students with higher previous qualifications was marginal for TMA 01 and TMA02, although higher qualification students then have higher submission rates for TMA03 (4.5 percentage points higher) and TMA04 (7.6 percentage points). The module team suggest the more challenging nature of TMA03 and TMA04 may partially explain this. The SST working with analytics undertook a mid-module action plan to target students who appeared to be 'wobbling'. This work is currently being evaluated.

Table 3 shows a similar pattern for 15B.

	TMA01	TMA02	TMA03	TMA04	TMA05
Low quals (non)	79.2	69.1	53.5	39.8	44.7
Low quals (pass)n=218	85.1	78	63.1	46.7	54.3
High quals	85.9	77.2	67.6	54.3	60.7

Table 2: TMA submission rates for DD102 2014J (% of students at start date)

	TMA01	TMA02
Low quals (non)	75.3	66.1
Low quals (pass)n=308	82.1	76.5
Higher quals	84.7	79.2

Table 3: TMA submission rates for DD102 2015B (% of students at start date)

An alternative way of analysing the different submission rates is to use odds ratios. Using low quals (non) as the baseline to compare other students, the tables below compare the odds of submitting TMA01. For 14J and 15B students low quals (pass) had odds around 1.5 times those of the odds of low quals (non) for submitting TMA01. This compared to odds ratios of 1.6 and 1.8 for high quals for 14J and 15N respectively. Put more simply, a student who received the PaSS call has a greater chance (better odds) of submitting assignments than a student who didn't get the PaSS call (low quals), but less likely than a student with higher qualifications.

	Odds Ratio	chi2	P>chi2	[95% Conf. Interval]	
Low quals (non)	1.000000	.	.	.	.
Low quals (pass)	1.503518	3.82	0.0505	0.996246	2.269085
High quals	1.608620	33.39	0.0000	1.366984	1.892968
Pr>chi2 = 0.0000					

Table 4: Odds ratios for 14J TMA01

	Odds Ratio	chi2	P>chi2	[95% Conf.Interval]	
Low quals (non)	1.000000	.	.	.	.
Low quals (pass)	1.500729	6.030	.0141	1.082897	2.079781
High quals	1.814068	36.18	0.0000	1.489756	2.208982
Pr>chi2 = 0.0000					

Table 5: Odds ratio for 15B TMA01

Constructing reasons for the difference in submission rates can only be speculative, but there is some evidence from both the conversations during the PaSS call, as well as a separate scholarship project currently being undertaken following twenty students through the module.

The reasons may be as follows:

- Students are better prepared for the start of study following the call
- Students are more confident to contact their tutor and so seek help
- Students are more likely to access wider support (e.g. through the SST)
- Student are more likely to have sorted 'other' barriers, e.g. loans, computing problems
- Students are more engaged and resilient with a greater sense of belonging to the institution.

A possible argument is that students who were not contacted were a weaker group of students than the students who were spoken to even though their formal qualifications were the same and thus skew the data. This may be true if such students were self-selecting, or for example calls were screened. The view of the team is that this is unlikely to have any significant impact on the conclusion with no evidence of this effect, and is unlikely to change the results in any significant way.

Staff making the calls commented that mature students sound more confident in asking and thinking about the prompts within the call, whereas younger students required more coaxing to understand their concerns and levels of preparedness. Some additional skills development in effective communication techniques may be useful for this.

There were other themes emerging from the data, most notably students undervaluing what an AL will do, including in some cases not even being aware that they would be allocated a tutor.

'Student would be reluctant to contact a tutor'

'Didn't know he would get a tutor'

'She thought she might get one'

'Surprised that a tutor would be available for on module support'

Of those who appeared more aware of the role of the AL, they were broadly divided between those who saw them as the 'markers of their work', 'someone who will answer queries, but not aware they would have a chance to meet them in tutorials', and those who appeared to have a clear grasp of what the role of the AL is in supporting their studies.

There was a wide range of expectations on how many hours they were expected to study, ranging from just a couple of hours a week up to around 40 hours. The conversations would suggest that many students are registering without accurate knowledge of the recommended number of hours expected to study, reinforcing the need to have a 'conversation'.

Other concerns included time management, study skills, general apprehension/fear of the unknown, computing worries, and being isolated. However, an equal proportion of students commented on being excited and ready, raring to go and get started. More analysis is going to be undertaken to see if there is any evidence on the association between how students felt pre module and their subsequent performance.

Looking forward

The Social Sciences SST are confident that the PaSS call makes a difference. Further refinements are being made for October 2015 including slightly revising the interview schedule depending on how close to start date the call is undertaken. In addition, a screencast has been produced for help with navigating the module website that can be referred to, working with Access colleagues to explore a short bespoke study resource for students who need 'extra help', as well as directing to the Access route when appropriate. Targeting more students for October 2015 will require additional AL input, as some of the work hits 'peak workload' for front line staff and the workflow will need to be managed carefully.

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2. Simpson, O (2010) 22% - *can we do better? The CWP Retention Literature Review* 94669. mrsite.com (accessed May 9th 2015)
3. defined as having less than one 'A' Level
4. http://www.admissions-review.org.uk/downloads/finalreport.pdf (accessed May 15 2015)

For questions please contact Martin Higginson, Academic Lead, Social Sciences SST (m.r.higginson@open.ac.uk)

Helen Cooke

Supporting Open degree students with choosing their next module

Helen Cooke, Senior Manager for the Open Programme in the Learning and Teaching Centre explains the set-up of a new online forum

In November 2014, the Open Programme Team ran an online discussion with Open Degree Student Consultative Forum participants on the topic of building a community of Open degree students online. Student feedback from this discussion indicated that we could make better use of the forums on the Open Qualifications website in the following ways:

- Providing contextual qualification information
- Students have queries that are 'Open specific', so there was a need for information about module choice and possible module combinations which were Open Degree specific
- Sharing student experiences of module study
- Module choice information could include information and advice from students who had previously studied those modules
- Providing a community space
- Supporting students when they feel isolated due to different study pathways, or when they are in-between modules
- Linking students up through their study plans
- Supporting students who were studying similar pathways or subject areas, or who were at the same level of study.

As a result, we have launched a new 'module choice' specific forum on the Open Qualifications website in April 2015 for all students currently (or considering) studying for an Open qualification. This is available in the 'Common room' section of the website **http://learn4.open.ac.uk/mod/forumng/view.php?id=8961**

The forum will help students with choosing subject areas or specific modules to study as part of their Open qualification, as well as providing an opportunity to meet other students who are following similar study paths. There is a separate thread in the forum for each of the subject areas that students might be studying and these relate to the main undergraduate subject areas and associated Student Support Team (SST). The forum is currently being moderated by an Associate Lecturer but we have been encouraging students to help each other by talking about their experiences of different modules, subject areas and study paths. We have also asked our Open Programme representatives in each SST to help moderate the relevant subject thread.

Open degree students have been alerted to the forum via a notice on StudentHome and a link has now been included in the module choice email messages sent out to students from May onwards (the 'Q2' MILLS intervention). We will also be working with our SST representatives on ensuring that students are directed to this forum in other refreshed MILLS messages being sent out from October 2015 onwards.

Rachel Hilliam and Juliet Coleman

Working with SRF to get students started in the right place

Retention, progression and completion are a key focus in terms of the University and therefore SST priorities. One of the main factors in our ability to retain students is to ensure that they are registered on the correct starting module for their qualification.

This is a particular issue in Mathematics as the subject (like languages) builds heavily on prior knowledge. Until a foundation of essential underpinning knowledge is in place students cannot start or progress in Mathematics. Students who start with the wrong module quickly become overwhelmed with unfamiliar mathematical concepts and language and therefore drop out. For this reason the Mathematics and Statistics qualifications have two starting points 'gentle' and 'standard' which are designed to address the problem of selecting the right starting point and to ensure that all students are at the same end point by the end of Level 1.

For many years the Mathematics Programme has used paper or web-based diagnostic tools like 'Maths Choices' **http://mathschoices.open.ac.uk** as their main source of pre-entry advice to students. The advisers in the SST also use this resource as the basis for their guidance conversations with students. We saw a huge value in looking for opportunities to build awareness of the value of diagnostic activities in all areas of the university where advice was given to students pre-entry.

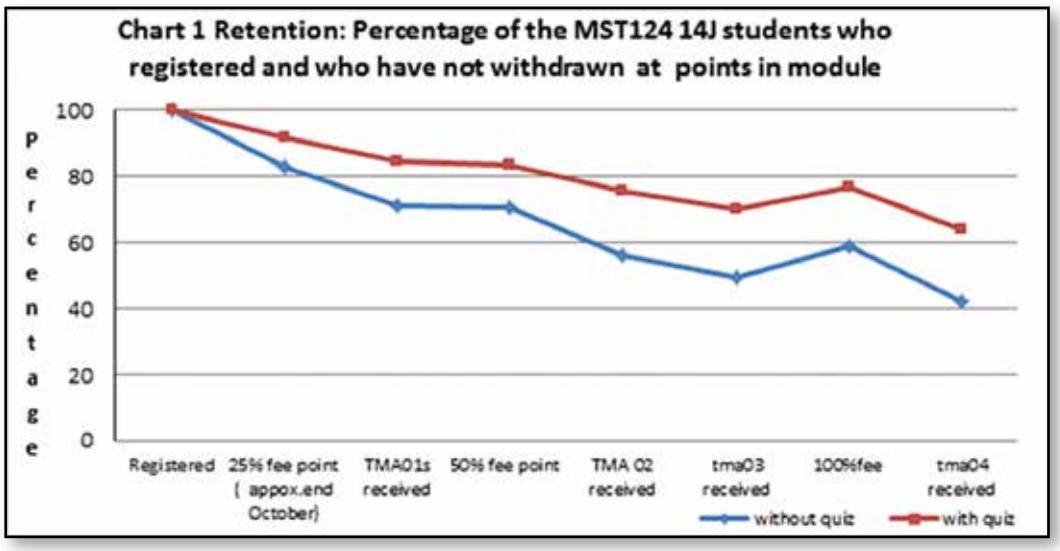
The best starting point for this knowledge sharing was with our colleagues in Student Recruitment and Fees (SRF). They had already indicated a desire to understand more about the resources they had available to them when speaking to mathematics enquirers. They were painfully aware, as were SST teams, that unacceptably high numbers of students made late, costly and disruptive Mathematics Level 1 module changes due to having started modules that were too mathematically challenging. SRF colleagues confirmed that the change of study intensity team (CSI) within SRF were aware of the disproportionate numbers of mathematics students seeking to change modules but until faced with the numbers hadn't realised the problem was quite so significant. Based on our strong evidence base, and a clear shared goal to get the right students on the right modules with the right workload, it was possible to get the SRF and the SST teams (both adviser and academics experts) working together to try to approach the problem collectively.

The collaborative activity was timely as SRF were undergoing a training program of understanding and implementing enhanced telephone techniques. It was agreed by senior managers in both teams that we could use mathematics students as a pilot for testing out these techniques so that every time a mathematics student phoned, the staff in SRF would have extra tools and knowledge to put their new techniques into practice. Both the academic lead and a senior adviser worked with the SRF Trainer to provide training to all the SRF team leaders in Nottingham, who then cascaded the training to their teams. We talked through examples of how the call techniques could be used specifically with mathematics students and the type of questions and responses which would enable the right subject specific information and diagnostics to be provided to students. By working within this framework we were able to understand the type and range of information this important group of staff needed.

The project quickly demonstrated that our collaboration was not simply about the SST sharing knowledge with SRF. It became clear very quickly, in conversations between SRF, advisers and academics, that front line staff in SRF had invaluable and hitherto untapped, insights into the Mathematics and Statistics enquirer experience which, if used, could enhance the overall student experience of our modules. As much of the curriculum at Level 1 in mathematics had been recently re-written and was in the process of being refreshed during the first year of the SST's life, we thought it was important to involve the SRF team in reflecting on the student experience of our entire Level 1 curriculum towards the end of each presentation. To this end we instigated Level 1 Review meetings to which we invited SRF staff, Level 1 Mathematics and Statistics module chairs and SST advisory staff, each of whom were able to share and collate their unique perspectives on the new curriculum. One early outcome of these meetings was that the teams worked together to completely refresh and update the enquirer resources and diagnostics such as the 'Are you ready for MST124 quiz' hosted on 'Maths choices' ensuring that students had the best advice and tools to make a more successful start to their studies.

In a project with Staff Tutors, the performance of students on MST124 14J who had previously completed the 'Are you ready for MST124 quiz' clearly showed their improved chances of retention and success (Chart 1).

The results from the quiz for students registering for 15J are currently being used to inform calls to vulnerable students. These students' decisions following the calls will be logged and further evaluation of their performance on the module is planned.



Eddie Tunnah

Working with SSTs to deliver one-to-many careers activities and forums

The last 18 months have seen a large increase in the number of one-to-many activities delivered by the Careers Advisory Service. These one-to-many activities include OU Live sessions and podcasts, developed to supplement already existing online services such as a vacancy service and a comprehensive careers website.

However the focus of this article is subject specific career forums which, although we have been running for a number of years, have significantly expanded since the arrival of the fixed-term Extended Careers Team in summer 2013 (funded until summer 2016), as part of the Study Experience Programme (SEP).

Key to the success of these forums is making students aware that they are happening, and we work closely with SSTs to do this. A Psychology and Counselling forum was run in April 2015, and was advertised by an email sent from the SST a few days before the forum began. For this forum we liaised with our SST colleagues to decide when the email would be sent and to which students. The messaging consisted of an email with brief details of the forum and also an accompanying OU Live session about career options with a Psychology degree. URL links were included to make accessing both activities straightforward. The forum was also advertised by messages on the Psychology and Counselling Qualification website and on module websites.

Too late in the day it was discovered that we could have included DAx links that would have enabled us to measure click-throughs from the emails. The use of DAx links will help establish which form of advertising was the most effective, and will be used next time. After the mailing was conducted the SST let us know how many students had been contacted.

Careers forums have several advantages over traditional one-to-one support. They allow large numbers of students to engage for relatively little staff resource. Students can also access the resources at the time, or after the event. Perhaps their greatest strength is that in addition to learning from a careers professional, or an employer, students can benefit from peer to peer learning. A good example of this was in the Psychology and Counselling forum last year, when a thread started by a student enquiring about how to get into work with armed forces veterans suffering from Post-Traumatic Stress Disorder (PTSD) was offered advice by fellow students:

‘ Hi, I have just started my psychology degree and am based in Suffolk. My ambition is to eventually work exclusively with forces personnel, both serving and retired, suffering with mental health issues such as PTSD. I have done a little research via combat stress and the MOD but I was wondering if you could suggest which topics I should be focusing on to pursue a career in this field and the best way for me to reach my goal?’ **[Student 1]**

‘ Hi, I have never met anybody else that shares the same career goals as myself so I really appreciate your question. I have recently left the Army after 7 years and have been studying psychology with the OU with the aim to work with PTSD also. I see one of the above posts recommends volunteering. I wanted to pass on the web link for SSAFA they have a fantastic volunteer service and extremely good training. I see some training can be done online now but there are also opportunities to go to workshops. They have a wide range of areas you can volunteer in also.’ **[Student 2]**

‘ Thank you so much for this. I’ve been helping close friends with PTSD which is why I am trying to qualify to help others who suffer. Couldn’t find out how to volunteer and this has given me new hope.’ **[Student 3]**

We are currently planning a range of subject specific forums for the 2015/16 academic year, and will be in touch with the respective SSTs in due course to arrange student messaging.

Careers Forum facts

- In 2014/15 4 generic quick query forums and 10 subject based ones have or will run.
- Subject based forums have included: Business Studies, Education, Arts (publishing and writing focused), Languages, Social Sciences, Environment, Access, and Psychology and Counselling.
- Forums tend to run over 2 or 3 weeks. This relatively short duration allows effective use of staff resources and means forums are busy and dynamic.
- Forums are proving popular with students, with engagement increasing. For example:
  - 651 students viewed the 2015 Psychology and Counselling forum, an increase of over 150% on the same forum in 2014.
  - The Languages forum in February 2015 had over 70 separate discussion threads.
  - The Environmental sector forum in March 2015 received over 180 postings, averaging over 15 a day, across 26 individual discussion threads.
- Where possible forums are hosted on Qualification websites, and Faculties see them as an important way of encouraging students to use these sites.

For further information on our work visit our new **Careers and Student Employability: Resources for staff website**. Generic careers forums can be found on the **Careers Workspace**, and subject specific forums are usually located on Qualification sites in the common room area, see for example **Psychology and Counselling**.

Joanne Beard

Clementine Whiting

Developing Visual Analytic Reports for MILLS Interventions

Tasked with producing analytics reports on SST interventions, Joanne Beard and Clementine Whiting give an outline of the reports, their complexities, and provide some visual examples of the first set of M2 reports which are available to SSTs.

About the M2 interventions

The M2 intervention is undertaken by SSTs before module start and aims at starting an early dialogue with learners deemed to be 'at risk' to explore issues around preparing to study and signposting to online resources including the induction website and Qualifications Online.

The intervention is set up using the Student Support Tool, and the mode of intervention can be an html email, a tailored free text email, or a telephone call.

The visual analytics reports show snapshots of specific criteria both before and after the intervention has been made, to see what is different.

Data sources

The M2 analytics reports draw on data from a variety of systems via the OU's Data Warehouse:

- SS Tool - generates the intervention and holds the SST student allocation data
- VOICE – holds information on interventions and interactions with students
- CAMEL – records the despatch of an email and for html emails whether students open the email and/or click on the links in the email
- CIRCE – student data
- Campaign link data – this is data generated by having campaign links in free text emails
- StudentHome website data – the usage of sections of the Help Centre, such as induction

Data challenges

The challenges in respect of the data have been:

- How to measure intervention success when drawing on existing data only
- How to aggregate data correctly from multiple data sources
- How to draw out effects when there are no provable causal links between an intervention and subsequent sets of student behaviours
- How to interpret or gain insights from the data in order to attribute value to the intervention

Visual challenges

The challenges in respect of producing visualisations have been:

- Distilling out which data sets might provide an insight once displayed visually
- The functionality of visualisation software can limit the display options
- Do the visuals portray or indeed tell the correct numeric story in a straightforward way

The M2 analyses

A Reference Group used the Learning Analytics Evaluation Framework to distil out what SSTs would want to know about the M2 interventions and whether specific learner behaviours might take place, called target behaviour.

The behaviours identified for the M2 analysis included:

- opening and clicking on a link within an email intervention
- calling or emailing an SST
- disclosing a disability
- changing workload (number of credits studied)
- visiting Your OU Induction and Skills for OU Study webpages

This next section looks at some examples in the reports.

HTML emails

HTML emails have generic intervention text, include branded pictures and embedded web links. Some SSTs use them and some do not. For this type of email we are able to see whether the learner has opened the email and whether they have clicked on the website link/s within the email.

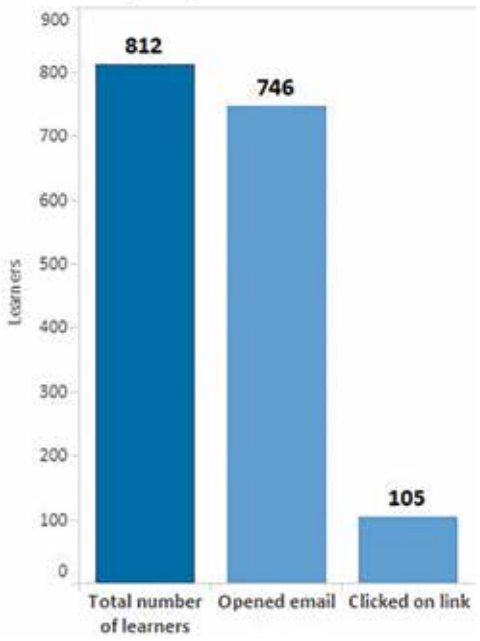


Figure 1 HTML template email. This visual shows that the majority of learners (92%) opened the M2 email and 13% of learners clicked on the website links contained within the email. SSTs are then able to look at the 'Website usage' visual to see if this might be because students have already visited the websites, and help with considering whether the timing for sending the email out is correct for their learners.

Free text emails

Ideally SSTs would have liked to have been able to tailor the html templates as they include pictures and embedded web links, however this format of email currently needs specialist IT developers so has not been possible. Therefore many SSTs have written and used plain text emails for the MILLS messages which they tailor to their curriculum area and as it's not possible to have embedded web links they have included a campaign link (DAx) to take students to the websites. These DAx links are used to gather data about whether the learner has clicked on the link within the free text email, however we are unable to discern how many learners opened the email but did not click on the link/s.

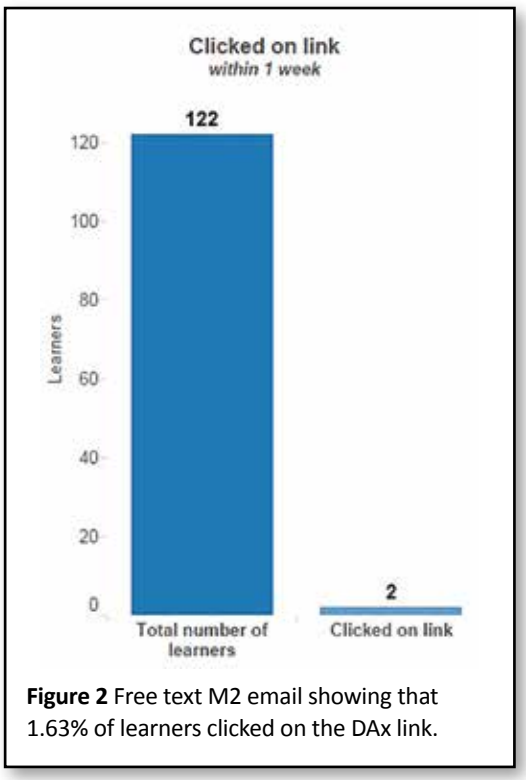


Figure 2 Free text M2 email showing that 1.63% of learners clicked on the DAx link.

Phone calls

At present there is a limited amount of information on interventions made by a phone call. We can identify the number of phone call activities that were created in VOICE, but data recording the completion of these phone calls is inconsistent and partial. With the help of SST Learner Support staff recording information it is a possible area of future development.

Contact with the university

There is a long standing debate as to whether an email encourages students to self-serve online by including website links or whether it actually encourages personal contact from the student either by email or a phone call. Of course it depends on the purpose of the intervention itself, and with an M2 we know that we are encouraging both; firstly, for all learners it is the use of the induction website to build their confidence and study skills and secondly for those learners where they haven't declared a disability on registration but may have one, we are encouraging them to make contact with us in case specific arrangements need to be put in place. The visual 'Contacted an SST' has been designed to see if we can gain a better understanding of student behaviour in respect of each intervention. Interestingly the results on M2s do vary so this may be where the SST itself has a far better understanding of what is happening.

The inevitable question which falls out of the 'Contacted an SST' analysis is SSTs wanting to know the reasons why students made contact. This is one of the data areas Avinash Boroowa and Joanne Beard explored with external consultants and found that the current VOICE categorisation structure was currently too complex to derive any detailed analytics below the highest level of 'Type'. There is much which could be done but it would need a new VOICE taxonomy and for this to be used consistently by staff, so significant time investment. In the meantime, we have a 'type' analysis included in the design for the annual report so we will gain a meta-level insight on contact reasons.

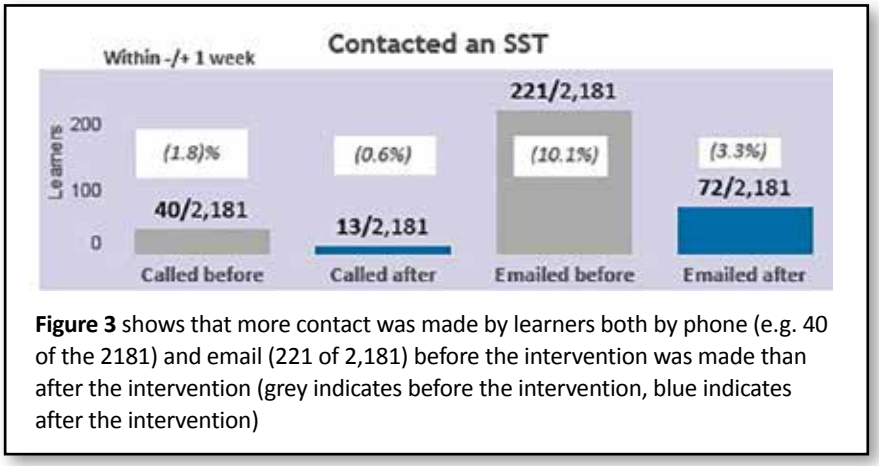


Figure 3 shows that more contact was made by learners both by phone (e.g. 40 of the 2181) and email (221 of 2,181) before the intervention was made than after the intervention (grey indicates before the intervention, blue indicates after the intervention)

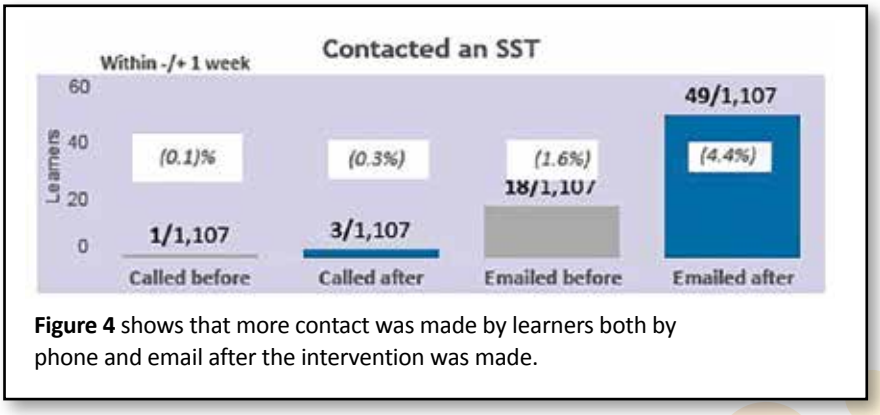


Figure 4 shows that more contact was made by learners both by phone and email after the intervention was made.

Disability disclosure

The Reference Group said that after an M2 is sent out they would be interested to see an analysis of the disclosure of disability. They advised us that, in their experience, learners are often reluctant to disclose their disability at the point of registration in case they are not accepted for study and it is at a later point they feel reassured and disclose.

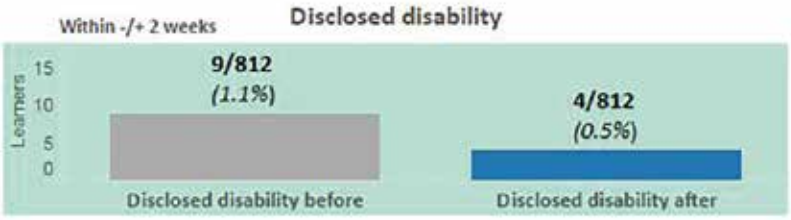


Figure 5 shows that 9 students disclosed their disability before the M2 intervention and 4 students disclosed a disability after the intervention.

Dicing and slicing

The ability to view the same data sets for subsets of student characteristics is something which is described as 'dicing and slicing'. At this point we are able to provide the analyses by gender, age and ethnicity, and for any combination of these. SSTs are able to access the data sets themselves and select which combinations they are interested in researching.

We have been working hard to extend the dicing and slicing to include the qualifications students are studying for, but we have found that old and new framework rules where students can study multiple qualifications leads to datasets with duplicates that can then be double counted by the algorithms we have. So we think the best way forward may be to develop a separate visual for qualification rather than implementing it as a dice and slice option.

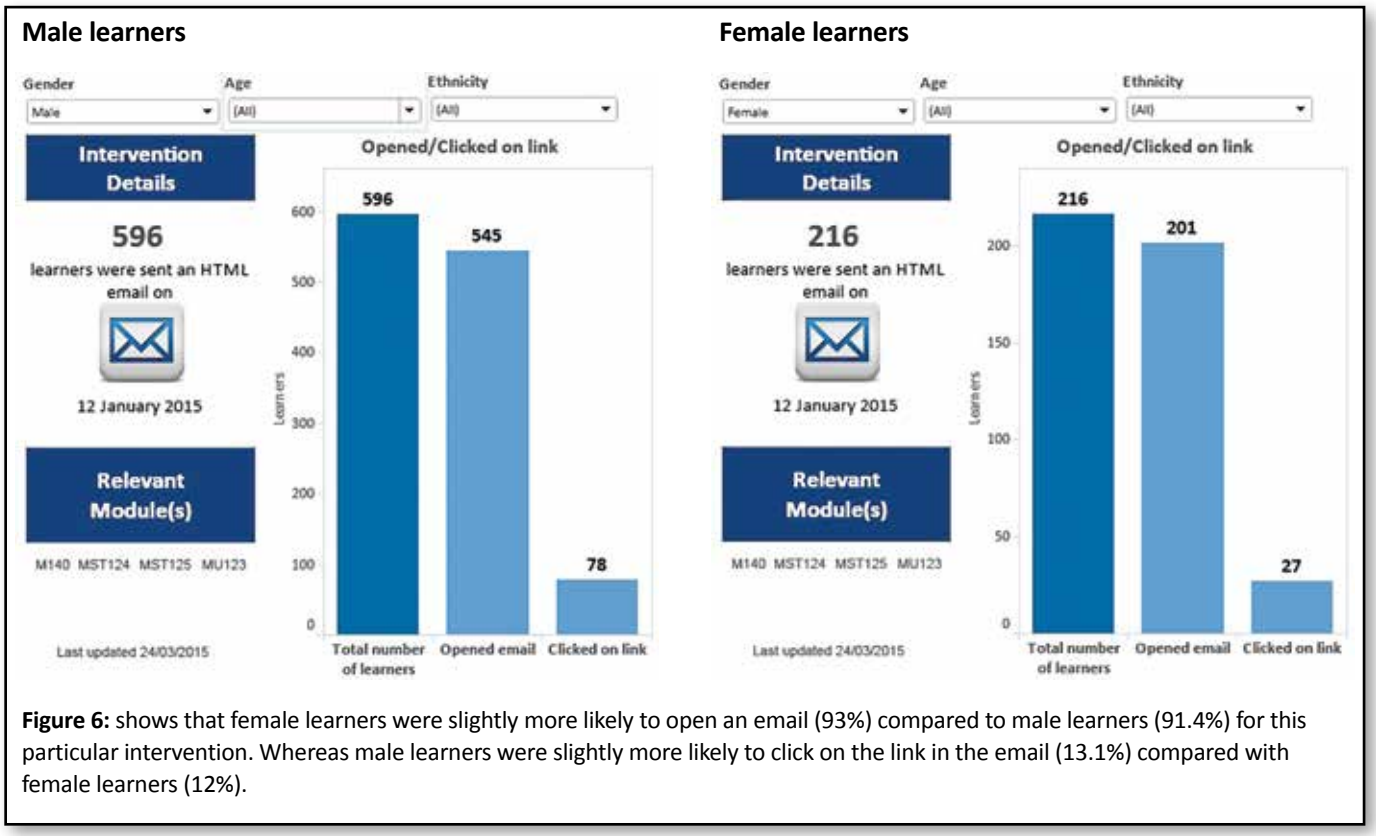


Figure 6: shows that female learners were slightly more likely to open an email (93%) compared to male learners (91.4%) for this particular intervention. Whereas male learners were slightly more likely to click on the link in the email (13.1%) compared with female learners (12%).

Interpreting analyses

The analytics reports are being produced for SSTs to use. One of the things we know from undertaking the analytics work is that understanding the context of an intervention is really important in terms of interpreting what the analyses is showing. The SST practitioners themselves, particularly the Data Interpreters, have detailed knowledge of who was selected for an intervention and why they were selected, and this knowledge is crucial for making sense of the visuals. For example, some reports show that learners included in that intervention made no use of online resources and in our quality checks we found that this was because they were offender learners who would not have any online access. The SST has the contextual knowledge to know these are offender learners from the way they have titled their interventions and selected the students but others wouldn't necessarily know this and could easily misinterpret the analysis.

What's coming up next?

By the end of June reports on M2, M3, M5 and M6 interventions will be available to SSTs and work will then focus on developing the annual analytics report in time for Student Support Teams to review as part of their Annual Report in October. Work is also underway by the Analytics Project to implement a new visualisation tool called SAS Visual Analytics, so in the longer term there will be web visual reports rather than Tableau workbooks.

Further information

MILLS interventions reports are available on the SST Programme web pages along with instructions on downloading Tableau Reader.

http://learn3.open.ac.uk/mod/subpage/view.php?id=79312

Feedback, ideas and comment are always welcome, especially through the blog.

David Wilson

Prompting Student Action: the M4 TMA01 study engagement email

Last summer David Wilson took the decision to include the MILLS M4 TMA01 intervention in the suite of emails under the Study Engagement strand of the Fee Income Management project (FIM) and to centralise it's delivery to students. David explains to Joanne Beard some of the challenges and the early learning.

The M4 intervention in the MILLS (Model of Integrated Learning and Learner Support) framework is designed to be sent to students who have missed the submission date for their first TMA. SSTs email all students who fail to submit, urging them to contact their tutor/SST.

Some SSTs were using the M4 for all of their modules, but others had decided to focus on their level one modules. David Wilson explained that as part of the Study Engagement strand of FIM he saw there was the opportunity to develop and deploy the intervention more systematically and purposefully on all undergraduate modules.

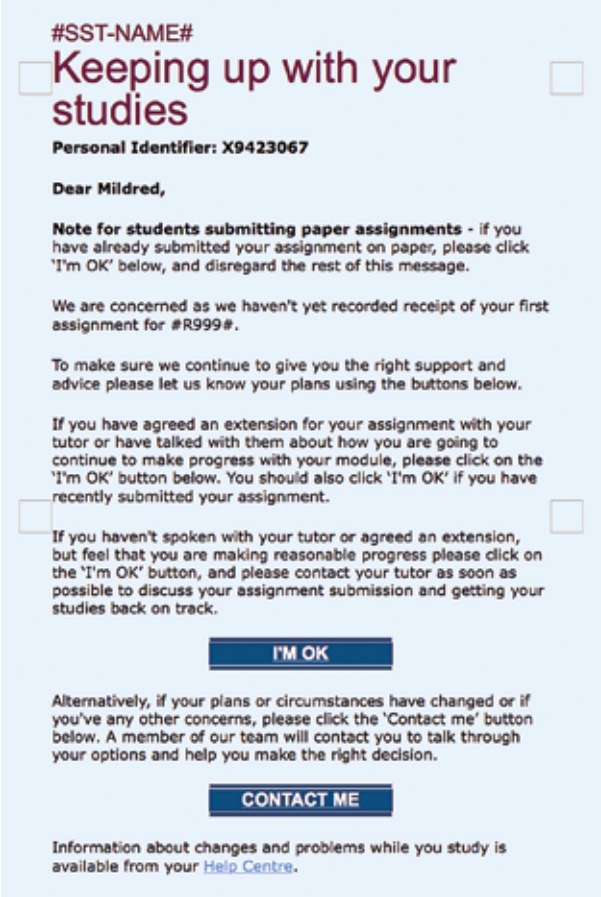
David says

"early on in the project we were clear that the first assignment was key to securing students' active engagement in study, and if we used the M4 email in a smart way it could have a powerful part to play in calling students to action"

The email itself has been designed in such a way that the student is actively encouraged to make contact with the University. With 'click me' buttons and a web form which includes a free text box for requesting contact, students can let us know if they are struggling or if they want us to make contact with them. They can also tell us that they are 'OK'. As part of the work the submission of the first assignment was tracked and over 30% of the recipients responded to the message by submitting their TMA without directly using the buttons and web form to reply.

David feels strongly that this type of 'call to action email' offers a really useful mechanism for SSTs to have a purposeful dialogue with students in the future. He says

"the simple design of the messages means that students can read it quickly and then select the response they want to give us very easily"



#SST-NAME#

Keeping up with your studies

Personal Identifier: X9423067

Dear Mildred,

Note for students submitting paper assignments - if you have already submitted your assignment on paper, please click 'I'm OK' below, and disregard the rest of this message.

We are concerned as we haven't yet recorded receipt of your first assignment for #R999#.

To make sure we continue to give you the right support and advice please let us know your plans using the buttons below.

If you have agreed an extension for your assignment with your tutor or have talked with them about how you are going to continue to make progress with your module, please click on the 'I'm OK' button below. You should also click 'I'm OK' if you have recently submitted your assignment.

If you haven't spoken with your tutor or agreed an extension, but feel that you are making reasonable progress please click on the 'I'm OK' button, and please contact your tutor as soon as possible to discuss your assignment submission and getting your studies back on track.

I'M OK

Alternatively, if your plans or circumstances have changed or if you've any other concerns, please click the 'Contact me' button below. A member of our team will contact you to talk through your options and help you make the right decision.

CONTACT ME

Information about changes and problems while you study is available from your Help Centre.

Having read the first hundred or so free text responses which came in from students David said

"they were vignettes of students in difficulties, suffering from illness or struggling to get to grips with a new job"

Being used to dealing with such student issues both SRF and SSTs have been able to follow up and provide students with the information, advice and guidance which is right for them. It also means that if they are a student with a loan from the Student Loan Company we can potentially stop them incurring debt unnecessarily.

The more tricky challenge, according to David, has been what to do about the 20–25 % of students who did not respond in any way to the message and did not submit their assignment. SSTs try to phone these students at least twice, but they are often more difficult to make contact with, and the success rate in terms of these students continuing to study is currently about 8%. David explained that an ongoing difficulty for SSTs is that they have limited resources and many are worried about how they balance support for different student groups and maximise their effectiveness across the whole of the student body.

David says that he has two surprises. Firstly, the variation in time period before the first assignment is due for submission.

"For many modules TMA01 is due within the first month to six weeks, but for some modules it's much later than this and in a few cases students are four or five months into study before their first assignment is due"

The second surprise was that for many modules, nearly 50% of students do not submit their first assignment by the original cut-off date, although fewer than 10% fail to submit at all on most modules.

There are still some challenges in ensuring the despatch of the email and its follow-up runs smoothly. One challenge is to make sure that Associate Lecturers are included appropriately in the process. Any student who is given an extended submission date which is recorded in OU systems is not sent the M4; students are also strongly advised to talk to their tutor if they haven't submitted. And where assignments are submitted on paper to tutors, in subjects such as maths, students are told that if you have submitted your assignment on paper then you can respond that you are 'ok'.

As part of the Study Engagement strand there has been a wealth of data collected about the various engagement check emails and the student responses and data about these responses will be evaluated at the end of 14J presentations to assess lessons to be learnt more fully.

David says that he has lots of questions relating to the intervention and is particularly curious to know what happens to some of the students, in particular

"whether students who ask for help via the M4 TMA01 engagement check go on to complete the module, and do they pass?"

Favourite Visualisation Links

Experts from Marketing, IET's Student Statistics and Survey Team and the Analytics Project in the Learning and Teaching Centre have selected some of their favourite data visualisations and explained why they like them.

David Cook

US Federal Budget / US Trade Deficit

Two visualisations that float my boat are the interactive US Federal Budget flow diagram

http://www.brightpointinc.com/interactive/budget/index.html?source=d3js

and the animated US Trade deficit graphic

http://www.brightpointinc.com/interactive/ustrade/index.html?source=d3js

Both were created using a JavaScript language called 'D3' which utilises the latest internet browser technology to enable user interaction. The visuals shine because they are both clever and dynamic, allowing people to 'discover' the data and turning what are essentially quite dull subjects (federal and trade budgets) into something fun and creative.

Thematic census maps

Interactive mapping is an excellent way of making datasets come alive too by showing geographical trends and relationships that would otherwise be difficult to grasp. Good examples are the thematic census maps produced by the Office for National Statistics (ONS). I particularly like the workplace population maps which allow users to explore people's educational qualifications, employment statuses and hours worked.

http://www.ons.gov.uk/ons/interactive/census-2011--workplace-population-maps/index.html

Mike Habieb

Banish meeting boredom: 13 tips for better meetings

I like this visualisation because it suggests things to do and others to avoid, and whilst is relates primarily to meetings, much of it is relevant in other settings. If I were smarter, I would make sure I applied them more often than I do!

http://blog.gotomeeting.co.uk/2015/02/25/banish-meeting-boredom-13-tips-for-better-meetings.html?utm_source=email&utm_medium=email&utm_campaign=weeklyemail&mkt_

Stephanie Lay

Anscombe's Quartet

Explanation: **https://eagereyes.org/criticism/anscombes-quartet**

Working example: **https://public.tableau.com/profile/stephanie8736#!/vizhome/AnscombeQuartetExample/AnscombesQuartet**

This isn't the most eye-catching visualisation, but I really like it because I find it's a neat way to explain why we need to go beyond descriptive statistics and show how data visualisation can be so helpful in discovering patterns in datasets.

Jim Peard

Mapping the 1854 cholera outbreak

Tim Deak of Panoptical uses Tableau to re-visit John Snow's classic mapping of the 1854 Cholera outbreak in London.

https://public.tableau.com/s/gallery/mapping-1854-cholera-outbreak

I like it because

- It demonstrates how a Tableau report can be used to tell a story
- It's a really good example of a visualisation helping to clarify the data and the report leading to effective action

Diversity in chemistry higher education

This dashboard shows the ethnicity, gender split and socioeconomic background of first year students studying chemistry

https://public.tableau.com/profile/rsc.ict#!/vizhome/Tableaudashboarddemo/Diversitybystudy

I like it because it shows

- Another use for Tableau story-points - to link lots of reports on the same theme
- Lots of visualisations on each page, but nicely designed

Clare Sparks

A guided tour of UK skies

I appreciate this isn't of the bar chart type of info – but this is my favourite visual. I first saw it at the London transport museum last year. It's a map of flights by time over the UK – they took the co-ordinates and altitude of flights and mapped their movement.

http://nats.aero/blog/2014/11/take-guided-tour-uk-skies/

It tells a story and provides clear visual insight, but is stunningly beautiful too.

Laura Vella

Visual illusions

These serve as a good illustration of the care we need to take when presenting visual data.

http://junkcharts.typepad.com/junk_charts/2012/09/insufficiency-and-illusions.html

Clementine Whiting

Endangered safari

This is a pretty funky visualisation that I found on Tableau's viz of the day:

https://public.tableau.com/s/gallery/endangered-safari

It is very powerful in providing a story of endangered species in Africa.

I chose this visualisation because I like the story that the visualisations show of endangered animals. For example, the picture of the elephant shows that they originate all over the southern part of Africa. It is coloured yellow to show that they are vulnerable to endangerment. The good news is that the image is facing to the right, so we can see that the population is increasing. The story, however, is not so positive for the Dama Gazelle. They only populate isolated parts of northern Africa. The colour red indicates that they are critically endangered and the fact that the image is facing left shows that their population size is decreasing.

Contacting us

The SST Programme is based in the Learning and Teaching Centre. You can access our website

http://learn3.open.ac.uk/mod/subpage/view.php?id=62598

You can email us **SST-Programme@open.ac.uk** with questions, suggestions or to ask for something to be added to the website.

And there is information about the team on

http://intranet6.open.ac.uk/learning-teaching-office/learning-and-teaching-centre/team-members/sst-programme

The Open University

The Learning and Teaching Centre