

Student feedback to improved retention: using a mixed methods approach to extend specific feedback to a generalisable concept

Abstract

Across the Higher Education (HE) sector student feedback is used to feed into University processes and guide decision making. In this study data gathered allowed the authors to investigate a hitherto neglected, but important, cohort of successful students – those who succeeded when all the odds were stacked against them. The identified group of students had relatively low predictive probabilities of passing their module, and yet despite all the odds passed. These identified students were interviewed by phone which yielded a much richer data set than is often available from student surveys. The advice they considered to be important to future students included specific guidance to get ahead, to plan and to contact their own academic tutor. Based on this advice an opportunity for future students to have a flexible early start on a specific module was created. A 4% increase in the number of registered students who subsequently started the module was maintained through to module completion.

Keywords: predictive probabilities; retention; student feedback; qualitative; quantitative; mixed methods;

Introduction

This paper describes the collection of student feedback on two specific modules which was then effectively used to implement change on a third different module. Student feedback was obtained in a small qualitative study from a group of students who had, despite the odds, succeeded. This rarely identified specific group of students in

providing feedback is described, along with adopted methodology. The impact of the action taken to address a specific element of this feedback is then reported.

The work was undertaken with distance learning students at the Open University (OU) UK who were studying the equivalent to a first year undergraduate entry level Mathematics or Statistics module at a traditional university. First year undergraduate modules in Mathematics and Statistics at the OU typically consist of 30 credits and a total of 120 credits is required to complete the equivalent of year 1 of full time study at a traditional HE institution. Open University students are typically older, studying part time and are geographically more dispersed than at traditional campus based Universities. Study materials which take the place of lectures are available electronically. Each module typically lasts for 9 months and the majority of students start in October with a subset having a second start date in February. During the 9 months of module study students are assigned to an Associate Lecturer (AL) who provides tutorials and feedback on assessments throughout the duration of the module.

Research questions

The purpose of the study was to establish whether we could use student feedback to improve the study experience of other students. A small number of students were contacted and asked to discuss their insights into their own success. The contacted group were very important because they had been successful despite their initial likelihood of success looking slim.

The second phase of work considered the question of whether it was possible to turn any of the insights into practical actions. In fact the student feedback led to several initiatives of which just one, the “flexible early start program” is described here.

The final phase related to whether students would choose to take part in the flexible start program and their assessment of the option. An evaluation of success in terms of initial response rate, student feedback and subsequent retention and pass rates on the module was an integral part of this last phase.

Literature Review

Student feedback is collected as a variety of levels and meets a number of purposes, (HEFCE, 2014, NSSE, 2017). However, gathering feedback, and effectively utilising it to instigate change, are very different activities. Shah (2017) and Blair & Noel (2014) report that whilst there is plenty of evidence of collecting students feedback there is relatively little on the impact of changes made as a result of the feedback.. Many institutions, including the Open University, hold their own annual surveys to provide more in depth information specific to that institution. Open University (2017) includes an indication to students on how their feedback is used to improve materials and learning experiences. More broadly, Watson (2003), provides a number of case studies which explore how students are informed of the impact their feedback. The nature of the OU teaching model means that Associate Lecturers deliver tutorials and academic support but have little immediate, direct input to decisions about timing of module deliver and module content. Much student feedback requires action at the institution, or at least the whole module level. An advantage of this is that a single change at the module level can impact upon thousands of students during the presentation of the module. In this study it was hoped that student feedback could be shared with future students and it would carry credibility as previous students had both “source credibility and similarity” (Tombaugh&Mayfied,2014; Silvia,2005) .

Focussing on what makes for study success is not a new research pursuit – retrospective examination of factors contributing to study success generally reveal that a student does well if they have a predictable social, cultural, educational and cognitive profile which contributes to their chance of success. Various models have been built which both explain the observed retention for groups of students and which provide a basis for targeting additional support. New data is sometimes collected for use in predictive models but more usually existing registration data and data from a virtual learning environment data is used to identify students “at risk” (Sanders et al. 2016; Rose-Adams 2013; Fowler&Norrie 2009; Essa&Ahad 2012 and Simpson et al. 2006). Additional support resources are then targeted to the “at risk” students.

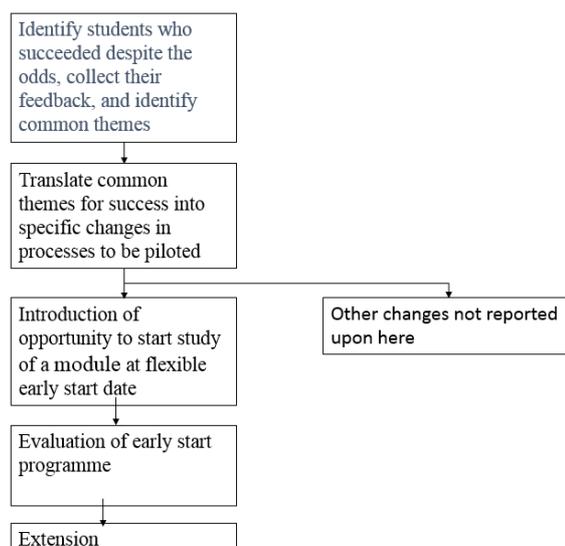
Many HE institutions use predictive modelling tools and indeed JISC (2017) has a project to share, develop and promote the use of analytical tools including the use of predictive probabilities. Within the OU we have a longstanding model (Calvert,2014) which was adapted to generate predicted probabilities of success prior to module start. The factors which are used to predict student success act as proxies for information not available for all students such as student study habits, resilience, self-efficacy, motivation etc.

The opportunity created for students was to introduce a flexible early start on one entry level module. Transition to University level study is known to be both critical and problematic for students and is an area which many institutions are currently implementing change, (Reason et al. 2006; Everington, 2017; Thomas & Hanson 2014 and Turner et el. 2017) . For the Open University, with its operation of an open entry policy, there are no formal entry level qualification requirements. Hence whilst issues are similar, solutions may be different.

The approach to analysis taken throughout the project was a mix of qualitative and quantitative approaches. Within the social sciences this is a widely used approach, usually labelled as mixed methods, with various classification (Tashakkori & Teddie 1998,2003; Creswell & Plano Clark,2007) based around the types of methods used i.e. qualitative or quantitative, their importance i.e. primary or secondary and the order in which they are used i.e. concurrent or sequential. Integration of data from different approaches can occur at various stages in the process. Mixed methods research also uses a range of sampling approaches including a set of purposive sampling techniques (Teddlie&Yu,2007) where specific cases are selected for a specific reason rather than being identified by some variant of random sampling. A specific subset of specific purposive case sampling is revelatory case sampling where the case itself is the main focus of interest rather than any underlying issue.

Methodology

Figure 1: Overview of study



Identify students who succeeded despite the odds, collect their feedback and, identify common themes

Purposive case sampling, more specifically revelatory case sampling, was adopted in the first phase of this project. The Open University's model for predicting student success was used to identify educationally vulnerable students from two cohorts studying "*MUI23: Discovering Mathematics*"; one in October 2014 and another in October 2015. The model used to generate predicted probabilities is based on all the available proxy factors which are known to be associated with passing a module.

Predicted probabilities may thus be viewed as measure of "likelihood of passing" or as a measure of "prior ability". The students who were identified as "succeeding against the odds" were those had a low predicted probability of passing the module and yet did indeed succeed in passing the module.

Permission was gained from the University's Student Survey Panel (SRPP) and the University's Ethics Panel to contact the students who were identified as having 'succeeded against the odds'; 168 students were contacted via email and invited to take part in semi structured, one to one, telephone interviews. As the Open University is a distance learning institution, face-to-face interviews were not a viable option. Two experienced Associate Lecturers were recruited to conduct the student interviews and be involved in the analysis of information, together with identification and development of future actions.

Two preliminary meetings between the lead researcher and the Associate Lecturers took place to ensure the interview approach was consistent. Ten semi – structured phone interviews were then conducted and these focused on asking the students to provide advice which could be provided to future students regarding how to

succeed. Students, during the course of the interview, were asked to identify three “top tips” that they would wish to pass onto future students. A further meeting amongst the interviewers enabled emerging themes to be considered and discussed.

Specific changes as a result of student feedback

Predictive models, which are built and used prior to students’ starting their study, rely heavily on demographic data. This presents a problem as the University has no control over the demographics of the student population and therefore seemingly limited ability to change the outcome of success. Whilst predictive models offer little insight for effective change, student feedback comments do provide some understanding. The students who had succeeded, despite the odds appearing to be against them, were invited to identify three top “tips” to be shared with future students. One of the top tips was to “start early” but, to a large extent, this required a however this required a structural change to the delivery of a module to enable students to follow such advice.

A flexible early start programme was therefore introduced. In some cases students may, through a combination of circumstances, choose to register for a module several months in advance of the actual module start date. During these intervening months the students do not have access to the module material or an Associate Lecturer. It therefore seemed feasible that some of these students would like to take advantage of a facility which would enable them to start their study before the official module start in October. As a distance learning institution the University has an infrastructure to effectively deliver online tutorials and this infrastructure could potentially be used to deliver an “early start” option for students.

Concerns around access practicalities, impact and fairness to students who would not be offered the opportunity of an early start, alongside concerns with raising student expectations re submission of assessment tasks early etc, were addressed via

internal discussions and negotiations. Access to materials was achieved by building a temporary website which linked all the electronic versions of materials, software, forums and tutorial rooms necessary for study of the first three (of 12) units of the module. Funding was established to pay two Associate Lectures to be both academic tutors and deliver a timetabled set of tutorials for the early start students. All students who had registered by the end of July on the module were emailed and offered an opportunity to commence their study, on a rolling basis, at a time of their choosing. Initially the expected take up by students was 20-30. It rapidly transpired that take up would be substantially greater and additional funding for further Associate Lecturers was obtained. There was no further follow up invitation and just over 400 students were offered the opportunity of a flexible early start.

Student feedback, on the flexible early start programme, was sought via two brief online surveys embedded within the early start programme website. Students were also asked for their views on the programme, with the value of hindsight, around half way through the main course presentation.

The analysis plan was designed with two main aims. The first was to statistically evaluate the impact which taking part in the early start programme had on retention. The student intake on the module consisted of three distinct groups; those who were offered a part on the early programme and who took it up; those who were offered a place and declined to take up the place and a third group who enrolled after the end of July and therefore not offered a place. These groups might well perform differently and this could be due to a number of factors including differing initial “likelihood of success” on the module. The predictive probabilities of success for individual students are a composite measure that can be used to control for “likelihood of success”. They are generated just prior to module start and take into account all the significant data that the

University holds which is known to be associated with student success. Comparisons of success between the three groups of students was therefore planned with a control for prior likelihood of success.

The second analysis strand was to analyse student feedback to a set of questions about the early start programme including free text responses. Quantitative data was to be extracted and emerging themes identified. The intention being to use the comments to modify/ extend the programme in subsequent years.

Results

Can a small qualitative study yield generalisable results?

The conclusion was that indeed the feedback from just ten students who “succeeded despite the odds” could lead to insights that were applicable to other modules and to a wider range of students. Early analysis of a few of the telephone interviews identified common themes. One of the clearest themes was the resilience, determination and positive approach of the students: they were “can do” students. Two other clear themes emerged in discussions which the students attributed to their current success:

- The importance of being well organised
- The value of being willing to try new and different study approaches.

The top tips from the students are summarised in Table 1 and most of these were shared with subsequent students and/or became the basis for action by the module team.

Table 1: Specific top tips given by the successful students to future students

Start early!
Familiarise yourself with and use the student study planner;
Make contact with your tutor and be ready to discuss areas of difficulty with them
Go to the tutorials
Get networked! Join a Facebook group. Pair up with a study buddy. Make good use of forums;
Don't be scared or threatened by it at the beginning, it is not as bad as it looks!
Don't be afraid to try different ways of learning to see what works
Don't look too far ahead, just go through step-by-step; The module is doable as it takes you step-by-step through the concepts
Make sure you fully understand each concept before moving on rather than just remembering how to apply e.g. a formula;
Stick to good methodology and take a business-like approach.
If returning to study, don't be too hard on yourself;
Remember you need a break sometimes
Above all else enjoy the module
Be prepared to persevere - put in the work and you'll enjoy it.

These comments led to the introduction of several initiatives of which the most ambitious initiative was based specifically on the advice around **getting ahead /starting early**.

Would students be willing to start early if the opportunity to do so was created?

Students were found to be willing to start their studies well ahead of the official start date if they were given an opportunity to do so. The flexible early start programme was the most ambitious initiative based on the student feedback; specifically it was based on the feedback around getting ahead / starting early. The module, “*M140: Introducing Statistics*” was identified as suitable for a pilot for a programme designed to let students

get ahead. Some students enrol early and on this module there were 380 students identified who had enrolled by the end of July 2017 for the October 2017 presentation. All 380 identified students were offered the opportunity of taking part in the flexible early start programme and 212 took up the offer of a place. The take up rate of 56% was considerably more than anticipated and demonstrated clear student engagement with the idea.

Would retention alter following the introduction of the flexible start programme?

Retention did improve and the most notable increase was in the period between registration and the start of the module – for some students this may be a period of several months. It was conceivable that students would choose to alter their registrations having had an opportunity to try out M140. There was plenty of time for students to change registrations, at no cost, prior to module start and tutors were encouraged to discuss this as a positive option with students if they indicated an interest in the possibility. It was also a possibility that students might be initially retained on the module but drop out anyway at a later point. Both of these possibilities might have a negative impact on retention. It was, however, hoped that any such students would be few and that the overall effect of the programme would be to increase retention. Table 2 includes the number of students who registered, at any point, on M140 and the numbers still registered at the point when students incur a liability to pay 25% of their fees (which is in the 3rd week in October). It shows that 32 fewer students were registered in 2017 than in 2015 but that the number of passes in 2017 was higher.

Table 2: Students on M140 at comparable time points in previous years

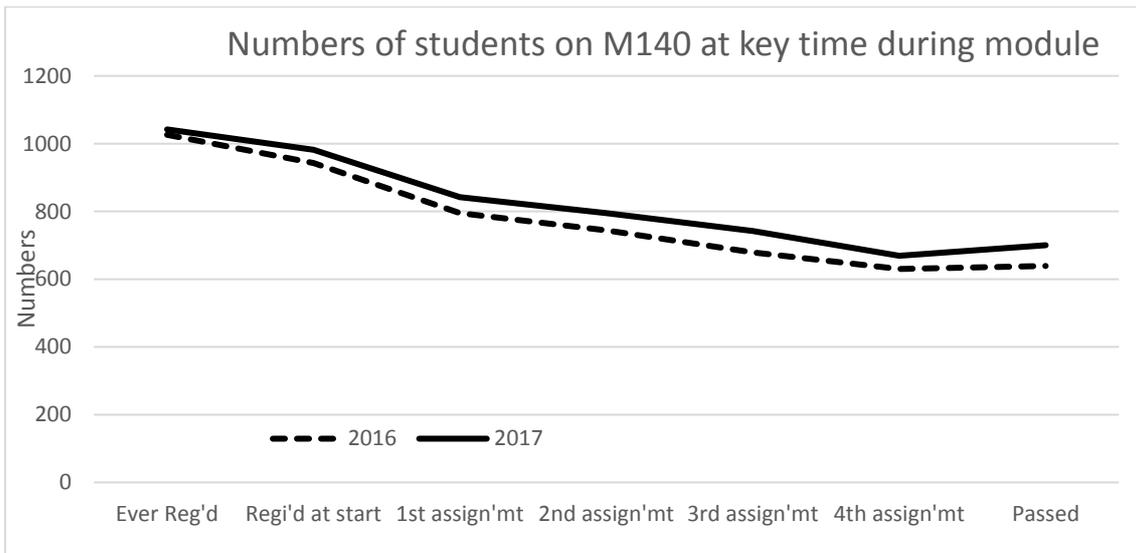
Number students	2015	2016	2017
Registered For M140 at any point	1074	1026	1042
Registered At start of M140	976	943	981
Registered at first fee liability point	919	885	935
Passed M140	685	639	687

In 2015 and 2016, 14% of the M140 registered students had withdrawn before the 25% fee liability point. In 2017, following the introduction of the flexible start programme, the comparable percentage of withdrawals had reduced to 10%.

Once a module starts there are a series of initiatives, by tutors, central support teams, and central academics to support students but, prior to module start, the only initiative is this flexible early start programme. The increase in retention prior to module start is therefore associated solely with the introduction of the flexible early start programme.

An Associate Lecturers marks four written assignments from their students during the module and there is a final written assignment which assesses work covered in the entire module. Whilst this end of module assignment is essentially similar to the earlier assignments it is not marked by the student's own Associate Lecturer and is effectively the end of module "exam". From an initial registration of just over a 1000 students slightly under 40 more students passed M140 than we would have expected based on results from previous years if the early start programme had not taken place. Students retained to the start of the module were subsequently supported during the module by various University wide initiatives and the initial gain in retention was maintained throughout the year (see figure 2).

Figure 2: Number of students active on M140 over the period of the module



Would the flexible start programme improve the pass rates for those students who registered early?

Students registered early on the module in 2017 did indeed achieve higher results than those registered early in 2015. Students who register early are not necessarily typical of all students nor are the characteristics of students who register early constant over time. For example, the amount of credit a student already has towards their qualification is an important proxy factor in the success of a student – the more the student has already achieved the more likely the student is to pass a module. In 2015 the average credit of students registered by the 22nd July on M140 was 80 credits; in 2017 it was 73 credits; and by 2017 it had fallen to 65 credits. Thus amongst students who registered early the 2017 students had less previous successful experience, equivalent to around a half a module of successful study, than the 2015 students. All other factors aside it would thus be reasonable to expect the 2017 early registered students to have a lower pass rate than the 2015 early registered students – just because the 2017 students had less successful experience. In fact amongst the 420 students registered early in 2015 there were 269 students who passed (64%); in 2016 the comparable figures were 398

registered and 256 passes (64%); and in 2017 the comparable pass rate was 66% (246 passes out of 270 early registrations).

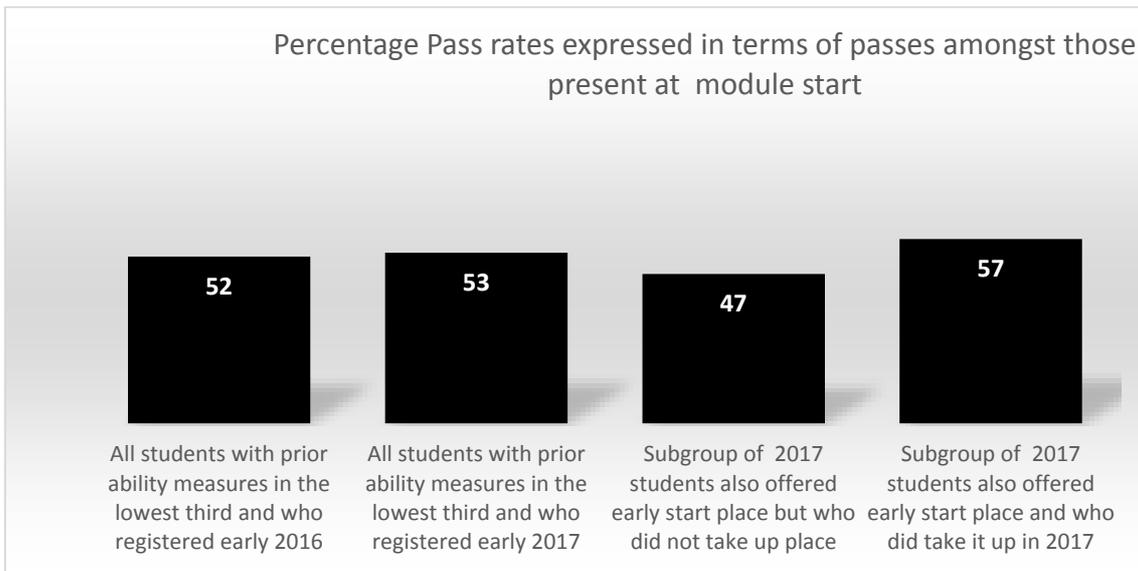
Would the flexible start programme have any impact on pass rates for “weaker” students who registered early?

Weaker students who registered early and did not take up an offered place on the programme had a lower pass rate than weaker students never offered a place. A way to identify the potentially weaker students is to use the University predicted probabilities from the same modelling process as used earlier in this study. The predicted probabilities can be viewed as a measure of “prior ability” as they are based on proxy factors, including for example the number of credits the students has already achieved, and which are known to be associated with success in passing a module.

Figure 3 shows that the pass rate for the weakest third of students who were also registered early in 2016 was 52%. For the weakest third of students in 2017, who were registered early, the pass rate was very similar at 53%. In 2017 all of this group of students were offered a place on the flexible early start programme because they had registered early. Figure 3 shows there is a substantial difference in the pass rate between those who did and did not take up the offer of an early start in 2017 – 47% compared to 57%. So amongst early registered, weaker students those students who took up a place on the programme had a higher pass rate.

The pass rate for the weakest third of all students in 2017 who were offered a place on the flexible early start programme, but who did not take it up, was 47% and this was lower than that for students of comparable prior ability who were never offered a place.

Figure 3: Pass rates for weaker students and the early start weaker students



Was the impact of the early start programme statistically significant?

significant? Logistic regression offers a way to identify whether participation in the early start programme was a statistically significant factor in retention after controlling for prior ability. The model was fitted with a positive outcome being defined in turn as

- that the student submitted their first tutor marked assignment in November
- that the student submitted their second tutor marked assignment in January
- that the student submitted their third tutor marked assignment in February
- that the student submitted their tutor marked assignment in March
- that the student passed M140.

Explanatory variables were, for each student, their predicted probabilities of passing the course (continuous) and a categorical variable, “participated”, set at -1 if the student was not offered a place on the programme, 0 if they were offered a place but declined and 1 if they took up the offer of a place. Analysis was carried out in Proc Logistic within SAS. A summary of the results are given in Table 3 and key results, having controlled for prior ability, are:

- Compared to never being offered the opportunity (coded -1) there is a consistently positive effect of being on the programme.

- There is a consistently negative effect of being offered a place and not taking it up.
- The positive and negative effects are statistically significant at the 10% level for the submission of the first assignment (10% level)
- The negative effect, in terms of passing the module, is statistically significant (1% level) for those who were offered a place on the early start programme but did not take up the opportunity..
- The positive effect, in terms of passing the module, is statistically significant (5% level) for those who in the early start programme.
- The importance of the prior ability measure increases, as expected, over the duration of the module. The measure chosen was specifically designed to predict passing the model and hence its importance ought to increase the later in the module stage.

The impact which taking part in the programme had on the submission rate for TMA01 is to be expected. The proximity of the first assignment to the end of early/flexible start programme, would account for an increase in submission rate, if participation in the programme was to have an increase in any assignment's submission rate. The logistic regression also indicates this effect occurs even after controlling for prior ability. After the first assignment the differences in assignment submissions is not linked to being on the programme once prior ability has been taken into account.

Perhaps more surprising is the result that shows the negative effect of not taking part when offered a place has in terms of passing the module. This again is significant after allowance for prior ability. This implies that the same factors which influence a student so that they do not to take up the early/flexible start option are still holding them back in terms of passing the module, but not for submission of their second, third and fourth assignment.

Perhaps this implies that a student who enrolls early and does not want to engage with materials early, is more anxious about their study. Perhaps that anxiety is apparent for the end of course assignment in a way that it is not for the “regular assignments” because it is effectively the end of module “exam”. So potentially are we seeing a version of exam nerves?

Table 3: Summary of logistic regression output

Analysis of maximum likelihood estimators	Estimate	Standard error	Wald Chi Squared	Pr>Chi Sq
November assignment				
Intercept	-0.1278	0.2310	0.31	0.58
Predicted probability of passing	3.3257	0.3921	71.93	<0.0001
Participated- code 0	-0.3179	0.1694	3.52	0.06
Participated – code 1	0.3214	0.1789	3.23	0.07
January assignment				
Intercept	-0.4219	0.2172	3.77	0.05
Predicted probability of passing	3.1606	0.3575	78.14	<0.0001
Participated- code 0	-0.2363	0.1536	2.37	0.12
Participated – code 1	0.2242	0.1549	2.10	0.15
February assignment				
Intercept	-0.8043	0.2107	14.57	0.0001
Predicted probability of passing	3.2286	0.3390	90.72	<0.0001
Participated- code 0	-0.1566	0.1437	1.19	0.28
Participated – code 1	0.1312	0.1399	.8801	0.35
March assignment				
Intercept	-1.1561	0.2080	30.91	<0.0001
Predicted probability of passing	3.1205	0.3258	92.85	<0.0001
Participated- code 0	-0.2053	0.1329	2.39	0.12
Participated – code 1	0.1065	0.1277	0.70	0.40
Pass module				
Intercept	-1.1821	0.2138	30.56	<0.0001
Predicted probability of passing	3.3675	0.3365	100.16	<0.0001
Participated- code 0	-0.3767	0.1357	7.7038	0.01
Participated – code 1	0.2623	0.1352	3.7618	0.05

Student feedback from being on the flexible early start programme

Responses from students on the programme were overwhelmingly positive with students attending online tutorials, using forums, loading and using module software, studying early Units with tutor support and setting up their own social network sites in addition to the University provided forums. Student feedback was sought a month into the flexible start programme enabling adjustments in the programme to be made and further feedback was sought at the end of the programme. A key question that was asked was the reasons for taking up the early start programme. At the time the questionnaire was issued there were 146 students on the programme and 34 responded to the questionnaire. The most frequent response, either singularly or in combination with others, was “I have time over the summer and I would like to use it for study”. The questionnaire was anonymous and hence there was no opportunity to link to actual student patterns of study. The response did however inform the decision not to offer a flexible early start programme to February start students and to build in further investigation of reasons for taking part in the future flexible early start programmes.

Additionally, a “with hindsight feedback” survey , was undertaken half way through the main presentation which started in October and this was intended to enable students to consider the value of the programme from a position of really understanding what the module involved. Two hundred and twelve students were emailed a link to the online questionnaire and 45 responded.

Table 4: Responses to change questions from the ‘with hindsight survey’ of students who took part in the flexible early start programme.

Q1: With the benefit of hindsight if there is just one thing we should change when we run the next Early Start Programme again what would it be?	Number of respondents	Q2: With the benefit of hindsight what is the one thing you thing we should definitely NOT change?	Number of respondents
Do not change anything	17	Keep as it is	17
Open up more units on M140	7	Keep the tutor	8
Enable real assignments to be submitted earlier	6	Keep tutorials	6
Have a study planner for the early/flexible start	5	Software available for loading	3
Have hard copy of units	4	Flexibility of sign up and study pattern	3
Explain the range and purpose of materials available	2	Other	2
Other	4	No response	6

The answers to the two survey questions relating to change were analysed together and the free text responses were categorised as groupings emerged. It was clear from both questions that the format of the programme had worked well and was appreciated by the students. The second question highlighted the value placed by the students on the tutors / tutorials and the “informality” of the programme in terms of sign up/ what to study and when, was appreciated.

Analysis of the free text led to two emerging themes – a reduction in anxiety for some students and a general concept of satisfaction with the programme. The following student quotes typify examples from these themes.

“I do feel more confident, as it was my first ever OU module I was anxious and didn't know what to expect until early start opportunity. “

“I have been an OU student for a great many years. During that time I have seen some good ideas come and go. But being able to start the course this early is quite simply the best idea I have seen in a very long time.”

Discussion and conclusions

A key design factor of this study was the integrated use of both qualitative and quantitative approaches. The hundreds of thousands of data items used within the predictive probabilities modelling led to the identification of a small, atypical group of students. Structured telephone interviews with this group of ten student's generated feedback that led to changes that in turn improved the student experience for hundreds of students and resulted in a measurable increase in retention.

Predictive probabilities of success, for individual students, can be used to identify students potentially at "risk" and hence focus additional support resources. This paper has, however, described two different uses of this type of data. Firstly to identify a purposive sample of students who had succeeded, despite predictable difficulties, and hence who potentially had relevant and important messages on how they succeeded. The second use has been to effectively provide a measure of "prior ability" that then was used to control for differences in initial likelihood of passing the module amongst groups of students.

Grebennikov and Shah (2013) describe the use of large amounts of qualitative feedback from students but valuable insights can similarly be gained using feedback from a carefully chosen, very small, atypical group. The focussed feedback from students who had succeed, although initially it did not look promising that they would, is not necessarily specific to the module they study.

The availability of a readily identified control group was an important element in the acceptance of the early analysis of the flexible start programme. Whilst the students on the flexible start programme were clearly more willing to engage they were only, in terms of the variables available for the predictive model, marginally more likely

to succeed. The only intervention occurring on the module between registration and module start was the flexible early start programme. It seems highly likely therefore that the increased numbers at module start are at least partially directly attributable to the programme. Potentially the success was because it gave students an opportunity to engage and engagement is a key factor in student success (Kahu,2013). Potentially the programme was acting as a “nudge” to students to start studying and potentially for others it did help reduce anxiety.

This study has identified that students registering early but not taking up an opportunity to study on a flexible early start are at greater risk of failing than other groups. This means we can target support resources towards this group.

The next steps are

- Evaluation of subsequent enrolment patterns of students who took part in the flexible early start programme.
- Repetition of the flexible early start programme with students due to start in October 2018 to establish if the findings in this study can be replicated in another year.
- Investigation via detailed telephone interviews with students who choose not to take part.
- Modification of the approach to offer an early start programme for October 2018 on a larger module with an intake of around 2,500 students compared to the 1,000 on M140.

Acknowledgments

This work was funded internally by The OU centre for STEM pedagogy (eSTEEem)
Linda Brown and Dave Edwards are Associate Lecturers who worked on obtaining the initial feedback from students who succeeded despite the odds. Colin Fulford, Mark Hobbs, Luay Salman and Tricia Terndrup are Associate Lecturers who worked on the flexible early start programme.

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