Succeeding Against the Odds

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Executive Summary

Focusing on what makes for study success is not a new research pursuit – retrospective examination of factors contributing to study success generally reveal that students who do well have a predictable social, cultural, educational and cognitive profile which places them well to succeed. Over a number of years, Open University researchers have developed sophisticated statistical models, based on very large student cohorts, to predict the likelihood of success for students studying OU modules. The models use retrospective data to identify patterns of success for students with a variety of characteristics. These studies have enabled University educational statisticians to accurately predict, even as early as enrolment, which students are most likely to be successful and which more likely to struggle or fail.

In this project data gathered allowed the authors to investigate a hitherto neglected, but important, cohort of successful students – those who really shouldn't have succeeded because all the odds were stacked against them.

This report focusses on an in-depth study of a small cohort of Mathematics and Science students who have 'succeeded against the odds' in their studies. Interviews with these students * have revealed a number of very valuable insights and practices which will provide, not only educationally vulnerable but also educationally able, students and their teachers with both practical and psychological motivational tools and techniques to promote success. The findings from the project have already been incorporated into an Induction Programme for a group of students on a Level 1 Mathematics entry module. This in turn has proved so successful that an adapted version of the Induction Session has been made available to all the students on the 2017 February start for entry level Mathematics & Statistics modules.   *

> *Funding from eSTEeM enabled the student interviews to be undertaken by two Associate Lecturers Dave Edwards and Linda Brown.*

Aims and scope of project

The aim of this project was to identify through the use of semi-structured interviews, the tools, skills, techniques and approaches used by a group of successful OU Maths and Statistics students who, at the outset of their studies, were predicted as highly likely to fail.

The plan was to capture and document any common themes and practices identified by the students as assisting their success and to use these insights in the induction and ongoing support of future student cohorts – both vulnerable and able.

Activities

Using the OU's model for predicting student success, two cohorts of educationally vulnerable students were identified, one in October 2014 and another in October 2015.

Predicted probabilities of success can be generated at various points in a module and those used in this project were generated around the end of October (after the first fee liability point). This effectively means that students were committed to their chosen module.

The project involved students on MU123 and S217. The choice of modules reflected an initial intention to look, not only for distinctive module themes, but also common themes across STEM modules and levels.

In 2014 49 MU123 and 33 S207 students were selected on the basis that they had passed their module despite their predicted probability of passing being less than 0.5.

In 2015 58 MU123 and 28 S217 students were selected because they were still active 'on module' students at the final fee liability point for their module in April 2016 despite the fact that their predicted probability of successfully reaching this point was less than 0.75.

Different criteria were used in the two cohorts. This reflected the requirement that in order to conduct a survey of students it is necessary to have the agreement of the University Student Research Project Panel (SRPP). This was sought in January and the application was referred to the OU's Human Research Ethics Committee (HREC) due to the use of predicted probabilities in identifying potential participants in the project. This additional loop- with the supply of extra information and the referral back then to SRPP- delayed the planned initial start from January 2016 to Mid-March 2016. However, with the final fee liability point being at end April 2016 for the 2015 cohort, it was decided to further postpone the start. This enabled the use of predicted probabilities generated for the final fee liability point rather than, as originally intended, the interim fee liability point at end December 2015- effectively allowing the use of more current data.   Interviews therefore commenced in May 2016 rather than as originally designed in January.

Having gained permission from the University's Student Survey Panel (SRPP) and the University's Ethics Panel the student cohorts identified as having 'succeeded against the odds' were contacted and invited to take part in semi structured, one to one telephone interviews.

Two experienced Associate Lecturers (ALs) were recruited to conduct the student interviews and to be involved in the analysis of information together with identification and development of future actions. The SRRP required a substantive amount of formal information to be emailed to students enabling them to decide if they wished to participate in the project. Therefore initial contact had to be via email and effectively led to a low response and massive bias in response. As this email was likely to be regarded as a 'General OU mailing' and not from the student's own tutor, this may have contributed to the bias. After the initial email, if there was no response, the ALs sent a more informal, personal email to the students.

Respondents were required to provide (formal) agreement to participate in a telephone interview. Ten semi- structured telephone interviews – six from the combined 117 MU123 sample and four from the combined 61 S207/S217 sample were completed.

The project lead held a meeting, with the two ALs, to refine the questions. A second online meeting was held, after two interviews had been completed, to compare the suitability of the approach and make any adjustments or refinements. Annex 1 contains the interview schedule that was developed. However as the intent was to capture student views on why they had succeeded the priority was to allow students to say what they wished and therefore the list in Annex A was only used as a prompt rather than a set question list. A summary of the conversations was produced by the interviewers rather than making a recording to keep the sessions informal. Students were offered a copy of the summary of the conversation for comment before it was regarded as a concluded interview.
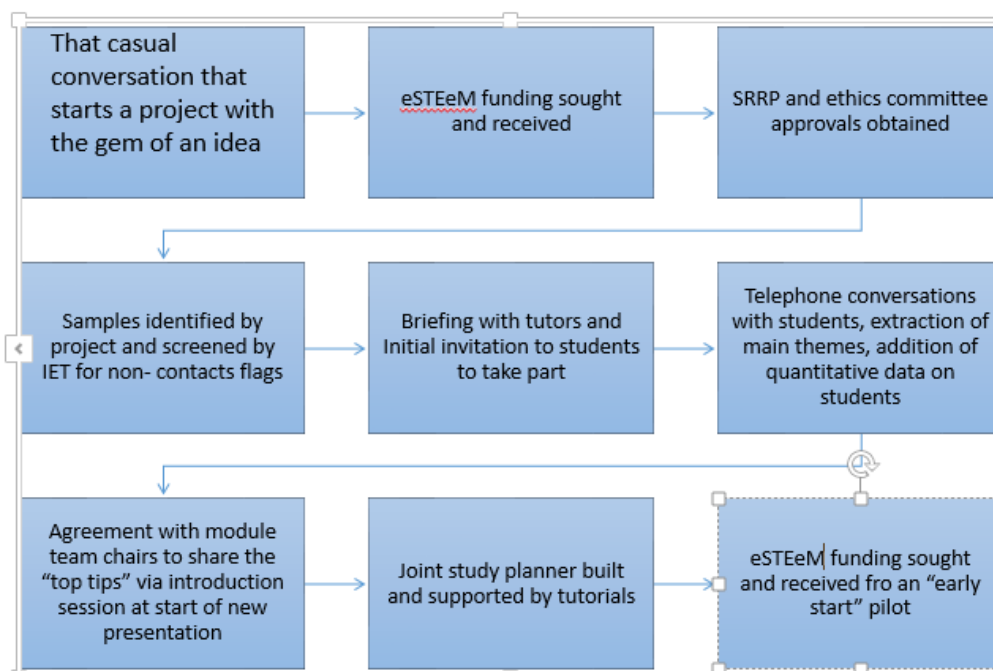
Finally the reasons why the predicted probabilities were so low for the student were added to the interview summary. In some, but not all cases, this confirmed information given to the tutors. This information was not provided to the tutors prior to the interviews so that such information to limit interviewer influence on the student's story.

The interviews were carried out and yielding a significant amount of qualitative data which was analysed to identify any common themes or practices used by the students to overcome their apparent inherent study disadvantages.

Early findings were captured and shared with relevant Module Chairs who agreed to the use of the findings being incorporated into student induction sessions.

This process is summarised in the diagram below.

Figure 1: Project Stages

That casual conversation that starts a project with the gem of an idea	→	eSTEeM funding sought and received	→	SRRP and ethics committee approvals obtained
Samples identified by project and screened by IET for non- contacts flags	→	Briefing with tutors and Initial invitation to students to take part	→	Telephone conversations with students, extraction of main themes, addition of quantitative data on students
Agreement with module team chairs to share the "top tips" via introduction session at start of new presentation	→	Joint study planner built and supported by tutorials	→	eSTEeM funding sought and received fro an "early start" pilot

Calvert, C. (2017) *Succeeding Against the Odds*. eSTEeM Final Report.

Findings

The aim of the study was to gain insights, via a qualitative approach, into how students felt they had managed to succeed in spite of the odds being stacked against them.

There will be considerable respondent and gender bias in the findings given the low response rate to the invitation to participate (6%) and the gender composition of the cohort of students interviewed. Whilst the initially identified cohort had a roughly 60:40 split between males and females the final participant sample had an 80:20 male: female ratio.

This is qualitative rather than quantitative research but , even so, it has to be acknowledged that generalisations from small, biased samples are not possible. However, even with the small sample and recognised biases the findings were extremely valuable and there were clear themes which have been captured for the benefit of future students preparing for and persevering with their studies.

The students who did respond were overwhelming positive about their OU study experience. Themes, from the interviews, were identified separately for MU123 and S217. These themes were then compared and common themes identified. In essence the AL interviewers identified that these successful students were characterised by a clear and characteristic "can do" approach.

 Two very clear themes emerged;

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

Student's Top Tips for Study Success.

The students were specifically invited to identify three top "tips" for future students and eight of the ten respondents did so. These are summarised below and formed the basis of sessions with new students on the October 2016 presentations of entry level Maths / Statistics courses;

1. Start early!
2. Get networked! Join a Facebook group. Pair up with a study buddy. Make good use of forums;
3. Familiarise yourself with and use the student study planner;
4. Don't be scared or threatened by it at the beginning, it is not as bad as it looks!
5. 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
6. Stick to good methodology and take a business-like approach.
7. Make contact with your tutor and be ready to discuss areas of difficulty with them
8. Go to the tutorials
9. Don't be afraid to try different ways of learning to see what works
10. If returning to study, don't be too hard on yourself;
11. Be prepared to persevere - put in the work and you'll enjoy it.
12. Make sure you fully understand each concept before moving on rather than just remembering how to apply e.g. a formula;
13. Remember you need a break sometimes
14. Above all else enjoy the module

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Impact

The impact of the project has been achieved at a number of levels.

1. The interview transcripts and outline findings have been shared with relevant module chairs.
2. OU Live Induction sessions have been set up with students new to Maths and Statistics study to share the "tips" from the study success insights gathered from the project participants
3. From student insights shared it was identified that an additional integrated MST124 and M140 study planner should be developed and supported by appropriately timed tutorials
4. A pilot for M140 students to start the module "early" is running from 1st July 2017

1. Involvement of Module Chairs

Module chairs are key stakeholders in research projects of this kind and sharing findings with them and gaining their views is of enormous value. This is especially true if the research provides insights on module presentation, structure and content. The small group of students involved in the project were overwhelmingly impressed with the way OU study materials provided them with valuable scaffolding for their studies – the study planner and the 'step by step' structuring of the module was very valuable to them as potentially educationally inexperienced and vulnerable students. They encouraged other new students to make use of these key elements of OU modules.

2. OU Live Induction Sessions

The key messages of getting organised and using the study planner were incorporated into a pilot 30 minute OU Live Induction presentation – with an additional 30 minutes for questions- geared at 16J students new to Mathematics and Statistics study .   The pilot for the 16J presentation was so well received that that it was rolled out to all 17B students on entry level 1 Maths and Stats modules. The 17B sessions were run by the members of the relevant module teams and offered pre module start.

The sessions introduced key study resources from the module materials and specifically focussed on the module study planner and the top tips identified by the students who had participated in the project.

The slides included key motivational messages from project participants

> "The module is do-able as it takes you step-by-step through the concepts;

> "Take a business-like approach"

> Go to tutorials!"Face-to-face tuition was fantastic. It really helped provide motivation and allowed discussion of interesting aspects of the material.

> Enjoy the module!"

Polling of students was used at several points during the OU Live Session-

*   to check they had received materials;
*   to see if they had responded to a welcome email from their tutor;
*   to see if they had seen the module website

- to see if and how they were using the study planner.

3. Developing an Integrated MST124 and M140 study planner

A clear message from the students in this project was around the importance of getting organised. The study calendar is a key element the OU provides to help students with organisational issues around study but it is module based. For students studying more than one module concurrently the study planners are of more limited use. We have over 400 students studying MST124 and M140 concurrently and hence we have piloted a joint study calendar, with associated tutorials, in 16J.

It was difficult to inform students of the alternative study calendar and tutorials. Student feedback already gathered from those attending the associated alternative tutorials includes the following quotes and the AL delivering the tutorials is very positive about the help he felt it provided the students.

Quotes from students include:

"I like the joint study planner, it gives me something to work to and I like the structure…. I think it is very helpful to have the tutorials at the same time that we are studying the module"

And

" I personally have found the joint study planner extremely helpful. I think it has been planned out well because it allows me to fully concentrate on a single unit at a time. I can't think of any negatives so far. I will be taking an extra module (MST125) in February 2017 and most likely will have to incorporate it on to my joint planner."

As a result we have a 17B joint study planner and the timetables for TMAs has been adjusted to make it easier for the students to deliver TMAs on time for both MST124 and M140.

It is hoped that the findings of this project will have value in supporting and motivating all new students not just those who appear vulnerable. The students in the project provided confirmation of the value of OU study planners and insights gained from their comments has directly influenced the production of a new integrated planner for students studying two popular modules, (MST 124 and M140) concurrently

4. M140 "Early start pilot"
There is an eSTEem funded pilot running from the 1st July 2017 to mid-September 2017 for students who have registered (PA status) for M140 17J. These students will be offered an opportunity to start M140 early with tutor support. Students who had registered by 1st June (170) were identified by the project and contacted directly with the offer of an opportunity to participate.   Over 50 responded positively within 24 hours. Voice records will be updated to indicate the student has taken part and they will transfer to their allocated tutor in mid-September.

List of deliverables

"What's in the box": PowerPoint imported into OU live for M140 Introduction session which includes many quotes from students

To be added – Project accepted for presentation at HEA's Annual Conference: *Generation TEF: Teaching in the spotlight* being held on 4-6 July 2017 at Manchester Conference Centre.

Figures and tables

Figure 1: Pre survey to survey to wider group

Table 2: S217 Predicted probabilities by level of previous maths study

References

Carol.Calvert (2014**) "Developing a model and applications for probabilities of student success: a case study of predictive analytics"** Open learning Vol 29, No.2, 160-173.

Addititional qualatative analysis for S217

Key factors identified by running one of the predictive models specifically for S217 were:

> *- the number of credits the student has already accumulated ;*
>
> *- if the student registered late (negative effect if late)*
>
> *-number of modules previous failed;*
>
> *And credit transfer or not (Positive effect if yes)*

An additional factor was then defined as the highest previous OU Level 1 maths module studied prior to S217 study. When OU **maths module** factor was introduced to the model the (significant) key factors, in order of importance, were:

- *OU Maths module*
- *the number of credits the student has already accumulated*
- *if the student registered late (negative effect if late)*
- *credit transfer or not (Positive effect if yes)*
- *the number of modules previously withdrawn from.*

The model therefore identifies that the single most important factor influencing passing S217 is the type of maths module previously taken.

The students who take S217, without taking an OU Math module, will have a variety of mathematical experience with varying degrees of currency and hence it is very difficult to determine where they are in a hierarchy of Maths qualifications. In terms of the initial predicted probabilities of success on S217 - table 2-   there is clear evidence that students without an OU maths module prior to S217 tend to do less well.

Table 2: S217 Predicted probabilities by level of previous maths study	MST125	MST124	S141	No maths module
Average predicted prob. of passing s217	0.67	0.67	0.61	0.51

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Annex 1: Semi Structured interview agreed format

Introduction

- Introduce self as researcher
- Thank student for agreeing to take part; emphasize benefit of reflection
- Confirm student has read 'Information Sheet', particularly 'Aim' and 'Information required'
- Confirm student happy to proceed; Well done for passing / getting past fee point in module

1. Why did you wish to study <module name >?
    - motivation; background; aspirations; pathway
2. How did you feel at the start of <module name>?
    - worries; strengths; weaknesses; maths background;
    - previous study & when; first OU module?
3. What were your expectations at the beginning? Did you expect to be a successful student?
    - try and ascertain what 'successful' means to this student
4. How well prepared did you feel?
    - obstacles to overcome; family pressures/expectations/encouragement
5. How did you find it? Was is what you expected?
    - Pick up points from above section; worries realised?
    - Did strengths help?
6. What difficulties did you have? What did you find challenging?
   About the module (particular topic)? About the process of studying?
   Why was this? How did you overcome them?
    - see topic list for <module name> ;
    - time management, understanding written texts, online aspects,
    - assessment, contact with tutor.
7. What went better than expected? Why was this?
    - Any useful module stuff? e.g: texts; activities; video clips; quizzes; study schedule
8. Is there any one thing about you that made you determined to carry on?
9. Is there anything the OU did that strengthened your resolve? Or weakened your resolve?
    - interventions; tutor contact; assessment feedback; SST; forums; other students; tutorials
10. Would you say that anyone else inside or outside the OU played a role in keeping you on course?
    - e.g. support from family & friends, other students, tutor
11. How did you feel when you completed the module?
12. Did you consider yourself successful?
    - pick up points from question 3.
13. What are you taking from this experience to further study/work?
    - anything that stands out from the middle section relate to background in first section
14. Has it changed your expectations?
    - pick up points from question 3
15. Do you have a message for students thinking of studying <module name> in the future?

Conclusion

- Many thanks for taking the time and effort to reflect on your studies and tell me about your experience…
  e.g. brilliant nuggets of information there, etc.
- I will send you a copy of the interview notes.
- Do you want a copy of the research when done?
- Best of luck in your future studies and beyond!

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Annex II: Respondents comments used in 16J presentations

Slide 3/18

You've signed up

There were two main messages that came out strongly from talking to your peers last year:
- Adopting a positive 'can do' attitude to studies, willing to try out different approaches;

    and
- Getting organised and making full use of what the OU provides, particularly the study planner.

Slide 10/18

MU123 Website → STUDY PLANNER

Tips and ideas:
- Be willing to try different strategies when planning and organising your studies. Also be aware that you might not find something that works straight away and it's all about finding methods and approaches that work for you.
- Put aside time for planning, reflection and monitoring your own progress.
- Adopt a business-like approach to study: set clear goals; find the right environment in which to study (without distractions); identify which are your best times to study; develop the discipline of good time-management.
- Use any management skills you already have, e.g. from the workplace, to deal with study intensity and organisation.
- Be consistent - a relatively modest amount each day (rather than a large amount every now and then) seems to build confidence and stamina and you are less likely to "run out of steam" when the study gets more difficult, particularly towards the end of the module. Also remember to take a break from time to time. In other words, pace yourself.
- Develop and improve study skills, e.g. studying maths texts, strategies for when you get stuck, asking questions of tutors, note-taking at tutorials, discussing and communicating maths.

Slide 13/18

Exploring the study planner further....

Tips and ideas:

- Have a copy of your study schedule to hand; know where you are in the module. You may need to adapt the study planner to suit the way you work.
- Work ahead of schedule if you can, particularly in the early days, but ensure you don't miss important dates.
- Have a warning system in advance of an important deadline (TMA, iCMA, EMA, Tutorial), e.g. an alert on your mobile phone, put in outlook calendar or diary.
- Plan what you're going to study, when and where, dependent on what you find works best for you.
- Plan ahead for periods when study time may be restricted, e.g. periods away from home.
- Slipping behind schedule can be demotivating. If this does happen, contact your tutor at an early stage as soon as problems start to arise.
- Make full use of the additional resources to complement the study text. Our students used these to explore, clarify and revise topics, particularly when they found them difficult to follow in the text. The quizzes are considered good practice for iCMAs, and the activities suggest forms of words when writing up TMAs. Students found the video clips of lectures very useful.
- Tick off each bit in the schedule as you complete it.

Slide 15/18

Our students' tips include:

Messages from students:

"Don't be scared or threatened by it at the beginning, it's not as bad as it looks!"

"Make sure you fully understand each concept before moving on, rather than just mechanically remembering how to apply, e.g. a formula. Deeper understanding contributed to the enjoyment of the content."

"The module is do-able as it takes you step-by-step through the concepts; enjoy the module!"

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Tutorials

Our students outlined the following as the main benefits of attending tutorials as:

- Gaining valuable support from an MU123 tutor
- Meeting with other students; you may be able to find a 'study buddy' or form a study group.
- Opportunity to discuss ideas and ask questions.

Remember that tutorials are part of the module package to help you succeed. These may be held online (accessible from the MU123 website) or face-to-face at various venues; sign up on your StudentHome page. They aim to review and illuminate the material that you have been studying, as well as covering communication and study skills.

Messages from students:

- One student said that he missed the support of tutorials when he couldn't attend.
- "All of this face-to-face tuition was fantastic. It really helped provide motivation and allowed discussion of interesting aspects of the material. Go to tutorials!"

Tutor

In our student interviews, support from the tutor didn't feature as strongly as we thought it would. The thoughts of students who did mention it are as follows:

- Be proactive and open the dialogue with your tutor at an early stage. One student felt that he needed feedback at an earlier stage than the first TMA. One suggestion is to send in a dummy e-TMA (TMA00) early on with your solution to an exercise in MU123 that you have found challenging.
- Discuss areas of difficulty with your tutor when studying the material
- When you receive your marked TMA, use the feedback to confirm what you have mastered (tick this off) and to revisit the areas where you need to improve your understanding. Contact your tutor if there's anything in the feedback that you don't understand. Note down any learning points to be put right in the next TMA. Build this into your plan.

One student that he was 'amazed' at the amount of feedback received (marked TMA) and described it as 'complete'.