Typical Support Seeking Behaviour of STEM Students, their Outcomes and Successes

eSTEeM Final Report

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Content

Executive Summary

The importance of personal, non-academic support of students especially in a distance learning environment is well documented in the literature. An HEA report (Jacklin et al, 2007) stated that the way that support is provided and organised is important and negative experiences result from delays in students receiving a response. Students indicated that it can be difficult to commence their studies and managing students' expectations versus the realities of life in Higher education can be a challenge at the start of a module. In the report recommendations it stated the importance of knowing who to contact, where to go and what support is available. This is backed up further by Simpson, (Simpson, O., 2018) in chapter 3 he states that:

'A good adviser will also use his or her experience and skill to help the student clarify and conceptualize the issue or problem, as well as challenging the student's perceptions when appropriate.'

This project investigated student-initiated interactions with the OU in terms of volume, nature and composition to understand the potential links between the successful resolution of these queries and the students' academic performance on STEM modules. The investigation focused around the crucial 6 weeks from the final enrolment date through to the submission of the 1st assignment in a module in 2 consecutive academic years 21/22 and 22/23.

Data from the academic year 21/22 was examined, from our findings several groups were identified as not performing as well in their initial assignment following a slower response to a query. These results were shared with colleagues in the student support team and the personal learning advisers who offered a coaching service to our students.

The personal learning advisers contacted students in one of our identified groups, black students, earlier in the 22/23 academic year than they did in 21/22. The data from the 2 academic years has been compared and recommendations made on the effectiveness of this earlier intervention.

Aims and scope of the project

Introduction

This project investigated student-initiated interactions with the Open University in terms of volume, nature and composition to better understand the potential links between the successful resolution of these queries and the students' academic performance. The period covered was the 6 weeks from final enrolment date to the first submission deadline.

In line with the OU's Access, Participation and Success (APS) strategy, we examined the contacts that students make with the student support team in the time between the final enrolment date and the first submission date. The aim being to identify sub-groups of students based on protected characteristics where improvements would be made to their study outcomes following these contacts. The focus was then on making recommendations of how student outcomes could be improved. An examination of this data in this manner hasn't been carried out before in the OU.

General Background

The importance of personal, non-academic support of students especially in a distance learning environment is well documented in the literature. Main findings in an HEA report (Jacklin et al, 2007) were that the way that support is provided and organised is important and negative experiences result from delays in students receiving a response. Students indicated that it can be difficult to commence their studies and managing students' expectations versus the realities of life in Higher education can be a challenge at the start of a module. In the report recommendations it stated the importance of knowing who to contact, where to go and what support is available. This is backed up further by Simpson, (Simpson, O., 2018) in chapter 3 he states that:

' A good adviser will also use his or her experience and skill to help the student clarify and conceptualize the issue or problem, as well as challenging the student's perceptions when appropriate.'

The Open University context

Direct student contact occurs within Academic Services through a variety of mediums, covering a multitude of topics and at different points in time. This project investigated those interactions in order to understand the overall position of our dialogue with students. To manage the volume of contacts the investigation was focused around the crucial 6 weeks from Final Enrolment Date through to the submission of the 1st assignment in a module. With a baseline established the work moved into cutting the understanding by APS characteristics to see if they impact on the baselines. It was critical to understand the outcomes from this. Given the wide nature of this work, we chose to focus on queries relating to STEM specific modules/qualifications. Furthermore, it was important to understand how these interactions impacted upon the success the students have. Success for each of the categories of interaction meant something totally different based on the content and timing of the interaction. This needed to be understood to ensure that we could measure the differences in outcome for students.

From this investigation we developed a series of recommendations which augment the directed interaction between the university and the student. Having identified a group of students (black students who registered late on a module) to focus on we first of all had discussions with the AD Academic Excellence and a Senior Manager in the Student Support Team before we approached the Personal Learning Advisor Service with our recommendations. They piloted a series of interventions in the academic year 21/22 for this sub-group of students. We have integrated their outputs from their interventions with our recommendations from this project.

Based on research to date, at the Open University and further afield, there appears to have been limited investigations carried out to understand the nature of student interactions in this fashion. The outcomes will add to the limited scholarship work which has been undertaken up to now in this area.

Project aims.

The overall aim of the project was to address the differences in service, and subsequent success, that students experience which relate to their characteristics and queries they have. This was split into several objectives.

1) Identify categories, frequency and patterns of contact by students. Determine measures of success for the categories of interaction.
2) Understand the performance differences for students based on their characteristics to limit a focused subset of activity to investigate.
3) Apply to SRPP & HREC for relevant permissions before commencing qualitative research.
4) Conduct qualitative research with staff and students regarding cases relating if notable differences in performance are identified.
5) Generate and prioritise a set of recommendations to improve the notable differences in performance.
6) Review the outcomes of the pilot to understand the impact.
7) Disseminate the work done and the results acquired throughout the entire project to relevant stakeholders within the university and externally through conferences, published paper.

Activities

The overall aim of this project was to identify ways of better supporting students who contact the student support team so that ultimately they will have improved success in ther studies and pass their assessments. This will help the university close awarding gaps for vulnerable groups of students. The project was conducted in several phases, the activities undertaken in each phase are described below.

For the October presentations (J) in the academic years, 2018/19, 2019/20 & 2020/21, analysis was carried out of all incoming service requests (contacts from students) to the STEM Student Support Team. Direct student contact occurs within Academic Services through a variety of mediums, covering a multitude of topics and at different points in time. This project investigated those interactions in terms of volume, nature and composition in order to understand the overall position of our dialogue with students. To manage the scale of the work the investigation focused around the crucial 6 weeks to Final Enrolment Date through to the submission of the 1st TMA in a module. With a baseline established the work then moved into cutting the understanding by APS characteristics to see if they impact on the baselines.

It was important to understand how these interactions impacted upon the success the students had. Success for each of the categories of interaction meant something totally different based on the content and timing of the

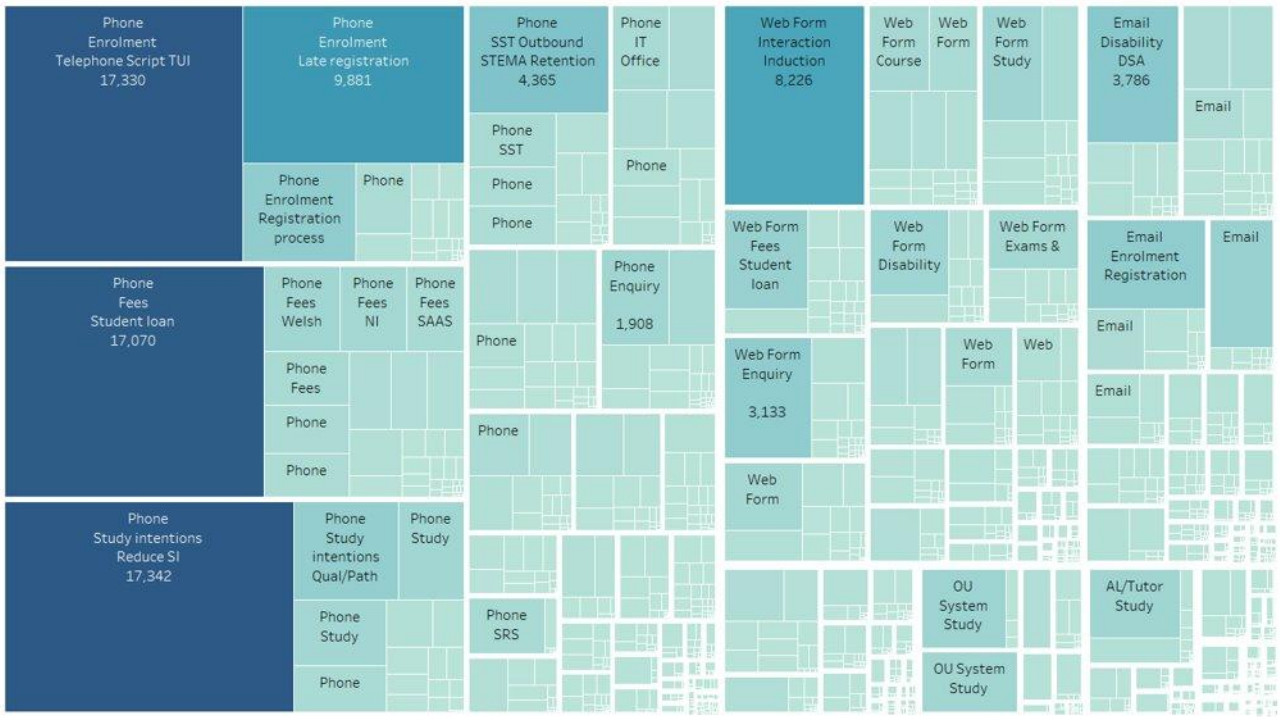
interaction. This needed to be understood to ensure that we could measure the differences in outcome for students.
During this period interim results were shared at the eSTEeM conferences in May 2022 (poster) and a presentation at the 2023 eSTEeM conference, with STEM staff tutors at their conference in March 2023 and at the AL EDIA conference in May 2023.
Data from the academic year 21/22 was examined, from our initial findings several groups were identified as not performing as well in their initial assignment following a slower response to a query. These results were shared with colleagues in the student support team and the personal learning advisers who offered a coaching service to our students. The Personal Learning Advisers were planning to contact students in one of our identified groups, black students, earlier in the 22/23 academic year than they did in 21/22. The data from the 22/23 academic year was evaluated and compared to the academic year 21/22 with a view to making recommendations of how effective this intervention had been.

Findings

Direct student contact occurs within Academic Services through a variety of mediums, covering a multitude of topics and at different points in time. This project investigated those interactions in terms of volume, nature and composition in order to understand the overall position of our dialogue with students. To assist the focus of the work the investigation concentrated on the crucial 6 weeks to Final Enrolment Date through to the submission of the 1st TMA in a module. With a baseline established the work moved into cutting the understanding by APS characteristics to see if they impact on the baselines. It was important to understand how these interactions impacted upon the success the students had. Success for each of the categories of interaction meant something totally different based on the content and timing of the interaction. This needed to be understood to ensure that we could measure the differences in outcome for students. In this context, success was measured by the students TMA 01 score.

Initial data analysis using tableau produced the following results.

Figure 1. The most popular combinations of query.



(note the dark blue larger boxes indicate higher volumes of queries, the lighter blue smaller boxes indicate lower numbers of queries.)

As represented in the graphic above there were over 1800 combinations of source, type and specific area for queries. Phone was the majority contact point for students. Queries were based around multiple topics but Enrolment was the most popular type. See figure 2 for further breakdown of the queries by method of contact.

Figure 2. Methods of contact with the Open University.

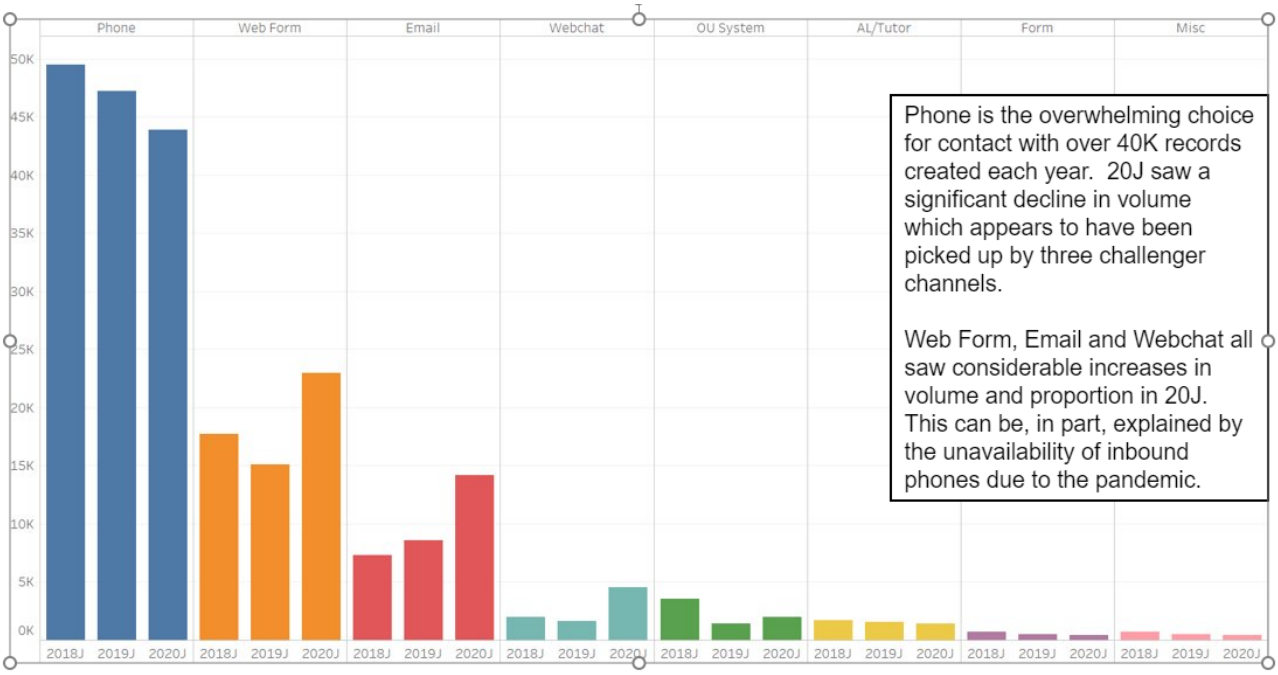


Figure. 3 shows which topics received the most queries.

Figure 3. Number of queries received by type.

	2018J	2019J	2020J
Fees	13,051	14,981	15,863
Enrolment	12,185	10,263	19,792
Study intentions	12,893	11,758	12,729
IT	5,693	4,956	5,141
Enquiry	4,891	3,871	5,767
Disability	4,409	4,958	4,604
Course materials	3,652	4,991	4,567
Interaction	4,249	1,795	2,371
Personal Admin	2,425	2,575	3,256
Study issues	2,813	2,765	2,576
Exams & Projects	1,494	1,611	1,513
Qualifications	863	1,031	1,549
Credit transfer	562	682	2,179
Course choice	1,078	800	1,142
Assignments	1,012	978	1,006
Administration, Apprenticeship...	589	1,155	1,096
Study Check	2,215	218	9
Misc	629	624	884
Tutorial	949	480	379
SRS Outbound	907	437	254
Library	531	621	442
Careers	332	610	395
VLE Feedback	327	515	480
Tutor	403	371	439

SR Area	
Student loan	20,803
Reduce SI	20,219
Telephone Script TUI	17,389
Late registration	11,479
Induction	8,226
Registration process	7,362
DSA	5,217
IAG	5,065
Office 365	4,073
Disability Support	3,163
Information	2,509
Qual/Path	3,047
Advice/Guidance	3,029
Reference request	2,866
Study Related Costs	2,697
Financial help	2,604
Welsh Student Loan	2,598
Tutor referrals	2,301
SAAS PTFG (Scotland)	2,274
Module Websites	2,242
Course related information	2,227
Module change	2,129
Module software	2,043
Grand Total	135,562

The top 10 Types reveal that there is a spread of topic Areas.

Over the 3 presentation periods Student Loan and Scripted TUI conversations rank highly. Outside of these conversations regarding Reducing Study Intensity rank highly.

This view indicates several Areas to be investigated in order to understand what the performance and success for cohorts could be

(Key - Darker blue indicates higher numbers of queries and lighter blue indicates lower numbers of queries. TUI stands for Task user interface, DSA, disabled students allowance and IAG, information, advice and guidance.)

Based on the data in figure 4 the areas identifed for further investigation were, Student Loan, Reduced Study Intensity (reduce SI) and Late Registration.

Figure 4 The topics that received the highest volumes of queries.

	Volume	Avg. Age	Time to Close	Avg. TMA01 Score
Student loan	20,803	33.1	11.8	74.8
Reduce SI	20,219	34.2	1.9	75.4
Telephone Script TUI	17,389	32.4	0.3	74.7
Late registration	11,479	32.5	3.5	74.4
Induction	8,237	32.2	0.0	83.9
Registration process	7,362	33.0	7.2	77.5
DSA	5,217	34.8	6.2	73.5
IAG	5,123	33.3	7.5	72.3
STEMA Retention	4,395	32.1	1.4	73.6
Office 365	4,073	34.8	0.8	78.0
Disability Support	3,163	34.3	17.2	75.3
Information	3,085	35.3	2.4	76.2
Qual/Path	3,047	33.8	5.7	78.4
Advice/Guidance	3,029	34.7	5.3	72.4
Reference request	2,866	30.8	5.1	77.4
Study Related Costs	2,697	34.2	7.3	70.7
Financial help	2,604	33.3	5.6	72.6
Welsh Student Loan	2,598	33.6	2.8	71.0
Tutor referrals	2,301	30.2	2.1	68.4
SAAS PTFG (Scotland)	2,274	32.5	5.5	76.2
Module Websites	2,242	41.2	2.5	78.7
Course related information	2,227	33.7	4.0	76.4
Module change	2,129	34.9	1.8	77.5
Check Point 1	2,112	32.6	4.6	70.6
Module software	2,043	39.1	1.9	77.4
Grand Total	142,714	33.4	4.6	75.6

Based on the data areas for further investigation are as follows…

- Student Loan
- Reduce Study Intensity
- Late Registration

These three areas have a high volume of records. Student Loan has a very high "time to close" which might provide scope to improve.

(Key - Darker blue indicates higher numbers of queries and lighter blue indicates lower numbers of queries. TUI stands for Task user interface, DSA, disabled students allowance and IAG, information, advice and guidance.)

Identifying target demographic areas were based on a couple of approaches. Each of the 3 service request topic areas were first cut by the demographics:

- Age
- Ethnicity
- Gender
- Carer
- Disability
- Low Previous educational qualifications (PEQ)
- Low socio-economic status (SES)
- Student in a Secure environment (SiSE)

The performance of each demographic was split by 2 variables

- Days to complete the service request
- Average TMA 01 score

See the attched powerpoint presentation for a summary of the analysis.

For **Student Loan queries**, students aged over 50 saw a negative impact on their performance. Their average TMA 01 scores were between 2 and 5 marks lower than the entire cohort. The time taken to answer their queries is the longest across all the age ranges. Students from an Arab, Asian Other and Black Other backrounds who had student loan queries also had negative impacts on their performance in TMA 01. Although the numbers involved were small, their TMA 01 scores were between 2.5 and 4 marks lower than the entire cohort. Students in Secure Environments with Student Loan queries gained scores 1.3 marks lower than the entire cohort and experienced lengthy waits for responses of more than 35 days.

For **Study Intensity queries**, students from a Black Other, Gypsy/Traveller and Pakistani background had queries which negatively impacted on their performance. Their average TMA 01 scores were between 2 and 14 marks lower than the average for the entire cohort. For the Pakistani students their queries took much longer to answer than average. In this category, students with a disability were negatively impacted on their TMA 01 score, their marks on average being 0.4 marks lower and their queries took longer to answer. Given the large number of students in this category, action to answer these queries quicker could significantly improve the outcomes for these students. Students with a lower socio-economic status recorded TMA 01 scores 0.5 marks lower than average and recorded scores lower than all other categories of students with Study Intensity queries.

For **Late Registration queries**, students from a Black background (Caribbean, African and other)experienced a negative impact on their performance in TMA01, their average score was 12.3 marks lower than the entire cohort average and represented the widest gap against the other types of queries. Students in Secure Environments were negatively impacted by Late Registration queries, more than other query types and their queries took on average 1.6 days longer to be resolved.

For the second phase of the project we decided to focus on the Late Registration of Black students as there scores were 13.5 marks below that of the average on TMA01 and the time taken to answer their queries was 2 days longer than average. Given the relatively small numbers of students this was a manageable cohort for the project.

At this point we shared our initial findings with Operations Managers in the STEMA Student Support Team and, separately with the Personal Learner Adviser team. The team were already supporting Black students and they informed us that they would be carrying out earlier interventions on 2022J which would coincide with our focus on the 6 week study period between final enrolment date and the first assignment being submitted.

Following the Personal Learner Adviser intervention we re-evaluated the data for 2022J against that of students who would have experienced the intervention. The students are therefore called “Before” and “After” based on the time they interacted with us and whether they experienced the intervention as such.

Figure 5. The scores of students in TMA 01 with a late registration versus all other queries by ethnicity group.

Firstly, looking at average TMA Score for students in the **Late Registration** group, we can see several differences. For many cohorts of student the performance differences (compared to all types of query) after the intervention are much more volatile. In the original data, whilst scores vary, differences are limited. After the intervention much wider gaps can be seen. Some of this could be attributed to stark volume differences in the data being compared. There are only 3,000 Late Registration records after the intervention and some of the defined groups contain only several hundred records. However, for Black

students, the difference seen for Average TMA 01 Score is the lowest (-2.3 marks) and much closer to the overal difference (-1.5 marks). Further, whilst average score for this student group with a Late Registration has not changed since the intervention, all other groups are much lower than pre-intervention.

Figure 6 The length of time it takes to close a late registration query versus all other queries by ethnicity group.

The second performance measure we checked was the time to close queries regarding Late Registration for our target group. Comparing the before and after metrics more generally there is little change in the time to close for Late Registration and the gap to other queries more generally. There is, however, a large change for the Black student group. Whilst the gap to close queries has closed to only -1.8 days the time to close, for Late Registrations, has increased from only 3 days before to almost 7 days after the occurrence of the

intervention. Again, there are caveats regarding the sample size for this group and comparison but the evidence indicates a decline in the experience for students.

One final piece of evidence to understand is that the proportion of Black students experiencing Late Registration (compared to all queries) has declined. Before intervention is was 5.6%. After intervention this dropped to 3.6%. This compares to the whole cohort changing from 5.7% to 3.8%. So Late Registrations have declined more widely but slightly faster for Black students.

Impact

This project has an impact on the student experience as the data has shown that there is a link between how quickly a student has a query they make to the student support team answered, and their performance in TMA 01. The students most impacted by this were Black students who were registered late on a module. In the academic year 22/23 the Personal Learning Adviser service offered early interventions to Black students. We evaluated this intervention by re-evaluating the data we had examined for the previous academic year. Based on these analyses our recommendations are:

- **Targeted Early Interventions**
- Introduce 'Personal Learning Advisor' style interventions to other high-risk or vulnerable groups in topic areas pertinent to them, for example Student Loan Query assistance for students over 50
- Use predictive analytics to flag students for proactive outreach so we can head them off before becoming a Late Registration or High Study Intensity query.
- **Accelerate Query Resolution**
- Introduce dedicated specialist support teams for specific groups for processes and/or groups
    - Review enrolement policies to identify structural barriers for groups experiencing excessive delays
- Develop tailored guidance for staff that allows them to be supportive and sensitive to queries that may cause delays for student groups

- **Communication**
    - Develop clear, timely and accessible communication to students around key processes
- Augment support to be multilingual and multimedia to reach a diverse range of students who consume information in different ways

Further, future possible research questions could include :

- How do students' socio-economic and demographic backgrounds influence their preferred method of contact (phone, email, chat) and does this affect query resolution and outcomes ?
- How do intersecting identities (e.g., ethnicity + disability + low socio-economic status) influence the nature and impact of student support queries ?
- What are the long-term academic outcomes (e.g., retention, progression, final grades) for students who experience early study barriers like late registration or loan issues?

Dissemination

Deliverables

The main deliverables for this project are this final report with its recommendations and the PowerPoint presentation attached which contains more details on the analyses of data undertaken. At the time of writing there aren't any external publications.

Figures and tables

Figure 5. The scores of students in TMA 01 with a late registration versus all other queries by ethnicity group.
Figure 6 The length of time it takes to close a late registration query versus all other queries by ethnicity group.

References

Jacklin A., Robinson C., O'Meara L., and Harris A. (2007), *Improving the experiences of disabled students in higher education,* HEA report [online] available at https://www.researchgate.net/publication/253525979_Improving_the_Experiences_of_Disabled_Students_in_Higher_Education (accessed 18/02/2021)

Simpson, O. (2018 ebook). Supporting Students in Online, Open and Distance Learning (2nd ed.). RoutledgeFalmer.[online] available at https://doi-org.libezproxy.open.ac.uk/10.4324/9780203417003 (accessed 18/02/2021)

University approval processes

This project did not require any approvals from SRPP, HREC or data protection.

The HREC questionnaire was completed but HREC said that there was no need for an approval from them. Students weren't surveyed or took part in focus groups so approvals from SRPP and data protection weren't needed.

Appendices

Aiken and Collier Appendix A, presentation of initial data analysis PowerPoint.

See attached file.