



THE EXPERIENCES OF STUDENTS TRANSITIONING BACK TO IN-PERSON LEARNING POST-COVID-19

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ABSTRACT

This paper reports on a preliminary study that was carried out to understand the experiences of engineering students transitioning to on-campus learning following the Covid-19 pandemic. Two cohorts were considered: year 1 students joining the university for the first time after having experienced considerable disruption for the final two years of their schooling and year 2 students who experienced their first year at university almost entirely online. Data was gathered from student surveys which found that the greatest areas of difficulty for students were the academic level of the programme and the workload. A limited comparison was drawn between this finding and some pre-pandemic data which suggests that the difficulty that students had in this area was higher than for students before the pandemic, indicating that two years of disrupted education may have had a negative impact on students' preparedness for higher education. Qualitative open-ended responses by students showed that there was a clear preference for face-to-face teaching, but that students see clear benefits to online resources and lecture recordings, and value having some flexibility in how they learn. Some reduction in student performance was noted.

1 INTRODUCTION

1.1 Background

The onset of the Covid-19 pandemic forced educational establishments across the globe to switch to online and blended modes of delivery, and the impacts of this have been widely reported on. For higher education institutions this has posed a myriad of issues, not only at the time of the emergency responses and rapid online shift, but it is likely that the effects of the pandemic will be felt for many years to come. One of

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the main areas of concern is how to support students on an ongoing basis who have experienced large gaps in their educational experience or who have struggled with transitioning between online and in-person learning.

1.2 School closures and their impact on incoming university students

It has been estimated that 168 million students under the age of 18 in primary and secondary education missed in-person schooling for almost a full year by February 2021 due to the Covid-19 pandemic [1]. The issues faced by school pupils and students during this time are well documented, with many adverse consequences of school closures being identified from lost learning to increasing social disparities and serious welfare issues for vulnerable groups. For school-age children it has been reported that daily learning time was more than halved on average during online delivery, with low-achieving children undertaking even less than this, and receiving less parental engagement with learning activities thus widening the gap between high and low-achieving students [2]. Correlations have been drawn between lower educational level of parents and lower attainment of pupils during this time [3]. School age young people have also been reported to be at higher risk of mental health issues as a result of the pandemic, particularly those who were already more vulnerable, those who were approaching key examinations following the lockdowns, and those who had parents who were keyworkers [4].

Concerns have also been raised about lowering of academic standards due to difficulties in properly assessing students. For example, in the UK, those completing their final year of schooling were awarded calculated A-level grades in both 2020 and 2021 rather than sitting formal examinations, in a process fraught with much difficulty and dispute. Initial studies have reported reduced validity of these calculated grades compared to actual grades, and this is likely to cause difficulties for students when progressing into university, and pose issues for higher education institutes, as they may not accurately reflect student ability [5]. Francis et al highlight a variety of issues for incoming students and their new institutions, including variation due to different educational experiences, lack of experience with examinations and formal assessment, and knowledge and practical skills gaps [6]. This presents specific challenges for engineering subjects which require a combination of theoretical knowledge and practical skills.

1.3 Effects of university closures on existing students

Within higher education in the UK and many other countries, almost all university in-person teaching was halted in favour of online modes of delivery. Within the authors' institution, less than 6 weeks of on-campus teaching took place between the end of March 2020 and September 2021. For those students already at university during the campus closures, problems caused by the switch to online learning were widespread. From an educational perspective these included difficulties accessing appropriate technology and reliable internet connections [7], reduced engagement with course content, limited opportunities to engage with teaching staff, and significant shifts in assessment procedures and practices. From a wellbeing and



social point of view, students have reported difficulties in establishing and maintaining social networks and increased mental health issues [8].

1.4 Positive aspects of the online learning experience

Despite the challenges of the online switch, a number of aspects that students find beneficial for learning have emerged. Among these the flexibility afforded by online resources to allow students to access material at a time and place that suits them [9]. This may be particularly beneficial for students with additional learning needs, or who have commitments outside of university such as caring responsibilities.

Students have expressed an appreciation for being able to review material, in particular recorded lectures, as this helps with the learning process and is an excellent revision tool. Students have reported increases in self regulation as a result of learning online, and more control over their own time. They have also reported satisfaction with having materials available in advance to allow them to prepare before attending live classes, either online or in-person.[10]

1.5 Rationale

The aim of this study is to evaluate if the prolonged disruption to learning due to the pandemic has had a negative influence on the experience and preparedness of undergraduate students starting on-campus learning in the school of Mechanical and Aerospace Engineering (SMAE) at Queen's University Belfast. Comparison will be drawn between the experiences of students joining year 1 after over a year of disruption to their schooling, with students joining year 2 after a year of online university teaching. Some limited comparisons will also be drawn with previous data gathered from students transitioning directly into year 2 prior to the pandemic, and outcomes compared with pre-pandemic data.

2 METHODOLOGY

2.1 Selected Cohorts

Analysis was limited to year 1 and 2 undergraduate students in SMAE for several reasons. Firstly, the year 1 students entering in the 2021-22 academic year were the first cohort of students to commence their university studies on a fully on-campus basis since the Covid-19 pandemic. It was of interest to assess whether the disruption to their secondary school education over the previous two years had a discernible impact on their experience, and on the ease with which they transitioned into university. The year 2 students were selected as they had completed most of their first year online, and had virtually no on-campus experience prior to 2021-22.

2.2 Learning environment

The students in this study returned to full on-campus teaching in September 2021. Classes were held in the same manner as they had been pre-Covid, but with additional safety measures in place, such as a requirement of students to wear masks, and a 2m exclusion zone between staff and students, to allow staff to remove masks for teaching. In addition to the traditional lectures and tutorials, a number of

the beneficial aspects of online learning that had been identified during the pandemic were retained, such as providing recordings of the live lectures and providing digital resources on the virtual learning platform (VLE) well in advance of live classes.

2.3 Survey

A survey was sent to the students around one month after the first semester started, asking them to rank the difficulty of the following areas on a 5 -point Likert scale:

1. The face-to-face (on campus) teaching arrangements
2. The academic level of the programme
3. The workload of the programme
4. The accessibility of appropriate IT facilities when off-campus
5. The ease of finding information and help when needed

A further section of the survey consisted of a number of freeform comment boxes to allow further detail on the five areas above, or any other comments, to be provided.

3 RESULTS

3.1 Survey data

The survey received 109 responses from year 1 students (62%) and 110 responses from year 2 students (64%). Responses to the Likert scale questions on the perceived difficulty of various areas are presented in figure 1 as a percentage of students choosing each option from “very easy” to “very difficult”.

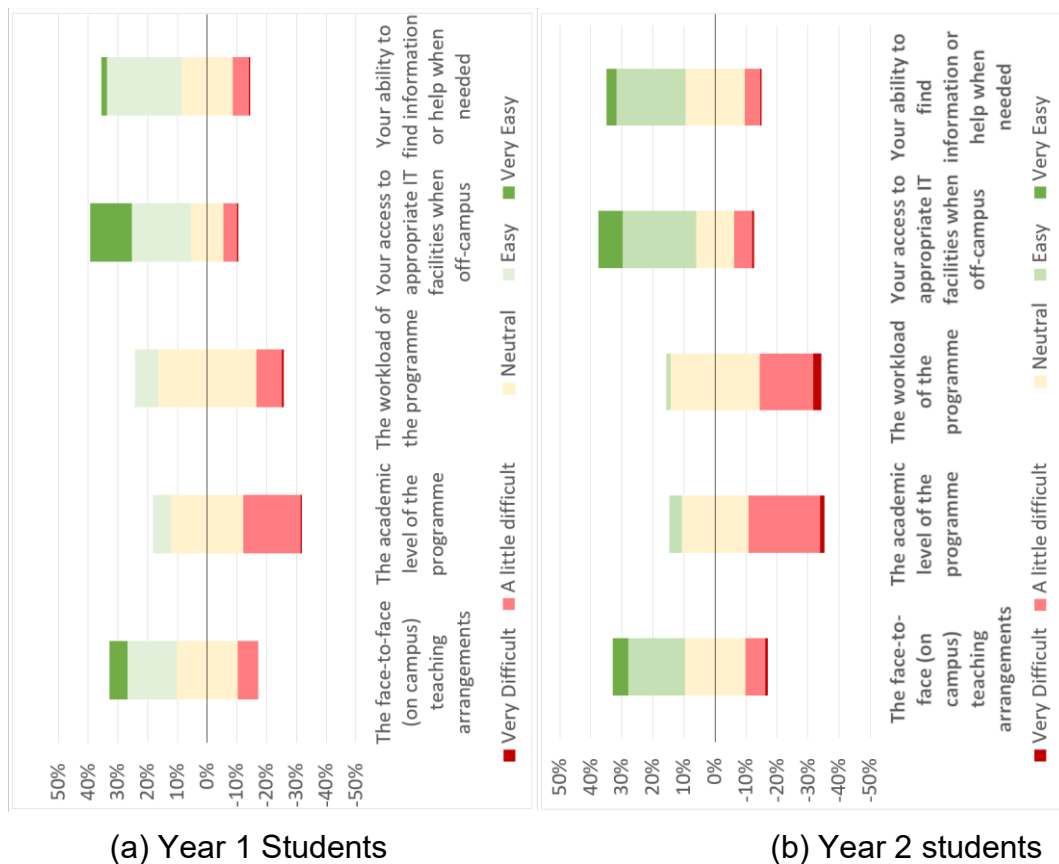


Fig 1: Responses to question “How challenging were the following issues?”

Responses were also weighted from (1-5), from “very easy” to “very difficult” and these are presented as mean scores in table 1, along with the median and mode responses for each question. A T-test was also carried out to determine if the responses from the year 1 and year 2 students were significantly different.

It can be seen that students found the academic level and the workload of the programme the most difficult aspects, and this was true for both year 1 and year 2 students, although year 2 students found these more challenging than year 1. This could be simply a reflection of the higher academic level in year 2. No significant differences were seen between the two groups on any of the other questions.

Table 1: Weighted scores from survey responses

	Weighted means - level of difficulty from 1-5 (from very easy to very difficult)		Significantly different? P Value
	[median] {mode}		
	year 1	year 2	
The face-to-face (on campus) teaching arrangements	2.57 [3] {3}	2.60 [3] {3}	no p=0.706
The academic level of the programme	3.28 [3] {3}	3.44 [3] {4}	yes p=0.038
The workload of the programme	3.04 [3] {3}	3.43 [3] {3}	yes P<<0.001
Your access to appropriate IT facilities when off-campus	2.15 [2] {2}	2.35 [2] {2}	no p=0.101
Your ability to find information or help when needed	2.55 [2] {2}	2.55 [3] {2}	no p=0.932

3.2 Comparison with pre-pandemic data

It was desirable to determine whether the issues that the students reported with academic level and workload were unique to these post-pandemic cohorts. The only somewhat comparable data that exists from pre-Covid was a survey carried out on two groups of students who entered the same degree programmes at year 2 from two different foundation programmes [11]. One of the groups consisted of international students, mainly from China, and the other cohort was a group of students mainly from the Northern Ireland region, where the university is located. These students had been asked if they felt prepared for the academic level of the programme, and ranked from “strongly disagree” to “strongly agree”. The responses have been weighted with the same weighting system used in this study, where 5 is “strongly disagree” and 1 is “strongly agree” and presented in table 2.

It can be seen that the students entering the university in 2021 showed clearly more negative responses than those entering pre-Covid. Caution should be drawn in making definite comparisons between these two as the questions were not asked in

exactly the same way under the same context, but may give some indication that the disruption to learning over the course of the pandemic has had a negative influence on student preparedness for university level study.

Table 2: Comparison of perception of level of difficulty pre- and post-Covid

	Weighted means - level of difficulty from 1-5 (from very easy to very difficult)			
	[median] {mode}			
	2021 year 1	2021 year 2	Pre-Covid International students	Pre-Covid "local" students
The academic level of the programme	3.28 [3] {3}	3.44 [3] {4}	2.42 [2] {2,3}	2 [2] {2}

3.3 Student comments

Open-ended responses were collated for each of the five areas surveyed. When asked for comments on the mode of delivery, a clear majority expressed preference for face-to-face teaching, with 42 different comments explicitly expressing this opinion and 21 generally positive comments about the current on-campus arrangements out of a total of 104 comments on the teaching arrangements (table 3). Among the year 2 students there were two students who stated they had preferred the online teaching the previous year, and six students who expressed a wish for more options where they could choose to attend online or in-person flexibly. Both sets of students expressed some difficulty in following face-to-face lectures, however, several students stated that they found online resources very helpful, including the lecture recordings (table 4).

Students appeared to be comfortable in the learning environment, and would have preferred less Covid-19 restrictions rather than more. Several year 1 students found the requirement to socially distance from the lecturers to be difficult, while only 4 students expressed any safety concerns about being on campus (table 5).

Table 3: Selected comments on face-to-face teaching, online learning and flexible delivery

Year 1 students	<p><i>"Much better than my previous two years of online teaching."</i></p> <p><i>"It's really good and helpful that we are able to attend in-person lectures and classes with the Covid pandemic currently."</i></p>
Year 2 students	<p><i>"I am enjoying the face to face arrangements and much prefer it to the online content last year"</i></p> <p><i>"I find it very helpful to learn from and help my peers as we learn together instead of isolated."</i></p> <p><i>"I am happy to attend face to face teaching when necessary. It is nice having the option to work from home"</i></p> <p><i>"I think I prefer a mix of face-to-face teaching and online classes to have a little variety."</i></p>

Table 4: Selected comments on note taking and online resources

Year 1 students	<p><i>"I am struggling to make the appropriate notes from the board whilst listening to my lecturers."</i></p> <p><i>"The backup of the recordings and live stream is very useful"</i></p>
Year 2 students	<p><i>"Finding it hard to follow FTF lectures after using pre-recorded video lectures for a whole year."</i></p> <p><i>"I think the recorded lectures are a helpful resource"</i></p>

Table 5: Selected comments Covid-19 restrictions

Year 1 students	<p><i>"I find this difficult as students aren't able to be shown how to do something because of the restrictions."</i></p> <p><i>"Sometimes it's a bit difficult in modules like engineering design when the lecturers can't come up to us to help because they must socially distance."</i></p>
Year 2 students	<p><i>"Due to the situation of Covid, the face-to-face teaching is still a bit dangerous"</i></p>

3.4 Overview of outcomes

At the time of writing, end of year results have just become available. Initial impressions from teaching staff were that student performance through the year on coursework and continuous assessment was comparable to previous years, but that exam performance was much poorer. This view may have been influenced by the fact that performance during the last two years, where a significant amount of assessment was online and open-book, was higher than normal. An initial comparison has been drawn up comparing the averages and failure rates in 2018-19 (pre-Covid) and this year (2021-22), across three engineering science year 1 modules (MEE1001, MEE1004 and MEE1008), and two year two modules (MEE2001 and MEE2007). These modules were chosen as they have have similar assessment types and weightings (40% coursework and 60% exam), and have not had significant changes between the two years.

Table 6: Overview of student outcomes in selected year 1 and 2 modules

Module	2018-19				2021-22			
	Overall average	No. of fails (1st attempt)	No. of students	% Fail	Overall Average	No. of fails (1st attempt)	No. of students	% Fail
MEE1001	63%	22	160	13.8%	60%	33	168	19.6%
MEE1004	56%	19	160	11.9%	49%	36	168	21.4%
MEE1008	60%	11	158	7.0%	55%	18	169	10.7%
Year 1 averages	60%			10.9%	55%			17.2%
MEE2001	52%	27	145	18.6%	52%	18	111	16.2%
MEE2007	51%	24	134	17.9%	48%	21	97	21.6%
Year 2 averages	52%			18.3%	50%			18.9%



The results (table 6) indicate that for year 1, there has been a notable drop in averages for the modules in 2021/22 compared to 2018/19, and a clear increase in the percentage of students failing the modules on their first attempt. This would agree with the high perceived difficulty that the students reported, and indicate that students joining university directly from school in 2021/22 were not as well prepared for university as students joining pre-pandemic. For year 2, there was a modest drop in module average and increase in failure rate for one of the modules, but not for the other, which had the same average and a decrease in failure rate compared to 2018/19. This would suggest that while the second year students perceived the difficulty level to be higher than year 1 students at the beginning of the year, this may simply be due to the higher academic level in year 2, and that a previous year of online university study may still have prepared them adequately for in-person learning in year 2. This data compares only two years, and does not give a full picture at module or programme level and more in-depth analysis will be completed in due course.

4 SUMMARY AND ACKNOWLEDGMENTS

A survey of students returning to in-person learning after the pandemic has shown that both year 1 and year 2 students expressed difficulty in dealing with the academic level of the programme and the workload, and this was seen to a greater extent in the year 2 students. The level of difficulty experienced by students appears to be more pronounced than for students who joined the programme as direct entry into year 2 before the pandemic based on some limited historical data that is available. Comments made by students show a clear preference for face-to-face learning over online learning, however students see great benefits in supplementary online resources and in retaining innovations that were introduced during the pandemic such as the provision of lecture recordings as standard, and use of advanced features in the VLE. This correlates well with student feedback during online learning which expressed clear satisfaction with asynchronous elements including lecture videos, and other content on the VLE. Students appear to appreciate the opportunity to access content at a time and a pace that suits them, and to be able to revise content with the full lectures available to watch and review as many times as needed. It is hoped that the availability of this additional content will support the students as they develop their skills in independent study, providing additional opportunities for note-taking and revision as they become accustomed to the lecture environment. Initial data on student outcomes indicates some drop in performance, with notable increases in the percentage of students failing modules on their first attempt. The next steps in this study will be to assess attendance data, engagement with online resources and student outcomes in detail, and to determine if the indications of an increase in perceived difficulty level has had a significant effect. It will be important to continue to monitor the experiences and performance of these groups of students, and to design appropriate interventions where necessary to ensure that they are not disadvantaged by the disruption to their education in the long term.



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