How do students perceive face-to-face/blended learning as a result of the Covid-19 pandemic?

Abstract:

The impact of Covid-19 has had a far-reaching effect on higher education institutions. However, few studies report on the relative perceptions of students about face-to-face (F2F) and blended learning (BL) in periods when Covid-19 is/not a consideration. Using a sample of 103/79 undergraduate students, a mixed-method approach is utilized to report qualitative and quantitative evidence regarding student perceptions. The results demonstrate BL is perceived more positively during the Covid-19 pandemic. However, F2F is preferred to BL when Covid is not an issue. F2F learning is perceived more positively to BL because students feel that there are limitations to BL in terms of; interactions with the lecturer; group work; peer engagement; class involvement; and the ability to ask questions about technical information. Moreover, qualitative evidence shows that students perceive F2F to be superior to BL because social elements expected in a F2F environment may not be embedded into netiquette frameworks. From a policymaking standpoint, we encourage embedding social elements into BL to enhance student experience so that student's negative attitudes regarding the transition from F2F delivery to BL can be minimized. From a practical standpoint, we provide insights about strategies to embed socials elements into netiquette frameworks.

Keywords; Face-to-face, blended learning, student perceptions, student experience, Covid-19

1.   Introduction

The Covid-19 pandemic is expected to have a long-term negative effect on the world economy (World Bank Group, 2020). The pandemic has also directly influenced Higher Education and student experience. In most academic institutions, face to face (F2F) learning has been replaced by blended learning (BL) and/or online. Given the sudden change to the academic environment, it is important to document student preference to report how students have perceived different teaching approaches before and during the Covid-19 pandemic. Proponents of BL imply it can be considered an opportunity to enhance student experience (Bernard et al. 2014; Connolly et al., 2006; 2003; Hall, 2006; Kirkpatrick, 2005; Liu et al. 2016; Mariott et al., 2004 ; Spanjers et al. 2015). On the other hand, there is evidence that BL can be a limiting factor in lecture delivery (Burgess, 2008; Concannon et al., 2005; Koskela et al., 2005; Lomer and Palmer (2021) Mariott and Mariott; 2003; Robson and Greensmith, 2009; Selwyn, 2016). Thus, Covid-19 provides a unique opportunity to test student preference in a situation where they expected to receive F2F delivery at the start of the semester, but F2F was replaced BL delivery as a result of the Covid-19 pandemic. There is the potential that students perceive they have been receiving a 'lesser' learning experience when F2F is replaced by BL delivery. On the other hand, it is also possible that students feel uncomfortable attending F2F lectures during the Covid-19 pandemic. To address this knowledge gap, quantitative and qualitative data is collected via questionnaires to provide students with a platform to express their opinions regarding changes in preference, motivation,

stress, flexibility, support, engagement, and group work in periods when Covid-19 is/not a consideration.

We are motivated to conduct this study for several reasons. First, the challenges associated with the sudden move from F2F to BL as a result of the Covid-19 pandemic (including preference, motivation, stress, flexibility, support, engagement and group work) are widely reported in the literature from an educator's perspective (Sangster, 2020). However, a knowledge gap exists because the preference of students towards BL/F2F during the pandemic is not well-established. Thus, we are motivated to report student voice to offer insights to educators about strategies to enhance student experience. Second, the rapid move from F2F to BL has the potential to establish BL as the 'new teaching normal' (Bettis, 2020; Huang, 2020; Fogarty, 2020; Sangster et al., 2020). However, there is a potential that students prefer BL during the Covid-19 pandemic, but prefer F2F learning when Covid-19 is not an issue. We are therefore motivated to discover the perceptions of students in, i) periods considering Covid-19 and ii) periods when Covid-19 is not a consideration. Offering insights about student preference in a situation where Covid-19 is/not an issue can provide management with resource planning insights.

Third, whether student perceptions about BL and F2F learning are consistent over the semester can have important planning implications. There is the potential that students become frustrated with BL due to its sudden implementation. On the other hand, students may consistently perceive BL to be a more complete experience compared to F2F. Thus, we are motivated to capture perceptions at two different occasions to report how students interpret the changes associated with learning at different periods during the pandemic (28/9/2020-12/10/2020 and 30/11/2020-

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14/12/2020). To the best of our knowledge, we are the very first to empirically examine whether students' perceptions about F2F/BL change during the pandemic. Fourth, whilst there may be opportunities to develop online materials as a result of Covid, a lack of resources has the potential to increase the disparity between tertiary institutions (Sangster et al., 2020; Fogarty, 2020). Thus, we are motivated to demonstrate the perspectives of British undergraduate students at Sheffield Hallam University as the basis for future international comparative analyses.

For completeness, we offer highlights below. A full discussion is included in section 5. Based on a sample of accounting students at Sheffield Hallam, we find:

- Students prefer F2F learning when Covid is not a consideration.

- BL is preferable in the Covid period because of the physical risk associated with the pandemic.

- Students consider BL to be limited in terms of; interactions with the lecturer; group work; peer engagement; class involvement; and the ability to ask questions about technical information.

- Thus, when F2F is suddenly replaced by BL, an element of social interaction facilitated by F2F is considered lost, but still desired by students.

- The results imply students perceive F2F to be superior to BL is because social elements expected by students in a F2F environment may not be embedded into netiquette frameworks.

- We would therefore encourage educators to incorporate social elements into netiquette strategies to enhance BL deliveries in 'normal times' in preparation for a similar disaster scenario.

2.   Literature Review and Hypothesis

2.1. Literature

The Covid-19 pandemic has had a dramatic influence on the professional/personal lives of academics. Jung et al. (2021) report the uncertainty associated with online/BL teaching has; heightened faculty workload; disrupted work routines; and increased the prevalence of anxiety and psychological issues associated with isolation. In a Dutch context, de Boer (2020) surmises that the challenges associated with online teaching have made university employment a less attractive proposition. Greenberg and Hibbert (2020) infer that given the toll that the Covid has had on the private as well as professional lives of academics, particular attention should be paid to post-traumatic stress. Belkhir et al. (2019) implies that early career researchers have the potential to be negatively affected mentally due to the stress associated with Covid-19. Sangster et al. (2020) collect qualitative data from 72 accounting academics in 30 countries with each academic reporting context, challenges, reflections and future plans (amongst others). They find that 48.3% consider that the modifications required to deliver lectures has increased stress levels. Taken together, reflective studies acknowledge that the sudden and dramatic pivot from F2F to BL and/or online teaching has had a negative impact on higher education practitioners.

On the other hand, some consider the Covid-19 pandemic as an opportunity to develop new virtual frameworks. Sangster et al. (2020: 437) report that before the pandemic, a blended approach has been considered tomorrow's world. But following the pandemic, virtual environments are expected to become a more common feature in

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Higher Education. Sangster et al. (2020) report that optimism exists amongst academics about the opportunity to enhance virtual learning environments. It is also reported that the implementation of BL can enhance student experience. Using a case-study approach, Yang and Huang (2020) posits that whilst the sudden change to teaching has disadvantages, the pandemic can expedite the development of new online materials.

They also interpret that BL has the potential to accommodate different learning styles to become the 'new normal'. Bettis (2020) surmises that whilst there are new challenges when traditional universities adopt online teaching, the Covid-19 pandemic can be an opportunity to enhance student experience by providing students with flexible deliveries via recorded lectures. Barber (2021) shows that South Korean students have adapted to e-learning during the Covid-19 pandemic, implying that the change from F2F to online was not perceived negatively by students. Taken together, there is a consensus the pandemic has a negative short-term influence on educators and academic institutions. However, some argue that the Covid-19 pandemic has been an opportunity to enhance BL deliveries. Thus, one of the most important questions for educators following the Covid-19 pandemic is whether BL and/or online can be considered a viable alternative to F2F teaching on a consistent basis.

In the UK, and in the university in which this study has been conducted (Sheffield Hallam University), the majority of teaching deliveries are F2F. However, there has been an increasing impetus to include BL into curriculum design. The Teaching Excellence Framework amongst other has been an external driver for educators to come up with unique and marketable teaching deliveries (Gewirtz & Cribb 2013; Cleaver et al., 2014; Quinn, 2020). Thus, in some universities, there are institutional shifts to incorporate technologically-enhanced learning and BL into

curriculums (Blackmore and Kandiko, 2012; Sharpe and Beetham, 2010; UCL, 2017). In the extant literature, various advantages are shown to be associated with BL. BL is considered interactive, tailored to different learning styles and can provide higher volumes of material (Afacan, 2016; Connolly et al., 2006; 2003; De Beer and Mason, 2009; Hall, 2006; Hastie, et al., 2010; Kirkpatrick, 2005). There is evidence that virtual learning can increase motivation and engagement (Mariott et al., 2004). BL can be adapted to meet the requirements of students (Benson and Kolsaker and 2015; McCabe and Connor, 2014). Moreover, various meta-analysis studies report that BL has either a small (Bernard et al. 2014; Spanjers et al. 2015) or large (Liu et al. 2016) positive effect on student performance. Taken together, strong arguments exist to infer that incorporating an online element into traditional F2F deliveries can enhance student experience.

On the other hand, whilst BL is considered as a value adding teaching strategy from a theoretical perspective, there is evidence that when F2F is replaced by BL, students consider some aspects of the virtual environment to be limited (Bentley, 2012; Turner, 2015). Some argue that BL is a limiting factor because it reduces students' incentive to engage in technical subjects (Concannon et al., 2005; Robson and Greensmith, 2009; Selwyn, 2016). Koskela et al. (2005) find that while virtual learning is suitable in higher education and worthy of praise from students, the approach is not considered superior to F2F delivery. They also find that BL is perceived to be a lesser learning experience to F2F delivery. Burgess (2008) reports that from a part-time students' perspective in the UK, F2F delivery is an essential pedagogical approach. Mariott and Mariott (2003) also report that whilst accounting students use the internet every day at university, they are uncomfortable using the internet as an educational

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tool. Lomer and Palmer (2021) collect qualitative evidence from 227 students in focus groups to evaluate student engagement perceptions based on an institutional change from F2F to BL at the University of Northampton. They find that students perceive that BL offers less value for money compared to F2F. Thus, whilst BL can be considered as having advantages, equally, there is evidence that students perceive F2F to be a superior to BL.

Given there is mixed evidence about the suitability of BL prior to the Covid-19 pandemic, a knowledge gap now exists with regards to whether students' perceptions about BL/F2F have changed as a result in the Covid-19 pandemic.

2.2. Study background

A longitudinal study by Li et al. (2021) shows that anxiety and student stress in the second wave is higher compared to the first wave. The study implies that Covid-19 research should state how many cases were prevailing at different data collection periods. Therefore, to provide insights about the mind-set of students, we provide an overview of changes to teaching as a result of factors relating to the pandemic. In the study, data is collected in two different periods. Data was initially collected at the start of the semester between 8/9/2020 and 12/10/2020. This period was the start of the 2nd wave. During this period, students were expected to receive BL in the traditional sense (Graham, 2006), with lectures being taught 2/3 F2F and 1/3 online. At this point, the number of Covid-19 cases in the UK was in 7,000-8000. However, over a period of 5 weeks, the Covid-19 situation worsened. There were two instances in which students caught Covid-19 and were required to self-isolate. On the 1st of November, the number of Covid-19 increased to roughly 23,000. As a result of the increasing prevalence of the

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pandemic, BL lectures were replaced with online lectures from week 6-12. At the end of the semester, questionnaire data was collected from 30/11/2020-14/12/2020. The number of Covid cases was roughly 15,000 at this. Therefore, this study covers the period from the start of the second wave to the start of the third.

2.3. Hypothesis development

In the literature, there is conflicting evidence whether BL is superior to F2F. Increasingly, higher educational institutions incorporate BL into teaching deliveries (Blackmore and Kandiko, 2012; Sharpe and Beetham, 2010; UCL, 2017). Various studies imply that BL is superior to traditional approaches because BL is interactive, provides a high volume of material and is tailored to different teaching styles (Afacan, 2016; Connolly et al., 2006; 2003; De Beer and Mason, 2009; Hall, 2006; Hastie, et al., 2010; Kirkpatrick, 2005). BL is also shown to increase student motivation and student performance (Bernard et al. 2014; Liu et al. 2016; Mariott et al., 2004; Spanjers et al. 2015). Thus, there is the potential that students now accept that because of the Covid-19 pandemic, BL is the new normal. To test the effectiveness of BL relative to F2F, from a student body perspective, we develop a statistical hypothesis to test whether the effectiveness of both deliveries can be considered equivalent.

Whilst BL is considered by many to be a well-designed approach, BL can be a limiting factor, inferring F2F can be perceived more favourably by students (Concannon et al., 2005; Mariott and Mariott 2003; Lomer and Palmer, 2021; Robson and Greensmith, 2009; Selwyn, 2016). Based on our observations from emails and student communication during the previous semester, when students were required to self-isolate/receive online teaching (March-June 2020), we found many students were

frustrated by the change from F2F to BL. The communication with students led us to develop the supposition that students prefer F2F to BL. Thus, to qualify whether our supposition is correct or only true for a handful of students, we conduct empirical tests in a period where modifications have been made to enhance the virtual learning environment (October-December 2020).

<Insert Figure 1 approximately here>

As shown in Figure 1, there are numerous studies including Sangster et al. (2020) reporting the limitations associated with BL as a result of the Covid pandemic, including: i) student preference to learn (Burgess, 2008; Mariott and Mariott, 2003) ii) student stress (Andrew, 2020; Govender, 2020) iii) motivation (de Boer, 2020; Tamrat, 2020) iv) flexibility (van Schalkwyk, 2020) v) support (Jung et al., 2021) vi) engagement, (Agasisti and Soncin, 2020; Lomer and Palmer 2021; Perrotta, 2020), and vii) group activity (de Boer, 2020). Based on the emails and various forms of communication received by students, we conjecture that the null hypothesis for student perceptions listed i-vii would be rejected. More specifically, i-vii elements are likely to perceived less favourable by students in a BL environment compared to a F2F environment (see Figure 1). Based on the above, we make the following hypothesis:

H.1 Students prefer F2F learning when not considering the Covid-19 pandemic

Next, we test whether student perceptions about BL and F2F are different before and during the pandemic. Mchone (2020) provides empirical evidence that BL can be an effective method of learning when social interactions are embedded into classes via F2F delivery. However, Moja (2021) reports there are two elements of

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concern students perceive when teaching deliveries change from F2F to online learning as a result of Covid-19, i) the physical danger associated with the pandemic and ii) the anxiety associated with moving from a face to face delivery to online. Various studies show that the physical threat of the virus is a concern for students. Lalot et al. (2021) find that the physical threat of the pandemic has a negative psychological effect on British nationals. Zaccoletti, et al., (2020) demonstrate that the Covid-19 pandemic also has a negative influence on student engagement and motivation. Saxena et al. (2021) show that because of the Covid pandemic, students are increasingly motivated to enrol in virtual learning environments to reduce potential physical interactions. Taken together, there is evidence that the Covid-19 effect has the potential to increase student's preference and motivation to learn via BL delivery.

In various emails, we found that students have anxiety in attending F2F classes during the Covid-19 pandemic. Furthermore, in face to face interactions during the 5 week period in which lectures were 2/3 F2F, students verbally expresses that coming to classes was stressful, elements of group work and engagement were less effective, and that because of the implementation of various Covid-19 policies, their learning experience was reduced. We therefore interpret that students' perceptions about BL/F2F learning are not fixed but can change as a result of circumstance (Figure 1). As stated in H1, in a period without Covid-19, we believe students prefer F2F learning. However, because of the fear of the virus, students are likely to prefer BL during the Covid-19 period. Based on the above, we develop the following hypotheses:

H.2 Students enjoy BL more in the Covid-19 period

3.   Research design.

A mix-method approach is used to collect qualitative and quantitative data via a questionnaire (Appendix 1). Quantitative data about student perspectives is collected as binary 0 (no) /1 (yes) values in Table 2. In Tables 3- 12, 1-5 (ordinal) Likert scales report student perceptions. A value of 1 represents strongly disagree, 5 represents strongly agree. Questionnaire data is collected via a Google-form questionnaire. An 'opt in' approach has been used to collect data. To facilitate data collection, an email was sent out to the student population (310). Moreover, in seminar sessions, the link to the Google-form/ email was referenced. It was stressed to all students in the seminar that the questionnaire responses were not designed to be a critique of the class in which the questionnaire was introduced, but their attitudes towards F2F and BL 'in general'. Written response (qualitative) data is collected as narrative from a questionnaire (at the end of the semester); to support our empirical results; give context; and to give students an opportunity to express their voice.

We use z/t difference tests to compare student perceptions for parsimony. Whilst OLS regression can provide valuable insights using a dummy variable approach, we did not feel it was appropriate to collect student specific information such as gender, household income, motivation, intelligence, work status and disability etc., because making assertions about any 'group' during the Covid-19 pandemic was not accepted by the research ethics committee. To ensure that our results are not bias, the following steps have been taken. First, respondents are randomly assigned based on surname, not assigned. We expect that a surname is unlikely to influence student perceptions. The

random sample approach is considered a well-suited approach in classroom econometric studies to control for endogenous effects (Gujarati and Porter, 1999; Lim and Mali, 2021 Shadish et al., 2002). Second, as suggested by Cook (1991) collecting data at two periods improves the predictive validity of empirical classroom tests because it allows researchers to discover transient or permanent effects. Thus, data is collected at two different periods, i) at the start of the semester and the i) end of the semester.

In Table 1, we list the details of the student sample. All participants are second year accounting undergraduate students at Sheffield Hallam University. The respondents come from 20 seminar groups, from 4 different classes. The lecturers incentivised students to complete the questionnaire by explaining that the questionnaire information will provide them with a 'voice' in the Accounting Education/ academic community. At the start of the semester, the questionnaire was open from the 28/9/2020 to 12/10/2020. At the end of the semester, the questionnaire was open from the 30/11/2020 to 14/12/2020. At the start of the semester, of the 310 potential participants, 103 students completed the questionnaire. At the end of the semester, 79 students completed the questionnaire. We conjecture that because of examinations and revision for tests, the slightly lower level of responses at the end of the semester can be expected.

<Insert Table 1 roughly here>

4.   Empirical results and qualitative data

In the empirical analysis section, in Panel A (for all Tables) full-sample descriptive statistics are listed. The results for Panel A therefore represent the mean and median values from the combined samples, taken from the start and the end of the semester. In Panels B-C, mean and median difference t/z tests show whether the perceptions of students about F2F and BL are transient or consistent based on data collection at two different points, the i) start and ii) end of the semester. Qualitative evidence is included where appropriate for completeness. Moreover, the results for Tables 2-12 are visually represented in Figures 2-4 for ease of reference. Thus for readers who may not have a keen interest in empirical analysis, please refer to Figures 2-4 below, which illustrates student response for all questions included in Appendix 1.

<Insert Figure 2-4 approximately here>

4.1. Student preference

In Table 2 Panel A, students report whether they prefer F2F or BL learning, regardless of the pandemic (binary options). Overall, we find that on average, 63% of the students prefer F2F, 37% prefer BL. In Table 2, Panel B, we conduct mean (t) and median (z) difference tests to compare whether the perceptions of students have changed over the period of the semester. Insignificant mean/median difference test results show that the attitudes of students about F2F and BL are consistent at both periods with values of 0.61 at the start of the semester and 0.64 at the end of the semester. We infer based on qualitative evidence (below), involvement and the ability to ask questions are likely reasons why F2F is preferred over BL.

<Insert Table 2 roughly here>

Key Qualitative Information

✓ *Student a: "Face to face learning is the best and I enjoy it because I can ask questions."*

✓ *Student b: "I much prefer face to face teaching because I feel am more involved in the lecture."*

✓ *Student c: "Easier to understand the topic more when face to face as it's easier to ask questions."*

✓ *Student d: "I prefer face to face learning as I believe it allows for more focus and help should i need it as it's easier to explain any issues i am having with the work because I am involved in the class."*

4.2. Student preferences (not) considering the Pandemic

In Table 3, Panel A, we find that more students agree that F2F learning is an enjoyable learning approach prior to Covid-19, with an average score of 4.09. However, when considering Covid-19, the average value of student enjoyment is 3.22 (Δ - difference of 0.87). In Table 3 Panel B, we directly compare how the attitudes of students have changed over the semester. We find students consider F2F delivery more enjoyable prior to Covid-19 (t value, 2.49***; z value 3.02***). In Panel C, we find that

F2F is a less enjoyable learning approach when considering the Covid-19 issue (t value, -2.74***; z value -2.64***). Therefore, at the end of the semester; i) F2F delivery is perceived to be to be more enjoyable when Covid-19 is not an issue, and; ii) less enjoyable when considering the Covid-19 issue. The results imply that Covid-19 directly influences students' perceptions about F2F learning.

<Insert Table 3/4 roughly here>

In Table 4, Panel A, we find that that BL can be considered an enjoyable learning experience when Covid is not an issue (3.01). However, when Covid is considered an issue, student enjoyment slightly increases to 3.46, a change of 0.45. The results suggest that students may have greater enjoyment to learn via BL as a result of the Covid pandemic. However, in Table 4, Panel B and C, we find that there is no significant change in student attitudes about BL from the beginning to the end of semester both with/without considering the Covid-19 issue. This result can be expected because BL delivery would be similar regardless of the pandemic.

4.3. Motivation

In Table 5, Panel A, we show that students' motivation to learn F2F is on average 4.32 prior to Covid-19, but 3.58 when considering Covid-19 (Δ0.72). The results imply that students have lower motivation to learn F2F in the Covid-19 period. In Panel B and C, we find that the value of students' motivation to learn F2F slightly increases from 4.28 to 4.37 (Δ 0.09) prior to Covid-19, and decreases from 3.67 to 3.44 (Δ0.23) when considering Covid-19. Whilst the results are not statistically significant, the

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results suggest that students are slightly more motivated to learn F2F when covid-19 is not an issue, but less motivated when Covid-19 is an issue.

In Table 6, Panel A, we report that students' motivation to learn via BL is on average 3.14 without considering Covid-19, and 3.49 when considering Covid-19 (Δ0.35). The results show that when considering Covid-19, students are more motivated to learn via the BL approach. Interestingly, without considering Covid-19, the mean values of student motivation are 4.32 (F2F, Table 5, Panel A) and 3.14 (BL, Table 6, Panel A) (Δ1.28). However, when considering Covid-19, motivation is almost the same for F2F (3.58, Table 5, Panel A) and BL (3.49, BL, Table 6, Panel A) (Δ0.09). In Panel B, we find that students are less motivated to learn via BL from the start of the semester to the end of the semester (t value, -4.14***; z value -3.99***). There is a statistically insignificant difference in BL motivation when considering Covid-19 at the start and end of the semester. The results imply that students are far less motivated to learn in F2F when considering Covid-19, but have indifferent motivation to learn F2F/BL when considering Covid-19. Furthermore, students are less motivated to learn via BL at the end of the semester compared to the start of the semester, suggesting preference can change. Qualitative data (below) implies that a lack of support/interaction reduces motivation in the BL environment, suggesting that interactions between lecturer and students should be a key consideration for effective BL classroom management.

<Insert Table 5/6 roughly here>

Key Qualitative Information

> ✓ *Student e: "Online learning is harder to be motivated and is <u>less aided, I feel from</u> <u>tutors."</u>*

> ✓ *Student f: "I never feel motivated with online teaching when I don't have a specified time to do work like in a face to face classroom and think my learning has declined <u>because I can't talk to the tutor."</u>*

> ✓ *Student g: "Less motivated with blended learning, builds stress and feels <u>less</u> <u>supported."</u>*

4.4. Stress

Next, we test whether F2F learning can be considered stressful to students. In Table 7, Panel A, the results show that students perceive F2F learning is more stressful when considering Covid-19 (3.31), but less stressful when Covid-19 is not an issue (2.21) (Δ1.10). The results imply that F2F learning is a cause of higher stress in the pandemic period compared to the period prior to the pandemic. In Panel B, we report students feel F2F is less stressful from the initial data collection period (2.36 - 2.01 = Δ -0.36; t value -2.38**). We also find that whilst the results are not statistically significant, F2F learning is also considered less stressful when Covid is an issue (Δ -0.21). The results imply that after a semester of learning via BL (in which the Covid-19 pandemic forced students to learn online), students' perceptions about the stress associated with F2F decreases.

In Table 8, Panel A, we identify whether BL is considered stressful to students. When considering Covid-19 and not considering Covid-19, the values are 2.80 and 2.76. The results are as expected because Covid-19 is unlikely to have an effect on BL. The results imply that there is no difference between stress levels associated with BL before and after Covid-19. Interestingly, the difference between F2F stress and BL stress is Δ0.59 (2.80 - 2.21). The results imply there is not a large difference in stress levels from a student perspective in attending BL and F2F session when not considering Covid-19. However, when the data is collected at the start of the semester and the end of the semester, the results suggest that over the 28/9/2020 - 14/12/2020 period, students become more stressed when not considering (Δ0.37, t value, 2.23**) and considering Covid-19 (Δ0.33, t value, 1,86**). The results suggest that overall, F2F and BL stress can be considered equal, but over the period of the semester F2F (BL) is considered to be less (more stressful) from the start to the end of the semester. The results of qualitative data are listed below for three students. A common theme for all students is that stress is manifested in student's inability to interact with classmates.

<Insert Table 7/8 roughly here>

Key Qualitative Information

✓ *Student h: "Online study did not allow you to interact with my friends. It is also not easy to discuss yours issue with the teacher. It is more stress full stop for anyone to study online."*

- ✓ *Student i: "I have personally found blended learning quite stressful as <u>I struggle to engage and cannot study with peers for support."</u>*

- ✓ *Student j: "Face to face is so much better because we can discuss issues. We can't do this as well online. <u>I also feel stressed because I can't discuss any of my work with friends.</u>*

4.5. Flexibility

In Table 9 Panel A, we find that F2F (3.17) and BL (3.59) are considered to be relatively similar in terms of flexibility. In Panel B/C, we find that students consider no difference in terms of F2F or BL at the start or the end of the semester with results being virtually identical. The results imply that students from our sample do not consider flexibility to be an issue for F2F or BL deliveries.

<Insert Table 9 roughly here>

4.6. Support

In Table 10, Panel A, the difference between F2F and BL support is reported. Students strongly agree that F2F learning provides support (4.45). On the other hand, students only slightly agree that BL provides support (2.93). The difference between F2F / BL support is one of the highest differences at Δ1.52. In Panel B, we find that students more strongly agree that they feel more supported in a F2F teaching environment over the sample period (Δ0.18, t value, 1.78*). In Panel C, students feel less

supported based on how they perceive BL at the start and the end of the semester (Δ0.26, t value, -1.94*). We list the results of student responses below to report why students perceive they feel less supported in a BL environment. The key themes relating to support is that learning is easier F2F because students can ask questions and have more support in completing numerical issues. Furthermore, because BL is a new style, there is the potential that students are not adapted to the style, so it may be challenging.

<Insert Table 10 roughly here>

Key Qualitative Information

✓ *Student k: "Face learning is better in the sense it's <u>easier to ask questions and get instant response from the tutor.</u> Online there may IT issues that inhibit that.*

✓ *Student l: "It is <u>difficult to ask questions, especially numerically, through email.</u> I feel like I am<u> missing out on a seminar environment whereby the tutors can watch us learn and process information</u> - you don't know what isn't thoroughly explained to you and isn't printed in a textbook.*

✓ *Student m: "Because online learning is a new style, <u>many students are not prepared to engage in the new style."</u>*

4.7. Engagement

In Table 11 Panel A, students are shown to disagree that F2F learning limits student engagement (1.95). However, students agree that BL limits student engagement (3.40). The results imply that there is a large difference to how students perceive engagement as a result of F2F and BL (Δ1.45). When we compare whether students perceive that engagement levels change from the start of the semester to the end of the semester, the results are statistically insignificant. As discussed below, the reason why students may not engage via BL is because they feel uncomfortable engaging in an online environment.

<Insert Table 11 roughly here>

Key Qualitative Information

✓ *Student n: "There is also a lack of engagement by some students when online, again this could be due to them <u>not feeling comfortable to go on camera </u>with effectively strangers.*

✓ *Student o:" <u>I do not feel comfortable asking questions online</u> because I feel like I cut across the lecturer. I also find it strange talking into the camera"*

4.8. Group Work

Next, we test students' perceptions about group-work in F2F and BL environments. In Table 12 Panel A, we find that students agree that F2F is an effective environment for group-work (4.28). The results also show that BL is not considered an

environment that provides an opportunity for group work (2.46). The difference between both teaching methodologies is Δ2.02, the highest difference of any student perception. As expected, students perceive that F2F is a far better environment for group activities. In Panel B, we report that students feel group work is better facilitated using F2F at the end of the semester compared to the start of the semester (Δ0.39, t value, 3.68***). The students also report that BL provides lesser opportunity for group work at difference stages of the semester (-Δ0.2.7, t value, -1.85*). The below offers student perceptions about challenges associated with group work. The results again imply that an inability to physically meet peers is an issue that is negatively perceived by students.

<Insert Table 12 roughly here>

Key Qualitative Information

✓ *Student p: "I prefer to have face to face learning as it is not only more enjoyable but it is also a lot easier as I am motivated to attend all my seminars and lectures on time and it is also is a chance to <u>see my fellow peers and friends in class</u>.*

✓ *Student q: <u>"The 5 minutes before and after face to face class are very important to be able to ask any questions</u> that may come up but aren't deemed important enough to email about. In blended learning there is less <u>time to get to know classmates before group projects.</u>*

- ✓ *Student r: "Group work is not ideal in an online scenario as not everyone has the required technology/know how of software to make it work, also as people have not met previously it can be very awkward interacting online only.*

- ✓ *Student s: "Group work, in my opinion, was proved more difficult due to learning not being entirely face to face as me and my group had to rely on zoom and group chats to chat about our work. This meant we couldn't each have as much as an impact as we may have been able to if we were doing it in a face to face environment.*

4.9. Blended learning positives

For completeness, we report on some qualitative evidence why some students prefer BL to F2F. As reported in Table 2, 37% of students prefer BL to F2F. Some of the reasons that BL is preferred to F2F are listed below.

Key Qualitative Information

- ✓ *Student t: "The ability to re-watch lectures and schedule your own learning is a big positive for blended learning however there are disadvantages such as not being able to ask any questions immediately.*

- ✓ *Student u: "I think staying safe is the most important thing, so I prefer blended learning.*

- ✓ *Student v: "i think face to face is better, however due to restrictions i think blended is*

> *the best option.*
>
>
> ✓ *Student w: "Face-to-face would be more comfortable <u>if I had trust in others to follow</u> <u>the covid-19 guidelines</u> but that seems to be less and less apparent.*

Qualitative evidence suggests that; i) some students prefer BL because they feel safer in their home in the Covid-19 pandemic; ii) BL is convenient because students can re-watch lectures to gain a more complete understanding of the class material, and iii) students fear that other students will not follow the Covid guidelines.

4.10. Summary of results

The following allows us to accept H1. Students prefer F2F learning because it promotes involvement and engagement. Students enjoy F2F teaching more when Covid is not an issue. Students have higher motivation to learn F2F before the pandemic because they feel interactions between tutors and fellow students are important. F2F learning is shown to be less stressful compared to BL. Students perceive that they are more supported via F2F teaching because students can ask questions in real time. Students also perceive is easier to ask questions about numerical issues in a F2F environment. Students also perceive that engagement and group work is more effective via F2F learning.

<Insert Figure 5 approximately here>

The following allows us to accept H2. Students prefer F2F teaching less when Covid is an issue. Students enjoy BL more as a result of the Covid-19 pandemic. Perceptions about BL in terms of levels of enjoyment have not changed from the beginning to end of the semester relative to F2F. Students have lower motivation to learn F2F during the pandemic. Students are more motivated to learn via BL during the pandemic, but feel slightly less motivated from the start of the semester, to the end. F2F learning is more stressful as a result of the pandemic, BL is not. Furthermore, qualitative evidence reflects that students are fearful of the virus and do not feel comfortable physically participating classes during the pandemic.

5.   Conclusion, discussion and avenues for future research

This study makes the following contributions. First, BL is seen by some as a superior approach to traditional pedagogical methods (Bernard et al., 2014; Connolly et al., 2006; 2003; Hall, 2006; Kirkpatrick, 2005; Liu et al. 2016; Mariott et al., 2004 ; Spanjers et al., 2015). On the other hand, others imply that BL can be a limiting factor in student development (Burgess, 2008; Concannon et al., 2005; Koskela et al., 2005; Lomer and Palmer, 2021; Mariott and Mariott; 2003; Robson and Greensmith, 2009; Selwyn, 2016). The Covid period is therefore a unique opportunity to extend the literature by demonstrating student preference in a situation where students expected F2F delivery, but were required to adapt to a BL and/or online approach. Our empirical results demonstrate that student's preference to receive lectures via BL increases during the Covid-19 period. The results imply that the move from BL during the pandemic was well received by students. The study therefore contributes to the literature by providing resource planning insights to management. A trade-off exists

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with regards to resource allocation. Whilst budgets may be tight following the pandemic, we would recommend that universities invest in enhancing BL for two reasons. First, management may choose to allocate resources to enhance BL deliveries to enhance student experience in preparation for similar disaster situations. Second, the sudden change from F2F to BL and/or online learning is recognized as having a significant impact on educator's mental health and stress levels (Belkhir et al., 2019; de Boer, 2020; Greenberg and Hibbert, 2020; Jung et al., 2021; Sangster et al., 2020). Thus, in normal times, investment in BL deliveries can be improve the professional lives of employees, as well as having institutional benefits, if a similar pandemic situation were to occur, as suggested by Courtene-Jones et al. (2020)

Second, some argue that as a result of Covid-19 the pandemic, BL can be considered the 'new normal' (Douglass, 2005; Bettis, 2020; Sangster, 2020; Yang and Huang, 2020). This study reports that whilst BL may be considered a well-designed pedagogical strategy in disaster situations (or in the future), 63% of our student sample would prefer F2F to BL if the Covid pandemic had not occurred. Put simply, qualitative and quantitative evidence demonstrates that students at Sheffield Hallam University are more motivated and prefer F2F when Covid-19 is not a consideration. The results can be interpreted in two ways. Students long for a return to normality thus prefer F2F teaching. On the other hand, students simply prefer F2F learning. Our qualitative evidence provides evidence in support of the latter. Results show:

- Students have a higher preference/motivation for F2F because of a feeling of involvement.
- It is also stated that the ability to ask questions about technical material is reduced in a BL environment relative to the F2F environment.

- Student stress levels are equal when receiving BL/F2F in the Covid-19 period. However, students have lower levels of stress via F2F when Covid is not an issue, suggesting stress is relatively higher in a BL environment.

- Qualitative evidence suggests that fewer interactions with the tutor is a potential reason for stress, as is the inability to engage with fellow students.

- Students do not feel comfortable engaging online.

- The largest perception difference between F2F and BL is associated with group learning. Students feel that the inability to interact with their peers socially is the largest flaw associated with BL.

- The one potential redeeming feature is that whilst BL is considered inflexible by educators (van Schalkwyk, 2020), students do not perceive a difference in flexibility between BL and F2F delivery, implying that flexibility may not be a limiting factor associated with BL delivery.

Third, based on our evidence, we offer practical solutions. Overall, our results imply that students prefer and are more motivated to learn F2F. The reason students prefer F2F to BL is because social elements including; engagement, interaction with peers/lecturer, and an ability to ask technical questions are perceived as being limited in a BL environment. Barber (2020) reports that a lack of social interactions is a limiting factor in online learning. It is inferred that to overcome some of the limitations of BL, lecturers can develop interactive tasks to enhance the engagement, motivation and academic performance of students in online environments (Barber 2021; Mchone, 2020). Therefore, we would encourage universities to develop standardised netiquette frameworks that mimic classroom interactions. The netiquette strategy that we would suggest is to create a space that mimics the social interactions 10 minutes before and

after a F2F lecture. In our experience, we found that students were idle in the 10 minutes before the online lecture. However, in the 10 minutes before the F2F lectures, the limiting factors that are associated with online lectures occur. Future studies may consider developing strategies to enhance social netiquette frameworks in a BL environment and report their effectiveness from the perspective of students. Fourth, we report that whilst the majority of our results remain consistent, some student perceptions change from the start of the semester to the end of the semester. As explained in section 4.10, we find that students consider F2F offers more support and is less stressful at the end of the semester, compared to the first. Thus, consistent with Li et al. (2021), we find that student perceptions at specific periods differ based on the perceived threat of the virus.

Next, we provide avenues for future research. A limitation of this study is that data is collected from accounting students at a single institution. We posit that based on random sampling, the perceptions of accounting students at Sheffield Hallam University are equivalent to accounting students at other British higher educational institutions. However, we cannot rule out that students in different universities have different attitudes towards F2F/BL. Therefore, we encourage future studies to compare the perceptions of student cohorts at different universities. Moreover, there is the potential that the perceptions of students that study technical subjects such as accounting may not be equivalent to students studying non-technical subjects. To add granularity to our findings, we encourage future comparative analysis studies to test whether the perceptions of technical/non-technical students differ.

Finally, we list limitations. Our Student's received BL learning for a 5 week period from October the 1st. During this period, classes were taught 1/3 online and 2/3

F2F. From week 6-12, all classes were taught online. Therefore, providing an analysis of BL verses F2F in a period where students expected BL, but have been provided online teaching has the potential to introduce bias. Because of Covid-19's impact on student's lives, a desire to return to F2F learning may represent the hope to return to 'normal'. We would encourage future studies to capture empirical evidence in the i) pandemic period and in ii) subsequent periods to address the effect of recency bias on student preference. Moreover, we collect a sample of 103 and 79 respondents out of a population of 310 accounting students. It can be argued that the sample represents students with an incentive to complete questionnaires. However, these limitations are indicative of all questionnaire studies. Furthermore, whilst we find accounting students at Sheffield Hallam University prefer F2F learning when the Covid-19 pandemic is not an issue, but prefer BL when Covid is an issue, the results may be different if students have insufficient resources to engage (Tamrat, 2020). Moreover, there is evidence that national (Korean) characteristics influence regulatory frameworks (Choi et al., 2017; Lim and Mali, 2018, 2020; Mali and Lim, 2018, 2019, 2020, 2021). We therefore encourage future meta-data approaches to enhance the predictive validity of our analysis. Meta-analysis can provide further insights about the attitudes of students from different countries that lack the resources to engage in effective BL environments.

In this study we test whether students have perceived their learning experience differently as a result of BL and F2F teaching, before and during the Covid-19 pandemic. However, there are variables that are likely to have impacted student experience, but not identified within the study, for example: whether a student or family members have underlying health conditions; whether students live in student accommodation or at home; student's academic level and ability; previous university

experiences; stress; levels of perceived support; family income; gender and ethnicity, amongst others. Guney (2009) shows that endogenous characteristics (male/female, working/not working, and learning disability/no learning disability, amongst other) influence student engagement and performance. With such data, regression analysis could provide enhanced predictive validity to empirical tests. Because we have been unable to collect the above data during the Covid-19 pandemic due to ethical concerns from the research committee, we are unable to report whether such characteristics influence a student's preference for BL or F2F learning. Future regression analysis projects may report whether student's frustrations during the pandemic or propensity to engage in BL/F2F activities is as a result of specific characteristics. Furthermore, this study captures student experience during the Covid-19 pandemic where some students are fearful of the physical threat of the virus. On the other hand, some students are shown to have a desire for normal classroom interactions. The face-to-face > blended learning delivery is one that many universities are exploring as a permanent change, thus a subject area that warrants research. Future longitudinal studies into the ongoing perspectives of students when the Covid-19 issue is not prevalent can extend the literature by means of a comparative analysis.

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