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Using a Survey and Discussion Forums on Students' Satisfaction and Experience to Inform the Development of a New Virtual Learning Environment (VLE): A Data-driven Approach to Technology Use in Learning and Teaching

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Using a Survey and Discussion Forums on Students' Satisfaction and Experience to inform the Development of a New Virtual Learning Environment (VLE): A Data-driven Approach to Technology Use in Learning and Teaching

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Abstract

The virtual learning environment (VLE) is of great importance in Higher Education as a repository for course content, communication and student support. Students' satisfaction with the VLE may impact greatly on their engagement with the VLE itself, and, consequently, module content and learning more widely. In moving to a new VLE we wished to optimise its design for our students' needs by determining features that impact students' usage. As such, in this study we tested the satisfaction of psychology students with the layout used in our current VLE, Blackboard Learn (BbL). Using an online survey, students rated their satisfaction for each element of the BbL template on a 7-point Likert-type scale, from 1 ('extremely dissatisfied') to 7 ('extremely satisfied'). Eighty-seven students enrolled in the BSc Psychology (N = 68) and BSc Psychology (Sport, Health and Exercise) (N = 19) programmes completed the survey. Results showed that, overall, students were very satisfied with their BbL structure. Open-text comments indicated students appreciated the clear, organised structure, making it very easy to navigate. However, students suggested clearer labelling and greater consistency across modules would improve their learning. These findings will be used to inform the template of our new VLE.

Introduction

Due to the increased use of internet-based learning management systems and social learning networks, some educators have decided to employ the use of technologies to improve students' skills learning and educational quality (Almoeather, 2020). Virtual learning environments (VLEs) are also used to create an attractive and interactive educational setting for 21st century students (Alharti, 2020). Although Higher Education institutions have made a significant effort to encourage students to embrace new digital technologies for blended and virtual learning, there is tangible evidence that students have conflicting opinions on whether they should accept or reject the usage of this new technology (Aliyu, Arasanmi, & Ekundayo, 2019). This study aims to give a comprehensive picture of students' acceptance and satisfaction of VLEs; in this case Blackboard Learn (BbL). One avenue in which VLEs have shown a particular strength is the sharing of additional materials or resources to support teaching

and learning. Students have embraced the use of BbL and other VLEs for additional material such as questionnaires, quizzes, and discussion forums (Alves, Miranda, & Morais, 2017). In one study, students' satisfaction was higher when things like animations, chats, questionnaires, quizzes and e-mails were used within the VLE (Topal, 2016). In a quantitative study by Steele et al. (2017), participants were given a survey in which over 39% ($N = 22$) of students said that the discussion forum was their first place to visit when logging in to their VLE. This is supported by Fissore et al. (2019), showing that discussions forums and activities on the VLE promote interaction between students. Activities performed on the VLE were reported and compared with engagement with their current course; this indicated that these activities helped to increase engagement and participation among students, as well as promote the development of social skills and teamwork (Fissore et al., 2019). However, students' participation may depend on the type of activity performed, differentiating between online and non-online activities. In-person learning environments can foster a sense of community and social interaction that some students thrive in, while others may benefit from the variety of activities offered in online learning (Del Carmen & Salcedo, 2017). Uziak et al. (2018) conducted a longitudinal study to determine students' opinions on BbL, its efficiency and effectiveness, as well as its promotion of interaction between students and instructors. Participants completed a structured questionnaire with 45 items at the end of each semester from 2007-8 to 2015-6. Of the 275 students who completed the questionnaire, 79% ($N = 217$) of participants stated that BbL presented the course content in an organised way, and 81% ($N = 223$) of participants confirmed its effectiveness in managing class activities. This shows that the majority of students were satisfied with BbL in the management of course content and activities.

VLEs can also be used in blended learning, with positive effects on students' learning performance, professional skills and learning attitudes. Jaffer, Govender and Brown (2017) analysed interviews, surveys and course evaluations on massive open online courses and concluded that students preferred face-to-face learning in combination with online learning because it allows for contact with peers. Pechenkina and Aeschliman (2017) further showed that blended learning was preferred by students, stating it had improved their comprehension as work could be discussed with peers in groupwork as well as providing them with a variety of learning activities given with VLEs. The usefulness of VLEs may therefore lie primarily in the provision of additional resources to support learning. However, blended learning may not suit everyone. Chang, Hung, and Lin (2015) demonstrated that students who are less interested in using technology or who have less reflective learning styles are more fearful of learning in such a setting and run a higher risk of withdrawing from the course. In addition, some studies have reported participants' dissatisfaction with online learning in a manner no different from traditional learning. Furthermore, Alharthi (2020) studied students' attitudes towards the use of technology in online courses. Results demonstrated students were not happy or satisfied with online learning technologies and would not recommend online courses with the technology as it currently exists. Students' engagement is an important element in determining student achievement and success, especially if students are learning through VLEs (Alokluk, 2018). Gathering the views of our students of their VLE was therefore a crucial aim of the current study, to ensure VLE design was optimal for the engagement and learning of our students.

The discrepancy in outcomes may reflect the more complex relationship between VLEs use and students' satisfaction. Cassidy (2016) measured student satisfaction before and after introduction of a VLE for two modules

(one core and one elected), via module evaluation surveys. Student satisfaction increased following VLE introduction for the core module, whilst there was no clear relationship between VLE use and satisfaction for the elected module. This is despite the acknowledgement by students of improved communication and teaching method variety with the VLE for both modules. Such may have been driven by pre-existing engagement with the module, as the shift was primarily from those ambivalent towards the module (from ‘neither satisfied nor dissatisfied’ to ‘satisfied’ or ‘extremely satisfied’ ratings), or due to the core module being a subject many students find difficult (i.e. Research Methods). Thus, baseline engagement and module content may influence engagement and perceived usefulness of VLEs.

With the continued growth of VLE usage, it is important for educators to gain an understanding of the impact of students’ interactions with course content, as it directly affects students’ learning and engagement (Steele et al., 2017). Understanding the aspects of VLEs that aid students’ teaching and learning is particularly important, given the brain’s limited capacity for information processing (Mayer, 2002). Too much content can lead students to feel overwhelmed, distract their attention away from crucial information, and disengage with the VLE (Sweller, 2004). VLEs are therefore most effective when the less helpful or least utilised elements are removed and only those aspects students need most are retained (Al-Ugaily, 2021; Godett, 2022; Hamutoglu et al., 2020; Liu & Cheng, 2021). Indeed, MacLeod, Yang, Zhu and Li (2018) recommended that student needs be assessed as an integral part of optimal VLE design. So far, there is limited research investigating the features, within BbL, of most use to students, nor the impact on student satisfaction. This study therefore sought to test students’ (dis)satisfaction with BbL; specifically, investigating in depth the views of our students with regard to each element of a new BbL shell structure implemented in Psychology undergraduate programmes.

Method

Participants

Participants were recruited from the cohort of students enrolled in the BSc Psychology and BSc Psychology (Sport, Health and Exercise; (SHE)) degree programmes at the authors’ institution in the academic year 2021-2. Eighty-seven students completed the study ($N = 68$, 78.2% from BSc Psychology; $N = 19$, 21.8% from BSc Psychology (SHE)). Thirty-nine students (44.8%) were in their first year of study (FHEQ Level 4) and 48 (55.2%) in their second year (FHEQ Level 5).

Materials

The structure used in BbL for all modules (or ‘Blocks’) consisted of two main parts. The first related to the module in question, and contained the ‘Block Hub’, the ‘Block Communication’, and the ‘Block Progression’. The second related to the support available for students: academic (‘Academic skills Support’, ‘Employability Skills’, and ‘The British Psychological Society’), and non-academic (‘Tutoring’, ‘Peer-Assisted Learning (for Level 4/Year 1 students only), and ‘Wellbeing & Mental Health support’). Students were asked to rate each of the sections and sub-sections in terms of overall satisfaction on a 7-point Likert-type scale from 1 (‘extremely dissatisfied’) to 7 (‘extremely satisfied’). They were then asked to include a comment on something that they considered worked

well, and something that they considered needing improvement for each of the different sections and sub-sections.

Anecdotal Data

In addition to the survey, discussion forums were held to explore students' experiences with each section of the BbL shell in greater depth. The group format was used to ensure that discussion with their peers led to richer information than that provided by the open questions on their own. Students were recruited from the same cohort of students as the survey. All discussion forums were held and recorded via MS Teams and details of each are provided in Table 1. Recordings were analysed systematically by two researchers independently, each noting down the feedback that students had provided; this to avoid making mistakes or overlooking critical factors. The two researchers then worked together to identify patterns emerging in the feedback (Braun & Clarke, 2006).

Table 1. Details of the Six Discussion Forums

Discussion forum	Duration in minutes and seconds	Participants
1	00:25:12	P1: BSc Psychology (SHE) Level 6 P2: BSc Psychology Level 6 P3: BSc Psychology Level 5 P4: BSc Psychology Level 5 P5: BSc Psychology Level 5 P6: BSc Psychology Level 6 P7: BSc Psychology Level 6
2	01:12:01	P8: BSc Psychology Level 4 P9: BSc Psychology Level 4 P10: BSc Psychology Level 4
3	01:06:40	P11: BSc Psychology Level 4 P12: BSc Psychology (SHE) Level 4 P13: BSc Psychology Level 4 P14: BSc Psychology Level 4 P15: BSc Psychology Level 4 P16: BSc Psychology Level 4
4	00:52:45	P17: BSc Psychology Level 4 P18: BSc Psychology Level 4 P19: BSc Psychology Level 4 P20: BSc Psychology Level 4 P21: BSc Psychology Level 4 P22: BSc Psychology Level 4
5	00:56:22	P23: BSc Psychology Level 4 P24: BSc Psychology Level 4 P25: BSc Psychology Level 4 P26: BSc Psychology Level 4

Discussion forum	Duration in minutes and seconds	Participants
		P27: BSc Psychology Level 4
		P28: BSc Psychology Level 4
6	00:48:54	P29: BSc Psychology Level 4
		P30: BSc Psychology (SHE) Level 4
		P31: BSc Psychology Level 5
		P32: BSc Psychology Level 4
		P33: BSc Psychology Level 4

Ethical Considerations

All procedures were granted ethical approval from the authors’ institution’s Research Ethics Committee (approval number: 20942-A-Feb/2022- 37940-2). The survey was created and delivered via Qualtrics. Participants were presented with a Participant Information Sheet and provided written consent prior to commencing the study (for both survey and discussion forum). Upon completion of the study, participants were provided with a debrief statement describing the aims of the study and contact details for support (if required). Participation was strictly voluntary, and students could stop at any time without giving an explanation; Level 4/Year 1 and Level 5/Year 2 students received two credits for their participation as part of an assessment.

Results

Overall Satisfaction

Results showed students were highly satisfied with the ‘Block Hub’ section, moderately satisfied with the ‘Block Progression’ and ‘Additional Resources’ sections, and not very satisfied with the ‘Block Communication’ section of the BbL shell (see Figure 1).

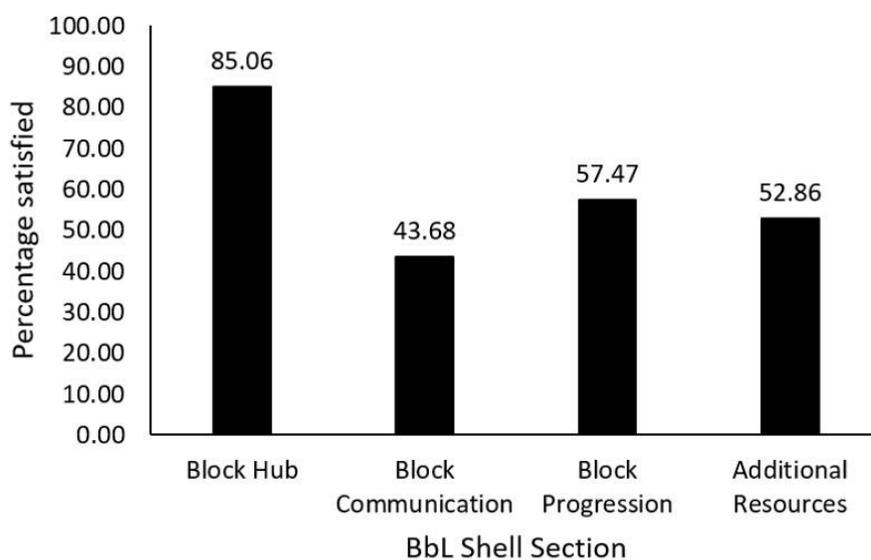


Figure 1. Percentage of Students Satisfied with Each Section ‘Overall’* (*The percentage satisfied is the sum of the ratings ‘somewhat satisfied’, ‘very satisfied’ and ‘extremely satisfied’.)

In the sub-sections below, results for each section of the BbL shell will be outlined showing survey quantitative data, open survey quotes and discussion forum data.

'Block Hub'

In more detail, students were extremely satisfied with the 'Block Hub' sub-sections (Figure 2), in particular the 'Learning Materials' sub-section. In terms of strengths, students mentioned that the categorisation of content per week made it well organised, easy to use and navigate. One student commented: "Course content (lectures, slides and more) is easily visible and all in one place." (P15). To further improve this sub-section, students suggested more consistency in the labelling across modules and adding more asynchronous materials, especially resources/activities that can be accessed without having to download: "Possibly quizzes could be added after each week to test our knowledge on the module" (P32). Students were least satisfied with the 'Handbook/Syllabus & Block Outline' sub-section. Nevertheless, students did find this section useful for setting expectations for the module: "Being able to view what to expect in the module and plan out your work." (P63).

The key contributing factor for the lower satisfaction score in this sub-section seems to derive from a lack of consistency across modules as to what academics use this sub-section for: "Not all lecturers have the same material in this section. Inconsistent." (P34). Students were very satisfied with the 'Welcome' sub-section as the content was clear, informative and provided in a simple format. They particularly liked that the most important information could be found at a glance (e.g., contact details, office hours, photographs of the academics teaching the block, etc.): "Good front face for the module and familiarising yourself with teaching lectures when pictures are involved" (P19). However, students mentioned there was some inconsistency across modules as some did not include all teaching staff involved in the module: "To improve I would make sure all staff members who will teach the module actually fill out this page as some did not" (P62). Students were quite satisfied with the 'Talis Reading List' and the 'Panopto Recordings' sub-sections. For the 'Talis Reading' list, they liked that the sub-section was well organised, and materials were easy to find. They particularly liked the distinction between essential and beneficial (optional) reading material: "Everything is labelled, e.g., 'Essential reading', 'Additional reading', links are provided for each book, it gives you information about how and where to find the books." (P27).

Students mentioned a few technical issues with using the reading list, which have been fed back to the relevant department. A suggestion that could feed into our VLE design is the inclusion of a wider range of reading material: "It's nice to have essential readings in one place, but I feel that sometimes there isn't a wide range unfortunately." (P15). In relation to the 'Panopto Recordings' (the lecture videocapture system) sub-section, students commented on the accessibility, clear layout, and the use of subtitles: "This is very useful because it makes watching back lectures and workshops so easy due to the quick accessibility and clear layout of them." (P8).

The overarching theme that students mentioned with regards to improvements was (again) inconsistency. It was noted that titles, location, time of availability, and content all showed inconsistencies across modules: "It can get a little confusing when lectures have random videos from previous years and the titles don't necessary line up with the name of the slides." (P71). Discussion forum comments matched with these across the different sub-

sections. In addition, students mentioned that the ‘Panopto Recordings’ folder could be removed, and all recordings could be embedded within the ‘Learning Materials’ of the relevant week.

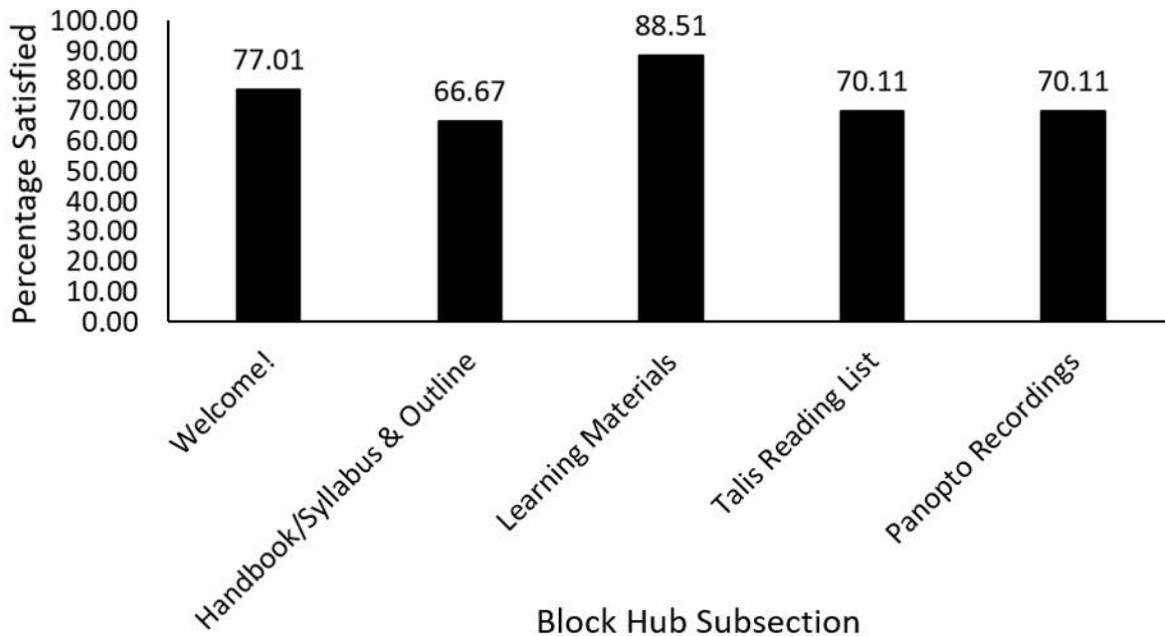


Figure 2. Percentage of Students Satisfied with the ‘Block Hub’ Sub-sections

‘Block Communication’

Students were very satisfied with the ‘Blackboard Collaborate’ sub-section (Figure 3) of the ‘Block Communication’ section. Blackboard Collaborate is an in-built online classroom functionality within BbL. Students liked using this for watching teaching sessions live: “Great place to watch lectures and rewatch” (P3). However, students found it difficult to locate recordings from past teaching sessions: “This section isn’t as clear as Panopto. One has to click on the three lines [‘hamburger’ icon], and then navigate to the appropriate lectures. It took me a while to find the lectures when we were using Blackboard Collaborate.” (P15).

Students were less satisfied with the ‘Notifications/Announcements’ sub-section. Students mentioned that this was a good place for communication and staying up to date: “Keeps you updated when something is poste [*sic*]” (P22). However, students remarked that this sub-section is not often used by academics and recommended that academics post updates more frequently: “It isn’t very useful as not many people use it” (P1). A similar picture emerged for the ‘Discussion Boards/Forums’. Students generally thought this was a good idea: “A good way of sharing answers to questions instead of privately communicating via e-mail, allowing for other course members to receive help. A way of preventing the same questions being repeatedly answered.” (P68); however, this sub-section was not used very often: “Good idea in theory but no one uses it.” (P22). In the discussion forums, students consistently commented that they use e-mails rather than the announcements area within BbL. Some students also noted that whilst they sometimes would refer to the discussion forum before sending an e-mail if they had a question, they never themselves had posted a question on the discussion forum.

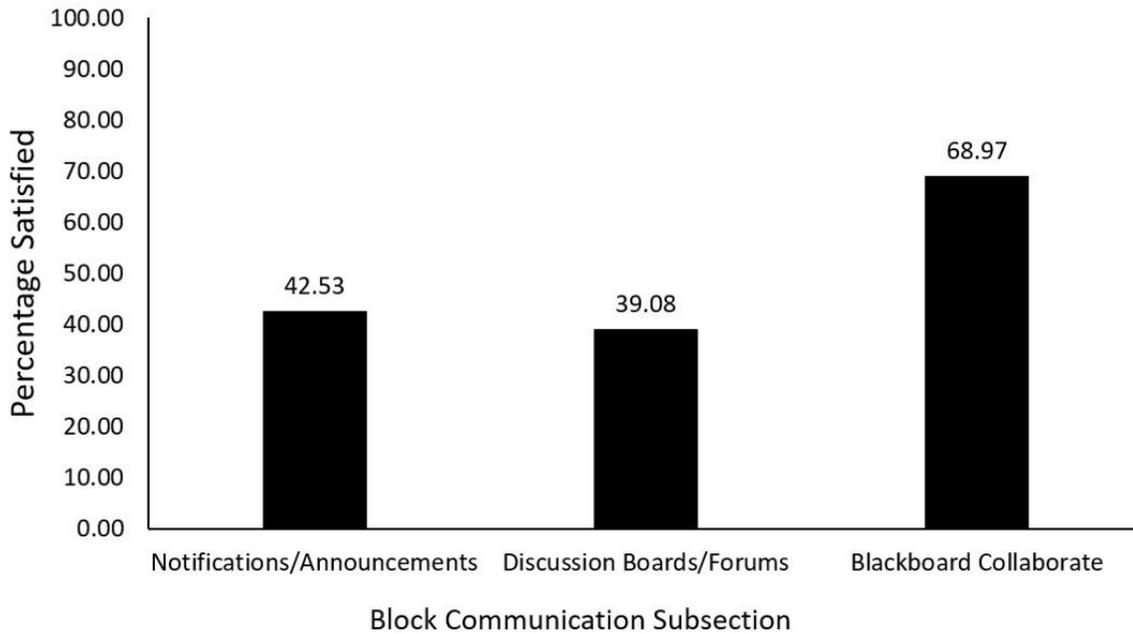


Figure 3. Percentage Satisfied with Each 'Block Communication' Sub-section

'Block Progression'

Students were very satisfied with the 'Assessment Information' sub-section of the 'Block Progression' section (Figure 4). Students mentioned that the information for their assessments was clear and easy to access: "The 'Block Progression - Assessment Information' sub-section works well because it is an easy and efficient way to get a detailed organised description of everything that is required to for you to get a good grade on your assessment." (P47). The main suggestion for improvement was to include more examples of high-quality work to prepare for the relevant assessment: "Include examples of work related to assessments and module." (P33). In the discussion forums, students mentioned that they liked the security of having all information crucial to their assessment in one place, even if certain details are provided during lectures.

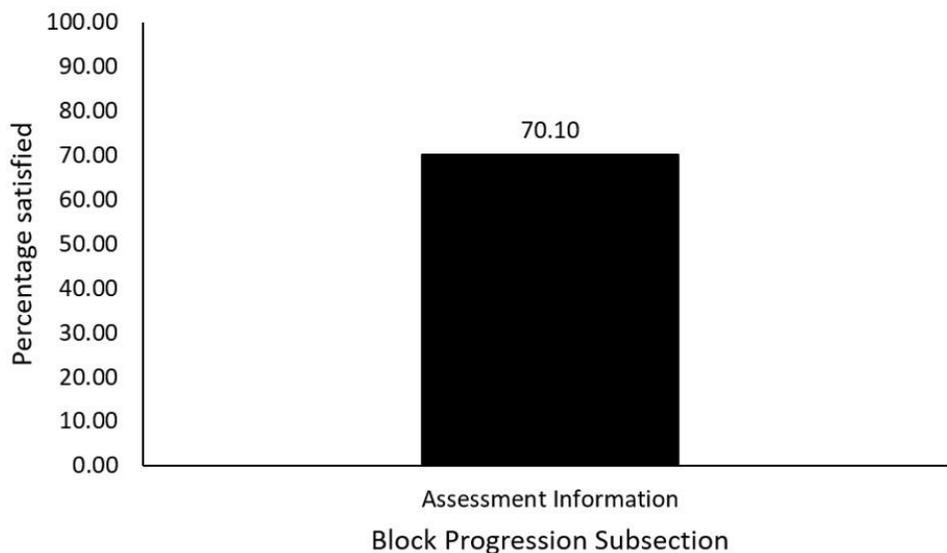


Figure 4. Percentage Satisfied with Each 'Block Progression' Sub-section

‘Additional Resources’

Overall, students were not very satisfied with the ‘Additional Resources’ sub-sections despite these sub-sections being included based on students’ feedback and recommendations from the previous academic year (Figure 5). For all six sub-sections, students commented that these were easy to use and navigate: “Everything is there that you need.” (P58). In addition, they mentioned that these sub-sections contained useful information and relevant sources of support: “Shows all the places to get support and help.” (P59). For the ‘Employability Skills Support’, students highlighted that this sub-section provides specific information tailored to career support and job opportunities: “Helps us for future jobs and what to do when preparing for them.” (P44). The ‘Wellbeing and Mental Health support’ sub-section received positive comments related to the support students felt it provided: “I think this section helps a lot especially because of the pressure and changes we deal with as students. It helps us feel supported.” (P8).

In terms of improvements, many students commented that they did not really use these sub-sections which may explain the lower satisfaction scores: “Need to be encouraged more amongst students.” (P77). There appears to be a misunderstanding amongst the students about the purpose of the ‘Additional Resources’ sub-sections. These were intended to be areas for further support (both academic and non-academic support) with links to signpost students to relevant professional services at the University and beyond. However, from the feedback provided by the students, they wanted more content within these sections in addition to the signposting links: “Maybe have a brief description of the content on the page rather than clicking links to be directed to another website.” (P87). During the discussion forums, students shared similar thoughts and added that if they needed to access this information, they would go to the ‘Communities’ section which contains all the relevant information for students across all levels and programmes.

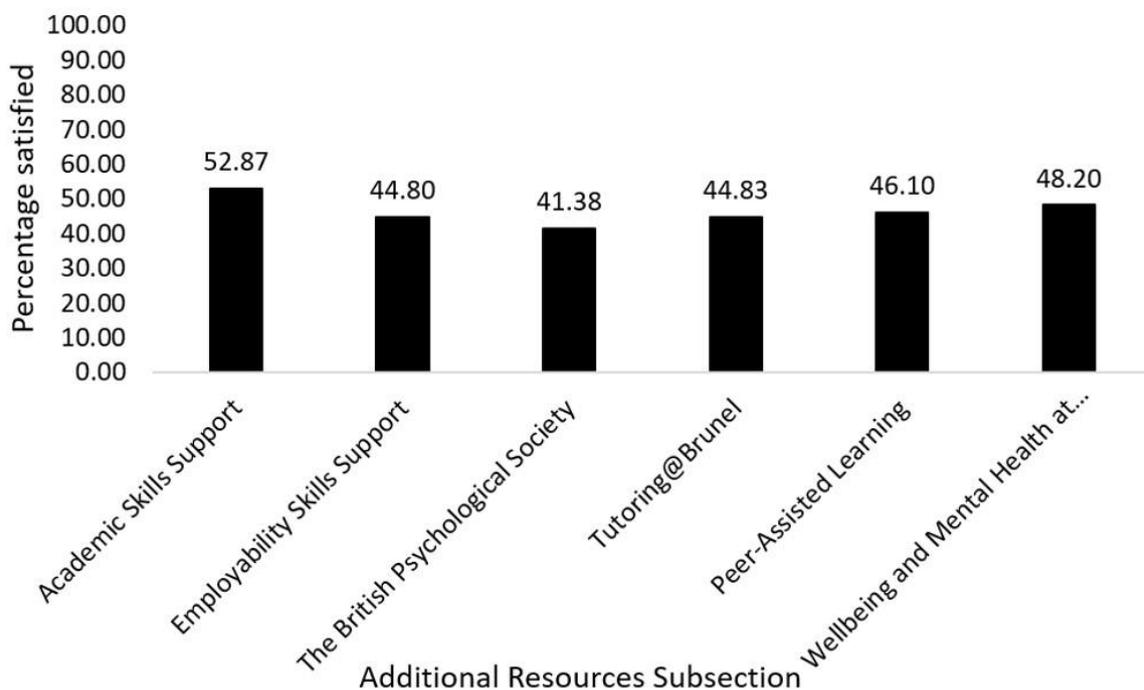


Figure 5. Percentage Satisfied with Each ‘Additional Resources’ Sub-section

Discussion

The aim of this study was to determine whether students enrolled in the BSc Psychology and BSc Psychology (SHE) programmes were satisfied with each element of the structure of their VLE. Results showed that, overall, students were satisfied with the BbL structure. Key findings were that students like clear labelling and resources that will help them with assessments. Consistency, or lack thereof, across modules had the strongest effect on their satisfaction. Notably, whilst students commented that 'Discussion Forums' (as part of the VLE) were a good idea, these were not used a lot in practice.

The lack of use of discussion forums is interesting, given that communication is often perceived to be one of the primary uses of VLEs (Davies, 2020; Fissore et al., 2019; Rienties & Toetenel, 2016; Steele et al., 2017). Clear lines of communication between lecturers and students are associated with increased perceived usefulness of the VLE by students, as well as increases in student engagement, satisfaction and retention (Rienties & Toetenel, 2016). Almehi (2021) found discussion forums were rated the most important element of BbL for establishing a strong student-lecturer rapport. However, the value of discussion forums may depend on the pre-existing perceptions and expectations of the students. Hamutoglu et al. (2020) found that students' appreciation of discussion forums differed as a function of whether or not they found extra guidance helpful. Those who valued guidance rated discussion forums positively, whilst those who did not want extra guidance through their VLE were more negative in their ratings.

The richness of communication may be a crucial feature also. Rienties and Toetenel (2016) found student satisfaction and engagement both increased as communication opportunities afforded by the VLE increased. It is possible that in our case, 'Discussion Forums' were not utilised frequently enough by academics. Coupled with a lack of consistency of use across modules, this may have led to lower perceived utility and engagement with discussion forums by our students. It is also noteworthy that Rienties and Toetenel (2016) were investigating VLE use primarily in online distance learning settings, and Almehi (2021) was researching learning during the COVID-19 pandemic shift to exclusively online teaching. In our case, where our on-campus degree programmes afford students the opportunity for other forms of contact with academic staff, students and staff may prioritise online discussion forums less.

It is important to note that the success of VLEs depends on a variety of factors, including the design and usability of the platform, the quality of instructional materials, and the support provided to students (Cosgrave et al., 2011; Hamutoglu et al., 2020). For the students surveyed by Almehi (2021), the most common reason for liking BbL was how clear and convenient it was to use as a learning platform. Our study supported this, with high satisfaction ratings for those sections of our BbL shell most commonly described as having clear and accessible content. Students commented that categorising learning materials by week made it easy for them to find what they were seeking. Clarity in the labelling of lecture recordings, slides and readings made content more accessible and allowed students to set their expectations for the requirements of each module. Providing assessment information in a distinct, easy to find section was also viewed favourably by students, giving them the confidence that they knew where to find everything and would not overlook materials crucial to their assessments. Ease of use is

associated with a greater willingness to engage with VLEs (Alexander, McLachlan, Barcellona, & Sackley, 2019). This is important given that greater VLE use is also associated with higher academic performance (Boulton, Kent & Williams, 2018).

In line with students' preferences for clear and consistent use of the VLE, the main factor associated with reduced satisfaction was material or information being difficult for students to find. The most common cause of frustration was inconsistency in the use of the different sections of the BbL shell across modules. One of the issues frequently noted by students as reducing their satisfaction was that academics did not put materials in the same place, making it difficult to navigate and locate materials across modules. Prior research similarly shows that lack of consistency and clarity are the two factors that students discussed as negatively affecting their VLE experience (Alexander et al., 2019; Cassidy, 2016). Ease of use was also reduced when students had to click through multiple sections to find material (Garrett, Chiu, Zhang, & Young, 2016). Ensuring consistency of layout across the modules within a programme of study could improve satisfaction and usability of BbL for students (Almaiah & Alyoussef, 2019; Garrett et al., 2016).

Another commonly raised point by the students was the desire for more quizzes within the VLE. Whilst some academics included these, others did not. Quizzes are an element that prior research has shown to be highly rated in terms of likeability (Almehi, 2021), with students reporting a diversity of activities, quizzes in particular, helpful in supporting the development of knowledge and understanding (Alexander et al., 2019). Such resources are also advisable for pedagogical reasons, promoting active learning that is associated with increased student motivation and success (Kazmi & Riaz, 2019).

The other factor associated with lower satisfaction was where students thought a section or the material contained therein was not of relevance to them. This was most evident with the 'Additional Resources' section. The section was included based on student feedback from the previous academic year, providing links and information about various sources of additional support, such as academic skills advisors, library resources and wellbeing. However, the students surveyed generally indicated they did not need to access this information, or showed a lack of understanding about what the section was intended for. Qualitative data from Cassidy (2016) similarly showed that perceived relevance of the material was an important determinant of how highly liked a module's VLE space was. Material perceived as lower in relevance was associated with more negative comments about the module's VLE. For our students, the need to click to other websites to access the 'Additional Resources' materials may also have reduced satisfaction with this section, as discussed above. Whilst this had been intended as a hub to signpost students where to find the relevant resources, this unforeseen consequence will be taken into account in the design of our new VLE template.

Overall students felt satisfied with BbL as their VLE due to the user-friendly interface, accessibility and availability of resources. Another important feature of VLEs that enhances student experience is the flexibility that it provides (Fissore et al., 2019). Our results confirm this as students mentioned that BbL provided flexibility to re-watch lectures, which made it easier to learn and prepare for assessments. The ability to review lecture content, particularly the way it allows students to engage with the content at their own pace, contributes to the

favourable perception of students regarding availability of lectures on VLEs (O’Callaghan, Neumann, Jones, & Creed, 2017).

The use of VLEs has the potential to engage students in learning activities, provide them with easy access to learning resources, and facilitate interaction with their peers and instructors. Studies have shown that students who use VLEs are generally satisfied with the technology and perceive it as a valuable addition to their learning environment (Eom & Ashill, 2016; Al-Fraihat, Joy & Sinclair, 2020). Al-Fraihat et al. (2020) found that students’ satisfaction with VLEs was positively related to their academic performance. Another study by Eom and Ashill (2016) demonstrated that VLEs enhanced students’ engagement and motivation, leading to better learning outcomes. The current structure of the BbL shell was designed with careful consideration of previous research regarding these factors influencing engagement and satisfaction. It is encouraging to see such research-led design has led to the desired high level of satisfaction among our students. These principles and the feedback of our students in this study will therefore feed into the design of our new VLE.

Conclusion

This study sought to determine whether students were satisfied with the BbL structure that had been developed based on literature, student feedback and suggestions from the previous academic year. Results showed that students were satisfied with the structure, in particular the navigation, its ease of use, and availability of resources. Inconsistency across modules and unclear labelling made it difficult to find materials and caused confusion amongst the students. These points will be used to inform the template of our new VLE.

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