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Barbagallo, M. S., Porter, J. E., & Lamunu, M. (2020). Evaluation of a Blended Online and Digital Learning Mode of Anatomy and Physiology for Undergraduate Nursing Students. *Computers, Informatics, Nursing*, 38(12), 633–637.

Available online: <https://doi.org/10.1097/CIN.0000000000000639>

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Abstract

BOLD learning includes a variety of activities that combine engaging classroom-based education with online learning. The aim of this study is to evaluate undergraduate students' perceptions of a BOLD curriculum for Anatomy and Physiology (A+P) in the nursing degree. A quantitative methodology was used with a sample of 100 undergraduate nursing students from a single Australian University. The data was collected using Lime Survey and then analysed using Statistical Package for the Social Sciences (SPSS) V24. Descriptive statistics was conducted and presented in this paper. There were a total of 100 students, of which 90% were enrolled in the standard mode compared to 10% in a flexible mode of delivery. Results indicated that 29% of students preferred laboratory classes as having the most impact. Participants (46%) also agreed that recorded lectures were useful, with 36% indicating that the online platform was easy to navigate going as far as wanting more online quizzes (49%). Over half of the students (54%) acknowledged that A+P was important for their future careers. The BOLD learner preferences in delivering A+P related courses should be adjusted in order for learning to be effective for undergraduate students in the future.

Key Words

Blended, Online, Undergraduate, Nursing

Introduction

In the past decade, blended learning has become a topical trend in education.¹⁻⁴ Blended learning is defined as a combination of face-to face learning and online learning. Blended learning also includes being able to choose learning experiences that match students' preferred learning style, enabling them to achieve individual learning goals.⁵ Students welcome the flexibility of the blended approach, can complete content whenever they want, and the blend of lectures and tutorials together with online forums offers a range of approaches to learn.⁵

Page et al,⁶ state that students' perceptions of their own learning experiences have been linked to their success in human biosciences and that there are several factors that influence the students' perception, such as; being overwhelmed by the content, the quality of the teaching in the subject, and if they feel supported by the teaching staff. In this instance, the authors suggest it is vital for the teaching staff to recognize these factors in the course design. Eagleton⁷ also state that students respond positively to course learnability and the relevance of the subject for their future careers. Similarly, Eagleton⁷ also argues that students find it difficult to comprehend that they need to understand anatomy and physiology to be able to apply them in topics such as pathology and diagnostics. In addition, in a blended learning environment (BLE), students need to be exposed to a variety of tools to master the content. Riesen et al,⁸ also showed that students considered the BLE acceptable for learning with, from and about each other and that it is important to have face-to-face interaction, and that they enjoy the face-to-face delivery method above others. Yet students indicate higher levels of satisfaction with smaller-classes over a large lecture-

based format.¹ Jokinen & Mikkonen² stated that such challenges must be taken into consideration when planning and implementing blended teaching and learning.

Further work has proven that students do prefer a blended learning approach. Students expressed their positivity about using a blended learning approach when learning about evidence-based medicine in a Medical school where assessed competency was significantly higher compared to a didactic approach.⁹ This is also in agreement with Elmer et al,¹⁰ where blended learning in physiology laboratories increased student perceptions of blended learning and laboratory preparedness more so than traditional teaching.

The importance of the online content cannot be overlooked. The clarity and design of the web-based content, as well as the direction within the learning content are important.¹¹ Additionally, blended learning provides good opportunities to enhance students' learning if it carefully complements face to face lessons with online learning modules.⁴ As Jokinen & Mikkonen² states, blended learning creates more realistic environments, which motivate students and enhance their learning process. Likewise, blended learning provides good opportunities to enhance students' learning in and about work.

The purpose of this study is to evaluate student experiences and perceptions of a blended online and digital (BOLD) curriculum in a first year fundamental Anatomy and Physiology (A+P) subject in an undergraduate nursing degree. It is envisaged that the findings of this study might provide valuable insight into the learning preferences of nursing students in A+P courses. While this paper presents findings for a nursing curriculum, its considerations are transferable to other disciplines where fundamental A+P or biosciences are taught.

Methods

Study Design

This quantitative research focused on undergraduate Bachelor of Nursing students who were enrolled in Anatomy and Physiology courses in 2016 at Federation University Australia in a BOLD delivery. The survey was designed using a 5 point Likert scale incorporating; strongly agree (scoring a 1) to strongly disagree (scoring a 5), and in other questions extremely important (scoring a 1) to not important (scoring a 5) and a Yes, No, N/A. The survey design was based on a similar research, which maximises the content validity.¹² The survey, which was entered into Lime Survey, was left open for a period of eight weeks with frequent email reminders to students to complete the survey. The survey took approximately 20 minutes for participants to complete.

Sample Population & Recruitment

Participants were recruited from among 490 undergraduate Bachelor of Nursing students from Federation University Australia at its two regional campuses in the state of Victoria Australia. Participants comprised of undergraduate students who were enrolled in Anatomy and Physiology course as either standard and flexible students across two consecutive semesters. Standard students come on campus every week to learn meanwhile flexible students study predominately online and attend the campus for intensive weeks of on-campus work in each semester. Students were invited to participate in this research project via an email invitation. Students received a flyer via email, which included a link to the explanatory statement and online survey. Implied consent was assumed when the participant clicked on the link and answered the survey questions. The participants were

assured that participation in this project would have no effect on their academic grades, or affect opportunities for future employment

Ethical Implications

A low minimum risk ethics application was submitted and approved by the University Human Ethics Committee (Project B16-112). No negative impact was anticipated by participating in this evaluation study. However, counselling services were made available to participants if required. The researchers were not involved in the recruitment process.

Data Analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 24 (IBM, 2016). Descriptive statistics analysis was used to describe the study population, expressed in percentages and frequencies with a mean, median and mode. Raw data were coded before analysis in SPSS V24.

Results

Demographics

Out of 490 students enrolled in the courses 20.4% (n=100) completed the survey. Most of the participants consisted of an age range of 18-23, 66% (n=66), followed by age range of 24-29, 13% (n=13), those whose age ranged from 30-35 were 8% (n=8), then both age range of 36-40 and 41-45 age ranges were 5% (n=5) each and 46-50 age range were 3% (n=3) participants. The participants comprised of 90% (n=90) female, 8% (n=8) male and 2% (n=2) other. There were 92% (n=92) participants who study full time and those who study part

time constituted only 8% (n=8) of the total data set. Participants who were enrolled as standard (on campus) students were 90% (n=90) and 10% (n=10) were enrolled as flexible students.

Resources utilised in the study of A+P.

Participants were asked to rate, in order from most to least useful, the resources they utilised in the study of A+P. The top four were, lab classes 29% (n=29), followed by reading the textbook 15% (n=15), then making detailed notes 13% (n=13) and working through online lessons 9% (n=9) (Table 1 shows the items ranked as the most important). The four resources ranking lowest out of 19, were; other 52.2% (n=50) which was not described, both Peer Assisted Study Sessions (PASS) sessions and Mastering A+P (an online textbook resource) each at 10.4% (n=10), and semester timelines 7.3% (n=7).

Participants were asked what they would like more during their study of A+P, with 49% (n=49) of participants wanting more practice quizzes, 44% (n=44), lessons with activities and 43% (n=43) wanting weekly lab material. Introduction to online platform, Mastering A+P and Weekly Forums were not desired by 86% (n=86), 87% (n=87) and 88% (n=88) of the population respectively. In addition 7% (n=7) of the participants responded that no additional resources were required for their effective study of A+P.

Preferred options of the online course module release

Participants were asked to select when they want the online course modules to be open. Out of the participants, those who wanted 'all the modules to be open by the start of semester' were 38.4% (n=33), those who preferred 'conditional release of next module

upon completion of the previous week' were 25.6% (n=22), those who preferred '1 module opened each week' were 19.8% (n=17), and 16.3% (n=14) favoured 'batches of modules open in stages'.

Experience of learning A+P

The participants were asked why they enjoyed the topics in A+P, out of the participants, 39% (n=39) replied that 'its relevant to the degree they are studying,' 38% (n=38) responded that 'the material was easy to follow/understand,' 32% (n=32) answered 'it informs their understanding of A+P,' and 29% (n=29) responded that they 'liked the facilitator'. When the participants were asked to select one reason why they did not enjoy A+P, 75% (n=63) responded that 'the material was hard to follow/understand,' 14.3% (n=12) replied 'not interesting', 4.8% (n=4) answered 'not relevant to the degree they are studying' and 6% (n=5) stated 'other'. When participants were asked to rate the statements listed about the online platform and their learning experience in A+P, 30.1% (n=25) responded 'strongly agree' with the statement 'I found the online platform easy to navigate,' 36.1% (n=30) answered 'agree' with the statement 'the recorded lectures were useful' and 45.8% (n=38) were 'neutral' to the statement 'the weekly topic forums were useful' (Table 2, denoted with a *).

As indicated in the findings (Table 3, denoted with a *), participants rated the statement listed about the laboratory sessions in A+P with 42.7% (n=35) and 41.5% (n=34) responded 'strongly agree' with the statement 'the laboratory classes helped my learning' and 'I enjoyed the hands-on learning' respectively, the participants who 'agree' with the statement 'I liked working in groups' was 43.9% (n=36).

When participants were questioned how important they think an understanding of A+P will be for their future career, 54% (n=44) responded with 'extremely important', 14.8% (n=12) answered 'important', 12.3% (n=10) chose 'very important', n=8 (9.9%) replied 'somewhat important' and 8.6% (n=7) reacted 'not important'. Also, when participants were asked if they think that A+P will assist them in the future with their career, 53.1% (n=43) responded, 'extremely important,' 13.6% (n=11) answered 'very import,' 12.3% (n=10) participants stated, 'important and 'somewhat important' then 8.6% (n=7) responded, 'not important.' Participants were also asked how they think A+P has prepared them for their future studies. Out of the participants, 30.5% (n=25) answered 'strongly agree,' n=22 (26.8%) responded 'somewhat agree', 25.6% (n=21) replied 'agree'.

Discussion

The primary purpose of the current study was to examine first year undergraduate Bachelor of Nursing students' perceptions of the BOLD mode of learning of A+P. When students were asked about the online platform and their learning experience in A+P, 36.1% (n=30) students responded that the recorded lectures were useful and 30.1% (n=25) of students responded that the online platform was easy to navigate. The noted usefulness is most likely due to recorded lectures being time flexible and can be watched repeatedly whenever and where they want. Ireland et al,⁵ state that students welcome the flexibility of blended learning because they can complete module work whenever they want. However, according to Page et al,⁶ students did not like online recorded lectures as a substitute for the face-to-face lectures where 70% of students requested more face-to-face time. Philips et al,¹ state

that students replied that it took more time to complete the online lectures. In contrast the data presented here supports the findings of Ireland et al,⁵ where the flexibility of the online learning is preferable given the balance with a face-to-face component, in this instance a laboratory class.

When participants were asked to choose one reason for not enjoying A+P, 75% (n=63) of the participants responded that the material was hard to follow or understand. Eagleton⁷ states that students did not expect A+P modules to be so comprehensive. However, in the current study, students valued A+P learning with the hope that it would assist them in their nursing program as well as prepare them for their future careers. According to Eagleton,⁷ students' responses concerning A+P learnability and significance for future careers was positive. This finding in the context of the current study is particularly useful for refining the online content. While students in both this study and that of Eagleton,⁷ report on the significance and importance of the study of A+P its delivery needs to be carefully balanced and delivered.

The advantages of blended learning in the current study include the fact that students liked the recorded lectures, laboratory classes and working in groups. In the current study, 41.5% (n=34) of students agreed that laboratory classes were interesting and enjoyable. Thus, 42.7% (n=35) strongly agreed that laboratory classes helped their learning. Woltering et al,⁴ state that blended learning carefully balances face-to-face learning with online learning. This indicates, it is possible to bring the advantages of face-to-face classes and online lessons together in the BOLD curriculum mode.

Hands-on learning is the preferred method of learning by the students with evidence of laboratory classes being rated the highest and with the most impact on A+P learnability. Furthermore, 43.9% (n=36) students liked working in groups. Phillips et al,¹ state that a BLE approach may possibly enhance the teaching of a wide variety of health profession students with higher student satisfaction. In addition, 43% (n=43) students chose weekly laboratory classes along with the practice quizzes 49% (n=49) and lessons with activities 44% (n=44) as the additional resources they required in the study of A+P. According to Page et al,⁶ when students were asked how the learning experience could be improved, the majority of students responded by asking for more contact time with lectures and tutors. Together the data presented in this study along with that of Page et al,⁶ suggests that the balance of online content and that of face-to-face is a delicate balance.

Limitations

The number of participants that completed the online survey via Lime Survey was much smaller than expected. This resulted in a small sample size (n=100), which equated to only 20.4% of the sample population. This limits the generalizability of the current study and the authors recognise that a much larger sample size would have enabled a more comprehensive evaluation of the BOLD learning experiences and preferences of the undergraduate nursing students in the A+P courses. In addition a wider survey encompassing the BOLD learning experience should be developed in order to gain further insight in to the students' perceptions.

Recommendations

In terms of BOLD curriculum for nursing students studying A+P the majority of the students want all modules to be open by the start of the semester. Furthermore, students required weekly laboratory classes, the practice quizzes and lessons with activities as additional resources in the study of A+P. Furthermore, there was limited literature regarding undergraduate students' perceptions of blended learning in regional Australian Universities. Further evaluations of BOLD pedagogy for undergraduate nursing A+P related curriculum is required.

Conclusions

BOLD learning combines traditional and online method of learning; therefore, it facilitates various style of learning. The hands-on learning and online recorded lectures were ideal for the undergraduate Bachelor of nursing students in their study of A+P. However, further evaluations of the BOLD A+P courses within undergraduate nursing programs is required. This will empower and promote long term learning within undergraduate nursing and health science students at large.

References

1. Phillips JA, Schumacher C, Arif S. Time Spent, Workload, and Student and Faculty Perceptions in a Blended Learning Environment. *American Journal of Pharmaceutical Education*. 2016; 80(6): 102.

2. Jokinen P, Mikkonen I. Teachers' experiences of teaching in a blended learning environment. *Nurse Education in Practice*. 2013; 13(6): 524-528.
3. Nilsson M, Östergren J, Fors U, Rickenlund A, Jorfeldt L, Caidahl K, Bolinder G. Does individual learning styles influence the choice to use a web-based ECG learning programme in a blended learning setting? *BMC Medical Education*. 2012; 12: 5.
4. Woltering V, Herrler A, Spitzer K, Spreckelsen C. Blended learning positively affects students' satisfaction and the role of the tutor in the problem-based learning process: results of mixed-method evaluation. *Advances in Health Sciences Education: Theory and Practice*. 2009; 14(5): 725-738.
5. Ireland J, Johnson N, Adams D, Eboh W, Mowatt E. Blended learning in education: effects on knowledge and attitude. *British Journal of Nursing*. 2009; 18(2): 124-130.
6. Page J, Meehan-Andrews T, Weerakkody N, Hughes DL, Rathner JA. Student perceptions and learning outcomes of a blended learning in a massive first-year core physiology for allied health subjects. *Advances in Physiology Education*. 2017; 41(1): 44-55.
7. Eagleton S. An exploration of the factors that contribute to learning satisfaction of first-year anatomy and physiology students. *Advances in Physiology Education*. 2015; 39(3): 158-166.
8. Riesen E, Morley M, Clendinneng D, Ogilvie S, Ann Murray M. Improving interprofessional competence in undergraduate students using a novel blended learning approach. *Journal of Interprofessional Care*. 2012; 26(4): 312-318.
9. Ilic D, Nordin RB, Glasziou P, Tilson JK, Villanueva E. A randomised controlled trial of a blended learning education intervention for teaching evidence-based medicine. *BMC Medical Education*. 2015; 15: 39.

10. Elmer SJ, Carter KR, Armga AJ, Carter JR. Blended learning within an undergraduate exercise physiology laboratory. *Advances in Physiology Education*. 2016; 40(1): 64-69.
11. Klümper C, Neunzehn J, Wegmann U, Kruppke B, Joos U, Wiesmann HP. Development and evaluation of an internet-based blended-learning module in biomedicine for university applicants -- Education as a challenge for the future. *Head & Face Medicine*. 2016; 12: 13.
12. Craft J, Hudson P, Plenderleith M, Wirihana L, Gordon C. Commencing nursing students' perceptions and anxiety of bioscience. *Nurse Education Today*. 2013; 33(11): 1399-1405.

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Table 2. Analysis of the online platform and students' learning experiences in A+P.

Table 3. Analysis of students' experiences of A+P laboratory classes.