

DO ACCELERATED STUDENTS IN NURSING BENEFIT FROM FACE-TO-FACE SUPPORT WHEN ONLINE SUPPORT IS AVAILABLE?

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ABSTRACT

We have demonstrated that the diploma-entry accelerated students in a nursing program need additional support at the start of their studies in bioscience and pharmacology to prevent high rates of attrition. This support consists of a formative, online activity of resource notes and quizzes covering key concepts in bioscience and pharmacology, and a face-to-face workshop addressing academic skills and reviewing bioscience material, presented to the students in orientation week. Subsequently, we developed an online eBook: Getting Started in Bioscience, Pharmacology and Microbiology; <https://sites.google.com/site/gettingstartedinbioscience/>. The aim of the present study was to determine whether it was necessary to provide both the face-to-face workshop/review lectures and the eBook, as support for nursing students undertaking the biosciences and pharmacology. In order to do this, firstly, we evaluated the eBook showing it was well received by the both accelerated and traditional students. Secondly, we evaluated the face-to-face workshop/review lectures in 2016, when the students had access to the eBook, and this showed high appreciation by the students. Finally, we compared the analysis of the face-to-face workshop/review lectures in 2016 with the analysis in 2011, which was prior to the eBook, and showed that the students' appreciation of the face-to-face workshop/review lectures was not altered by the introduction of the eBook. Thus, continuing face-to-face support for nursing students prior to studying bioscience and pharmacology, despite the introduction of an eBook, may be worthwhile.

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INTRODUCTION

Since the transfer of nursing education into the higher education domain in the 1970s it has been documented that the bioscience subjects pose a challenge for commencing nursing students in some countries. In the UK, the traditional nursing students find bioscience and pharmacology among the most difficult to learn, mainly due to their poor science background (reviewed in McVicar, Clancy, & Mayes, 2010). In Australia, diploma students are given academic credit to enter the Bachelor of Nursing at second year level and these students also struggle with the biosciences (reviewed by Ralph, Birks, Chapman, Muldoon, & McPherson, 2013). At QUT, accelerated entry into the second year of a nursing degree is given to diploma students, and domestic and international graduates. Of these accelerated students, only the diploma-entry students have higher attrition rates in bioscience and pharmacology than the traditional students (Doggrell & Polkinghorne, 2015; Doggrell & Schaffer, 2016a). Thus, diploma-entry students may need support to succeed in these disciplines.

THE STORY SO FAR

At QUT, we introduced a strategy to prepare the diploma nurses for the pharmacology and bioscience units of a nursing degree, from 2010-2013. This strategy included a formative, online activity consisting of resource notes and quizzes covering key concepts in bioscience and pharmacology, which was made available to the diploma students on Blackboard. A second part of this strategy involved a face-to-face workshop addressing academic skills and reviewing bioscience material, and was presented to the students in orientation week. The strategy was well received by the students, and was associated with reduced attrition of the diploma students at QUT (Doggrell & Polkinghorne, 2015; Doggrell & Schaffer, 2016a).

After a change to the nursing curriculum at QUT, it was considered that the support strategy for diploma students may no longer be needed, and it was not offered in 2014/15. However, in response to requests from both diploma-entry and traditional students for support in pharmacology, in the middle of semester 2 in 2014, a peer leader-led revision skills workshop was held for all students. This peer leader workshop highlighted revision methods to better understand concepts in

pharmacology. All of the attending students agreed or strongly agreed that there was a need for support in pharmacology. The unit outcomes for the attending students were the same as for the whole class (Doggrell, Menzies & Bakon, 2015).

A comparative analysis of the withdrawal and failure rates of diploma-entry and traditional students in 2014, showed the combined withdrawal and failure rates were higher for diploma-entry (21%) than traditional nursing (8%) students at the main campus at QUT (Doggrell & Schaffer, 2016b). At the QUT regional campus, the withdrawal and failure rates were high for both traditional (24%) and diploma-entry students, 20% (Doggrell & Schaffer, 2016b). This suggested that, despite the change in nursing curriculum, diploma-entry students still required support in bioscience/pharmacology, and that the traditional students at the QUT regional campus may also require support.

In 2015, we developed an eBook based on the strategy we had previously used to support the diploma-entry students. The objectives of the eBook were as follows: to provide a “Formative” activity testing key bioscience concepts; to provide the students with “Review” lectures covering first year bioscience material; to provide students with some information about academic skills (“Academic Self-Assessment”) needed for university studies; and to identify key university services and support available for students. We subsequently made the eBook available to the students on Blackboard for semester 2, 2015. From 2016, we provided both the traditional and diploma-entry students with both a face-to-face workshop and the eBook online: Getting Started in Bioscience, Pharmacology and Microbiology; <https://sites.google.com/site/gettingstartedinbioscience/>

AIMS

The aim of the present study was to determine whether it was necessary to provide both the face-to-face workshop/review lectures and the eBook, as support for nursing students undertaking the biosciences and pharmacology. In order to do this we completed the following: (i) an evaluation of the eBook in the pharmacology unit in 2015 and in the bioscience unit in 2016; (ii) an evaluation of the face-to-face workshop/review lectures in 2016, when the students had access to the eBook and (iii) a comparison of the analysis of the face-to-face workshop/review lectures in 2016 with 2011, which was prior to the creation of the online eBook.

METHODS

Discussions with the QUT Human Ethics Committee indicated that ethical review by the committee was not required for this project, provided students were not identifiable, and the study was conducted in accordance with the Australian Government National Statement of Ethical Conduct in Human Research; these conditions were met by the study.

The evaluations involved questionnaires using a Likert scale; they were completed by the students voluntarily.

- (i) Evaluation of eBook; Getting Started in Bioscience, Pharmacology and Microbiology

The students studying pharmacology evaluated the eBook in semester 2, 2015, when the diploma and traditional students were in their second and fourth semesters of university, respectively. A different cohort of diploma-entry and domestic and international graduates studying bioscience in their first semester at university evaluated the eBook in semester 1, 2016. Evaluations were undertaken in tutorials for the pharmacology unit and practicals for the bioscience unit. The questionnaire included the following:

1. The “Formative” material was presented in a clear and organized manner.
2. The “Academic Self-Assessment Literary” tool directed me to learning support.
3. The “Review” lectures were presented in a clear and organized manner.
4. Undertaking the “Quizzes” made me more confident of my future learning.

In addition, those that had attended the face-to-face workshop/review lectures, were asked to consider whether they required both the workshop and the eBook.

- (ii) Evaluation of face-to-face workshop/review lectures

The diploma-entry and domestic and international graduate students studying bioscience in their first semester at university evaluated the workshop in semester 1, 2016. The students completed the evaluation at the end of the workshop. The questionnaire included the following:

1. The demonstration of the community website was informative and valuable.
2. The library and learning skills were presented in an informative manner.
3. The information presented in the bioscience review lecture was informative and appropriate.
4. The information presented in the microbiology review lecture was informative and appropriate.
5. The interview with a previous accelerated student was informative and valuable.
6. Overall, the workshop was informative and valuable.

The students were also asked to comment on ways to improve the workshop and to suggest other useful topics or support services.

- (iii) Comparison of the evaluation of face-to-face workshop/review lectures before and after the availability of the eBook

Questions 2-5 in section (ii) were included in the workshop evaluation in 2011, which was prior to the introduction of the eBook, and in 2016 after the introduction of the eBook.

Analysis of data

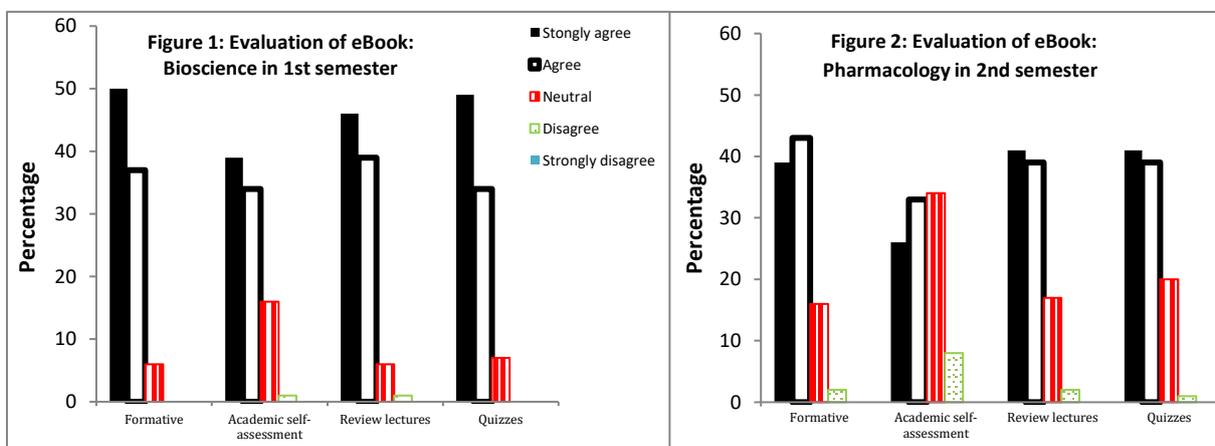
The percentage responses to the 5 points on the Likert scale surveys were determined for both the evaluation of the eBook and workshop. Comparisons between cohorts were made using the Odds ratio (OR) calculator https://www.medcalc.org/calc/odds_ratio.php with $P < 0.05$ being considered significant.

RESULTS

Evaluation of eBook; Getting Started in Bioscience, Pharmacology and Microbiology

The eBook has been evaluated twice; firstly in the bioscience unit in 2016, when the accelerated students were in their first semester at university, and secondly in the pharmacology unit in 2015, when the accelerated students were in their second semester of university, but had not had access to the eBook previously.

In the first semester of 2016, there were 229 students in the bioscience unit, which was specifically designed for accelerated students in their first semester at university; 162 students attended the practicals in week 3 and responded to the survey. Of these, 95 (59%) had used the eBook, and the majority of these students strongly agreed or agreed with the 4 statements on the eBook (see (i) Evaluation of eBook; Getting Started in Bioscience, Pharmacology and Microbiology) (Figure 1). Ninety-one percent of the accelerated students who used the eBook in the bioscience unit would recommend it to other students. Ninety of the students had used the eBook and attended the face-to-face workshop/ review lectures, and 84 of these considered it necessary to have both.



second semester at university. All of the students responded to the survey, and of these, 199 (50%)

had used the eBook, with use being higher for the accelerated (57%) than the traditional students (45%). For the eBook users, most of the students strongly agreed or agreed that the “Formative” activity and the “Review” lectures were presented in a clear and organized manner, and that undertaking the “Quizzes” made them more confident for the future (Figure 2). Furthermore, 92% of the students who used the eBook would recommend it to other students.

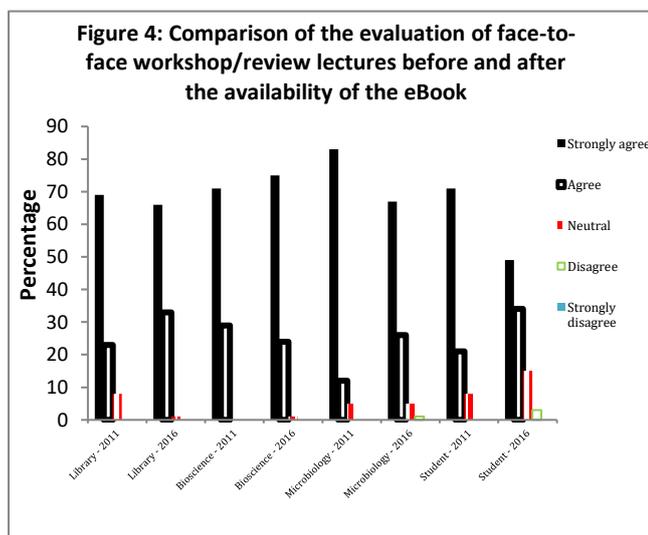
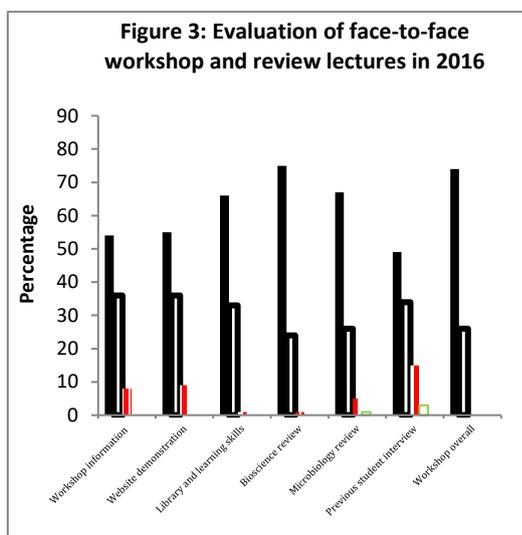
In comparing the two surveys evaluating the eBook (Figures 1 and 2), more than 80% of bioscience and pharmacology students strongly agreed or agreed with the statements regarding the “Formative” material, “Review lectures” and “Quizzes”. The percentage of students who strongly agreed with the four statements (see (i) Evaluation of eBook; Getting Started in Bioscience, Pharmacology and Microbiology) was significantly higher for the bioscience students in their first semester of university than for the pharmacology students in their second/fourth semester of university, for questions 1, 2 and 4 ($P < 0.05$ from OR). Similar percentages of students in the two cohorts strongly agreed or agreed with question 3 regarding the “Review lectures”.

When the data for accelerated and traditional students in the pharmacology unit were compared, the combined strongly agreeing and agreeing percentages were higher for the accelerated than traditional students (data not shown). Thus, the percentages were 89% for the accelerated vs 61% for the traditional students on the “Formative” activity (OR = 0.1933, $P < 0.0001$); 69% vs 47% for the “Academic self-assessment” (OR = 0.3984, $P = 0.0018$), 87% vs 68% (OR = 0.3175, $P = 0.0018$) for the “Review” lectures, and 86% vs 72% for “Quizzes” (OR = 0.4186, $P = 0.0168$), respectively.

Additionally, on comparison, the combined strongly agreeing or agreeing percentages for the accelerated students in both the bioscience and pharmacology units were not significantly different. Thus, the percentages were 89% for the accelerated students in pharmacology vs 87% for the accelerated students in bioscience for the “Formative” activity; 69% vs 73% for the “Academic self-assessment”, 87% vs 85% for the “Review” lectures, and 86% vs 83% for “Quizzes” respectively.

Evaluation of face-to-face Workshop and Review Lectures

In the first semester in 2016, 100 students from the bioscience unit (44%), attended the workshop; of these 76 students completed the workshop evaluation. More than 80% of the completing students agreed or strongly agreed with all the statements (see (ii) Evaluation of face-to-face workshop/review lectures) included in the questionnaire (Figure 3).



Comparison of the evaluation of face-to-face workshop/review lectures before and after the availability of the eBook

A comparison of the responses to the statements asked in 2011, which was prior to the introduction of the eBook, and after the introduction of the eBook in 2016 (see (ii) Evaluation of face-to-face

workshop/review lectures, statements 2-5 inclusive) is given in Figure 4. In comparing the two evaluations, more than 80% of bioscience and pharmacology students strongly agreed or agreed with the statements regarding the "Library and learning skills" material, "Review lectures" and "Previous Student" before and after of the availability of the eBook. Analysis showed that the combined strongly agree and agree percentage was not significantly different for the Bioscience review (100% in 2011 vs 99% in 2016) or Microbiology review (95% vs 91%) before or after the availability of the eBook. A higher percentage of students strongly agreed or agreed with the statement regarding the "Library and learning skills" in 2016 than 2011 (99% vs 92%, $P = 0.04$), whereas fewer students appreciated the "Previous Student" in 2016 than 2011 (83% vs 92%, $P = 0.04$).

DISCUSSION

We have previously shown that, a strategy to support accelerated nursing students, reduced the attrition of diploma students (Doggrell & Polkinghorne, 2015; Doggrell & Schaffer, 2016a). Subsequently, we developed an eBook based on this strategy (Doggrell & Schaffer, 2016b). This study shows that the eBook, Getting Started in Bioscience, Pharmacology and Microbiology was well received by both the accelerated nursing students in a first semester bioscience and second year pharmacology unit.

We made the eBook available to both accelerated and traditional students, as we have recent evidence that some of the traditional nursing students also need support in bioscience and pharmacology (Doggrell, Menzies & Bakon, 2015; Doggrell & Schaffer, 2016b). Although the eBook was not specifically designed for the traditional students, and they were not so appreciative of the eBook as the accelerated students, there were a high percentage of traditional students strongly agreeing or agreeing with components of the eBook; $\geq 60\%$, for the "Formative" activity, "Review" lectures, and "Quizzes". Thus, it seems worthwhile that the eBook be made available to traditional students. Alternatively or additionally, tailor-made support for traditional students who are struggling with bioscience or pharmacology may be needed, and we do this at QUT with the STIMulate program (Devine & Doggrell, 2016).

One of the reasons for creating the eBook was to replace the face-to-face support. However, the student evaluation of the face-to-face workshops and review lectures was very favourable in 2016, despite the introduction of the eBook. Indeed, the student evaluation for the face-to-face lecture resources was very similar before and after the introduction of the eBook; with more than 80% of the students strongly agreeing or agreeing with the statements relating to these lectures. There was a small difference in the support for the "Library and learning skills" in favour of 2016 (99%) over 2011 (92%), which is unlikely to relate to the introduction of the eBook. The difference is more likely to relate to the different presenters, but suggests that both presenters were highly appreciated. There was also a difference for the interview with a "Previous student", which was less appreciated in 2016 than 2011. This is probably due to there being a different previous accelerated student for the workshops in 2011 and 2016 with, in our opinion, the 2011 student being more enthusiastic about their experience than the 2016 student.

One of the most interesting findings of this study was that most of the students who attended the face-to-face workshop/lecture resources had also used the eBook and would recommend both, and considered it important to have both. Thus, we have decided to continue face-to-face support for nursing students prior to studying bioscience and pharmacology, as the students are strongly supportive of this. However, the main limitation of our study is that we do not know whether it is the eBook or the face-to-face support alone or both that are needed to reduce the attrition of accelerated and traditional students.

Another reason for writing the eBook was to make this support available to nursing students at other universities, as the problem of accelerated students struggling with bioscience and pharmacology is a common problem in universities in UK and Australia. Thus, the eBook has been made available on a standalone Google site; <https://sites.google.com/site/gettingstartedinbioscience/> which is freely available.

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