Collegian 24 (2017) 491–497

Contents lists available at ScienceDirect

Collegian

journal homepage: www.elsevier.com/locate/coll

Evaluation of an instrument to measure undergraduate nursing student engagement in an introductory Human anatomy and physiology course

Stephen Brown*, Alex Bowmar, Sue White, Nicola Power

Auckland University of Technology, Auckland, New Zealand

ARTICLE INFO

Article history:
Received 22 July 2015
Received in revised form 28 July 2016
Accepted 21 September 2016

Keywords:
Undergraduate engagement
Exploratory factor analysis
Paramedicine
Midwifery

ABSTRACT

Engagement with a course may improve academic performance, however, appropriate instruments are needed to measure engagement. Using an exploratory factor analysis approach, the 23-item Student Course Engagement Questionnaire (SCEQ) was used to quantify undergraduate nursing (n = 102), midwifery (n = 64), and paramedicine (n = 40) student engagement, in a compulsory anatomy and physiology course. Subscales identified were described as "skill engagement (8 items)", "emotional engagement (6 items)", "participation/interaction engagement (6 items)", and "performance engagement (3 items)". These accounted for 54.3% of total variance, and all had Cronbach alpha coefficients >0.76. The only difference between the students was a lower skills engagement in the paramedicine students, compared to both nursing and midwifery students. We suggest the SCEQ is an appropriate instrument to quantify course engagement in this population and on this type of course. A valid tool to measure course engagement in these students is pertinent, as it could be used to identify the impact of novel pedagogies on student engagement.

1. Introduction

Human anatomy and physiology, and subjects such as pharmacology, pathophysiology, and microbiology, provide the fundamental knowledge to support the practice of Western medicine. Therefore, an understanding of these disciplines presents a clarity between being a practitioner and an observer in the delivery of patient care and treatment (Pangaro, 2010; Woods, Brooks, & Norman, 2007). These subjects provide the scaffolding for clinicians to understand the biological mechanisms which underpin advanced health care practice (Rathner, Hughes, & Schuijers, 2013). However, the teaching and learning of these subjects has presented a major hurdle in undergraduate nursing education (Davies, Murphy, & Jordan, 2000; Davis, 2010; Jordan, 1994; Jordan, Davies, & Green, 1999; McVicar & Clancy, 2001), whereby feelings of incompetence and inadequate preparation are major reasons for students discontinuing their nursing studies at universities (Crane & Cox, 2013). An increased student engagement with these science based subjects may improve both confidence and academic performance, and possibly encourage a student to complete their studies.

Engagement is a construct with both behavioural and affective components. A behavioural component describes a form of engagement which incorporates a student's individual approach and style of learning, their motives to study, and their strategies to succeed (Herrmann, 2013). A student's affective engagement with an undergraduate course describes the amount of emotional involvement a student has with their learning of the material on the course, and their emotional commitment to studying the course material. A student may learn by being more engaged both behaviourally and emotionally, and this may have a positive effect on persistence, satisfaction, achievement, and academic success. Collectively, this should contribute positively to the overall student experience on an undergraduate course. This is not only a benefit to students, but also to institutions, as they can potentially demonstrate that by engaging a student on a course, they are adding to the value of the education they provide (Kuh, Cruce, & Shoup, 2008).

Several methods have been demonstrated to increase student engagement on an academic course, for example, instructors can adopt an 'active learning' instructional style. Active learning is an approach in which students become engaged participants in the classroom (Miller & Metz, 2014), and it has been suggested that active learning is concerned with motivating students to engage more meaningfully in both their individual study, and with their chosen course – this includes a student's willingness to engage

* Corresponding author.
E-mail address: bahrainstephen@gmail.com (S. Brown).

http://dx.doi.org/10.1016/j.colegn.2016.09.006
1322-7696/

in class discussion by putting forward their opinions, and offering comments (Herrmann, 2013). Students are encouraged to be responsible for their own learning through the use of audience-response systems and class debate, rather than focusing on rote memorization of facts. It has been suggested that active learning may encourage a student to accomplish higher-order objectives such as analysis, synthesis, and evaluation (Bonwell & Eison, 1991). As an example of active learning, the flipped classroom format may improve both student learning and student engagement (Bates & Galloway, 2014). A flipped classroom is an education approach that reverses the traditional educational arrangement by delivering academic content outside of the classroom, for example, online. Activities that have traditionally been considered homework are relocated into the classroom. In this flipped classroom, students watch online lectures, collaborate in online discussions, or carry out research at home and engage in concepts in the classroom with the guidance of an educator. It is likely that an integration of both traditional lecture and active learning methods may also be beneficial (Cavanagh, 2011; Minhas, Ghosh, & Swanzy, 2012).

During engaging and interactive lectures, students are given short periods of lecture followed by "breaks" in which active learning is used to help reinforce the material just presented – these breaks are incorporated into the lecture to promote engagement, improve student performance, and allow immediate application of course material (Ernst & Colthorpe, 2007; Lom, 2012; Richardson, 2007). Engaging lectures improved both short term student academic performance and long-term retention of information, and an increased perceived effectiveness of lectures, a decrease in student distractions during lectures, and increased student confidence with the material (Miller, McNear, & Metz, 2013; Steinert & Snell, 1999; Wilke, 2003). Student engagement can also be increased through the use of learning communities, using a technique that has a group of students taking the same classes together (Zhao & Kuh, 2004). This collaboration and cooperation between students may increase individual academic performance, in part by fostering both behavioural engagement (improving study skills) and emotional engagement (commitment and connecting with colleagues). Increasing student engagement with a course may also increase student persistence (Kuh et al., 2008), and it may also increase a student's mastery of challenging material.

It has been reported (Miller, McNear, & Metz, 2013) that although the majority of students may prefer an engaging lecture format, some students maintain a preference for the traditional lecture. This was also reported in a cohort of medical physiology students (Huang & Carroll, 1997) where negative perceptions of engaging lectures suggested that a more traditional didactic lecture format was preferred. Traditional lectures have the benefit of providing the lecturer's personal overview of the material, integrating information from multiple sources, and clarifying complex information (Matheson, 2008). On the other hand, lectures may be less effective when courses require the application of facts or critical thinking tasks (Steinert & Snell, 1999). This could be a significant issue in physiology courses for health care practitioners, in which it is necessary to transfer and apply information from the related fields of biology, chemistry, and physics to clinical practice (Michael, 2006). Engagement and academic performance on a physiology course may be improved if the content was more closely applied to health care practice. For example, undergraduate nursing students appeared to learn physiology content best when it was related to experiences in their workplace (Davis, 2010), although, recently qualified nurses were more likely to indicate that physiology in their pre-registration curriculum was rarely linked to clinical practices. Nursing undergraduates also reported that they were generally disappointed with the lack of integration of the principles of physiology with nursing practice (Davis, 2010). Thus, a more overt connection between physiology theory and practice may facilitate engagement with a course, and may increase both student retention and student progression.

There is a clear distinction between institutional engagement and course engagement. A student's engagement with an institution (i.e. institutional engagement) reflects the endorsement of the institution's identity and values by the student. Higher levels of institutional engagement are indicated by how much the student feels connected with their institution, and how much the student feels they affiliate and associate with the institution. These are different constructs to course engagement. A course is a discrete component of a degree, delivered over a set period and focussing on a specific topic area. Instructional strategies such as active learning, engaging lectures, flipped classrooms, and learning communities are intended to increase student engagement with a course, and these are more likely to be under the control of the course instructors. Therefore, in this research, we aimed to evaluate an instrument to measure course (and not institution) engagement. An initial evaluation and validation of such an instrument (the Student Course Engagement Questionnaire SCEQ; Handelsman, Briggs, Sullivan, & Towler, 2005) was performed on data from undergraduates in the disciplines of psychology, political science, and mathematics. This evaluation identified 4 latent factors with an exploratory factor analysis approach, and these factors were termed 'Skills Engagement', 'Emotional Engagement', 'Participation/interaction Engagement', and 'Performance Engagement'. Although not explicit, the factors which were described as skills engagement and participation/interaction engagement could collectively describe a student's behavioural engagement with the course. Despite the availability of this instrument, currently there is a paucity of data on course engagement in nursing, midwifery, and paramedicine students. There are no data available on the engagement of these students with an introductory course in Human anatomy and physiology. Therefore, in this report we evaluate the responses of undergraduate nursing, midwifery, and paramedicine students to the SCEQ instrument, using an exploratory factor analysis approach. We hypothesised that the instrument had a similar internal data structure to that reported by Handelsman et al. (2005), when the data were obtained from students on the academic disciplines of nursing, midwifery, and paramedicine.

2. Methods

2.1. Course and setting

This study was approved by the University's Human Ethics Committee. This research was carried out at a large publicly funded higher education institution, in a School of Interprofessional Health Studies. This school is responsible for teaching two introductory courses in Human anatomy and physiology for all pre-clinical students, and passing these courses is a requirement for continued progression in the nursing, midwifery, and paramedicine programmes. These programmes typically attract students with a diverse range of pre-university educational experiences, including both school leavers and those re-entering formal education following a period of either work or unemployment. The gender balance in these programmes was approximately 85% female, however, some named pathway programmes (for example, nursing and midwifery) were predominantly female (>90%). Demographics of the students were not specifically collected for this study, as access to both student identity and confidential personal details were restricted by the Ethics Committee.

This research specifically targeted the first semester course in Human anatomy and physiology. This course was a compulsory first year course taken by all students enrolled on the nursing, midwifery, and paramedicine degree pathways. The course was