Final year nursing students' preparedness for medication administration during COVID-19: A multi-site survey study

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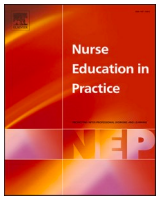

Block learning: Evaluation of a new teaching approach for nursing and midwifery education

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ABSTRACT

Aim: The aim is to present outcome and engagement data from the initial years of the implementation of a new teaching approach in entry to practice nursing and midwifery education.
Background: The Block Model (TBM) is a teaching approach that involves studying one unit of study at a time over a four-week period, as opposed to the traditional semester model. This paper presents data revealing the impact of TBM on student engagement and overall experience in entry to practice Bachelor of Nursing and Midwifery programs.
Design: The evaluation retrospectively compared key indicators pre- Block Model implementation with outcomes for nursing and midwifery students using TBM approach using standard data sets and external comparators such as the Student Experience Survey and National Employability Survey.
Methods: The study presents a comparative analysis of key indicators and graduate outcomes for students. We use reportable data and two external comparators, the Student Experience Survey and the National Employability Survey, to gauge student learning and graduate employability. The evaluation was conducted in a tertiary institution in Australia with for nursing and midwifery students who completed their studies using TBM approach at the university.
Results: The implementation of TBM in nursing and midwifery programs resulted in improvements in learner engagement, retention rates and pass rates. Improvements were also noted graduate outcomes, with an increase in full-time graduate employment.
Conclusions: The results suggest the Block Model is a promising new teaching approach in nursing and midwifery education, with potential benefits for learner engagement, retention and pass rates.

1. Introduction

In university teaching, the traditional model used in higher education is teaching across a semester. In Australian higher education, semester one is generally from February to June and semester two operates from July to November each year. In Bachelor of Nursing and Midwifery programs, these semesters are applied to the delivery of teaching and learning content. This in addition to using, in some cases, other semesters such as summer semester and winter semester often to accommodate Professional Experience Placements (PEP) which runs alongside or are integrated in the delivery of theory units. The semester teaching approach produces a structure of teaching and learning in Bachelor of Nursing and Midwifery programs where units are run simultaneously and generally of 12 weeks duration.

The university's Block Model (which will be referred to from here onwards as TBM) is a unique teaching approach to delivering nursing and midwifery entry to practice education (Irvine et al., 2021; Male et al., 2020) and was introduced university wide in 2018 to improve student outcomes and reduce attrition of students. Attrition of nursing and midwifery students in undergraduate programs is common and a global concern with some reports indicating a 25–27% attrition rate in the first year of enrolment (Chan et al., 2019; Gaynor et al., 2007).

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Good retention in Bachelor of Nursing and Midwifery programs relies on excellent principles and strategies for student engagement, which in turn has been shown to increase retention (Tower et al., 2015). However, student success is also reliant on student behaviours (such as attending orientation sessions, classes and participation and study habits) as well as access to supports that students may need to facilitate academic success (such as learning and academic support) (Tower et al., 2015). Academic success in higher education according to York et al. (2015) includes such elements as the attainment of learning outcomes, acquisition of skills and competencies, persistence (i.e.: retention and engagement), satisfaction, academic achievement and career success (job attainment). TBM offers a new approach to teaching potentially enhancing student success while potentially reducing student attrition from programs.

A new way of conceptualising the educational model, TBM was developed and implemented in 2018 for all students at the university located in Melbourne, Australia. The new approach to teaching and learning was aimed at enhancing the quality of the student learning while addressing the issue of increased student attrition rates (McCluskey et al., 2019). The Block Model was implemented across the whole university and included entry to practice nursing and midwifery programs. It is a uniquely different way to engage students in their learning in preparation as beginning graduate nurses or midwives, being at the time of implementation the only university in the world to use this approach in nursing/midwifery education.

The university drew on the experience of several Canadian and United States (US) universities in building the Block Model, drawing on the `one unit' at a time approach used in the Liberal Arts and Science disciplines in relatively small institutions. Since the pioneering work of the Block Model in 2018, there have been variations of the TBM introduced in other Australian universities. For example, the introduction of a trimester model where teaching is broken down into 6-week `blocks' at one other Australian university, enabling increased flexibility for students in completing 8 units in 6 teaching periods. Similarly, variations of TBM are emerging in the United Kingdom in 2022 (one university offering teaching in a 6 week block model in a Bachelor of Nursing program) (Southern Cross University, 2023; University of Suffolk, 2022).

Key elements of the design of TBM include student-centred and outcomes-based approaches in teaching and learning practices within a technology-rich framework. The educational model and design are underpinned by evidence-based research and practice, preparing students for lifelong learning and reflective practice using constructive alignment (Biggs and Tang, 2011). The principles of constructive alignment are core to the teaching a learning approach and is embedded in the design of focused learning outcomes, linking assessment tasks to learning outcomes and purposefully designing learning activities that support the successful completion of learning tasks (Biggs and Tang, 2011). Re-designing teaching and learning activities in this way has provided students with immersive opportunities to engage in actively constructing meanings of knowledge for their practice, while challenging them to think independently and critically. Learning is fostered by an increased emphasis on actively engaging the student as individuals at the centre of their learning to be empowered in meeting their learning needs within the re-designed educational approach.

The unique nature of TBM means students concentrate on one unit at a time. Active learning occurs through a wide variety of scaffolded exercises, structured low, medium and high-fidelity simulation laboratories, case study and scenarios and small group work. In the classroom, technology is integrated into the student learning experience through a consistently structured learning management system (LMS) (that is, a master space on the LMS with Block-by-Block iterations of teaching). The master LMS space contains sequenced resources and activities, details of all assessment tasks and individual lesson plans for staff. Each space is designed to appear similar in appearance to reduce student cognitive load when they are looking for academic resources and information related to each unit.

Uniquely, students undertake one unit per 4-week block to exclusively focus on learning materials related to that subject matter, with successful achievement meaning progression into the next block unit. Each unit is undertaken in several interlinked block sequences. The sequence is structured so that the prior requisite theory and professional practice knowledge inform each student's development of critical thought and progression across the scaffolded learning program. If a student is unsuccessful in a theory unit, they may undertake the unit again within the same calendar year. In a traditional semester, an unsuccessful attempt of any units would delay a student's progress by one year, which can lead to student's becoming disengaged and increases the potential for student attrition. In TBM, where units are offered in subsequent blocks across the year, a student can undertake the unit again with the aim of consolidating their learning while completing their course in a timely manner.

Senior leaders and staff have championed TBM at the university with nursing and midwifery academics re-designing the present iteration of nationally accredited curricula offered for registration. The process required a paradigmatic shift in staff teaching and learning practices to embrace the new teaching approach. For example, expert educational design leads worked with key nursing and midwifery academics to align learning outcomes and assessments with integral practice threads such as public safety, cultural safety, person-centred and woman-centred care into units. Students were also involved in peer review of new teaching approach and related activities to provide an authoritative voice on their learning needs. Such processes ensured rigour and consistency in design of nursing and midwifery curricula for TBM teaching approach.

The goal of entry-to-practice nursing and midwifery programs is to prepare graduates for registration and practice in a variety of health care settings. The uniqueness of TBM helps students to focus on specific theoretical knowledge (one subject at a time) to integrate and align theory knowledge and clinical skills in preparation for Nursing Professional Experience Placement (PEP). Scaffolding of knowledge across the curriculum occurs with units of study as seen in traditional semester teaching approaches. Assessment approaches including the use of Objective Structured Clinical Examination tasks provide rigor in assuring students are prepared for placement by applying theory to practice. To facilitate deeper learning in preparation for practice, theory units are partnered with PEP units so that a theory unit is sequentially followed by a PEP unit. In this context, the proximity of theory and the practice units enables students to undertake theory linked to skills in one block and then put the care knowledge into practice in the placement block within the contexts of nursing and midwifery practice, demonstrated in improving levels of learner engagement. In the midwifery program, Continuity of Care Experiences are embedded in foundational theory block units to enhance understanding of the woman-centred practice experience. The Continuity of Care Experiences then extend across the duration of each year of the program. Creating such learning opportunities has the potential to reduce the impact of the theory-practice gap which can be an issue for students feeling underprepared for their PEP (Greenway et al., 2019).

Supportive learning activities are an integral part of bringing theory and practice together for students. To enhance the integration of theory and practice within TBM, several additional learning supports have been developed and implemented. The design and development learning of learning resources comprised of academics being supported by a Design and Development Team to populate learning content and activities on the web-based Learning Management System. While this was not independently evaluated, the approach provided consistency for students in their learning and reducing cognitive load. The approach facilitated students in being able to focus their learning experiences. Educational cognitive teaching theory supports the use of smaller pieces of information to facilitate student learning (Crompton et al., 2020). Other means of learning used in TBM are increased use of simulation, use of virtual reality and artificial intelligence. The new learning activities are supported by the use of such resources as the introduction of RN/RM

facilitated practice laboratories, for individual students to book additional time for skills practice in preparation for PEP, allowing students to further their knowledge in simulated learning and skills-based care. This is in addition to the use of structured clinical skills laboratories and simulation based education in education programs to improve students' preparation for practice (Hope et al., 2011). Digital technologies are also used to review knowledge, especially in the areas of medication administration and Electronic Medical Records (EMRs). TBM provides a solid platform for an integrated teaching and learning approach well suited to nursing and midwifery students in entry to practice programs.

The aim of this paper is to present the outcomes of student engagement and satisfaction data from the first few years of implementation of TBM. We also will provide a discussion of the potential benefits for nursing and midwifery student undergraduate education using this unique and new teaching approach.

2. Methods

This paper used an evaluative retrospective method to report on the implementation of the Block Model, where we used existing data that had been recorded for reasons other than research to provide a new description of the group under investigation Constructive alignment for teaching and learning, according to the early work of (Cohen, 1987) and (Biggs, 1996) emphasises consistency between objectives, teaching methods and learning outcomes. Constructive alignment has further developed connecting institutional culture and teaching commitment for successful implementation of contemporary teaching approaches (Tokede and Tivendale, 2017). Our evaluation is a presentation of Student Experience Survey data to demonstrate system and content alignment from the perspective of the student in relation to the Key Performance Indicators of pass rates, student engagement and student retention. Comparative analysis was undertaken using descriptive statistics. No ethical approval was required as data were extracted as part of usual reporting processes. Evaluation of two external comparators were used to gauge a range of measures in student learning and graduate employability for students enrolled in TBM curricula. The first external comparator, the Student Experience Survey (SES), is a survey offered to commencing and completing students. The SES is an integral part of the university's quality cycle processes and asks students to rate their skills development, learner engagement, teaching quality, level of support, learner resources and overall experience using a Likert scale. The SES is drawn on by the Academic Quality and Standards unit which collates and analyses survey outcomes which are then compared with data from other public universities in the State of Victoria offering nursing and midwifery programs. The second external comparator used was the national Employability Survey which is an instrument that invites employers to respond to questions about the employability of graduates to supplement the surveys which ask students about their employment outcomes.

3. Results

The Block Model operates at scale. The Bachelor of Nursing has over 1500 students enrolled, with 85% of those domestic students and 16% international students. Of the domestic students, over 50% are drawn from families where a language other than English is spoken at home. Students aged 25 and over make up around 40% of the cohort, with those 15–19 around 25% and the remainder between the ages of 20–24. Female students form 80% of the student body. The Bachelor of Midwifery/Bachelor of Nursing enrols close to 200 domestic students, around 99% are female. Around 30% of these students are drawn from families where a language other than English is spoken at home. Students aged between 20 and 24 make up around 40% of the cohort, with those 15–19 around 23% and the remainder 25 and over. Not only do these courses constitute a significant sample size, but differences in outcomes for students are differences that are experienced at scale.

Several units in the BN program that had a pass rate <75% during the traditional semester teaching model have revealed a steady rise following the implementation of TBM reaching a pass rate of 98%. The improved performance can be attributed to a potential reduction in student cognitive load where students focus on one unit of study at a time. Student anxiety related to potential delays in progression is also mitigated since students have the opportunity to repeat a unit of study in the subsequent block within the same year if unsuccessful at their first attempt.

In the dual degree- BNBM program, significant inroads have been made into students' success in units across all years of the 4-year double degree program. Of note, in the first year, pass rates improved from 87% in 2017 to 94% in 2019 of students enrolled in midwifery and nursing theory units. At the same time, first year student satisfaction scores rose to above 4 out of 5 on Student Evaluation of Units (SEU) surveys in 2020. The improved pass rate trend continued in the dual degree where a 100% pass rate was recorded for final year students in 2020, the first graduates from the double degree program in TBM. The improved student success rates and satisfaction scores aligned with an improved student retention rate from 74% to 82% of students across the BNBM program. Professional practice placements comprise up to 50% of each program. In the BNBM, pass rates in practice units increased since the introduction of TBM moving from 87% to 94% of first year students on professional experience placements (PEP).

The attrition rate in the BN program dropped from 26.50% in 2018 to a 15.95% in 2021. The drop-in attrition rate is aligned with the retention rate which improved from 73.44% in 2018 to 84.05% in 2021. There has been a substantial increase in the total number of students who completed the course in 2021 (n=443) compared with the previous years (2017 (n=237), 2018 (n=301).

Learner engagement in both programs, (ie: the BN and the BMBN) also steadily improved during the implementation of TBM (see Fig. 1). Notably at the height of the pandemic in 2020 learner engagement was 15% better than other universities in the State of Victoria (the region where the university is located in Australia).

Finally and more broadly, according to the 2022 Graduate Outcomes Survey (Challice et al., 2023) The university had an increase of 23.3% in full-time undergraduate employment from 2021 to 2022, coinciding to the time TBM had been successfully introduced across all courses. In addition, recent graduates of Australian higher education institutions, representing a sample of over 130,000 recent graduates six months after completion, provides a measure of short-term employment outcomes. For 2021–2022 at the university, the overall employment rate of graduating students including nursing and midwifery, improved from 78% to 81%. Of those respondents nationally, nursing represented the third largest cohort of the sample, 11,458 respondents (Challice et al., 2023).

4. Discussion

4.1. Learner engagement

It is well known that engaging students in higher education academic activities is important for the student experience, as well learner engagement has also been linked to high quality student outcomes (Kahu, 2013; Schoffstall et al., 2013; Xerri et al., 2018). Engaging students can take the form of a diverse array of activities such as student attendance, student interactions with their peers and faculty members and engagement in extracurricular activities such as being a student mentor or a student representative. The definition of learner engagement has evolved over time due to changes in teaching practices, especially after the pandemic where hybrid teaching became the norm in terms of pedagogy. Learner engagement theory as posited by Sinatra et al. (2015) outlines dimensions of engagement including the following; behavioural engagement (students participating through their actions), emotional engagement (the presence of positive or negative emotions as often depicted in satisfaction surveys), cognitive engagement

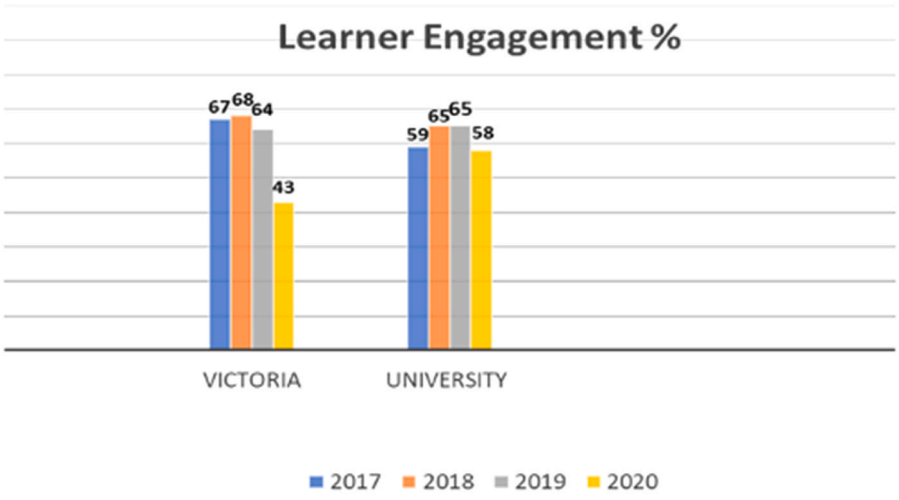

Fig. 1. Learner Engagement.

(demonstration of cognitive investment such as choosing challenging tasks, self-motivation and self-regulation) and agentic engagement (where the student contributes to the flow of learning by exerting their agency by personalising and enriching instruction) (Sinatra et al., 2015). More recently, Carroll et al. (2021), expanded on these notions of learner engagement introducing an applied model of learner engagement for the modern environment (Carroll et al., 2021). Their model includes influencing factors (individual, task and environment) and depending on the level of learner engagement, the engagement outcomes of individuals can be observed/assessed. The learner outcomes in this model include cognitive, behavioural and emotional outcomes similar to the model of Sinatra et al. (2015) also include physiological outcomes such as the physical manifestations of anxiety or enjoyment.

The data presented in our paper incorporate the aspects of learner engagement identified in learner engagement models, such as behavioural engagement (as seen by learner engagement and retention rates). Physiological outcomes such as the physical manifestations of anxiety or enjoyment were gathered as incidental information from student feedback, however due to word limitations for this paper qualitative data has not been presented here. Quantitatively, learner engagement improved over the time of the first three (3) years of implementation of TBM. Indeed, where the State average for learner engagement dropped dramatically at the height of the pandemic (as expected), students in the Nursing and Midwifery programs taught using TBM improved and was higher than the State average.

4.2. Better retention in the programs

The relationship between learner engagement and improved retention is well known (Finn and Rock, 1997; Reschly and Christenson, 2012) where high learner engagement can lead to successful student outcomes and preparedness of students. Student attrition in nursing and midwifery programs could be ascribed to poor engagement, student anxiety, students feeling ill prepared for the study load, or the responsibilities associated with the qualification (Eckerson, 2018). Managing student expectations of study load and improving student confidence in skills and knowledge development can lessen the risk of poor retention in programs for nursing and midwifery. In Australia, Kenny et al. (2016), reported student dissatisfaction were focused on feelings of poor preparedness for working in the profession, as did other authors (Jowsey et al., 2020; Oducado and Esotque, 2021; Wu and Norman, 2006). TBM as an immersive pedagogy and this teaching approach has the potential to improve levels of student retention in the nursing and midwifery programs for both domestic and international students. TBM provides learning where students are not juggling multiple units of study, rather mastering each unit before moving onto the next. TBM also offers multiple patterns of study that ensure student progression, as mentioned, when a student fails a unit, they can quickly enrol into the unit again (often in a subsequent block), rather than waiting for the next offering in a semester model which would be in the following year.

4.3. Improved pass rate

Improvements in pass rate across each year level of the programs were observed (that is in the Bachelor of Nursing and the Bachelor of Midwifery and Nursing) with improvement of 7% and 4% respectively. The Tertiary Education Quality and Standards Agency(TEQSA) (2020) for Australian higher education using predictive learning analytics for student engagement look to pass rates of students as a measure of student success. According to the TEQSA report on good practice, improvements in pass rates show increased engagement of students and are considered evidence of a positive learning experience provided by academics. While there are several definitions of academic achievement (Kuh et al., 2006; York et al., 2015) the success of learning achievement is demonstrated by students pass rates. While it is not reliable to isolate one variable as the best indicator of student success, research indicates using a combination of variables can offer a good prediction method (Al-Alawi et al., 2020).

4.4. Limitations

There is a need for caution when attributing cause and effect in the descriptive data presented on the Block Model in this evaluation, demonstrating the need for further research. Further evaluation of the performance of a combination of student outcome variables for programs using this new teaching approach in nursing and midwifery education in different contexts (such as in different countries) is warranted. The limitations of this evaluation additionally include TBM being taught only at one university in entry to practice programs for nursing and midwifery potentially affecting the generalisability of the findings. Limitations of the evaluation are that other factors such as the change in pedagogical approach linked to use of constructive alignment in TBM are not assessed in the presented findings. Such factors warrant further investigation in future overall program evaluations linked to student outcomes.

5. Conclusions

The Block Model (TBM) provides the opportunity for entry to

practice nursing and midwifery programs to consider an alternative to the usual semester teaching approach. The benefits as demonstrated by our evaluation include improvements in learner engagement, retention and pass rates, which are all university measures of academic success. The strength of this evaluation includes the use of more than one outcome to measure student success (learner engagement, retention and pass rates). More detailed information related to employer satisfaction with graduates would further strengthen the argument for using this teaching approach in nursing and midwifery programs. This teaching approach is unique and is somewhat disruptive to the norm for teaching in higher education. Our early indicators are promising in terms of improvement in student outcome measures. This teaching approach facilitated student opportunities for greater engagement which was evidenced by improved retention and pass rates. Consideration of new and innovative teaching approaches in nursing and midwifery undergraduate education, such as the Block Model, has the potential to positively influence nursing and midwifery student retention and subsequently the workforce, which now is in global deficit.

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CRediT authorship contribution statement

Edward Professor Karen-leigh: Conceptualization, Data curation, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Irvine Dr Susan:** Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **Kruger Associate Professor Gina:** Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **Tyler Deborah:** Conceptualization, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Philip Dr Susan:** Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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