# *The VU way: The effect of intensive block mode teaching on repeating students*

# The VU Way: The Effect of Intensive Block Mode Teaching on Repeating Students

Rudi Klein[a], Kate Kelly[a], Puspha Sinnayah[a,b] and Maxwell Winchester[a,c,d]

Corresponding author: Rudi Klein (rudi.klein@vu.edu.au)
[a]First Year College, Victoria University, PO Box 14428, Melbourne VIC 8001, Australia
[b]Institute for Health and Sport, Victoria University, Melbourne, VIC 8001, Australia
[c]Institute of Sustainable Industries and Liveable Cities, Victoria University, Melbourne VIC 8001, Australia
[d]Copenhagen Business School, Solbjerg Plads, Frederiksberg 2000, Denmark

**Keywords:** Block model teaching, active learning, repeating students

## Abstract

This study examines the impact on academic success of two different models of teaching for repeating students. Students who failed in 2017 under the traditional model of teaching, involving a twelve-week semester with lectures and tutorials, were exposed the following year to the newly introduced intensive workshop model of teaching, known as "The VU Way", whereby students study one unit at a time over 4 weeks in small active learning based workshops. Repeating students who had previously failed the same unit were asked to complete a questionnaire online, which elicited their perceptions of the two different teaching models. In addition, data was extracted from the university's central database to compare the success rate of failing students on their second attempt under the different teaching approaches. Results show a significant improvement in grades and pass rates with the new intensive block model of teaching along with positive student perceptions toward this more immersive and interactive workshop- based teaching method.

## Introduction

It is abundantly clear that student's participation levels in traditional lectures are on the decline and have been for more than a decade (Dolnicar, Kaiser, Matus, & Vialle, 2009; Ramsden, 2003). Due to this trend, universities are investigating new education delivery models. One solution has been for academics in higher education to provide a more interactive learning experience for the students (Freeman et al., 2014; Harasim, 1999). Another option is to provide accelerated or intensive teaching of higher education courses. These approaches to teaching have the potential to significantly transform the way knowledge is acquired and how content is disseminated in higher education.

### Intensive Teaching

Previous research has indicated that there a number of benefits reported by students who have undertaken an intensive higher education delivery (Ho & Polonsky, 2007). It is possible that this finding is congruent with other research that suggests that this generation of students may flourish under a different teaching model as they perceive the learning experience differently to past students. In an intensive mode of delivery, students are not required to take multiple units simultaneously, and they are no longer bound to complex timetables that differ among most individuals in the class. The opportunities for hands on, field practice within a unit is an overwhelmingly positive attribute of intensive delivery. This allows students to combine the knowledge that they gain in the classroom with hands on practical field learning that allows them to consolidate their knowledge in a meaningful manner, as well as engage with their community (Kolb, 1984).

Staff members who teach into intensive programs report that intensive delivery has greater potential in facilitating students to develop a passion for the subject that they are undertaking, as they are fully immersed and focused on one unit at a time and subsequently are more likely to approach their learning with a greater degree of enquiry (McCluskey, Weldon, & Smallridge, 2019). Due to the luxury of not being forced to divide their attention among different lectures, tutorials and assessments, intensive learning allows for deeper learning to take place about the content within a unit and provides students with the opportunity to think critically about the information they are being given. Students that are engaging with and thinking critically about the content are more likely to perform better on assessment tasks. To further engage students, intensive delivery facilitates the incorporation of active learning (McCluskey et al., 2019). Active learning is known to increase student motivation and subsequent outcomes as students are not passive consumers of information (Deslauriers, Schelew, & Wieman, 2011; Freeman et al., 2014; Kift, 2009; Kift, Nelson, & Clarke, 2010; Klein et al., 2019; Sinnayah, Rathner, Loton, Klein, & Hartley, 2019). Furthermore, intensive mode delivery allows for greater flexibility with assessments due to the extended time staff members spend with students and allows opportunities for students to engage in meaningful tasks that enhance their cognitive capabilities rather than limiting them. It provides a greater opportunity for students to be focused on the overall experience of their education rather than being overly assessment oriented, which ultimately, could lead to better outcomes. While it is difficult to discern whether it is the teaching strategies that engage students or the mode of delivery itself that has been found to lead to more effective outcomes. It can be confidently stated that facilitating a classroom experience where the student is active, supported and motivated leads to better learning outcomes.

**Students Perceptions of the Intensive Teaching Models**

It has been suggested that students of this generation need, and to a degree expect a different style of education that those students who undertook a higher education degree twenty years ago (Karaksha, Grant, Anoopkumar-Dukie, Nirthanan, & Davey, 2013). Universities may have to adapt their methods of teaching and delivery to attract future students and ensure the best for their futures. Past literature has suggested that students who undertake more intensive modes of unit delivery report higher rates of satisfaction. Moreover, this research acknowledges that while some students may experience apprehension towards the notion of intensive teaching with experience they quickly adapt to the more practical and engaging learning experience and subsequently report higher rates of motivation, greater learning confidence, and a greater on campus social network than those individuals who undertaken university courses that implement traditional models (Karaksha et al., 2013). When given the choice, many students will select the more intensive, accelerated program over the one that conforms with the traditional university experience (Welsh, 2012).

Furthermore, research indicates that the longer class times can be correlated with an increase in the quality of learning and overall mastery of the subject content (McCreary & Hausman, 2001). In support with these observations, other researchers have identified that students who undertake intensive time compressed teaching develop significantly better study habits, which subsequently encourages them to engage in practical in-class learner-centered activities compared with those who enrolled in a traditional didactic course delivery (Knight, De Leon, & Smith, 1999).

With regards to students who have failed a unit in first year on their first attempt, it is suggested that early interventions that encourage students to critically understand subject content can both reduce initial failure rate but also increase success rates on a second attempt at a unit after failing a unit for the first time (Ainscough, Stewart, Colthorpe, & Zimbardi, 2018).

Workshop teaching delivery allows teachers to adapt their teaching styles to a more learner - centered approach and many teachers report a more positive experience as the longer class times allow for more diverse teaching styles and a greater degree of creativity when developing their units (McCreary & Hausman, 2001). Students report that the more personalised teaching leads to greater self and academic confidence.

The irony that the value of active learning strategies in engaging students in the classrooms has become appreciated as the size of classes have continued to increase has not gone unnoticed (Exeter et al., 2010). The new teaching model adopted by the university now has only small class sizes for all units in first year.

## Class Size and Learning

There has been much debate on the effect of class size since the seminal paper on class size (Edmonson & Muldek, 1924). Some have gone so far as to suggest that lectures as a teaching method on their own have been discredited and should not be used in education (Pulliam, 1963), and then there are a number of studies that suggest there is little effect on the learning outcomes of students with varying class sizes (Siegfried & Kennedy, 1995; Williams, Cook, Quinn, & Jensen, 1985). There have been decades of conflicting findings in this area (Williams et al., 1985).

Large scale studies however, have found that a range of student outcomes improve as class size reduces from that of a large lecture to a smaller workshop at universities (Anderson, Mitchell, & Osgood, 2005; Arias & Walker, 2004; Cuseo, 2007; Ferreri & O'Connor, 2013; Gibbs, Lucas, & Simonite, 1996; Kokkelenberg, Dillon, & Christy, 2008; Preszler, 2009). School level studies such as the well-known Tennessee class size experiment, not only found that smaller classes led to better outcomes for students (Grissmer, 1999), but these positive outcomes were still evident five-years post intervention (Nye, Hedges, & Konstantopoulos, 1999; Nye, Hedges, & Konstantopoulos, 2000) and these effects were more pronounced for disadvantaged students at school level (Nye et al., 2000).

## Context

In 2017, Victoria University (VU) in Melbourne Australia, made the decision to redesign all first-year units to be delivered as intensive workshops in 2018; known as the VU Way. This decision was in part to create a more engaged and accessible for VU's distinct student cohort that consists of a substantial portion of academically disadvantaged students, who need more university support to succeed (O'Shea, Stone, Delahunty, & May, 2018). Many of VU's students come from low socio-economic backgrounds, and are the first in their family to attend university (Wheelahan, 2009). To aid in making higher education accessible to these individuals and to provide greater levels of student success, all first-year units were redesigned to fit into a four-week format that consisted of eleven, three-hour sessions.

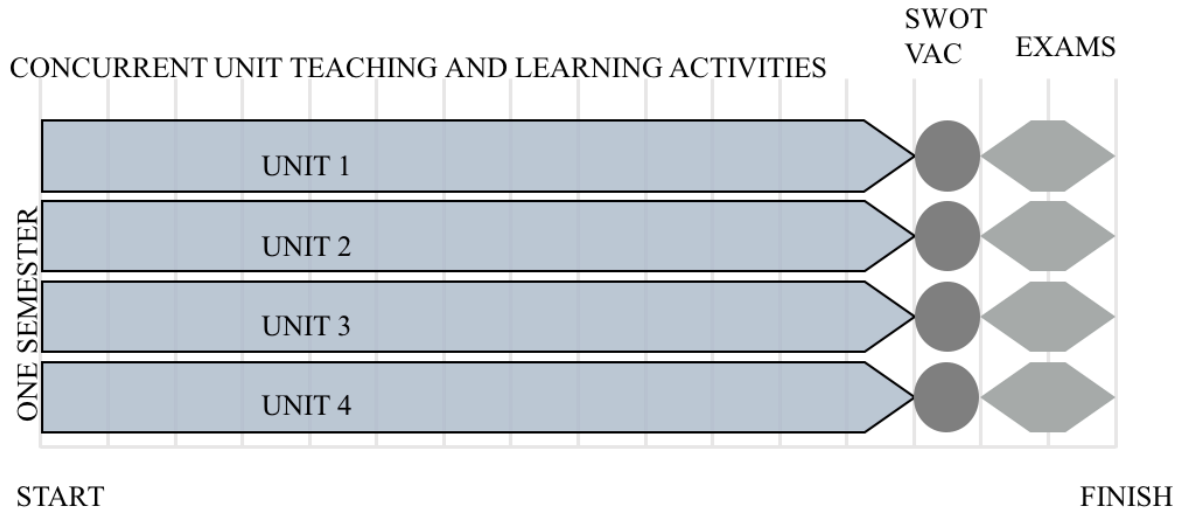


**Figure 1 shows a typical university semester over 12 weeks, where students take 4 units concurrently.**

By comparison, Figure 2, below shows the transformed intensive block model undertaken by VU where students attend only 1 unit at a time for four weeks, alongside concurrent complimentary activities such as study essentials workshops that include academic writing skills, presentation skills and so on.

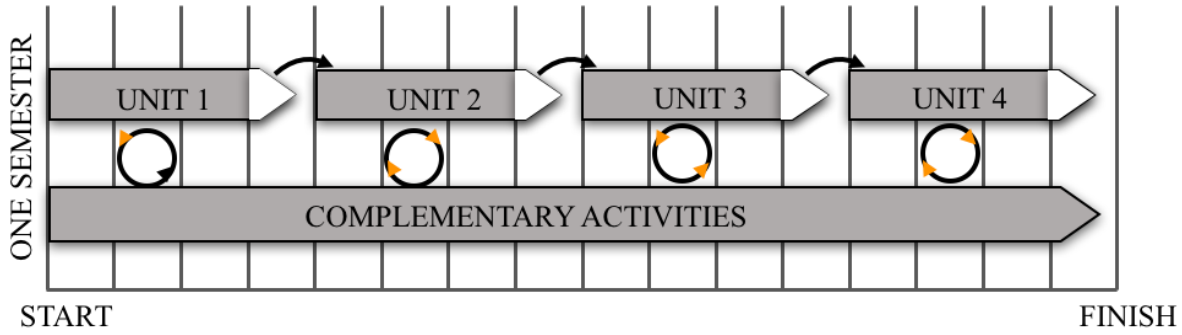


**Figure 2 shows the transformed intensive block model**

The focus of these units was to provide an immersive, engaging and collaborative experience for students entering their first year of higher education. The key goal in the modification of the delivery of these units was to have an intense focus on improving student learning gain and outcomes. The model was developed with the curriculum principles suggested by Kift (Kift, 2009; Kift et al., 2010):

- Transition – *it should allow a smooth transition from previous learning experience*
- Diversity – *it should be attuned and inclusive to the diverse range of students*
- Design - *it should be learning focussed and scaffold for student success*
- Engagement - *it should involve active learning and engage students*
- Assessment – *it should give students regular feedback on their progress*
- Evaluation and Monitoring - *it should be regularly evaluated and improved*

Aside from the concentrated nature of delivery there were a number of other changes made to the educational programme. Of note, was the complete removal of lectures from the first-year

units to be replaced by three-hour active learning workshops. Examples of activities that replace lectures include written case studies, problem-based learning, group discussions and activities, debates (such as philosophical chairs or socratic seminars), worksheets and video cases. Furthermore, all parameters relating to academic rigour, assessment standards and total contact hours have remained the same across the redesigned units.

Previous evidence suggests the implementation of this intensive block model has been very successful, with an increase in student grades (Bolton, 2018; Cook, 2018), a reduction in fail rates (Cook, 2018; Matchett, 2018) and student retention (Cook, 2018). A more mixed review of the benefits and limitations of such a model have been reported by others (Burton & Nesbit, 2002; Clark & Clark, 2000; Davies, 2006; Dixon & O'Gorman, 2019).

## Aims and Research Questions

The aim of this study was to examine the academic success of student's studying first year health and biomedicine units previously under the traditional teaching model with that of the new VU Way of block intensive teaching model. To address this aim, the following research questions are proposed:

RQ1: Does studying immersed and focused on one unit at a time in an intensive mode designed with active learning principles, lead to better outcomes for students who have previously failed under the traditional model of teaching?

RQ2: Do students who previously failed under the traditional model have a positive experience under the intensive model of delivery?

## Method

### *Participants*

To address RQ1, participants were selected from the student grades database over several years. In total, 1482 psychology students completed Psychology 1B (APP1013) and 756 science students completed 'Functional Anatomy of the Trunk' (RBM1100) between the years of 2014 – 2018. The subgroup of repeat students, consisted of a total of 94 participants who completed RBM1100 (n=62) and APP1013 (n=32) between the years of 2014 – 2018, at least twice. A summary of the participant data is presented in Table 1 below.

**Table 1: Sample sizes for repeating students in each unit of study**

| | 2014 - 2015 | 2015 - 2016 | 2016 - 2017 | 2017 – 2018 |
|---|---|---|---|---|
| APP1013 | n = 5 | n = 9 | n = 8 | n = 10 |
| RBM1100 | n = 6 | n = 7 | n = 18 | n = 31 |

## Active learning replaces lectures using a combination of student-centered learning activities

Replacing lectures, in the new VU Way model, students were encouraged to attend 3-hour theory workshops, (attendance rate >84% for all sessions). This learning environment consists of one teacher, one class room and small class sizes for the entire duration of the unit. Apart

from short periods of teacher-guided instruction, the majority of time is allocated to specific student-centred learning activities, to be completed within each workshop. In-class activities included hard-copy worksheets with anatomical diagrams from *Thieme* (Gilroy et al., 2019; Klein et al., 2019), computer-assisted learning, working in small groups, or using each other as models for demonstrating movement, relationships or function. In addition to the in-class activities, student are expected to complete set exercises prior to and following each class (Klein et al., 2019).

### *Survey Participants*

To address RQ2, participants taking the survey comprised of 52 university students who had studied a first-year unit under the traditional model in the years 2014 – 2017 and failed, who then repeated the same unit under the block mode model in 2018. Students were recruited from two first year health and biomedicine units and of the 52 participants, 15 were enrolled into the first-year psychology core unit (APP1013) and 34 were enrolled in 'Functional Anatomy of the Trunk' (RBM1100) a first-year biomedical unit. Students identified themselves as male n=21), as female (n=27) and 4 students did not specify their biological sex. The mean age for participants was 22.10 years (*SD = 6.04).* 33 students speak English as their first language, 14 do not and 5 did not specify. No students included in this study had any prior university education. No further inclusion and exclusion criteria were specified and no incentives were offered to participants. The unit's curriculum and assessment procedures remained the same over the 2017 and 2018 period.

### *Materials*

An online survey was developed using Qualtrics for use in this study. The survey comprised of 8 questions relating to the participant's demographic details (such as age, sex etc) and 11 quantitative questions about the student's experience with block learning in comparison to their experience with the traditional model. Furthermore, 3 qualitative questions were included to allow students to express their perceptions of the benefits and drawbacks of block learning. Furthermore, 10 quantitative questions about the student's opinions on their teacher's methods and approach were included and 1 qualitative question was included to allow students to further elaborate on their experience being taught by their teacher.

### *Procedure*

In the final teaching session of the unit, participants were asked to complete the online survey during class time. A link was also provided on the learning management system (LMS) for both units for students who were absent from the class. Students were able to complete the survey at their own pace and all participants were de-identified and their answers were confidential. Once all data had been collected, it was exported from the online survey into SPSS where descriptive data was collated and analyses were conducted. In addition, data from the university's student management system were analysed to explore pass rates and average marks for these students.

## Results

### *Student pass rate and average mark data*

Overall marks for the two units were analysed by extracting them from the student management system. Results recorded for all students enrolled in the units are presented in Figure 3, below.

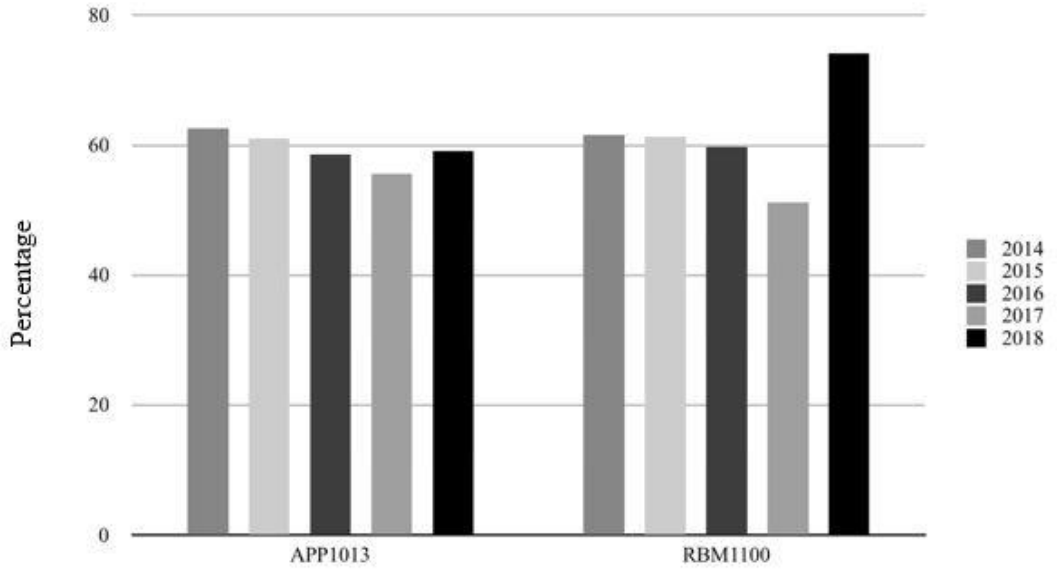


**Figure 3. Overall Mean Results for APP1013 and RBM1100 from 2014-2018.**

Figure 3 shows that, higher pass rates were achieved in 2018 compared to 2017, for both units analysed. Independent samples t-tests were conducted and identified that no significant differences were present from year to year prior to the introduction of block model for APP1013 (Psychology 1B). Despite this, there is evidence of a downward trend in pass rates between 2014 and 2017 for the unit APP1013. However, between years 2017 and 2018 a significant increase in pass rates was observed for all students completing the unit, $t$ (593) = -1.99, $p$ = 0.04. A similar pattern of results was observed for RBM1100 (Functional Anatomy of The Trunk). However, between 2016 and 2017 a significant reduction in the pass rates was observed, $t$ (316) = 3.57, $p$ <0.001. A significant increase in marks was observed between 2017 and 2018 where the implementation of the block model occurred, $t$ (370) = -10.14, $p$ <0.001. For both units, there is a clear downward trend between the years 2014 and 2017. This trend was reversed in 2018.

The average marks and pass rates for the subgroup consisting of only the students who failed in their first attempt in 2017 and repeated the same units in 2018 were investigated. The mean results for these students are presented in Table 2, below.

**Table 2: Mean Results for Students Who Completed the Unit in 2017 and Repeated in 2018.**

| | 2017 | 2018 |
|---|---|---|
| APP1013 | 22% | 53% |
| RBM1100 | 28% | 63% |

Paired samples t-tests were conducted for each of the units evaluated. For students completing APP1013 a significant difference between results in 2017 and 2018 was observed, $t$ (16) = -5.63, $p$ < 0.001. For students completing RBM1100 a significant difference between results in 2017 and 2018 was also observed, $t$ (34) = -7.02, $p$ < 0.001. This indicates that for both units,

students performed significantly better in 2018 under the block teaching model than in 2017 under the traditional model. To ensure these results were not exceptional, the subgroup consisting of repeating student average marks were analysed across 2015-16, 2016-17 and 2017-18. These results are presented in Table 3, below and are representative of the average increase that a failing student at one point in time achieved the second time around in the unit.

**Table 3: Differences in average mark for repeaters by years studied**

| | 2015 – 2016 | 2016-2017 | 2017-2018 |
|---|---|---|---|
| APP1013 | +24pp | +21pp | +31pp |
| RBM1100 | +21pp | +11pp | +34pp |

It can be seen from Table 3, that the average mark increase for repeaters was notably higher for students studying in 2017 and 2018 in comparison to those studying in earlier years. In the unit APP1013, in 2017-18 for example, the increase in mark achieved on average from the fail grade to the second attempt was an increase of 31 percentage points (pp). This can be seen from the results in Table 2, where students achieved an average grade of 22% on their first attempt in 2017, followed by an average of 53% on their second attempt in 2018. When comparing the results for the 2017-18 cohort of students, it can be seen that the increase in average grade is notably higher than was the case in the 2015-16 and 2016-17 cohorts.

***Survey Quantitative Data***

Students who repeated APP1013 or RBM1100 completed a survey to investigate their perceptions and experiences comparing the block model with the traditional model. Survey results are presented in Table 4, below.

**Table 4: Proportion of Participant's Who Responded Agree & Strongly Agree to Survey Questions**

| **Question** | **Combined Agree/Strongly Agree** |
|---|---|
| The workload was better than the traditional university model | 85% |
| The workshops were useful | 82% |
| The quality of this unit has met or exceeded my expectations | 82% |
| Learning via the block model has met or exceeded my expectations | 87% |
| The assessments were manageable in the given time frame | 92% |
| The level of detail I was given was appropriate and made me feel prepared | 85% |

Results in Table 4, above, suggest that most portion of respondents agreed or strongly agreed with questions presented regarding the quality of the intensive block model approach. Analysis of qualitative results are presented in the next section.

**Survey Qualitative Data**

Qualitative analysis indicated that student's perceptions with the new intensive model was more positive compared with their previous experiences with the traditional twelve-week university model. After conducting a thematic analysis, the ideas that were generated were clustered into four predominant themes; student centered learning, engagement and depth of learning, and perceived levels of achievement and finally student/teacher relationship. These themes are highlighted in Table 5 in more detail below.

**Table 5: Themes arising from qualitative analysis**

| Student Focused and Perceived Achievement | Definition | Examples |
|---|---|---|
| **Student Centred Learning** | Facets that relate directly to how the institution or the teacher is able to enhance student learning by addressing the students as individuals and being mindful of their diverse range of needs. | • 'Small classes allow you to ask questions straight away if you don't understand something.'<br>• 'Reducing stress makes completing tasks more enjoyable'<br>• '..Creating a stronger bond between lecturers and other students helps with group activities and assessments.'<br>• 'Easier to focus and concentrate on one unit at a time'<br>• '… [Teacher] makes everyone comfortable and learning with them was easy'<br>• '… [Teacher] takes the time to know us and understands us well. Thus, helping us to do better.' |
| **Engagement/Depth of Learning** | Educational strategies that were developed with the intent to enhance student engagement and increase the depth of understanding. | • 'Interactive learning makes for more learning'<br>• 'You're never bored when learning content which actually helps you remember what you learnt'<br>• 'Activities really enhance learning' |
| **Perceived Level of Academic Control and Achievement** | Components related to how students perceive that their experiences are enhancing their level of control in relation to their education and subsequently their achievement. | • 'More manageable to focus on one subject at a time'<br>• 'I can achieve more in less time'<br>• 'Despite not doing science in VCE I was able to achieve HD's…' |
| **Teacher/Student Relationship** | Elements related to how the teacher in the classroom is able to empower students and create a collaborative classroom environment. | • '[Teacher] is very mindful of the students and reassures us. Such a relief that an expert in the field has the heart to reassure us and act as a supportive voice.'<br>• 'Clear, communicative, understands the needs of first year students, engaging, humorous, knows the material well.' |

Every student who provided a response to the qualitative component reported that the intensive model learning was more helpful for their learning in comparison to the traditional model. Students reported feeling more committed to their studies and that they felt they were more supported in their learning. These bonds led to higher levels of student engagement in activity tasks and greater levels of motivation to partake in discussions.

## Discussion

This study shows that repeating students who failed a unit on their first attempt at University are more likely to succeed in passing on their second attempt within the adopted block teaching model. This study demonstrates the effectiveness of the adopted VU Way on academic success of poorer performing students. The observation of academic success is consistent across unrelated units of psychology and anatomy and is supported by previous observations that show intensive teaching modes to improve student outcomes (Klein et al., 2019).

Before considering the results, it needs to be acknowledged that over recent years, Australian Government Policy has expanded university study places and as a result, has reduced the ATAR (entry scores), year by year, of students entering degrees at a range of universities, including Victoria University (Preiss, Cook, & Butt, 2015). On this basis, it would be expected that a slight decline in student academic success be observed year by year, as higher ranked and more prestigious universities take in more students (Pitman, Koshy, & Phillimore, 2015).

The results suggest that failing students who took their second attempt under the intensive block model teaching delivery achieved significantly higher grades, and a larger proportion of them passed than had been the case when students had repeated under the traditional teaching delivery of large lectures and tutorials over a twelve-week semester. In terms of research questions developed for this study, the results suggest for RQ1 that the intensive, block mode of delivery does lead to better outcomes for students who had failed under the traditional model of teaching.

While it is not clear what the cause of this increase in performance was, previous evidence suggests it could be both the more intense four-week delivery with students taking only one class at a time (Ho & Polonsky, 2007), or the fact that large lectures had been replaced by smaller more interactive workshops (Anderson et al., 2005; Arias & Walker, 2004; Cuseo, 2007; Ferreri & O'Connor, 2013; Gibbs et al., 1996; Harasim, 1999; Knight et al., 1999; Kokkelenberg et al., 2008; Preszler, 2009; Ramsden, 2003) that contributed to increased student success. These results are consistent with the previous evidence presented that overall, the new model of teaching delivery has led to increases in a range of student success measures, including: student grades (Bolton, 2018; Cook, 2018), a reduction in fail rates (Cook, 2018; Matchett, 2018) and an increase in student retention (Cook, 2018).

In addition, the qualitative and quantitative analysis of student surveys complements the analysis of student pass rates and average grades above. The students responded overwhelmingly positively towards the new model of teaching delivery and actually stated that they believed the different delivery of the units was a contributing factor to their success. This in itself is worthy of note, given previous research which suggests that a positive student attitude towards learning will result in a higher rate of cognitive engagement (O'Neil, 1995). Student responses to all four major survey themes have a positive correlate and support the contention that this new environment of the block teaching is a viable pathway for student success at tertiary level. In terms of research questions set for the study, these results suggest that in response to RQ2, that students who had experienced both modes of delivery have a

positive experience under the intensive block. The results of this study are supportive of previous authors who suggest there may be benefits of offering units one at a time in a condensed time period, rather than several units concurrently over a longer period of time (Ho & Polonsky, 2007; Knight et al., 1999).

One of the guiding principles involved in designing curriculum for the first year block model, involved employing active learning strategies (Deslauriers et al., 2011; Freeman et al., 2014; Kift, 2009; Klein et al., 2019; Sinnayah et al., 2019; Smith et al., 2009). The thematic qualitative analysis (Table 5) conducted in this study, clearly indicated that student centered learning, which included, one teacher for the entire block, small classes and strategies that increased depth of understanding was very effective in achieving less anxiety and confidence. In addition, the results of this study are congruent with previous research that suggest that smaller, active learning workshop based classes, result in better student outcomes than large lectures (Arias & Walker, 2004; Ferreri & O'Connor, 2013; Kokkelenberg et al., 2008; McCreary & Hausman, 2001).

### *Limitations and Future Research*

There are a number of limitations to this study, the most significant of which concerns the inability to repeat this work as the transition window between the traditional (2017) and the new teaching method (2018) the university has adopted, is now passed. This study however, represented a unique one-off opportunity to capture this interesting transition phase in which students were able to experience both models.

Another limitation of this study, is that it is not clear what part of the major transition to teaching delivery contributed most to the success of the failing students on their second attempt. It could be any combination of a range of factors that include: teaching schedule, lectures being replaced with active learning workshops, extended time that staff spend with students, and varying assessment approaches. A further limitation is that the study was only conducted with repeating students, and therefore it only considered their perceptions of the new model of teaching delivery. It is possible that non-repeating students or staff perceptions may differ from repeating student perceptions, or that some students perform better under a traditional twelve-week semester than under an intensive mode of teaching. Over the long term, it is not clear what the effect of intensive teaching modes is on retention of knowledge; nor is it clear what the ensuing effects are, due to a long period of time elapsing between two subsequent intensive offerings.

Future research should investigate what aspects of the teaching delivery transition contributed most to student success. For example, a study could consider units of study that had already been offered as smaller workshops rather than large lectures and tutorials and exploring how much the intensive block mode of teaching delivery had upon these particular units. Future research should also be conducted to understand staff perceptions of the new teaching delivery model. Given the intensive block model mode of teaching employed has improved pass rates of unsuccessful students, research should be conducted to understand whether the improvement is consistent with an improvement with those students who are normally disadvantaged at university, such as first in family students (O'Shea et al., 2018). Finally, equally important for future research is to explore the longer-term impact of the block model of learning compared with the traditional teaching method, including consideration that different students may perform better under the traditional or intensive model. Further questions include: Do the benefits of the intensive teaching model outweigh those of the traditional model longer in the long term? Is there an improved retention and application of knowledge acquired in an

intensive time compressed teaching model comparable to when students complete multiple courses in parallel, over a longer period of time?

## References


Ainscough, L., Stewart, E., Colthorpe, K., & Zimbardi, K. (2018). Learning hindrances and self-regulated learning strategies reported by undergraduate students: identifying characteristics of resilient students. *Studies in Higher Education, 43*(12), 2194-2209. doi:10.1080/03075079.2017.1315085

Anderson, W. L., Mitchell, S. M., & Osgood, M. P. (2005). Comparison of student performance in cooperative learning and traditional lecture-based biochemistry classes. *Biochemistry and Molecular Biology Education, 33*(6), 387-393. doi:10.1002/bmb.2005.49403306387

Arias, J. J., & Walker, D. M. (2004). Additional Evidence on the Relationship between Class Size and Student Performance. *The Journal of Economic Education, 35*(4), 311-329. doi:10.3200/JECE.35.4.311-329

Bolton, R. (2018). Vice chancellor: More savings needed for university to meet tough new market. *Australian Financial Review, 16th September 2018*.

Cook, H. (2018). The university shake-up that's lifting students' grades. *Sydney Morning Herald, 30th May 2018*.

Cuseo, J. (2007). The Empirical Case Against Large Class Size: Adverse Effects on the Teaching, Learning, and Retention of First-Year Students. *The Journal of Faculty Development, 21*(1), 5-21.

Deslauriers, L., Schelew, E., & Wieman, C. (2011). Improved Learning in a Large-Enrollment Physics Class. *Science, 332*(6031), 862. doi:10.1126/science.1201783

Dolnicar, S., Kaiser, S., Matus, K., & Vialle, W. (2009). Can Australian Universities Take Measures to Increase the Lecture Attendance of Marketing Students? *Journal of Marketing Education, 31*(3), 203-211. doi:10.1177/0273475309345202

Edmonson, J. B., & Muldek, F. J. (1924). Size of Class as a Factor in University Instruction. *The Journal of Educational Research, 9*(1), 1-12. doi:10.1080/00220671.1924.11431606

Exeter, D. J., Ameratunga, S., Ratima, M., Morton, S., Dickson, M., Hsu, D., & Jackson, R. (2010). Student engagement in very large classes: the teachers' perspective. *Studies in Higher Education, 35*(7), 761-775. doi:10.1080/03075070903545058

Ferreri, S. P., & O'Connor, S. K. (2013). Redesign of a Large Lecture Course Into a Small-Group Learning Course. *American Journal of Pharmaceutical Education, 77*(1), 13. doi:10.5688/ajpe77113

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences, 111*(23), 8410. doi:10.1073/pnas.1319030111

Gibbs, G., Lucas, L., & Simonite, V. (1996). Class size and student performance: 1984–94. *Studies in Higher Education, 21*(3), 261-273. doi:10.1080/03075079612331381201

Gilroy, A. M., McPherson, B. R., Ross, L. M., Schuenke, M., Schulte, E., U., S., & Baker, E. W. (2019). Thieme Teaching Assistant [Database]. *Retrieved from https://www.thieme.com*.

Grissmer, D. (1999). Conclusion: Class Size Effects: Assessing the Evidence, its Policy Implications, and Future Research Agenda. *Educational Evaluation and Policy Analysis, 21*(2), 231-248. doi:10.3102/01623737021002231

Harasim, L. (1999). A framework for online learning: the Virtual-U. *Computer, 32*(9), 44-49. doi:10.1109/2.789750

Ho, H. W. L., & Polonsky, M. (2007, 3-5 Dec. 2007). *Marketing students' perception of traditional and intensive delivery : an exploratory study.* Paper presented at the Australian & New Zealand Marketing Academy. Conference (2007 : University of Otago), University of Otago, Dunedin, New Zealand.

Karaksha, A., Grant, G., Anoopkumar-Dukie, S., Nirthanan, S. N., & Davey, A. K. (2013). Student Engagement in Pharmacology Courses Using Online Learning Tools. *American Journal of Pharmaceutical Education, 77*(6), 125. doi:10.5688/ajpe776125

Kift, S. (2009). Articulating a transition pedagogy to scaffold and to enhance the first year student learning experience in Australian higher education. Final Report for ALTC Senior Fellowship Program. *Australian Learning and Teaching Council*.

Kift, S., Nelson, K., & Clarke, J. (2010). Transition pedagogy: a third generation approach to FYE—a case study of policy and practice for the higher education sector. . *Int J First Year Higher Educ, 1*, 1–20. doi:10.5204/intjfyhe.v1i1.13.

Klein, R., Sinnayah, P., Kelly, K., Winchester, M., Rajaraman, G., & Eizenberg, N. (2019). Utilising computer based learning to complement class teaching of gross anatomy. *International Journal of Innovation in Science and Mathematics Education, 27*(8), 10-25.

Knight, S. L., De Leon, N. J., & Smith, R. G. (1999). Using Multiple Data Sources to Evaluate an Alternative Scheduling Model. *The High School Journal, 83*(1), 1-13.

Kokkelenberg, E. C., Dillon, M., & Christy, S. M. (2008). The effects of class size on student grades at a public university. *Economics of Education Review, 27*(2), 221-233. doi:https://doi.org/10.1016/j.econedurev.2006.09.011

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development.* : Prentice-Hall, Englewood Cliffs, NJ 1984.

Matchett, S. (2018). Victoria U extends transformative first-year model to all students. Retrieved from Available: [https://campusmorningmail.com.au/news/victoria-u-extends-radical-first-year-model-to-all-students]. Accessed: 9th October 2018.

McCluskey, T., Weldon, J., & Smallridge, A. (2019). Rebuilding the first year experience, one block at a time. *Student Success, 10*(1), 1-15. doi:https://doi.org/10.5204/ssj.v10i1.1148

McCreary, J., & Hausman, C. (2001). Differences in Student Outcomes between Block, Semester, and Trimester Schedules. *University of Utah*, 25.

Nye, B. A., Hedges, L. V., & Konstantopoulos, S. (1999). The Long-Term Effects of Small Classes: A Five-Year Follow-Up of the Tennessee Class Size Experiment. *Educational Evaluation and Policy Analysis, 21*(2), 127-142. doi:10.3102/01623737021002127

Nye, B. A., Hedges, L. V., & Konstantopoulos, S. (2000). Do the Disadvantaged Benefit More from Small Classes? Evidence from the Tennessee Class Size Experiment. *American Journal of Education, 109*(1), 1-26. doi:10.1086/444257

O'Neil, J. (1995). Finding time to learn. *Educational Leadership, 53*(3), 11-15.

O'Shea, S., Stone, C., Delahunty, J., & May, J. (2018). Discourses of betterment and opportunity: exploring the privileging of university attendance for first-in-family learners. *Studies in Higher Education, 43*(6), 1020-1033. doi:10.1080/03075079.2016.1212325

Pitman, T., Koshy, P., & Phillimore, J. (2015). Does accelerating access to higher education lower its quality? The Australian experience. *Higher Education Research & Development, 34*(3), 609-623. doi:10.1080/07294360.2014.973385

Preiss, B., Cook, H., & Butt, C. (2015, 20th January, ). ATAR 2015: Average Victorian ATARs decline for most university courses. . *The Age*. Retrieved from Available: [https://www.theage.com.au/national/victoria/atar-2015-average-victorian-atars-decline-for-most-university-courses-20150119-12tiuj.html] Accessed 15th January 2019.

Preszler, R. W. (2009). Replacing Lecture with Peer-led Workshops Improves Student Learning. *CBE—Life Sciences Education, 8*(3), 182-192. doi:10.1187/cbe.09-01-0002

Pulliam, L. (1963). The Lecture: Are We Reviving Discredited Teaching Methods? *The Phi Delta Kappan, 44*(8), 382-385.

Ramsden, P. (2003). *Learning to Teach in Higher Education* (2nd ed.). London: Routledge.

Siegfried, J. J., & Kennedy, P. E. (1995). Does Pedagogy Vary with Class Size in Introductory Economics? *The American Economic Review, 85*(2), 347-351.

Sinnayah, P., Rathner, J. A., Loton, D., Klein, R., & Hartley, P. (2019). A combination of active learning strategies improves student academic outcomes in first-year paramedic bioscience. *Advances in Physiology Education, 43*(2), 233-240. doi:10.1152/advan.00199.2018

Smith, M. K., Wood, W. B., Adams, W. K., Wieman, C., Knight, J. K., Guild, N., & Su, T. T. (2009). Why Peer Discussion Improves Student Performance on In-Class Concept Questions. *Science, 323*(5910), 122-124. doi:10.1126/science.1165919

Welsh, M. (2012). *Intensive teaching modes: Benefits, drawbacks and directions forward*. Paper presented at the In: Mann, Llewellyn (Editor); Daniel, Scott (Editor). 23rd Annual Conference of the Australasian Association for Engineering Education 2012: Profession of Engineering Education: Advancing Teaching, Research and Careers, The. [Melbourne, Vic.]: Engineers Australia, 2012: 1096-1102. Availability: <https://search.informit.com.au/documentSummary;dn=238318258407254;res=IELENG> ISBN: 9780987177230. [cited 12 Aug 19].

Wheelahan, L. (2009). Do educational pathways contribute to equity in tertiary education in Australia? *Critical Studies in Education, 50*(3), 261-275. doi:10.1080/17508480903156854

Williams, D. D., Cook, P. F., Quinn, B., & Jensen, R. P. (1985). University class size: Is smaller better? *Research in Higher Education, 23*(3), 307-318. doi:https://doi.org/10.1007/BF00973793