Block teaching and active learning improves academic outcomes for disadvantaged undergraduate groups

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In 2018, Victoria University adopted a new teaching delivery model, now known as the Block Teaching Model (BTM). The aim of this study focuses on how this new approach to teaching has impacted student learning and academic success, in particular for students who come from a disadvantaged background, compared with those who come from a non-disadvantaged background. In this study, disadvantage is defined by the following categories: non-English speaking background (NESB), first in family to attend university (FIF), low socio-economic status (SES), low Australian Tertiary Admission Rank (ATAR) and gender (male students). Results indicate that when compared to non-disadvantaged students, the newly established BTM has achieved a significantly higher reduction in student failure rates across ATAR, SES, and NESB versus ESB and gender, while the reduction in fail rates for FIF was not reduced significantly more than NFIF. This work encapsulates the University's central vision, "The VU Way", which focuses on opportunity and success, and being transformational within the community in which it operates. More generally, this research lends support to the importance of active and intensive learning models in reducing disadvantage in tertiary education.

Introduction

Increasing student diversity within higher education has been identified as a key demographic trend for the period leading up to 2030. In recognition of this trend, we would expect a shift within national debates on higher education to include an increased consciousness of disadvantaged groups (Smit, 2012; Whitty, Hayton & Tang, 2015; Bradley, Noonan, Nugent & Scales, 2008).

Education success is strongly correlated to the wealth of a person's family, where they grow up and their background. The number of students affected by these factors are significant, and quoted as high as 17% across the World (UNESCO, 2020). A recent education report by UNESCO highlights, that a quarter of a billion children, adolescents and youth around the world are currently not in any form of training, and that the principal contributors to this devastating disparity in education are poverty, low socio-economic status, gender, language, location, and ethnicity which all contribute to academic disadvantage (UNESCO, 2020). In Australia, the national average of students who miss out on either work or study is around 15%, a figure equal to that of Northern Africa and West Asia (UNESCO, 2020). The most affected are children with disabilities, who are particularly at risk of exclusion from education, a percentage that ranges from 10 to 70% depending on the country involved (UNESCO, 2020).

In Australia educational disparity increases to 32% of students from low SES backgrounds, 38% from very remote geographical areas and 45% of students from the Indigenous population (Lamb, et al., 2020). This mirrors the participation rate seen in Sub-Saharan Africa of 31% (UNESCO, 2020). Certainly, in Australia, it has been shown for many years, that any student who did not have wealthy parents and who did not attend a private school was at a disadvantage of being accepted into a university course (Hester, 1994; Bradley et al, 2008). Socio-economic status (SES) disparities impact student success and engagement leading to poorer academic outcomes more than that of non-disadvantaged students (Finn, 1989). Higher income students are 2.5 times more likely of being extremely engaged in classes and coursework. In contrast, remote learning only heightens the disparities between these groups by demonstrating who has access to available resources at home. Students from lower economic background are four times more as likely to report difficulty in staying very engaged in online learning (Arkorful & Abaidoo, 2015). Equitable access to technology and resources remains a critical enabler in closing this gap (Finn, 1989). Discrimination, stereotyping and stigmatisation mechanisms are similar for all disadvantaged learners all over the world who are then at greater risk of exclusion. While 68% of countries have a definition of inclusive education, only 57% of these definitions cover multiple marginalised groups. Despite progress, many countries still do not collect, report or use data on those who are left behind. Inclusion and more importantly success in education is about ensuring that every learner feels valued, respected and can enjoy a clear sense of belonging, to make a better life for themselves and thereby improve the fabric of their community in which they live (UNESCO, 2020). While there is a broad consensus that defines disadvantaged students as those who are disadvantaged in achieving their educational goals at levels equitable to other societal groups, a myriad of causes can contribute to disadvantage.

At university, causes may include poverty (de Vuijst, van Ham & Kleinhans, 2017) or low socio-economic status (SES) (Hester, 1994; Engle & O'Brien, 2007; Engle & Tinto, 2008; McKay & Devlin, 2016; Jury, Smeding, Stephens, Nelson, Aelenei & Darnon, 2017); linguistic, non-English speaking background (NESB) (Hester, 1994; Oliver, Vanderford & Grote, 2012; Mestan & Harvey, 2014); a low self-perception of academic ability (Marsh, Parker, Guo, Pekrun & Basarkod, 2020); first in family to attend university (FIF) (Engle & Tinto, 2008; Blackwell & Pinder, 2014); indigenous groups (Pechenkina, Kowal & Paradies, 2011); gender (male students) (Conger & Long, 2010), and a low Australian Tertiary Admission Rank (Naylor & James, 2016). These particular causes of student disadvantage are of interest to this study and are further explored in this paper.

Socio-economic status (SES)

It is widely accepted that students from a lower income household have less academic success at university (Hester, 1994; Phillips & Loch, 2011; McKay & Devlin, 2016; UNESCO, 2020). This is true in not only Australia but also more broadly internationally as highlighted in the UNESCO report into education (Engle & O'Brien, 2007; Engle & Tinto, 2008; Rosenbaum & Becker, 2011; UNESCO, 2020). Socio-economic background or more simply poverty has long been implicated and found to have a significant effect on educational opportunities for young people all over the world including Australia, with a

trend that is widening (Lamb, Huo, Walstab, Wade, Maire, Doecke, Jackson & Endekov, 2020). A recent study of Australia's education system pointed towards an educational divide which if acted upon will still take an entire generation to bridge the gap (Lamb, et al., 2020).

Non-English speaking background (NESB)

Non-English Speaking Background (NESB) students are widely accepted as being at a disadvantage when attending universities (Hester, 1994; Miller, Bradbury & Pedley, 1998; Mestan & Harvey, 2014). However, this position cannot be generalised, as it has been shown that those students who were of Italian and Greek descent in Australia and whose fathers were also born in Australia tended to finish year 12 at least as frequently as non-disadvantaged students (Hester, 1994). In support of this, there is evidence that if given a chance to prepare sufficiently, NESB students can perform as well as their ESB peers (Miller, Bradbury, & Pedley, 1998). However, language continues to present barriers in education particularly when dissociated from cultural identity, especially to non-native English-speaking students such as First Nations American students (Demmert, 2001) or Hispanics living in the USA (Schneider, Martinez & Owens, 2006). After all, equality in education also means being able to view your educational experience through the lens of your own culture and language (Castagno et al., 2008).

First in family at university (FIF)

First-in-family (FIF) to attend university is another cohort of students characterised by substantially poorer educational outcomes, both in Australia and internationally (O'Shea, 2016; Harrell & Forney, 2003; Lehmann, 2009). While first-in-family learners can represent a significant proportion of the university student population, the participation rate is not necessarily matched by an equally high success rate (O'Shea, 2016). Indeed, research focusing on this group has indicated that they are at greater risk of departure from university when compared to their second and third generation peers, which can often be traced back to limited exposure to academic culture and parental expectations at home (O'Shea, 2016; Mishra, 2020).

Gender

Male disadvantage has been established in education for decades, both at secondary (Schneider & Coutts, 1985) and at tertiary level (Conger & Long, 2010; Kupczynski, Brown, Holland & Uriegas, 2014). It is notable to the point that there was a parliamentary enquiry into boy's education in Australia in 2002 (Hodgetts & Lecouteur, 2010). This highlighted that male underperformance can be traced back to the feminisation of the curriculum and skewed assessment practices favouring girls. Here, the suggested remedy consisted of policy and practice intervention in addressing the gender inequity in education.

Indigenous groups

Studies focusing on Indigenous students from a range of locations around the world have shown that they traditionally have been disadvantaged, with both lower participation and success rates in universities. Studies have demonstrated this in countries such as South Africa (Sadler & Erasmus, 2005), Australia (Hester, 1994; Pechenkina, Kowal & Paradies, 2011; Milne, Creedy & West, 2016) and for African-American (Allen, 1992) and First Nations (Brayboy, Solyom & Castagno, 2015) college students in the USA. In Australia, indigenous students have been given grades concessions at admission to university to increase participation (Hester, 1994)) and there is a recognised need for delivery of tailored academic support interventions to Indigenous students to minimise attrition at university. (Day, Nakata, Nakata & Martin, 2015).

How success may be improved for disadvantaged groups

Although access to higher education has increased substantially over the past decade, student success as measured by persistence and degree attainment has not improved at all. Higher education must do much more and on a much grander scale to promote student success, and literature reviews on interventions tried so far have focused mainly on three main areas of reform, remedial education, student support services, and financial aid (Brock, 2010).

Programs that have experimented with remedial education endeavoured to build social cohesion between students and faculty by integrating remedial content across courses (Merisotis & Phipps, 2000; Stuart, 2009; Roberts & Dunworth, 2012). Other methods have included improving student support services that are offered through regular, intensive and personalised counselling. Another mechanism has included to simplify the financial aid process and incentivise students to earn good grades and thereby persist with study. All of these programs and interventions have demonstrated some improvement in student outcomes. However, Brock (2010) argued that much more must be done to meet the scale of the problem.

Many other attempts to help disadvantaged students have concentrated on access as participation and not access as success (Akoojee & Nkomo, 2007). For example, many US colleges have a requirement that a certain proportion of Hispanic and African American students are given a place to study at the university, but there are no requirements that these students succeed to graduation; a similar approach is the case in South Africa (Akoojee & Nkomo, 2007; Downs, 2010). There have been calls to not only increase access for disadvantaged students in the USA but also improve graduation rates (Engle & O'Brien, 2007; Engle & Tinto, 2008; Phillips & Loch, 2011). By comparison, in Australia, the Go8 Universities (Group of Eight, n.d.) have demonstrated more success in graduating Indigenous students, but are limited in their scope, in how many they admit into their degree programs in the first place (Pechenkina, Kowal & Paradies, 2011). These participation strategies however, remain focused on access only, rather than learning and success.

Some academics blame secondary schools for insufficiently preparing disadvantaged students for university (Miller, Bradbury, & Pedley, 1998). However, there are actions universities can implement to improve not only access but equally important the success of disadvantaged students. A meta-analysis of programs that aim to improve the success of disadvantaged students suggests that most of the time they actually do improve the success of these students, although there is much variation in the level of success across programs (Kulik, Kulik & Shwalb, 1983).

The types of actions universities can take to improve success include (Rosenbaum & Becker, 2011):

1. Give students the academic skills they need to succeed at university with a curriculum that provides them with the study skills required to succeed;
2. Closely monitor student progress and give feedback;
3. Manage the high school-university transition closely.

In the case study of interest in this study, an intentionally developed transition curriculum with an intense focus on improving student learning and outcomes as suggested by Kift (Kift, 2009; Kift et al., 2010) was developed and implemented and has shown promise to improve learning success.

Traditional teaching model

The majority of higher education providers transmit their subject matter by means of lectures attended by large student numbers, with assessment principally focused around formal individual examinations (Bligh, 1972). This method of disseminating knowledge has long been challenged, Bligh (1972) said "that while it can be useful to teach information, it is not an approach that stimulates thought or change in attitudes" (Bligh, 1972, p.223). Research indicates that student participation in such traditional methods have been declining for some time (Dolnicar et al., 2009; Ramsden, 2003), as evidenced by poor attendance rates, poor grades, high attrition rates, poor student satisfaction and coupled with students not at the centre of teaching practices. Here, the dissonance between theory (best current practice) and practice in university teaching is clear.

Best practice has demonstrated that students need to be engaged in active learning (Freeman et al., 2014; Sinnayah et al., 2019; Houseknecht, Bachinski, Miller, White & Andrews, 2020). The gains of active learning strategies are tempered by reports of student resistance caused mainly by unfamiliarity with subject content and the extra effort required to construct knowledge actively as opposed to learning via a traditional teacher-centred approach (Owens, Sadler, Barlow & Smith-Walters, 2020). The Covid-19 pandemic in 2020 has also focused on the methods of how higher education providers deliver their knowledge, placing further pressure on the traditional teaching methods (Nerantzi & Chatzidamianos, 2020; Venton & Pompano, 2021).

In response to this trend, some universities have successfully tried alternative models that include offering an intensive teaching mode (Ho & Polonski, 2007) and a more active learning experience (Freeman, et al., 2014; Harasim, 1999). For example, active learning has been demonstrated to significantly improve results of students when compared to those attending traditional lectures (Revell & Wainright, 2009; Freeman et al., 2014; Houseknecht et al., 2020).

The intervention in a case study: Context of Victoria University

The case study of interest being explored in this research is that of Victoria University, Melbourne, Australia (VU). A distinguishing feature of VU's student population is that it features the highest proportion of students enrolling who come from non-English speaking backgrounds (NESB), and the second highest proportion of students arriving from a low SES or are the first in their family to attend university, compared with all other Universities in Victoria (Wheelahan, 2009; Messinis, 2015; McCluskey et al., 2019; Loton, 2020; McCluskey, Smallridge, Weldon, Loton, Samarawickrema & Cleary, 2020).

Within this unique educational setting, Victoria University's stated aim of being a university of opportunity within the local community was hard to fulfill and it needed to respond and change (McCluskey et al., 2019; McCluskey et al., 2020). VU's vision is to create a more engaged and accessible University for its unique student population that consists of a significant portion of academically disadvantaged students, who need more learning support through the application of extrinsic engagement activities to succeed (Messinis, 2015; O'Shea, 2018; Chapin & Oraison, 2019; McCluskey et al., 2019). A focused and intentional first year *transition pedagogy* was developed and embedded, aimed at student retention and success at the critical entry level of university. The focus of this transition pedagogy was to provide a framework that encompasses the teaching of a core curriculum that is engaging, challenging and intellectually stimulating, within a smaller class size and a more flexible delivery system framework (McCluskey et al., 2019; McCluskey et al, 2020).

Victoria University: A case study in active learning

Victoria University adopted a radically new teaching model, now known as the *Block Teaching Model* (BTM) (McCluskey et al., 2019), which combines both intensive teaching that has an active learning environment embedded, together with a transition curriculum specially designed for first year university on a much grander scale then ever tried before. Detailed reasons behind this change have been described previously (McCluskey et al., 2019; Klein et al., 2019a, Klein et al, 2019b; Victoria University, 2019; Victoria University, 2021).

Although the BTM is new to mainstream higher education in Australia, it has been used successfully for many years in other countries such as Canada, USA, Scandinavia and recently in UK (Nerantzi & Chatzidamianos, 2020). Here, the key difference is the change in temporal pattern of learning, progression and assessment of each course (called a "unit"

in Australia) (McCluskey et al., 2019). This delivery change is matched with an equally dynamic change in curriculum (Kift, 2009; 2010). To date this area of educational research has received little attention (Davies, 2006). Even though this delivery method has found increasing popularity, rigorous, methodologically robust research into the benefits and challenges of this form of pedagogy still remains in its infancy (Burton & Nesbit, 2002; Burton & Nesbit 2008; Davies, 2006; Mitchell, 2020). Of note and relevant in achieving the outcomes of this work is the sheer magnitude of organisational change required to introduce the new model in such a large university, which has no precedent in either the Australian or international higher education contexts.

The University as a whole needed to undergo a total organisational overhaul on a scale and complexity unprecedented in the Australian higher education sector, in order to be able to embrace this new mode of operation. This required significant changes to establish new administrative, managerial and oversight processes, including enrolments, student support, marketing, Quality and Planning, People and Culture, IT and Connected Learning, all participating in the rebuilding of its new operating systems (McCluskey ,2019; McCluskey et al, 2020).

VU's BTM is distinct from the traditional teaching practice consisting of lectures, in that it immerses the teaching academic into the student learning process for the entire duration of the unit of study; a constant companion in the 4-week learning journey in which the opportunity to build relationships is enhanced. This draws on findings by Barker (2015), who showed that a predictor of student retention was to ensure students have many opportunities to interact with the teaching academic in and out of the classroom.

The learning framework of the BTM uses only small class sizes (maximum 30 students), together with a higher frequency of contact, (3 times per week, each for a 3-hour duration), which also maximises the possibility so needed as an ingredient of developing enhanced student-to-student as well as student-staff relationships. While the academic remains the mentor within the student-centred teaching model, academics and students play an equally active role in the learning process. Previous research has demonstrated the positive effects on student outcomes of active learning environments. A meta-analysis of 225 studies of active learning found that removing lectures and including active learning strategies significantly improved student results, while students who participated in lectures rather than active learning workshops were more likely to fail (Freeman et al., 2014). This study focuses on the effect of the BTM on student learning and academic success for those who come from a disadvantaged background, compared with those from a non-disadvantaged background.

Aims and research questions

While earlier research has indicated that overall the BTM had increased success rates with disadvantaged students (McCluskey, et al., 2019; Samarawickrema & Cleary 2021), there was less specific analysis of the statistical magnitude of the change when compared to non-disadvantaged students or on a unit-by-unit analysis. This research extends this

previous research by conducting a unit-by-unit analysis using an independent t-test or ANOVA comparing a control group with disadvantaged groups across units. The present study aims to investigate the impact of the BTM on the failure rates of non-disadvantaged and disadvantaged students, and whether changes in the failure rates between these groups are significantly different.

RQ1: Are disadvantaged students are less likely to fail under the new block teaching model?

RQ2: Is there a significant change in the failure rate between disadvantaged and advantaged students and identify whether a change in the learning outcomes between these groups is significant?

Method

After gaining ethics approval (HRE17-192), data from a total of 137 first year units across various disciplines were extracted from the InfoVU database. This dataset was analysed by comparing a total of N=30187 unit results obtained in 2017 compared them with a total of N=31795 results obtained in 2018. This time frame represents before (2017) and after the introduction of the BTM (2018). Pass and fail rates from students from the following student cohort categories were compared:

1. First in family (FIF) to attend university vs not first in family (NFIF) to attend university;
2. Students from a non-English speaking background (NESB) compared with students from an English speaking background (ESB);
3. Students from a low socio-economic status (SES) compared with students from a high SES;
4. Students with a low ATAR compared with students with a high ATAR;
5. Male students vs female students.

Due to the large sample size (around 9000 students in total) and large difference in sample size for each group for comparison, statistical analysis on individual student results would have risked a type one error (Sawilowsky & Blair, 1992) hence the analysis was conducted at the unit of study level. Unfortunately, there were insufficient numbers of indigenous student results to conduct a statistical analysis on the fail rate reduction for this group. Comparisons were conducted on the unit level, containing a sample of 137 in each group for comparison. The percentage point change in failure rates has been calculated for each disadvantaged group versus the non-disadvantaged (control) group followed by either a two-sample t-test or ANOVA, depending on the number of groups in each analysis. A two-sample t-test was used to analyse first in family and English-speaking background data. An ANOVA was used to analyse ATAR and SES data, due to the multiple groups established. Significance was deemed at $p \leq 0.05$.

Results

Students from a Non-English-Speaking Background

In 2017, an average of 27% students across the first-year units (n=137) had failed. In 2018, this number had reduced to 15% of students who had failed the same first-year units.

In 2017, of 8305 NESB student results, 2748 (31%) had failed; compared to 22% of ESB students. In 2018, both groups had improved, with 18% of NESB students (a reduction of 13 percentage points) and 13% of ESB students failing a unit. NESB students, who had previously failed at a higher rate than ESB students had made a significantly greater gain in reducing fail rates, t (224) = 1.97, p <0.01 (Table 1).

Table 1: Difference in average fail rates across the time window of change for NESB students and the control group of ESB across 137 first-year units

Language background	Mean reduction in fail rate 2017-2018	df	t	p
NESB	13 percentage points	224	1.97*	0.01
ESB	9 percentage points			

NESB: Non-English-speaking background; ESB: English-speaking background

Students from low SES

In 2017, 33% of the results from a low SES were fail grades, compared with 27% for medium SES and 23% for high SES. By comparison, in 2018, these fail results had reduced to 19%, 15% and 15% respectively. A non-significant ANOVA overall was seen across groups (Table 2). When groups were compared separately, the low SES group's reduction in fail rate was significantly greater than the high SES group (F=.44, p<0.01) and the medium SES group (F=0.33, p<0.01).

Table 2: Difference in average fail rates across the time window of change for low, medium and high SES students across 137 first-year units

Socio-economic status	Mean reduction in fail rate 2017-2018	df	t	p
Low SES	15 percentage points	2	2.95	0.053
Medium SES	12 percentage points			
High SES	8 percentage points			

Low ATAR

The Australian Higher Education system uses what is known as the *Australian Tertiary Admission Rank* (ATAR). The universities use the ATAR score as a means to selection and

admission of students into their courses. It is a number between 0.00 and 99.95 and indicates a student's position relative to all the students in their age group who sat for the university entrance exam in any given year. A high ATAR means a good student performance and a low ATAR means a poor student performance in the exam. The average ATAR score obtained by students is typically around 70. Table 3 shows the reduction in first-year failure rates is greatest at the lower end of the admission ATAR, that being below 35 (18%), and has a continuously decreasing improvement effect as the ATAR score improves, from between 14% to 3% for students with an ATAR above 80.

Table 3: Difference in average fail rates across the time window of
change for different ATAR groups of students across 137 first-year units

Australian Tertiary Admission Rank	Mean reduction in fail rate 2017-2018	df	t	p
Below 35	18 percentage points	4	13.5*	<0.01
35-50	14 percentage points			
50-64	6 percentage points			
65-79	9 percentage points			
80+	3 percentage points			

First in family

The results indicate that there is no significant difference, but rather a non-significant trend, in the reduction in fail rates across students who are first in family to attend university and those who are not (Table 4).

Table 4: Difference in average fail rates across the time window of change for
FIF students and the control group of NFIF students across 137 first-year units

Family background	Mean reduction in fail rate 2017-2018	df	t	p
FIF	10 percentage points	224	1.96	0.6
NFIF	9 percentage points			

FIF: First in family to attend university; NFIF: Not first in family to attend university.

Gender

In 2017, 30% of male student results were fail grades, compared to 24% of female student results. In 2018, this had reduced to 17% and 14% respectively. The results indicate that there is a significant difference in the reduction in fail rates for female and male students, with male student fail rates reducing at significantly higher levels than female fail rates (Table 5).

Table 5: Difference in average fail rates across the time window of
change for male and female students across 137 first-year units

Gender	Mean reduction in fail rate 2017-2018	df	t	p
Male	13 percentage points	257	2.87*	<0.01
Female	10 percentage points			

Indigenous students

As highlighted earlier, there were insufficient student results for Indigenous students to conduct a viable statistical analysis, however results suggest a marked reduction in fail rates across all units for indigenous students, reducing from 36% in 2017 to 23% in 2018, compared with 27% in 2017 to 15% in 2018 for non-Indigenous students.

Discussion

Universities internationally have been challenged by how to ensure those from disadvantaged backgrounds succeed in higher education settings (Kulik, Kulik & Shwalb, 1983; Rosenbaum & Becker, 2011; Akoojee & Nkomo, 2007; Downs, 2010; Engle & O'Brien, 2007; Engle & Tinto, 2008; Phillips & Loch, 2011; Smit, 2012; Whitty, Hayton & Tang, 2015).

Analysis of the data presented here supports a positive impact of the newly introduced BTM at VU on student success from disadvantaged backgrounds. It shows that it is significant across a wide range of factors influencing both non-disadvantaged and disadvantaged student populations.

In response to the research questions set, the results suggest that not only are traditionally disadvantaged students less likely to fail under the new BTM, but the reduction in fail rate is significantly greater for most disadvantaged groups explored than non-disadvantaged students. This suggests that the BTM teaching model may be closing the gap between disadvantaged and non-disadvantaged students.

While the introduction of the BTM has lifted the learning outcomes of all students by a reduction in failure rates, it however, was significantly higher (6 percentage points) between the student populations from non-English speaking background (NESB) when compared with the English-speaking background (ESB) cohort; an improvement which favoured the NESB student population, compared with the ESB student population. Previous findings suggest NESB student performance can be improved if they are given a chance to prepare sufficiently (Miller, Bradbury & Pedley, 1998; Oliver, Vanderford & Grote, 2012; Mestan & Harvey, 2014). These results suggest that an active learning environment may give NESB students some of the extra preparation required.

Furthermore, the results demonstrate that students from a low socio-economic status (SES) had a greater reduction in failure rates (12.4 percentage points) than students from a high SES (8.0 percentage points). This reduction in failure rate mirrors the previous category of NESB/ESB in that it shows a greater improvement for the low-SES compared with the high-SES group. A finding supported by McCluskey et al. (2018) who found when dividing SES into low, medium and high status an increase in pass rates from 67% to 82% for low, 73% to 86% for medium, and 78% to 87% for high SES. This significant closing of the gap between lower and higher SES students studying under the BTM suggests that enabling low SES students to learn in an active environment, in small classes while studying one unit at a time can increase their success to almost the same level achieved by higher SES students.

The effect of failure rates on different level ATAR groups was significant. Students with a low ATAR had a greater reduction in failure rates (18 percentage points) in 2019 than students with a higher ATAR (3 percentage points). This observation is also aligned with findings by McCluskey et al. (2019) who showed that the biggest increase in pass rates was noted by students who entered with an ATAR of 31-40, although a large increase in pass rates was observed for all students with an ATAR less than 50. The impact of the BTM on students who enter higher education with a higher ATAR continues to decrease, indicating that it has a positive effect on all students and still able to engage with high achievers who have an ATAR of greater 80.

First in family (FIF) is also an under-recognised equity grouping which may come from and be embedded with low-SES, mature-aged, regional and remote, and Indigenous student groups. Previous research has shown that FIF tertiary students are more likely to be in a position of educational disadvantage over students who have other family members available to share the experience of university life and discuss their aspirations (Luzeckyj, 2017). The results of this study showed that there was no statistically significant difference between failure rate reduction for first in family (FIF) to attend university and not first in family (NFIF) to attend university (10.0 vs 9.3 percentage points). This is quite surprising as the sample size is very large, and other researchers have made the opposite observation (Chapin & Oraison, 2019).

Another area in which the results of this study suggest the BTM approach can close the gap of disadvantage is with male and female students. While traditionally, male students have been found to succeed in education at lower rates than female students (Hodgetts & Lecouteur, 2010; Schneider & Coutts, 1985), the results of this study suggest the BTM can close the gap in achievement levels between male and female students.

Also, a strikingly similar result profile indicating student success under the BTM has been observed when comparing pass rates from students based on their indigenous status. While sample size was small, the improvement in student success was clear with an increase of between 11-13% in pass rates (McCluskey et al., 2018).

These results support that the VU BTM has improved the pass rate for students in all categories, but having the most significant impact on students whose backgrounds have traditionally been linked with poorer academic outcomes at the beginning of their higher education studies. This suggests that active learning and intensive teaching, where students can concentrate on one subject area at a time, may help close the gap between disadvantaged and non-disadvantaged students.

Conclusion

This work makes a very important contribution towards identifying mechanisms for disadvantaged students in higher education that can lead to their academic success. The massive scale of the problem of improving the success of disadvantaged students in higher education, in no doubt requires a holistic multifaceted approach which is of no lesser magnitude in order to be effective.

We report here, that higher education institutions like Victoria University that provide a greater access to non-traditional and underprepared students are required to provide more help in the form discussed for these students to succeed.

These results indicate that when combining major curricular reform, together with comprehensive institutional change, the outcomes presented here can be achieved. A massive curricular reform is needed to incorporate a well-designed transition curriculum, which is student focused and engaging. Institutional reform is needed on a comprehensive scale to allow a set of unique circumstances to come together to enable this macro-engagement of students to occur.

The magnitude of scale of institutional response undertaken by VU may not be possible or of interest to other higher education providers. Neither is there sufficient evidence to suggest that this type teaching model will necessarily fit into all other university cultures. The data however, support that that newly introduced Block Teaching Model significantly reduces student failure rates across a number of social parameters such as high versus low ATAR, SES, NESB versus ESB, and male versus female students, while, interestingly, not significantly impacting FIF versus NFIF.

The BTM has contributed to and provided students with a learning environment that promotes the opportunity required by less independent learners to build relationships with each other, and with the teaching academic. The building of a sense of belonging, has seen the building of a student community of learning practice and is a significant contributing factor to the current success of students studying under the new BTM. Indeed, there is strong evidence supporting that small class size, the introduction of an active learning classroom environment, together with frequent student contact, is pivotal to relationship building and enhances the learning environment and is a key ingredient for academic success.

This analysis demonstrates that the change in teaching model together with an intentional first year student-centred transitional curriculum had its greatest impact where it was needed most, on the most disadvantaged student groups, with a greater reduction in failure rate compared with normal, confirming that the Block Teaching Model plays a valuable part in helping Victoria University to achieve its vision of uplifting the communities in which it operates.

Limitations and future research

Our definition of disadvantaged background has a relative narrow focus, and many other factors can also influence or present a hurdle to academic success. The cohort of students captured here is limited to a case study from a narrow demographic, that of Victoria University in Melbourne only. While this study is unique in that it explores the effect of a transition from a traditional lecture mode of delivery to a block mode delivery focused on active learning in a large university, it is only one study of such a transition. Ideally, this finding needs to be replicated in other universities that are transitioning from a traditional approach to a block approach, to ensure the effects seen in this case are not unique to Victoria University.

Further research should be conducted in different discipline areas to assess the impact of the BTM on the success of disadvantaged students in different disciplines. Further analyses should also be conducted across a range of study levels as this study was conducted only with first year units, to see whether the success of disadvantaged students continued through second year and beyond.

From a financial perspective, it is likely that the success of disadvantaged students would lead to more of them being retained. While beyond the realms of this study, it would be of interest to calculate the financial impact of retaining more students on the institution's bottom line.

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