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What about me? Staff perspectives on the implementation of Intensive Mode of Delivery in an undergraduate science program

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Many academics are facing the challenge of poor student engagement, particularly in terms of lecture attendance beyond the first few weeks of semester, when numerous assessment items and other priorities vie for the students' time. Some academics have found themselves addressing almost empty rooms by mid semester, despite their best efforts to offer a challenging and authentic classroom experience. This can be dispiriting, and has caused some teachers to introduce weekly in-class assessment items in an attempt to force attendance, only to compound the problem of over-assessment. This paper discusses an alternative approach to enhancing engagement, through the introduction of intensive mode delivery (IMD) in a third-year science unit at a large metropolitan university. The paper focuses on the staff experience, including the expectations, perceived benefits and challenges, the level of student engagement experienced, staff satisfaction and the overall effectiveness and efficiency of the delivery

model. The results showed that despite some identified roadblocks and perceived difficulties, the teaching team had a strong preference for the intensive model over the standard delivery mode. Although student opinions were divided concerning their preferences, the staff were impressed by the students' greater engagement, depth of learning and almost 100% attendance. The present findings will inform the design of learning experiences that are satisfying for both staff and students, and contribute to a growing body of knowledge about flexible delivery in Higher Education.

INTRODUCTION

Contemporary Higher Education (HE) institutions are facing the challenge of poor student engagement, particularly in terms of lecture attendance (French and Kennedy, 2016) beyond the first few weeks of semester, when numerous assessment items and work commitments vie for the students' time. Several factors contribute to this issue, including decreased government funding for the sector resulting in a push towards a "universal education system" (Davies, 2006), growing casualisation of teaching staff, and increased student enrolments encouraging conflicting student demands (e.g. studying and working at the same time) (Davies, 2006; Bates, 2015; Harvey, Power and Wilson, 2016). In addition, increased diversity among students can impact on the way they learn within a constantly changing environment filled with ubiquitous new technologies (Moskal, Dziuban and Hartman, 2013; Bates, 2015).

In response, many HE institutions are opting for alternative teaching formats, one of which is intensively delivered subjects (Hesterman, 2015; Harvey, Power and Wilson, 2016). Notwithstanding the difficulties in assessing the effectiveness of Intensive Mode Delivery (IMD) for promoting better learning outcomes, especially when compared with traditional teaching formats, the literature appears to support its adoption. Several researchers argue that well-designed and taught IMD units should be encouraged, as they provide a flexible alternative to meet students' needs, and have the potential to increase student motivation, commitment and attention (Davies, 2006; Hermida, 2014; Hesterman, 2015; Harvey, Power and Wilson, 2016; Male et al., 2016).

However, in 2006 Davies observed: "More research is clearly needed comparing IMD formats and other traditional forms of learning in particular subject areas" (Davies, 2006, p. 12). A decade later, this need remains. Recently, Male et al. (2016, p. 194) noted that experiential studies with IMD were scarce. In addition, few studies have focused on the application and effectiveness of IMD within science disciplines (Randler, Kranich and Eisele, 2008; Harvey, Power and Wilson, 2016). Thus, there is a well-defined need for new studies in this area. Furthermore, with the increasing focus on importance of Science Technology Engineering and Mathematics (STEM) skills for future employability, there is a need to ensure HE institutions are supporting the learning of students in these disciplines in way that is both innovative and effective (Finkel, 2016).

Finally, while previous studies have focused on the effectiveness of IMD for student learning, less attention has been paid to the staff perceptions of the approach and its impact on staff: this includes the impact on staff workloads and satisfaction, which ultimately impact on the students too. This paper explores the perceptions of a teaching and development team that offered IMD in one unit of an undergraduate science program for the first time. In particular,

we report on the challenges, constraints and benefits of the exercise. To this end, the following research questions were formulated:

1. What were the team's expectations concerning student engagement within IMD and were these expectations met?
2. What challenges and constraints were posed by IMD during the unit design and delivery phase?
3. What were the benefits and drawbacks of IMD?

LITERATURE REVIEW

Defining the concept

Descriptions in the literature of what constitutes intensive teaching are diverse, and there is much ambiguity in this area (Harvey, Power and Wilson, 2016, p. 2). Intensive Mode Delivery is an umbrella term that encompasses many formats, including: compressed, time-shortened, mixed-mode, blocked, accelerated learning, sandwich and sporadic modes (Wlodkowski, 2003; Davies, 2006; Hesterman, 2015; Harvey, Power and Wilson, 2016). The diversity of terms used to define IMD reflects the variety of needs to be met, different pedagogies underpinning learning design, the choice of teaching approaches and the selection of instructional activities. For instance, while the 'compressed' mode is offered during a standard, semester-long period, but within a shortened timeframe (Hesterman, 2015 p. 1), the 'accelerated' mode refers to programs delivered over a shorter period than one full semester, to fast-track university credits (Wlodkowski, 2003, p. 6). Within a program, 'accelerated-courses' (units) are taught in less time that the standard semester and offer fewer instructional contact hours than a conventional unit. Conversely, 'block' modes provide the same number of contact hours as a conventional unit, but compressed over a shorter timeframe (Davies, 2006). At the other end of the spectrum, the 'sporadic mode' consists of small teaching periods spread between 18 days and 5-10 weeks (Davies, 2006).

All the definitions above focus on two time-related properties of the concept: the intensity of the face-to-face contact hours and the duration of the teaching period. However, this ignores the delivery vehicle for IMD courses, which, outside the face-to-face time, nowadays includes a significant component of on-line material. While reducing costs to the university associated with printing and mailing traditional 'learning packages', this also fits with an emerging generation of students labelled the 'C' or 'connected' generation (Friedrich et al., 2010) because they are constantly "communicating, content-centric, computerized, community-oriented, and always clicking" (Friedrich et al., 2010, p. 2). Modern learners are increasingly exposed to digital technologies in all aspects of their lives, which results in development of "new cognitive capacities and learning styles" (Margaryan, Littlejohn and Vojt, 2011, p. 429). Embedding digital technologies in teaching is not only sensible, it is a *sine qua non* of modern education.

IMD appears to respond to the needs of both students and HE institutions in two ways: it provides an alternative format of delivery within a shortened timeframe, while responding to the need for a more flexible approach to learning and teaching. Thus, it is evident that the definition of IMD should include a third property – the choice of a flexible instructional approach. Considering all of the above, the authors of this paper adopted the definition recently advanced by Harvey, Power and Wilson (2016):

IMD is the delivery of an entire subject over a shorter time-frame than that of a traditional semester, and where the learning and workload outcomes are equivalent to a traditionally delivered subject. Learners may engage with IMD through traditional face-to-face contact and/or on-line or distance. (Harvey, Power and Wilson (2016, p. 2)

Intensive Mode of Delivery in science

Overall, IMD is not as widely adopted in science as it might seem. A recent audit revealed that less than half of all Australian universities offered intensive teaching in science, mostly in postgraduate courses, with only 24/158 units offered at the undergraduate level (Harvey, Power and Wilson, 2016). A possible explanation might be the changing demographics of students, with mature-age (postgraduate) students, life-long learners, often professionals, choosing part-time studies and favoring flexible delivery options, such as distance education (Moskal, Dziuban and Hartman, 2013; Bates, 2015; Porter et al., 2016), whereas undergraduate students, most often recent school leavers, favour the more traditional approach.

It also seems that the pattern of offerings is discipline-related and dominated by disciplines where "skill acquisition" is crucial (Davies, 2006). The 2016 audit by Harvey, Power and Wilson showed that management, business and law were the three dominant academic areas which employed IMD, whereas 10 years earlier the dominant disciplines using IMD were languages, arts, engineering and computer sciences, followed by science-based disciplines such as pharmacology or earth science (Davies, 2006, p. 7). Nevertheless, all the above-mentioned disciplines are considered "skill-focused", requiring pedagogical approaches promoting experiential, hands-on methods of learning.

Within science disciplines, some researchers have argued that assertions regarding the effectiveness of IMD are "largely anecdotal with little empirical evidence to support these claims" (Harvey, Power and Wilson, 2016, p. 6). Regardless of the difficulties with measuring the effectiveness of IMD, this teaching format certainly has the potential to engage students in the learning process, especially nowadays, with ubiquitous digital technologies encouraging independence and self-reliance. In fact, student engagement was one of the key reasons to adopt IMD in the context of the present study.

CONTEXT OF THE STUDY

This document reports on the experiences of staff who implemented IMD in a core biology unit of the BSc course at a large metropolitan university – the first foray into IMD for science at this University.

The third-year Animal Biology unit was offered for the first time in Semester 1 2015, employing a standard delivery mode of weekly lectures and laboratory classes, with a short field trip planned for the end of semester. As with many other units in the course, attendance by the 110 enrolled students was good initially, and feedback on the quality of lectures from an early student evaluation survey was excellent. However, attendance at lectures and practical classes fell steadily throughout the semester, reaching 10 to 15% by week 10, causing the field trip to be cancelled. When surveyed again at the end of semester, the results were disappointing, with an overall student satisfaction score of 2.8/5.0. The students commented that a perceived disconnect between the lectures, laboratory classes and the unit

assessment tasks provided a disincentive for attendance. The unit had no final exam and staff had tried to avoid over-assessment by not awarding marks on a weekly basis.

Thus, a key incentive for the current project was boost student attendance and engagement, while addressing low morale and frustration among teaching staff. Additional objectives included: strengthening inquiry-based and experiential learning; more focus on blended delivery; testing the features offered by One Note Class Notebook software; investigating factors that impact on students becoming independent, self-reliant learners; and improving the efficiency of use of staff time. In addition, this pilot project explored the potential for implementing IMD in the science program on a larger scale.

Approaches to learning and teaching

The unit aimed to prepare students for future studies, employment and/or research in animal biology. Thus, the overarching principle which guided the unit design was inquiry-based, experiential learning, with a strong emphasis on practical, hands-on learning as far as possible.

The approach of the teaching team was to offer four thematic modules, with one intensive one-day face-to-face session for each module, comprising lectures, workshops, laboratory classes and on the last day, a debate. Each intensive day was preceded by two to three weeks of self-paced on-line study. The total instruction time was similar to that of a traditional unit, with approximately 8 hours per week of self-paced study plus 32 contact hours with staff. Each module included one major assessment task, which included theory and practical work, and which was completed at the end of the day of attendance. Table 1 summarises the weekly schedule.

Table 1: Weekly schedule for Animal Biology unit offered by Intensive Mode Delivery

Week of the semester	1	2	3	4	EASTER	5	6	7	8	9	10	11	12	
Time	Learning and Teaching approaches													
9-10	Lecture		Lecture			Posters Preparation		Lecture		Lecture			Lecture	
10-11														
11-12			Workshop					Workshop		Workshop			Workshop	
12-1														
1-2			Break					Break		Break			Break	
2-3			Exercise					Exercise		Exercise			Exercise	
3-4	Self-study	Self-study		Self-study	EASTER	Self-study	Self-study		Self-study		Self-study	Self-study	Debate preparation	
4-5			Lab Practical					Lab Practical		Lab Practical				
5-6													Debates	
6-7														
7-8								Bat Hunt						
Assessment Item			Workbook 10%				Poster 30%	Workbook 15%		Workbook 15%			Debate 30%	
Module	Respiration & Transport					Senses & Communication			Movement		Animal & Society			

Four teaching teams composed of academics, tutors and professional learning designers were formed. To deliver the on-line component, the OneNote Class Notebook platform was used for the first time. All four modules followed similar design principles, with some variation in the amount and type of content between the four teams. The on-line content included short recorded lectures (10 to 20 min each), images, readings, practical exercises and a dedicated on-line space for peer collaboration. The level of student activity in the OneNote space was monitored electronically. The administrative aspects of the unit (e.g. Unit Guide, Assessment details) were also maintained on a Blackboard site to conform to the University's policy.

The project started in January 2016 and the delivery phase ran from March to June (semester 1), with 92 enrolments, representing a range of disciplines including biology, chemistry and science education students.

METHODOLOGY

Data collection and analysis
One aim of the project was to determine which elements of the new learning environment enhanced or deterred student learning from the teaching team's perspective. First, a series of team meetings were held to debrief staff, review student feedback and to discuss the next iteration of the unit. Next, in-depth interviews were conducted with each staff member, with written responses submitted by those participants who were unavailable. In total, eight out of nine teaching team members participated in the activity.

To allow in-depth analysis and interpretation of the data, the interviews were analysed using the theoretical framework of discursive psychology (Jørgensen and Phillips, 2002). This approach to discourse analysis is based on perceptualism, the belief that individuals acquire knowledge about the world through observation and the accumulation of information. The accumulated information is used to create categories, which are mental representations that allow an individual to create a meaning. The view of perceptualism is that "categorisation is based on direct, empirical experience" (Jørgensen and Phillips, 2002, p. 98). The language that individuals use to describe their environment reveals what they perceive.

In this study, the participants' perceptions of the learning environment, associated challenges, constraints and benefits, were identified by analyzing the interviews to identify recurring themes, and classifying these into colour-coded categories.

Next, the findings were examined in relation to existing literature, to identify recurring patterns as well as new findings about the IMD format. Table 2 presents the relationship between the research and interview questions.

Table 2: Relationship between research questions and interview questions

Research questions	Interview questions
1. What were the team's expectations concerning student engagement within IMD and were these expectations met?	1. What were your expectations with regards to students' behaviour/ engagement?
2. What challenges and constraints were posed by IMD during the unit design and delivery phase?	2. In your opinion, what were the biggest challenges and constraints posed by the unit to you? To your students? To the University?
3. What were the benefits and drawbacks of IMD?	3. In your opinion, what were the benefits of the experiment to you? To your students? To the university?
	4. Any additional thoughts you might have?

FINDINGS AND DISCUSSION

In response to research question one, the respondents expected a high level of student engagement with both the face-to-face and on-line and components of IMD. Expectations around attendance during the intensive days were exceeded, with an attendance rate of 98-99% across all four modules and for the duration of each entire day.

An expectation of improved engagement during the face-to face sessions was also met, with staff reporting an apparent increase in student motivation, commitment, and concentration during the face-to-face sessions. From the staff perspective, most students seemed well prepared for the day, as evidenced by the quality and quantity of questions asked during the lectures and tutorials. The staff also noticed considerable enthusiasm by the students during the laboratory practical classes, when completing experiments (e.g. dissection), collecting and analysing data. Combined with the attendance rate, this aspect of IMD led to considerable staff satisfaction and a high level of motivation to repeat and improve the process.

This result is consistent with earlier studies on IMD in science (Davies, 2006; Harvey, Power and Wilson, 2016) and seems to be a common finding across the majority of studies. Research indicates that IMD can provide opportunities for the academics to rethink their teaching practices and adopt more innovative methods, become more mindful of learners' diversity (Pritchard and MacKenzie, 2011), restructure their curriculum to embed more in-depth study of complex concepts (Harvey, Power and Wilson, 2016), and build stronger relations with, and among, learners (Davies, 2006).

The teaching team also expected the new delivery format to pose some challenges for students. For example, it was anticipated that some students may struggle to adopt a more independent, self-managed approach towards their learning, particularly concerning the on-line component. Furthermore, it was expected that the new on-line tool (OneNote Class Notebook), being an additional element to the standard Blackboard Learning Management System, might cause the students certain technical difficulties and confuse some less attentive

users. This might have led to frustration, impacting negatively on the students' perception of the quality and usefulness of the on-line component. Finally, it was foreseen that, due to the fatigue of staying focused for the duration of the entire day, some students would have difficulties with completing the assessment items scheduled for the end of the day.

Regarding the pre-class, on-line activities, the perception of students' engagement with this aspect of the unit was more nuanced. The respondents had the perception of the cohort being unequally split into two groups. The larger group included those students who completed at least the minimum number of preparatory activities on-line. This cohort seemed to be prepared for the day, despite their lack of familiarity with this delivery format and some confusion and anxiety about what would be expected of them on the intensive days. One respondent reported: "those who engaged did what was expected: they engaged with the intermediate topics, they completed the activities well. A lot of them used the Learning Outcomes as the guide to learn what needed to be learned". However, two respondents commented on the motivational aspects of the students' on-line engagement. It was perceived that "students continued to be obsessed with assessment", structuring their engagement around assessment items. The second cohort, smaller, but still noticeable by the teaching team, comprised those students who either failed to engage at all, or who engaged at an insufficient level and/or, at the last moment.

In summary, two broad problems were identified in relation to the ability of these third-year students' to act as independent, self-managing learners: a general lack of time-management skills and a lack of on-line learning skills. All respondents noticed that the students reported difficulties with time-management, self-direction and motivation for independent studies. It was often stated that the students "would leave it to the last minute". The teaching team were surprised to discover these issues, expecting their final-year students to be more self-directed, independent learners and to be more comfortable with the on-line environment. On the other hand, the respondents observed that during intensive days, students collaborated well in teams performing practical, hands-on activities. This suggests that they have developed collaborative skills, most probably due to the predominantly traditional approaches to learning and teaching applied through the degree.

The responses to research question two generated more detailed information and allowed a more in-depth analysis of the underlying challenges and constraints. Overall, the staff described four "transitioning challenges". The first challenge was related to transitioning from a content delivery mindset to an experiential learning mindset. This was centered around the problem of "engagement", understood as the ability of staff and students to stay focused for the duration of each intensive day, or student engagement with the on-line resources (and hence preparedness for engagement) and with specific learning activities during the intensive days.

The second challenge identified was the ability of staff and students to transition to a blended learning model. This was complex and encompassed several separate issues, including the staff and students' level of technical ability in using a new digital tool; the challenge of designing four cohesive modules, each taught by a different team; and the ability to tune the quantity, level and type of information to meet the learning outcomes as well as the individual needs and learning styles of a diverse student cohort (e.g. video versus printed material).

In addition, there were problems with communication between staff and students. Limited face-to-face contact meant that communication occurred primarily through on-line tools, and there was a general lack of student responsiveness to communication sent by the teaching team. One respondent mentioned: "It is a slightly truncated unit, students are not getting as much contact with us, communication is paramount, this could be built up in the prior information, we need to make sure that students interact with the information provided". Communication problems also arose between staff teaching different modules.

The third challenge was that of leading a relatively large and diverse teaching and development team to transition to a new collaborative working model. All members of the team were required to balance competing priorities, although different in nature. For the academic staff, these were conducting research, fulfilling service duties and teaching other allocated units. For professional staff members, playing the role of connectors between the sub-teams, meant managing teaching team's expectations with regards to the amount of support available. In this instance, the traditional collaboration model of relying on large meetings was not particularly effective and new ways are needed for managing new models of collaboration between diverse teams composed of specialists from various domains and disciplines (i.e. academic discipline specialists, learning and teaching specialists, technical and laboratory specialists).

The fourth challenge perceived by the respondents was related to the institution transitioning towards diverse and innovative delivery formats. As stated above, many modern HE institutions aspire to introduce innovative delivery models to better respond to students' needs and expectations. However, in practical terms the institution can create barriers such as the time-tabling system, which proved to be problematic in the current instance, leading to unnecessarily long intensive days and preventing some classes from being officially scheduled. Furthermore, some of the teaching spaces made available for the interactive workshops were poorly suited to the activities that were designed to take place and did not support interactive, experiential teaching approaches.

The challenges identified should be interpreted with the following factors in mind. The unit was redeveloped in a relatively short time-frame, with on-line-materials prepared only a few weeks in advance of their delivery. Few of the teaching staff and (it is suspected) few of the students, had any significant prior experience of IMD. The OneNote Class Notebook had not been used widely before at the University, and there were no previous users available to consult. Another challenge that proved to have a greater impact on the students than anticipated, was the institutional inflexibility, which contributed significantly to staff and student fatigue.

In response to research question three, the respondents perceived three key benefits, outweighing, to some extent, the difficulty posed by the challenges. The most important benefit was excellent student engagement in terms of attendance, and meaningful participation in all types of pedagogical activities (laboratory experiments, practicals, lectorials and tutorials). When interviewed about the specific benefits from the teaching team's perspective, one respondent stated: "Nice to stand in front of the class and have really well-structured questions, challenging questions; enjoyed that". This certainly boosted the teaching team's morale, encouraging more reflection on their current practices which extended beyond the unit offered. Another respondent enjoyed the fact that there was: "More innovative and progressive thinking about the pedagogy".

In terms of learning from the experience, the overall impression was that those students who followed the instructions and completed the preparatory activities were better prepared for the intensive days and for their assessment. One respondent noticed: "Taken from theory to practice, it [theory] was fresh in their mind. They had a better understanding of the animals and the system. At the end, it was the most knowledgeable cohort so far". Considering all the above, the benefits for the University appear evident – energised teaching teams and engaged students should contribute to a better overall student learning experience.

This project was born out of the teaching team' frustration, caused by a low level of student engagement, manifested by poor attendance, lack of communication with academics and too narrow a focus on assessment. Empty classrooms can be dispiriting, and may encourage some teachers to introduce more "arbitrary" strategies, such as weekly in-class assessments, in attempt to force attendance and attract students' attention. However, such decisions may compound the issue of over-assessment without providing an effective solution to the problem of student disengagement.

The project was certainly successful by addressing the main problem of student attendance, while achieving active participation, as presented under the term of "student engagement". This was achieved by enabling flexibility and encouraging active learning. However, the use of IMD to enable flexibility and encourage active learning does not improve learning outcomes automatically. The authors are aware of the fact that research investigating the correlation between the IMD and students' achievement of learning outcomes is inconclusive (Wlodkowski, 2003; Davies, 2006; Randler, Kranich and Eisele, 2008; Harvey, Power and Wilson, 2016). It is a complex issue and many factors should be considered. Nevertheless, the authors argue that improved student attendance and active participation during the face-to-face intensive days points to improved engagement with learning and hence a positive impact on student achievement. This, in turn, has an important, positive psychological impact on the staff involved.

CONCLUSION

From the perspective of the teaching staff, the IMD format was well received and the team was unanimous in their support of the new teaching mode and the continuation of this into the future. Despite fatigue caused by the intensity of the experiment, the team felt that the experience was more satisfying in terms of its effectiveness in providing students with rich learning opportunities, while making efficient use of staff time and University facilities. Respondents commented on the stimulating effect of seeing students attending lectures, workshops and practicals, asking questions and actively engaging with learning materials, their peers and with teaching staff.

The participants' responses also identified several directions for further work. First, the importance of investigating and acquiring experience in blended learning and teaching approaches appears to be paramount. As observed by the respondents, this approach posed a double difficulty. The students were required to apply self-direction, time-management and life-long learning skills which were not already developed in several cases. For the teaching team, the challenges presented by the blended learning approach pointed to the need for more training, tightening collaboration between specialists from diverse domains (content, learning and teaching, technical), and the importance of sharing this experience.

Furthermore, there is a need to better understand the individual students enrolled in the unit, to effectively apply blended learning approaches and promote more personalised learning. This means reconceptualising curricula to promote students self-directed, independent (but still collaborative), life-long learning skills. This also includes embedding communication skills with and between students and staff through digital technologies. The issue of "how" such digital transformation of the curriculum could be managed remains one the key questions of modern HE institutions.

Finally, HE institutions need to become more flexible, adaptable and agile at a practical level when trying to implement changes to their established organisational structures. This means reconsidering the duration of the teaching periods, more flexibility in terms of physical and digital infrastructures, and more targeted assistance to academics in the form of diverse teaching and learning teams.

References

Bates, A.W. (2015) *Teaching in a digital age: Guidelines for designing teaching and learning* Vancouver BC: Tony Bates Associates Ltd.

Davies, W. M. (2006). Intensive teaching formats: A review. *Issues in Educational Research*, 16(1), 1-21.

Finkel, A. (2016). S*ubmission to the House of Representatives Standing Committee on Education and Employment inquiry into innovation and creativity: workforce of the new economy*, Office of the Chief Scientist

French, S. & Kennedy, G. (2016). Reassessing the value of university lectures. *Teaching in Higher Education*, DOI 10.1080/13562517.2016.1273213.

Friedrich, R., Le Merle, M. Peterson, M. & Koster, A. (2010). The rise of generation C: implications for the world of 2020', *Booz & Co*, 1-20.

Harvey, M., Power, M. & Wilson, M. (2016). A review of intensive mode of delivery and science subjects in Australian universities. *Journal of Biological Education*, DOI 10.1080/00219266.2016.1217912.

Hermida, J. (2014). *Facilitating Deep Learning: Pathways to Success for University and College Teachers*, Apple Academic Press.

Hesterman, D. C. (2015). Intensive mode delivery of courses in engineering, computer science and mathematics. Crawley, Western Australia: The University of Western Australia, Faculty of Engineering, Computing and Mathematics.

Jørgensen, M. & Phillips, L. (2002). *Discourse analysis as theory and method*. SAGE Publications Ltd

Male, S., Alam, F., Baillie, C., Crispin, S., Hancock, P., Leggoe, J., MacNish, C., & Ranmuthugala, D. (2016). Students' experiences of threshold capability development with intensive mode teaching. In M. Davis & A. Goody (Eds.), *Research and Development in Higher Education: The Shape of Higher Education*, 39 (pp 192-201). Fremantle, Australia, 4 – 7 July 2016.

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education*, 56, 429-440.

Moskal, P., Dziuban, C. & Hartman, J. (2013). Blended learning: A dangerous idea? *Internet and Higher Education*, 18, 15-23.

Porter, W., W., Graham, C., R., Bodily, R., G. & Sandberg, D., S. (2016). A qualitative analysis of institutional drivers and barriers to blended learning adoption in higher education. *Internet and Higher Education,* 28, 17–27.

Pritchard, J., & MacKenzie, J. (2011). The variation in academics' experiences of teaching in an intense study centre compared with their traditional university settings. *Journal of Further and Higher Education*, 35, 339-353.

Randler, C., Kranich, K., & Eisele, M. (2008). Block scheduling versus traditional Biology teaching: An educational experiment using the water lilly. *Instructional Science*, 36, 17-25.

Wlodkowski, R. J. (2003). Accelerated learning in colleges and universities. *New Directions for Adult and Continuing Education*, 97, 5-15.