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# Using the affordance of technology to adjust the design of a flipped learning pedagogy to address the needs of students with complex learning needs

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Flipped learning pedagogy assumes that students can attend class for rich human-interactive learning experiences. However, student engagement is an important factor in successful studies, and students who cannot engage in the on-campus experience need to be considered. This paper reports on the redesign of a large first year unit in an on-campus learning institution to ensure engagement and participation in online and in-class learning and assessment activity, and specifically accommodate the needs of students who for reasons of location or learning difficulties may be unable to fully participate in a flipped learning approach and its assumptions of online and rich face-to-face learning activities. The three phases of this project were: to evaluate the current flipped learning approach to improve the quality for all learners, to interview staff and students as representatives of these non-standard students, and to propose pedagogical adjustments that would promote engaged and participatory learning for all students.

**Keywords:** flipped learning; student engagement; learning design

## Introduction

The flipped learning approach has gained popularity in tertiary and school educational settings as a way to enhance learning for students. Also known as flipped classroom, it is about inverting the location of class activity so that the traditional lecture class is shifted outside of class time, and the consolidation and assessment work normally done outside of class is shifted into class time (Bergmann & Sams, 2012) – typically as a lecture video viewed online, and a “real workshop of learning” in class making maximum use of face-to-face classroom time (Boyer, 2013; Hamdan, McNight, McNight, & Arfstrom, 2013).

Two years ago, a flipped learning approach was applied to a large introductory first year undergraduate class in marketing. The lecturer “offloaded content” into an online environment as pre-class activity (McLaughlin, et al, 2014). The newly labelled Workshop in the traditional lecture time comprised small and whole group discussion. Tutorials became the time and place for developing skills in teamwork and presentation, as students worked on their group assignments. Two challenges then emerged: the unit enrolment size tripled to over 800 students, and subsequently the Workshop was scheduled into a larger capacity room designed for tiered-audience performance plays. The lecturer was then approached regarding learning solutions for students who did not fit the mould of on-campus, class attending and/or group assessment activities. The lecturer, and co-author of this paper, was reluctant to use

lecture capture facilities to record lectures and compromise the active and engaged nature of the active Workshop sessions and possibly undermine the learning outcome focus on developing generic skills such as team work. It became necessary to focus on resolving these issues, maintaining the principle that all students are able to engage and participate in all learning activities and assessment in an equitable fashion, and thus have the opportunity to develop content knowledge and deeper concepts as well as skills.

## Literature review

### Flipped learning

Flipped learning is easily accessible term that supports traditional transmission models of teaching and learning. Studies, such as one by Lancaster, McQueen, and Van Amburgh (2011), find that providing traditional lectures online and active learning in class – in this case problem-based learning – results in statistically significant higher test results. This outcome is supported by a meta-analysis of research studies, which found that blended learning outcomes exceed those of classroom instruction by one third (Bernard, Borokhovski, Schmid, Tamim, Abrami, 2014). However, a captured or video lecture flipped into an online environment promotes antiquated methods of instruction (Ash, 2012), made easier and more efficient for teachers with lecture capture systems (LCS) that provide seamless recordings of live lecture sessions to online access modes. Furthermore, recorded lectures online are not reflective of flipped *learning* – active learning experiences are crucial (Brunsell, 2013) in both online and in-class environments. Contemporary technologies afford rich, engaging, active online learning experiences for on-campus students, thus “challenging many practices and long-standing assumptions of campus-based undergraduate education” (Coates, 2006, p.4). Engaging online practices integrated with the in-class time for engaging learners in challenging, active, and more interactive learning (Bull, Ferster, Kjellstrom, 2012) provides a far superior learning experience.

Flipped learning means teachers engage with learner-centred practices. The first comprehensive literature review of flipped learning practice, by Hamdan et al (2013), synthesises flipped learning into a model into four areas: flexible learning environments, student-centred learning cultures, content and methods that are best fit for purpose, and educators who are reflective, networked, and responsive in their focus on learning. Bergmann and Sams (2012), among the earliest flipped learning proponents, support the notion that flipped learning is about best fit practices. Having independent, more passive work online and out of class time, and having class time for mastery and advancement, focuses on assuring learning for all students. In this way,

due to the emphasis on students becoming agents of their own learning rather than the object of instruction, the flipped learning model can enable educators to make the shift from teacher-driven to student-centred learning (Hamdan et al, 2013, p.4).

In short, flipped learning promotes active engagement and participation of learners in their learning.

### Engagement and participation

The importance of engagement for student success at university is illustrated in the existence of national annual surveys such as USA’s National Survey of Student Engagement

(<http://nsse.iub.edu/>) and the Australasian Survey of Student Engagement (<http://www.acer.edu.au/ausse>). Research recognises the complexity of factors impacting on engagement which incorporates both academic and non-academic aspects (Coates, 2006; Krause & Coates, 2008), including academic, cognitive, intellectual, institutional, emotional, behavioural, social and psychological factors (Taylor & Parsons, 2011). Attention is on student engagement that promotes high quality learning, and a constructivist view that students are the agents of their own learning (Coates, 2006; Krause & Coates 2008). Although the AUSSE aims to inform institutions (ACER – 2012 Results), the survey instruments also delve into the challenges in learning, active learning, interactions between staff and students, as well as other holistic factors (ACER – Survey instruments). A holistic approach to a students' engagement at university, across the range of their experiences and interactions leads to students' higher quality learning (Krause & Coates, 2008), satisfaction and retention.

In a discussion of university quality assurance, Coates (2005) argues that student engagement with activities leading to productive learning is necessary, and productive learning occurs when students “challenge themselves to learn, to interact with new ideas and practices and to practice the communication, organisational and reflective skills that should help them learn and will form an important part of what they take from University education” (p.26). He defines engagement as “the nature of students' involvement with activities and conditions likely to generate learning” (2006, p.4). Involvement is the time and energy (physical and psychological) expended on learning (e.g. see Feldman, 1994; Astin, 1999) and has a strong impact on cognitive and affective development including learning, achievement and retention (Astin, 1999).

At the unit level, a literature review of student engagement by Taylor and Parsons (2011) identifies that engaging classrooms involve authentic, real and relevant learning focuses and activities; technology-rich learning environments; challenging, yet positive and open learning climates allowing for risk; collaboration between peers and between teacher and student; and a culture of learning. Esposto and Weaver (2011) found consistent improvement over three years in student attendance; engagement, enthusiasm and motivation, and marks (a full grade higher class average), when adjusting learner activities to include pair work, collaborative quiz assessment work and group assignments in a university second year Microeconomics unit. That is, when learners had high stakes, collaborative, purposeful tasks to do, they engaged more and achieved more highly. Ahfeldt, Mehta, & Sellnow (2005) in a project training staff across the institution in using engaging teaching methods, in particular PBL approaches, found from surveying 1831 students from 56 classrooms, that teaching practices are effective in increasing learner engagement via cooperative learning, cognitive challenges, and the development of personal skills. They found that the highest level of engagement was found in higher level classes, those with small enrolments, and classes using PBL approaches more; however, they noted: “all students deserve this same level of engagement in all their classes, regardless of level or size” (Ahfeldt, et al, 17).

### **The Large Class Engagement model, and complex learner needs**

Engagement of students in very large classes is particularly challenging, and class sizes are increasing. Mulryn-Kyne (2010) found that OECD universities have had significant increases in class size, which have had a range of negative impacts on students – particularly on student learning. She identifies that large classes result in a sense of anonymity and lack of belonging, leading to low attendance, poor engagement with content, inadequate learning environments for cooperative and active learning practices, and a difficulty for staff in leading engaging and

fruitful discussions. Increased class size also means a change in the nature of the university student cohort and has led to a more diverse range of capabilities, motivations and interest in academic study than traditionally experience in universities (Biggs and Tang, 2007). Jarvis, Halvorson, Sadeque and Johnston (2014) suggest a link between Service Dominant Logic (SDL) theory in marketing and the provision of educational experiences for engaging students in a service, may be a more effective focus leading to better and deeper learning as it focuses on engaging people in the process of the service, in this case education, potentially leading to a favourable view of their university learning as a whole (a notion prevalent in the NSSE and AUSSE surveys).

This paper draws together the components above to explore the way a unit can be revised to engage all students in a large class to participate in learning within a flipped learning approach. Not found in the literature is attention to non-standard students in flipped learning settings, who have an equal right to engage and participate. Non-standard students in this paper are those who are unable to engage in active classroom participation for a range of reasons. Further, we attempt to do this within existing resources, facilities and academic time.

## **The Context**

This large first year undergraduate unit, Marketing Management, had 860 enrolments in first semester, 2014. Numbers have increased markedly as the University moved to a model of 4 broad generic degrees. A number of issues have arisen: the university does not have lecture halls to hold even half of a large class cohort, and sometimes resorts to venues not designed for teaching. Second, the diversity of focus, interest and motivation has increased with core, complementary and broadening focus students in the same unit, adding to Biggs and Tang's (2007) identification of student cohort diversity including varying academic abilities, interests or motivations in university education.

Student diversity at the university also contains two alternate groups relevant to this unit: a regional centre, and students with learning challenges. Students who enrol to undertake their first year studies at a regional centre typically view lecture recordings of live lectures given to students at the main campus and work with a local tutor on small group activities such as tutorials. In 2013, the tutor for this unit left part way through and finding another tutor with appropriate knowledge to provide quality support in a regional centre was difficult. The second group of students with complex learning needs is very small, but addressing their needs effectively is mandated with the Australian Federal Government's Disability Standards on Education 2005 – the right to participate in education the same as students without a disability, even if on occasions adjustments must be made. In the words of staff in the office supporting students with permanent or temporary challenges to learning:

Both law and [university] policy and best practice to make learning material accessible for those with registered disability without compromising academic integrity, uni needs to keep an open mind about possible kinds of adjustments.  
(Interview, 2014)

## **Methodology**

This paper presents the learning design of a unit as preparation for implementation of the revised flipped learning approach for the unit.

Supporting the learning design are semi-structured interviews with staff and students who have engaged with this unit and student needs in the past. The interviewees comprised two staff from the learning disabilities office, and two staff (the director and a tutor) and a student from the regional centre. The interview questions sought from both staff and student their views of the specific needs of their particular context, their past experiences learning at the institution relevant to their context and specific to this unit, and their perspectives on the proposed new design. Research data was collated thematically to identify the complex needs of the two non-standard learner groups. These both guided the design and served as a checklist for the overall learning design.

An investigation of appropriate online tools to meet the teaching needs was conducted by a research assistant, and guided the proposed approach. A literature search for web design principles within LMS units was conducted to inform the redesign of the online space.

The overarching research question is: what redesign of an existing unit might allow students in a regional centre and those with learning challenges to engage and participate equitably in all aspects of a flipped learning approach within a large class?

The learning design in response to this question comprises three components and stages:

1. A definition of an engaged, participatory, flipped learning approach
2. Identification of complex learner needs for specific cohorts
3. The engaged, participatory flipped learning pedagogical design

## Discussion of the Learning Design

### Defining an engaged, participatory flipped learning approach

For this learning design our position outlined above is that all learners can and must be provided the opportunity to engage and actively participate in the learning activities.

As a flipped learning approach, the design is that primarily independent work (the ‘lecture’ content) is online, while active engagement in people-oriented activity is typically in class. However, to be flexible to the myriad complex needs of our students, it is also possible to conduct active group learning interactions in asynchronous and synchronous learning environments. Figure 1 illustrates the flexibility of learning space and time potential. Essentially, flipped learning focuses on the location and timing of engagement in learning activity and the primary focus here is that students can therefore attend activities as a first step in the learning process.

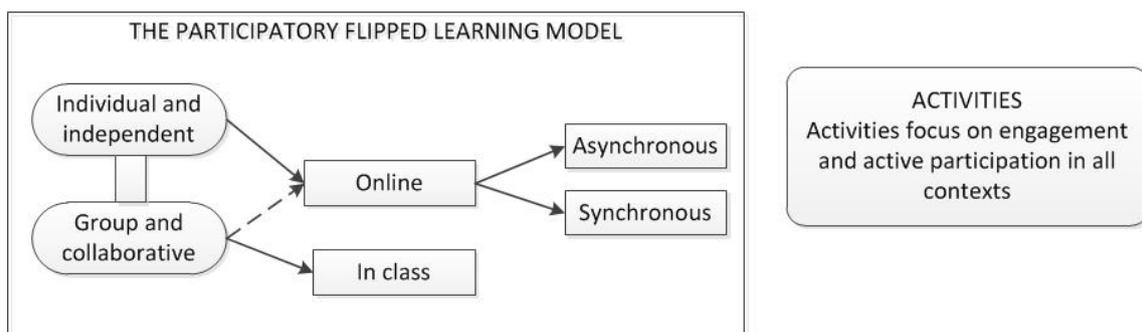


Figure 1: Participatory flipped learning model.

## Identification of complex learner needs

All students in the unit are confronted with issues in engagement arising from being in a very large first year class. Students at the regional centre, and students with learning difficulties potentially have additional challenges to meeting our flipped learning principles. From the semi-structured interviews, we identified the following.

### *Regional Centre*

On the one hand, students in the regional centre already engage with a transmission flipped learning approach – they typically view lecture recordings and work in very small groups with tutors. The interviewed student highly valued the recordings as they still got to hear the academic teacher and some student interaction in class, and could re-listen as often as necessary until confident of their understanding. These students are highly engaged, according to the Director, often seeking extra resources to support learning.

The equity arises in two ways. While they can hear a lecturer after the event, they are unable to engage with the expert lecturer in real time, and to hear and experience the conversations by other students as they conduct discussions and make sense and meaning of content (lecture recordings often miss the student input within the lecture room). Second, this unit when run by this lecturer does not record the workshop session. In the past, the lecturer has supported a local tutor to conduct the workshop. Students still lack access with lecturer and expert input received by students in the main campus workshop sessions. The tutorial experience was similar to main-campus students: a tutor to manage the session, and student group work.

A positive finding from the interview was an understanding that, in fact, students at the regional centre have a far greater institutional support and interaction than students on the main campus. Their engagement is subsequently also extremely high. The Centre itself seems to be fulfilling the needs of students in being engaged, participatory and involved – as long as there are recorded lectures.

When sharing the learning design plan (presented below), the student and staff interviewed felt that a synchronous connection with the main-campus workshop session would be an improvement – students would therefore be part of the whole cohort, and be able to interact in real time with the same expert lecturer.

### *Students with individual learning difficulties*

The needs of students in this group are extremely variable, therefore very complex, and essentially need to be addressed individually. There are several features of the design of this unit that are challenging to students with a number of conditions, and lack of lecture recordings is viewed as significantly detrimental to finding solutions for learning equity.

The staff interviews elicited the following generic issues for students with learning difficulties, whether temporary or permanent.

- *Challenges in accessing content in a class session.*  
In flipped learning, class time assumes and requires highly active engagement in oral learning activity. In a workshop style, delivery is multi-directional, messy with the non-linear nature of human communication, content-rich yet complex in presentation, and verbal. Some students may be able to be physically present to experience the event with the cohort, but may not have full access to the content in this kind of context. One solution is a note-taker, which serves to highlight difference. Lecture capture allows

some students to revisit the class content as often as they need to gain full access to the content, whether personally or through an audio-to-text converter.

- *Challenges in keeping to the same pace as all students.*  
Some students may not be able to work consistently at the same pace as other students within a defined period and set pace. In addition to the discussion around the first challenge, this unit provides online mid semester quiz assessment. A solution is to allow some adjustments, for example, online quizzes with extra time.
- *Challenges arising from social settings.*  
Some students experience anxiety being and interacting with others in large and/or small group interactions, including working with others or speaking in front of a class. In this unit, learning and assessment activities are strongly tied to social interactions. Several solutions are possible depending on the specific individual learning issue to be resolved: providing the opportunity for students to work through online interactions instead of face-to-face, adjusting the presentation requirements, assigning a speaker in the group to represent the workshop small group when needing to contribute responses to the large class setting, being clear about team work processes and teaching all students about effective team work, making processes clear, known and expected.
- *Student conditions that are unpredictable*  
A number of conditions are managed, but are unpredictable and can recur without warning (eg pain, chronic fatigue, mental health issues). An accepted principle is for staff to adopt a universal design perspective (e.g. see Bashan, Israel, Graden, Poth, & Winston, 2010), and to have alternative assessments or engagement/participation solutions prepared in advance.

When presented with the learning design below, and the return of lecture recordings as a solution for some students, the staff were optimistic that this unit would allow for their anticipated range of learner needs to be addressed.

### The engaged, participatory, flipped learning pedagogical design

Drawing on the pre-existing curriculum of the unit that could not be adjusted; the lecturer's disciplinary emphasis on skills and knowledge development; the developing principle of engaged, participatory flipped learning, and the feedback from staff and the student, the following learning design was proposed, presented also in Figure 2.

|                               |   |  |   |  |                               |   |
|-------------------------------|---|--|---|--|-------------------------------|---|
| <i>Learning focus</i>         | Introduction to topic<br>(Online lecture)   | Critical thinking skills for deeper learning ( <b>Workshop</b> )<br>&<br>Application of Concepts and Development of Generic Skills ( <b>Tutorial</b> ) |   |  |                               |   |
| <i>Learning activity</i>      | <b>ONLINE LEARNING ACTIVITY</b>   | <b>IN CLASS LEARNING ACTIVITY</b>  |   |  |                               |   |
|                               |   | LARGE GROUP WORKSHOP   |   |  | SMALLER GROUP TUTORIAL        |   |
| <i>Learning participation</i> | <b>"LECTURE"</b>  | <b>WORKSHOP</b>  |   |  | <b>TUTORIAL</b>               |   |
|                               | All students<br>Same environment<br>Individual time, place, pace                                  | Most students in lecture hall<br>Synchronous live  | Regional students in group location,<br>participate online synchronous  | Special case alternatives<br>own location asynchronous<br>captured session + forum | Students in tutorial sessions | Regional students in tutorial session<br>Special case alternatives  |
| <i>Learning engagement</i>    | View videos<br>Read textbook, PowerPoints<br>Listen to audio summaries<br>Complete online quizzes | Prepare for Workshop & Tutorial  | Complete discussion activities in groups<br>Lecturer manages activity, provides instruction and feedback, clarifies and extends knowledge<br>Includes "answer" notes written on a document for shared viewing<br><i>Regional and special case alternative students view notes on a shared online GoogleDocument</i> |  |                               | Students work in small groups on final group assignment and presentation<br>Tutor facilitates process and associated skills development |

Figure 2: Engaged and participatory flipped learning pedagogical design

### *Encouraging engagement with content, concepts and skills through lexical change*

First, words with traditional semantic connotations of teacher-oriented approaches to teaching and learning inherent in the lexical items of “lecture”, “workshop” and “tutorial” were replaced with alternative terminology to delineate to students that critical and active learning was occurring in all environments, whether online or in class. The online learning (formerly, the lecture) is termed “topic content” and introduces students to new knowledge and concepts. A range of mini lecturer videos, PowerPoint content resources, textbook readings, audio and quizzes lead students to engage with the same content as a lecture might contain, but with a variety of media and simple activity. The workshop is termed “Critical thinking skills development” and the tutorial as “Application of concepts and generic skills development”. This enables the intent of each in-class time to be clearly articulated, and the learning management system (LMS) unit has been designed to visually reflect this delineation and nomenclature as well (See Figure 3).



**Figure 3: LMS structure and naming to reflect learning focus**

Second, consistent with flipped learning approaches, lower level content knowledge is provided online, while deeper learning activity occurs in face-to-face or at least interactive and collaborative spaces. This fills the notion that flipped learning provides the means for deeper learning by putting this activity in the place where people meet and interact, where support and feedback are immediate, and where expert extension is provided in the moment of need.

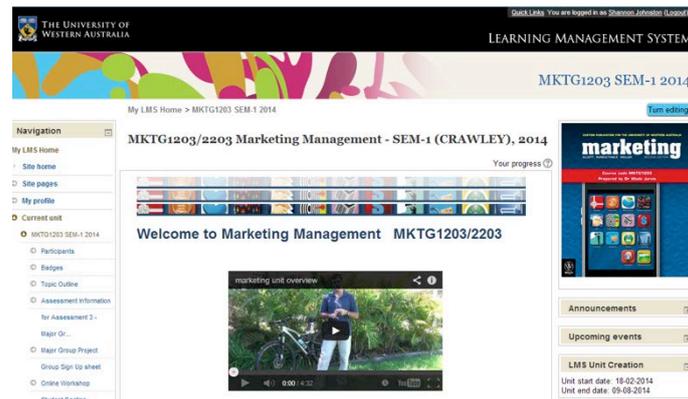
### *Developing the online environment to foster engagement*

As identified in literature above, interaction and connection with teaching staff, as well as peers, is critical for student engagement and ensuing benefits. Students engage in the workshop and tutorial components with both whole-group and small group interactions, in addition, the staff are more available to listen and discuss as the didactic lecture mode is reduced. The pedagogical design has strengthened this aspect so that workshops centre on small group activity, and tutorials are only for group assessment work and the development of generic skills of working in teams.

In addition, the LMS unit redesign also incorporates teacher presence, even though the online component is for independent work. The goal was to ensure instructor presence and personality extending to and through this environment. For instance, as illustrated in Figure 4, the unit opens to an introductory video by the lecturer, enabling students to hear about the unit and the flipped learning approach from the lecturer.

In addition, the lecturer introduces each week’s work and learning intentions in a personable manner and setting, including an overarching statement of learning for the week (see Figure

5). The LMS unit includes use of the Announcements and discussion board features to facilitate communication.



**Figure 4: Welcoming presence of lecturer in the online space**



**Figure 5: Personable and specific introduction to weekly online learning.**

### *Ensuring equitable access to learning*

Students engage and participate in the same learning focus, and same kinds of learning engagement activities: they all work on the same online resources; they all engage with the same learning discussion activities and gain access to the support, feedback, and expert guidance of the lecturer, and as far as is applicable, they all work on the same tutorial outcomes in small groups on the same assessment. However, the place and means for this participation may differ. In the proposed learning design, the regional location students meet in a group at the regional centre, and connect with the lecturer via a synchronous hook-up using, for example, via tools such as Google Hangouts or Skype, in order to engage in real time with a large workshop group of the main campus students. When main campus students break into small groups for discussion, regional students are in their own local group. When the lecturer writes shared notes on a document for main campus students to view, he will use google docs and provide the link for regional students to view in real time, and allow comments to be added. In this way, regional students engage as part of the whole class cohort and the lecturer in real time.

For students on the main campus with learning issues, a range of alternative processes are anticipated. The first approach is to work to ensure students can engage with the same learning experiences as other students, and following the kinds of solutions presented above. If a student cannot participate or engage with the Workshop activity, even with adjustments to accommodate the condition presented, then those students will be provided a recorded session to listen to, thus allowing equitable access to the lecturer speak and student feedback, access to the google doc notes that were developed during the workshop, and will engage with the activities through a discussion forum, gaining basic feedback in support from the lecturer. Alternative practices for tutorials and group assignment work need to remain flexible, but a number of anticipated solutions include the following. Students with difficulties in interacting in face to face sessions could be supported to seek a group of students interested in online communication (for various personal reasons such as lifestyle impacting on class attendance), presentations can be completed in alternative formats (e.g. recorded on video) or form of contribution negotiated. If the condition precludes participation in learning or assessment activity, then an alternative assessment item that meets the learning outcomes will be negotiated.

### **Concluding remarks**

This paper describes a critical examination and re-organisation of the learning spaces and focus within each space of an existing flipped learning approach, to enhance engagement and participation of all students in a very large first year undergraduate unit, ensuring the engagement and participation needs of two groups of learners with complex needs. The next step is to evaluate the experiences of students, and measure the engagement and participation against the principles and guidelines outlined throughout this paper.

This learning design did not aim on this occasion to challenge and change the underpinning theoretical premise and teaching approach embedded in the curriculum to reflect more contemporary methods such as situated and constructivist learning (eg see Herrington, Oliver, Herrington, & Sparrow, 2000). The purpose of these changes was to improve the current unit implementation for improved potential for student participation and engagement. This redesign tidied up the unit implementation as it stands in order that the flipped learning approach was more succinct and cohesive, and equitable opportunity is afforded for all learners to engage, participate, and potentially benefit from improved learning experiences.

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