INTEGRATING DIGITAL TECHNOLOGIES IN THE CLASSROOM: LECTURERS' VIEWS ON THE FLIPPED CLASSROOM APPROACH

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ABSTRACT

The 2016 Good University Guide demonstrated that Australian rural and regional universities are outperforming more established, and highly internationally ranked city peers in relation to student perceptions of the quality of teaching that they experience. Recently, many universities have encouraged academic staff to rethink the delivery method for subjects and give consideration to the further development of significant online components. Lecturers at rural and regional universities are increasingly encouraged and supported to include a variety of online resources in their subjects and to explore the use of promising methods such as the 'flipped classroom'. The 'flipped classroom' is an innovative pedagogical approach and is a technique that has attracted a lot of attention among school-based and tertiary educators. It is important to identify what influences the successful implementation of information and communications technology (ICT) for augmented learning in the context of the flipped classroom. This paper briefly outlines aspects of the flipped classroom approach and looks at how the school of Education, in a regional Australian university servicing rural and remote areas, in particular, is integrating this approach in their pedagogy. This paper reports on interviews conducted with the lecturers at the university about their views, understanding, and the challenges of the learning and teaching environment in a flipped classroom approach. This paper also reports the lecturers' perception of student learning when a 'flipped classroom' approach is adopted. As a variant of blended learning and an innovative pedagogical approach, it was found that the flipped classroom approach has gathered a lot of attention and challenges among university lecturers.

Keywords: augmented learning, rural and remote higher education, flipped classroom approach, ICT, inverted classroom

INTRODUCTION

The integration of technology in the classroom is rapidly changing our teaching and learning. In essence, technology is credited as a principal factor that changes the role of students into learning explorers and teachers into facilitators or guides, and enables students to take control of their learning (Armstrong, 2014). As a response to the call for technology enhanced techniques and a

more student-centred approach, many universities have encouraged academic staff to rethink the delivery method for subjects and give consideration to the further development of significant online components. For instance, lecturers at a rural university in Australia are encouraged to include a variety of online resources in their subjects and to explore the use of a 'flipped classroom' as a pedagogical response to the growing interest in technology integration in the classroom. Digital technologies can only be effective in combination with sound pedagogical approaches (Morgan, 2014).

FLIPPED CLASSROOM APPROACH

The 'flipped classroom' is an innovative pedagogical approach and is one of the latest educational techniques that has garnered a lot of attention among school-based and tertiary educators, and the media. The Flipped or inverted classroom method was described and popularized in 2007 by the innovative teaching experiment of two Colorado high school science teachers, Jonathan Bergmann and Aaron Sams (Butt, 2014; Findlay-Thompson & Mombourquette, 2014; Heyborne & Perrett, 2016; Keene, 2013; Milman, 2012; Moran & Milsom, 2015; Morgan, 2014; Raths, 2014; Siegle, 2014; Sinouvassane & Nalini, 2016). By recording their lectures, they provided students with the opportunity to view lectures at home, thus freeing class time for deeper face-to-face learning and understanding. Indeed, the main component of this method as defined by Love, Hodge, Corritore, and Ernst (2015) is to reverse *what happens in the classroom with what happens out of the classroom* (p. 745) as compared with a traditional lecture-based classroom. In fact, the move to a flipped classroom approach has created a number of challenges for educators because of a lack of consensus on what exactly this flipped model entails. This buzzword has been interpreted differently at the university level, in how it is structured and in the way that it has been used. Some people are interpreting it as no lectures and that some form of online material replaces the lecture and that the tutorial then becomes your workshop space. In this study, the term flipped classroom is defined as an educational technique that lecturers use to record their lectures, which provides students the opportunity to view lectures at home thus freeing class time for deeper face-to-face learning and understanding.

The idea behind flipping a classroom is not a new concept in education (Kachka, 2012b; Moran & Milsom, 2015; Sams & Bergmann, 2013; Tucker, 2012), as students have been asked over centuries to come to class prepared by competing required reading. In a sense then the idea of the students doing preparatory work, relates and pertains to the method as far back as 1990s when educators didn't have access to the technology to create videos (Baker, 2000). However, as Sams and Bergmann (2013) state:

> the flipped learning model simply leverages new technology to provide an audio-visual option to students as they prepare for class. More importantly, it redefines class time as a student-centred environment (p. 17).

According to Mason, Schuman and Cook (2013) and Ash (2012), inverting the classroom activity and offering content delivery through video lectures to be watched outside the classroom is a method that frees up class time for student-centered activities and problem-based learning. In fact, this method initiated a new way of thinking about teaching and learning by swapping homework for classroom activities.

In this method, teachers are present to provide guidance and correction when difficulties or misunderstandings happen in students' learning and problem solving. According to Butt:

> ...at the heart of the flipped classroom is moving the 'delivery' of material outside of formal class time and using formal class time for students to undertake collaborative and interactive activities relevant to that material (2014, p. 33).

So, any use of the class time to have more access to educators and more time to practice the concepts, takes advantage of the opportunities provided by this pedagogical approach (Findlay-Thompson & Mombourquette, 2014; Kachka, 2012a). In short, the flipped classroom provides students with a more collaborative learning environment in which they can focus more on working through problems with peers and teachers.

Using the flipped classroom in teaching and learning has provided various educational benefits for both students and educators. According to Sams and Bergmann (2013), applying this method assists educators to move away from direct instruction to a more student-centred approach. Mason et al. (2013) list three benefits for using the flipped classroom approach. These advantages include: a) freeing up class time for interactive activities and problem-based learning; b) allowing educators to present material in different ways to engage students with different learning needs and styles, and c) encouraging students to be self-learners. Other benefits of the flipped classroom as addressed by Álvarez (2012) include:

- Notes are now available at home for students who were absent.
- Students are less frustrated and disruptive in class because there is someone on hand to help one-on-one.
- A much larger percentage of assignments are completed and to a much higher quality.
- When an educator is absent (p. 20).

Flipping the classroom permits educators to teach both content and process (Findlay-Thompson & Mombourquette, 2014). As such, it enables educators to move *from the 'sage on the stage' to the 'guide on the side'* (Siegle, 2014, p. 51). As such, a 'sage on the stage' has been defined as *an instructor who imparts knowledge on the student through lecture alone*, whereas a 'guide on the side' is expected to assist students *to explore the content independently or within a group* (Gilboy, Heinerichs, & Pazzaglia, 2015, p. 109). It also provides the opportunity for educators to interact and collaborate with their colleagues and share videos among themselves. Hence, they can find out the most applicable teaching styles for their students (Morgan, 2014). This method has proven to be an effective addition to the education of gifted and talented students and to maximize their academic growth (Siegle, 2014). When used effectively, the method provides more opportunities for students to work at an appropriate pace, and educators have more chances to assist students with difficult content (Morgan, 2014). In addition, the approach may be useful to those students who miss the class and/or get little help with their studies because of budget problems. Flipping the classroom provides them the opportunity to have access to course material at any time (Morgan, 2014).

Although there are persuasive reasons to utilise the flipped classroom approach, it has drawn some criticism. Some researchers (Ash, 2012; Morgan, 2014) believe the method is nothing more than a high-tech version of a lecture. Critics complain that the important aspects of good teaching are neglected in this method (Morgan, 2014). Some other issues as outlined by Findlay-Thompson and Mombourquette (2014) are: creating a gap between high and low-income students; internet access problems, especially in the rural areas; the limited budget of educational institutions and the cost associated with software access; the required training sessions for teachers on how to use the software and to structure a flipped classroom; and the reliance on self-learning and motivation from students in this non-traditional method. Another primary concern is how to cover a concept in a short, concise, and bite-sized chunk (Tucker, 2012).

Although the principle of this method is simple, there are a multitude of ways of flipping the classroom as methods differ by subjects and educational philosophy (Ash, 2012; Raths, 2014). While some educators assign a video for students to watch at home, others ask students to watch them in class. Moreover, some videos of lessons are simply optional for students to watch as they just

include a variety of resources and information for students. However, as promising as the 'flipping classroom approach' sounds, it cannot be implemented effectively if students and educators alike do not have the required technology literacy to make it work, or if they are not motivated to participate in this mode of learning. In fact, the classroom environment has become a generational challenge for both students and lecturers based on their various level of proficiency and reliance on technology. As such, Berrett (2012) states, *content is not going to be the thing we do. We're going to help unpack that content* (p. 38). In short, although it has attracted a lot of attention of late, the flipped classroom approach alone does not increase students' success.

As a newly introduced educational trend, it is important to identify what determines successful implementation of ICT for augmented learning and the practicality of the flipped classroom in ensuring students have gained knowledge to build upon in later study units. As an integral part of the implementation of the flipped classroom model, the use of online video deserves focused attention. Digital technologies including online video have been targeted as a means to overcome systemic disadvantage experienced by regional, rural and remote students. Fleming and Grace (2014, p. 484) discuss the *systematic disadvantage experienced by rural and regional populations as a whole* and illustrate the problems associated with travelling to regional campuses from far greater distances than their city peers. This increased distance means increase cost to students in terms of money and time. In particular, *the implications of financial disadvantage are both immediate and far-reaching* (p. 484) in relation to regional, rural and remote students. Providing students with the opportunity to review videos and online course materials prior to lectures and tutorials in the flipped classroom model reduces the time that students need to be on campus, therefore assisting with reducing transport and time costs. According to Ragusa, Chan and Crampton (2009), providing Australian rural and remote students with digital resources that can be replayed multiple times leads to a reduction in student anxiety. Furthermore, Anderson's (2013) small study on the use of digital video resources in relation to regional, rural and remote students demonstrated that instructional videos online could reduce or eliminate the need to access instruction in on-campus computer labs.

This paper particularly looks at the Education lecturers' perceptions of integrating the flipped classrom approach with regional, rural and remote students through the effective use of online videos. To focus the study the following interview questions were formulated:

1) What are the advantages of integrating the flipped classroom in learning and teaching in a regional university servicing rural and remote students?

2) What would be some of the challenges in implementing the flipped classroom? How did you get around that?

METHOD

Participants

In this study, five lecturers were selected on the basis of their commitment to the flipped classroom approach and their past teaching experience using digital technology (ICT) to support their instruction. Three of the participants were male and two were female and they all belonged to the same age group (35-45 years). The group's educational rankings ranged from a lecturer to an Associate Professor.

Materials

The semi-structured in-depth interviews with participants served as a key qualitative data source and research tool for this study. As Chamot (2004) maintains, in this kind of interview, participants *are asked to describe what they are thinking or doing during a recently completed learning task* (p. 15). Furthermore, the researcher had the ability to more fully obtain clarification and to gain further information where necessary. Semi-structured interviews were guided by a large pool of questions derived from the literature on the flipped model. Asking a number of predetermined questions and topics in a systematic and consistent way, Berg and Lune (2012) state that *the interviewers are allowed freedom to digress; that is, the interviewers are permitted (in fact expected) to probe far beyond the answers to their prepared standardized questions* (p. 112). Probes are used to *deepen the response to a question, increase the richness and depth of responses, and give clues to the interviewee about the level of response that is desired* (Patton, 2015, p. 465). By combining the related interview questions supporting the objectives of the study, the most relevant questions were selected and rephrased and the repeated ones were removed. According to Ary, Jacobs, Sorenson and Walker (2014), *construct validity can be assessed by having some colleagues who are familiar with the purpose of the survey* review the proposed interview questions (p. 435). The validity of the instrument was reviewed by two experienced and qualified lecturers in the field to ensure that the items *are really measuring what they are supposed to measure* (Ary et al., 2014, p. 435). The structured interview questions were modified or deleted in accordance with the expert's recommendations. Some examples of semi-structured interview questions are:

1) What is your understanding of the 'flipped classroom' approach? From your perspective, what does it offer for learning and teaching?

2) Could you please discuss any advantages of integrating the flipped classroom in learning and teaching?

- Is this program effectively meeting your students' needs? Could you provide examples?

- Do you think that they are working harder on the task after integrating the flipped classroom? Examples?

Procedure

Ethical clearance was obtained prior to conducting the interviews. The interviews with participants were conducted to obtain their perceptions and understanding of the flipped classroom approach utilized through their subjects, and any challenges of the learning and teaching in this setting. As Patton (2015) postulates, *the quality of the information obtained during an interview is largely dependent on the interviewer* (p. 427). To facilitate the interviewer role, different interview protocols, perception questionnaires, and researcher-made flipped classroom inventories were consulted.

To complete the interview task, each recorded interview was made either in the lecturers' or researcher's office at a mutually agreed time. While interviewing, extra care was taken to ensure interviewees felt at ease and the researcher's personal opinions did not affect the subjects (Ritchie, Lewis, Nicholls, & Ormston, 2013). The interviews were selectively transcribed and analysed by the researcher to ensure that enough care had been taken for the data not to be lost and to elicit the useful information properly. The analysis was conducted via several steps including trimming the recordings, transcribing the interviews and developing a coding system, and finally checking the reliability of the coding scheme.

RESULTS

The results that follow are an interpretation of the qualitative responses provided by the lecturers. More specifically the commentary will focus on their perceptions of the advantages and disadvantages of the flipped classroom.

According to Jacob, a huge benefit of flipping the classroom is that it offers flexibility and the opportunity for the lecturer to respond to the needs of the students. As such, he states:

> *The students needed to have more time to engage with the content and by doing it flipped, they had the flexibility to spend more time working through the content.*

In addition, flipping the classroom has provided him more time in the tutorial to do more of the hands-on work with science equipment that he wouldn't have had the opportunity to do through a lecture. Consequently, he thinks that the subject has become more engaging, but not because the videos were online. He reasons that the flexibility of putting the videos online allowed him to make other changes which made it more engaging and increased the students' engagement with the materials. Additionally, Jacob argued that other advantages are around the opportunity to make changes to other aspects of a face-to-face lecture by making it more responsive to students. For instance, he commented:

> *Once a video is recorded, you don't necessarily have to give the lectures again every year, it might mean you re-record them every couple of years, so that you can use the time there to create other things online because there's no resources.*

In essence, it frees the lecturer's time to create other things that the students can engage with, for example, he can integrate some online quizzes in the area where students are struggling.

Although this approach has provided multiple benefits, Jacob has experienced some major challenges. For example, some of the issues include the use of Camtasia, lack of flexibility, and how to present the videos to the students in the online platform that they have to use. At his university, they use the Blackboard platform which he described as being somewhat clunky. It takes time to put the videos up as they go up as a single URL. There is no image of the videos that go up. Accordingly, he has had to put up the links and explain the links as there is no way to overcome that challenge. In using Camtasia, he also adds that:

> *When you record in Camtasia, you only record it at a certain size, so, some students wanted to watch the lectures on other platforms and they couldn't. So, there are some things there which we tried to get a solution and IT couldn't help.*

He also points out that the flipped model could not be used with the first year students as he thinks they lack experience and they benefit from a bit more interaction with the lecturer. In his view first year students are *finding their feet with how to do university* and thus, need more guidance. In teaching the third and fourth year subjects for a few years, he believes that he can predict what the students in those levels are going to ask and what assistance they will require. Thus, he can present the information in the workshop. Whereas for the first years, *they come from such a wide range, it's much harder to see what sort of questions they might have*. He thinks that the approach works quite well for the later years of a bachelor's degree or graduate diploma, but not for the beginning years.

Brian has also implemented a flipped model approach in his teaching. According to Brian, the flipped model offers possibilities. Despite the buzz around the flipped model in educational settings, Brian thinks that flipped is a relative and a relational term. To him, flipping a classroom is a response to what is seen as being quite one-sided, traditional teacher-centred approaches to education, especially in higher education; so, flipping it 180° is, in his mind, just reversing the problem. He argues that:

If you flip it, and perhaps you wouldn't call it flipped then, but if you move that 90° so that there's more of a dialectical process between teacher and student, which I think most good teachers know already, then I think you're going to get better outcomes than if you are just a teacher-centred sage on the stage windbag filling empty vessels, or if you're a sort of progressive, just everybody pooling their ignorance pedagogy as well.

Thus, it's a neutral concept to him as he thinks that using the term blended in a way is nonsense as there are plenty of traditional teachers who already blend their learning in different ways. Although they may not be hooking up to the latest iPad app or showing an interactive PowerPoint presentation, this doesn't mean that their learning isn't already blended as it might be blended in much more subtle ways. Indeed those subtle ways might actually be much more effective in engaging students in that classroom.

Being aware of the university's focus and funding in the current climate taps into what is happening culturally. Brian has experienced considerable challenges in implementing this flipped approach. These include access to technology, funding to access the technology, mastery of the technology, and keeping up with technological change and innovation. A lecturer just gets used to one operating platform or one software system and then it's updated and outmoded and overloaded by something else. He thinks that in a lot of the software and hardware development there is a lot of planned obsolescence. For example, he commented:

It's not in the interests of a big corporation like Apple to lay down all of their cards at once and release the best be-all and end-all phone or application or the latest Mac product at once.

Indeed, it's in their interests to keep a captive market and audience who need to buy that different shaped power plug in order to charge their new computer, or who obsessively thinks that it's important to get Version 6 instead of Version 5. For these reasons, he concludes:

…if the universities jump on that technological bandwagon a little bit too quickly, financially just to keep up with what's going on externally, you're going to be spending bucket loads of money just to update your computer so it's got a couple more meg and a couple more gigabytes and a bit of a faster processing speed that's not of use anyway, when the computer that you've had for the last three years is fine to kick for another three or four years, and if we're spending that sort of money just to look good, it can be much better spent elsewhere.

Julia has never had a traditional lecture and she has always had some type of flipped activity in the middle of a lecture. She claims that:

I would have to teach for 20 minutes, then straight to a group work activity; so I've always been flipping my classroom as such in creating more interactive spaces.

Julia thinks of the advantages to the learner in terms of flexibility, and to the staff in terms of freeing up some of their lecture time, and contact time. However, she believes that it doesn't replace the amount of effort that a lecturer puts into a lecture. It is costly in terms of the time it takes to produce the videos and the online materials. Although she thinks that there is a role for the flipped classroom as we've moved away from the traditional model of the lectures, she contradicts herself when she explains that in other disciplines within the institution such as medicine, dentistry, and those in the health and science domains, the traditional lecture still has a very focused role. Those disciplines operate quite traditional lectures and tutorials possibly because of the foundational knowledge that is required. Within these disciplines the flipped models might work better in later years of the course.

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To her, the challenges are around the structure. It is communicating the structure to the students and being explicit about what the demands are of the student. She admits that she is concerned about the impact on retention when a flipped classroom model doesn't work very well and may turn students away. She has been involved in a project as the subject design staff working with a colleague running the flipped classroom approach by considering cultural diversity. Accordingly, she knows the expectation from the lecturer that the students access all the materials and attend class with a knowledge base. Like Jacob, she affirms that first year students need small scaffolded tasks, to be supported, to have formative building to summative assessment, to have a structured transition from high school into university and it is important to ensure the flipped classroom materials online are done well. In short, she thinks the flipped classroom approach is *too much* for first years. She also admits the program can work for other levels (2nd, 3rd, and 4th year). She states:

> *They've been introduced into what higher education looks like, what university is about and then they might be able to enact and move into the flipped classroom.*

A side benefit of this approach according to Noah is that using videos in the flipped classroom approach, that is videos for students to watch at home, enables the students to deal with the content at home. It therefore frees up the classroom time for the actual engaging instead of delivering the content. To him, flipping the classroom means that, *students can demonstrate problem solving in there, so that's a benefit.* As a teacher, he is hoping to engage students and make sure that at the end of the day they can remember the four proficiencies, namely, understanding, problem solving, fluency, and reasoning. In addition, flipped videos can help him to have a basis to start a robust discussion with the students.

Although he has found the flipped model a good and useful approach, he notes that the success of the approach relies on the calibre of the students as they need to engage with the material first. While some students have come to be 'spoon-fed', and not to engage with the material, he recommends lecturers apply the approach carefully, knowing how to engage students.

Despite the attention that the flipped videos get, he argues that the challenges could be around access, and finding out whether students are really engaging with the material. Contrary to the challenges, he thinks that not having online access or computers at home is rare in Australia. He commented:

> *Probably if students do not have sort of online or computers at home, whatever, but I think it's rare here in Australia.*

In addition, he observed:

> *... even if they[students]come to the class without being prepared, when you workshop that idea, it's much better than the lecture because they might not really sort of benefit 100%. They'll probably benefit 60%, which I think is more than what they benefit from a lecture.*

Barbara has noticed several advantages in running her flipped classroom approach. For instance, she likes the *the slow pace of the video and the end summary.* Recently she conducted a focus group with her students and found they responded favourably to the flipped classroom activities, particularly when they were studying for their examinations. The students reported that they:

> *... could actually stop the video and make sure they understood the concept that she was trying to get them to understand.*

Students would do a mind map of what she was talking about. She has found it a very effective learning strategy as the students appreciated that:

they could stop the video, work on their mind map and then, keep playing that and pause it wherever they wanted to work on their mind map and then go back.

She thinks that if the flipped model runs the way it's meant to, students could get a deeper understanding of the material and it's probably a more realistic representation of learning. More importantly, she asserts:

We can't expect students to sit still for an hour while you talk. It's boring. So maybe trying to model some of the approaches that they might use in a class to try and engage students.

Regardless of the many advantages of this approach, she argues that:

…the problem that we've found this year is that when we come to class we're just repeating content that has been delivered online so how do we move on beyond that?"

Indeed, she believes that she had fallen into the trap of revising the flipped video for ten or fifteen minutes, when not all students had watched it. The other challenge for her is with regards to pedagogy and the types of activities that are implemented. She likes to be quite creative and tries new things. However, at times this comes with challenges. Further, she reflected:

The first flipped video took me a whole day to do, pretty much, if I add the hours up but then after that it's a lot easier.

Another challenge or *real barrier* has been getting to know the software and remembering what she has to do the next time she uses it. Although her intention has been to have the students develop a better and deeper understanding, she is not sure how successful she has been with the new approach. She admits that, *the first year subject is a high-fail subject*, and her aim is to reduce the failure rate.

CONCLUSION

According to the data gathered from interviews, some of the advantages as well as obstacles in successfully implementing the flipped model were found and highlighted. As such, the advantages are around flexibility, problem solving, depth of understanding, freeing the classroom and providing opportunities for the students to be actively engaged. These findings are in complete agreement with other researchers who have reported the various educational benefits of this approach for both students and educators (Mason et al., 2013; Álvarez, 2012).

Although there are credible reasons to utilize the flipped classroom approach, it has also faced obstacles. It seems that the challenges as reported by lecturers are around the use of Camtasia, rigidity (clunky platforms), access to technology and funding, technology mastery, upskilling in latest technological change and innovation, the structure and the pedagogy, and the types of activities to implement. Further complications arise since, as stated by Ash (2012) and Raths (2014), the principle of this method may look simple, but there are a multitude of ways of flipping the classroom based on the subject and educational philosophy differences.

The flipped concept requires professional development around how to deal with the challenges lecturers have found. In addition to the above-mentioned challenges, lecturers need to find out if students are engaged with the material. Indeed, students must have the motivation to follow the educational material provided through the flipped videos. Obviously students have the reading materials and the lecture notes, but giving them a flipped video to watch before coming to class, might give them a sense of what the content of the discussion in the class will be. In order to encourage students to engage with the videos, it might be worthwhile having the first screen of

the video up within the university on-line platform so that students can simply click to start the video, as that is what they are familiar with in the other technologies they use.

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