A Practical Action Research Project on the Implementation of the Flipped Classroom Teaching Model in a Further Education College

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A dissertation submitted to the University of Dublin, in partial fulfilment of the requirements for the degree of Master of Science in Technology and Learning

2013

Declaration

I declare that the work described in this project is, except where otherwise stated, entirely my own work and has not been submitted as an exercise for a degree at this or any other university.

Signed:_____

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I would like to thank my supervisor, Tim Savage,
for his support, guidance and encouragement.
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Abstract

The Flipped Classroom is an innovative teaching model which incorporates Blended Learning in the classroom. This multimedia approach takes direct instruction out of the class and puts it into the hands of the students. This is made possible by teachers recording their presentations and making these videos available to students prior to class. Students are encouraged to view these videos before attending the class in order to benefit from the extra face-to-face constructive time with the teacher.

The purpose of this study was to investigate and develop the Flipped Classroom teaching model in a Further Education College. A Practical Action Research methodology was chosen as it is a systematic study of a local problem from within a community rather than seeking external expert advice. This research followed an iterative process of a pilot study followed by three cycles. This process enabled modifications to be made as each cycle was developed in collaboration with the teachers. A total of six teachers and 92 students took part in this research.

The aim of the research was to establish both the teachers and students perceptions of the Flipped Class teaching model. A qualitative research method was employed and the data, collected from post-questionnaires, interviews and focus groups were analysed, coded and collated into themes. Emerging themes revealed that students were enabled to take control of their own learning by the ubiquitous accessibility of the videos. Teachers acknowledged that this model facilitated differential learning and agreed that technology should be incorporated into their teaching practices to meet the needs of the New Millennial Learners.

One unexpected finding showed a dependency of the students on the teacher as they feared that the teacher would be replaced by the videos. It was found that the students would not independently seek out videos to view; rather they relied on the teacher as an authority on the subject. The college recognised that innovative teaching models using technology should be utilised to meet today's students' requirements. However, the moratorium on hiring new staff has restricted the college intake of new teachers. Existing teachers are encouraged to update their technical skills through the Continuing Professional Development workshops organised by the City of Dublin Vocational Education Committee.

The outcome of this research produced a set of Guidelines and Procedures for teachers wishing to implement this teaching model in the future. The result of this research is the presentation of these Guidelines and Procedures to Continuing Professional Development workshops on behalf of the City of Dublin Vocational Education Committee in order to promote the use of Information Communication Technology within colleges.

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Abbreviations

ICT	Information Communication Technology
CDVEC	City of Dublin Vocational Educational Committee
FE	Further Education
LFM	Learning for Mastery
LMS	Learning Management System
NML	New Millennial Learners
OECD	Organisation for Economic Development
PC	Personal Computer
PSI	Personalised System of Instruction
TVI	Tutored-Video Instruction
VLE	Virtual Learning Environment
ZPD	Zone of Proximal Development

Chapter One – Introduction

1.1 Background

Blended learning is a teaching and learning approach which combines face-to-face time with on-line multimedia instruction (Bonk & Graham, 2005; Seel, 2012; Thorne, 2003). As technologies evolve this blended learning approach encompasses many forms. These approaches can be used within Learning Management Systems such as Moodle and on-line video tutorials. One of the new forms of Blended Learning which has emerged in recent years is that of the Flipped Classroom. The Flipped Classroom teaching method has been used in many schools and colleges throughout the United States where it was first implemented by Jonathan Bergmann and Aaron Sams in Colorado in 2007. Since then the phenomenon of the Flipped Classroom teaching method has spread amongst the teaching profession with many implications for the way teachers teach and students learn. This paradigm shift has changed the role of the teacher from a "sage on the stage to a guide on the side", a term first coined by Angela King in 1993 (King, 1993).

The technology used for Flipping the Classroom is a screen-recording software programme called Camtasia. This technology allows the teacher to record their presentation and make it available to students before they come to class. The students are able to view this on their home personal computer (PC) or any mobile device connected to the internet. They can view the presentation as many times as necessary and may pause and rewind as many times as they need. Putting the presentation in the hands of the students means that the teacher no longer has to teach to the middle level of the class, but can reach each and every student every day (J. Bergmann, Sams, A., 2012). This shift of presentation before class frees up class-time which in turn allows the teacher to spend more time with those students who may require extra assistance while also allowing the students who understand the concept to work ahead. The delivery of the presentation outside the classroom helps the students to interact with the content prior to class. Shibley and Wilson state that Flipping the Classroom helps students to interact with the content prior to class. *"Technology before class can be at the lowest levels of Bloom's Taxonomy"* (Shibley I.A. Jr., 2012, pp. 1-12) and should be so recognised. These lower levels of the classification of Blooms Taxonomy provide a basis for building on the knowledge and understanding of subjects presented to the students.

1.2 Research Questions

This dissertation addresses the following questions:

1. ***What are teachers and students perceptions of the Flipped Classroom in a Further Education College?***
2. ***What factors play a role in the implementation of the Flipped Classroom model from the perspective of an educational institution?***

1.3 Dissertation Roadmap

This dissertation is set out as follows:-

1.3.1 Literature Review

Chapter Two contains the Literature which includes reviews on The Flipped Classroom teaching methods; its history and background. Pedagogies of the Flipped Classroom are discussed and include Blended Learning, Social Constructivism and Mastery Learning. It contains reviews on the learning styles of New Millennial Learners, the role of the teacher and the reluctance of some teachers to change and outlines the activities involved in the Flipped Classroom.

1.3.2 Design and Implementation

Chapter Three contains the design and implementation of the Flipped Classroom. This implementation involved the creation of a course which was hosted on Moodle. This course aimed to gain participants of this model and provided information and encouragement for teachers to overcome their reluctance to engage with new teaching models. Administrators within the college have a role to play in assisting teachers to implement this new teaching model. This chapter further discusses how the subjective norm can assist in changing the cultural climate of a college by changing people's behaviours based on what they perceive of others performances.

1.3.3 Methodology

The methodology of a Practical Action Research design was chosen for this study as it was systematic plan which sought to improve a local situation. This chapter also covers the protocol and implementation of the study from Pilot Study through to Cycle Three of the Action Research process. The data instruments used were post-questionnaires, focus groups with the students

and individual semi-structured interviews with the teachers; the principal and vice-principal of the college. These data were analysed through coding and theming and the findings are presented in Chapter Five.

1.3.4 Findings and Analysis

The data was analysed after each cycle in order to implement changes and make improvements for future cycles. All the data was collectively analysed at the final stage to show the outcome of the research as a whole (Johnson, 2004). The findings of emerging data from post-questionnaires, focus group and interviews and are presented in a narrative format with samples of the coding and theming presented in the Appendices. Themes which emerged related to the control of access that students had over the videos. The ability of being able to pause, rewind and refer back to the videos was beneficial and students recognised that everybody works at a different pace. With the presentation taken out of the class-time students used this extra time to work on assignments and to engage with group discussions. Teachers stated that the videos would build on the confidence of students, while students acknowledged that accessing the video would benefit them as some may be too shy to ask questions of the teacher. The videos were useful also for dyslexic, and for foreign-national students. Teachers referred to the ubiquitous accessibility of the videos as advantageous to students unable to attend due to work/family commitments. The multimodality of the videos was found to be a very creative and innovative way to learn. Negative emerging data referred to being unable to ask the video a question while a minority had access issues.

The Principal and Vice-Principal acknowledged that technology should be incorporated to engage today's students. The infrastructure of the college has been updated in recent years and there is a commitment to maintain and expand technology to be incorporated into every classroom. The researcher assisted teachers to implement this new teaching method and will continue to provide support. One of the outcomes of this study has been the creation of Guidelines and Procedures for those wishing to implement this method. These Guidelines and Procedures will be presented at workshops for teachers wishing to implement this teaching model on behalf of the City of Dublin Vocational Educational Committee (CDVEC). These workshops form part of the promotion of professional development of teachers within the Further Education sector .

1.3.5 Conclusion

The conclusion in Chapter Six discusses the data analysed and presented in the Chapter Five. The analysed data indicated that the Flipped Classroom teaching model implemented in this college was a positive experience for both the teachers and the students. While negatives related by the teachers referred to being time-poor and technology-poor, for the most part it was found to be beneficial and teachers would implement this model to some extent for classes within the next academic year. Both teachers and students recognised that Differential Learning could be addressed by incorporating this Blended Learning approach. Teachers recognised that the adoption of new technologies could be incorporated constructively into their class and would address the learning styles of New Millennial Learners. The unexpected findings showed a dependency of the student on the teacher and related to the construction of the videos by the teachers and the expert authority displayed herein. Students expressed a fear of losing their teacher and viewed the videos as supplemental to be built upon class-time. Students valued their face-to-face constructive time with the teacher and acknowledged the video, created by the teacher, would build on that connection. Students saw their teachers as experts on their subjects and showed a preference of the teachers' videos over other independent videos available on the web.

1.4 Purpose and Motivation

The purpose of this research was to investigate and implement the Flipped Classroom teaching model in a Further Education College. It further set out to develop an understanding of this model from the perspective of the teachers, the students and the institute. The motivation of the researcher is to encourage and support teachers to embrace technology and incorporate Blended Learning in order to meet the needs of New Millennial Learners.

Chapter Two – Literature Review

2.1 Introduction

This literature review investigates the teaching model of the Flipped Classroom and the potential effect it has on today's classrooms. The scope of this review covers the origin and history of this method and explores the fundamental pedagogies used. It examines the impact this method has on both teachers and students and evaluates the role of technologies used in today's classrooms. This literature review specifies the context of the study while summarising and synthesising existing literature to obtain a new perspective (Tomal, 2010).

The method of this review involved sourcing information relative to the Flipped Classroom, organising this information into sub-categories and finally linking the information of the Flipped Classroom with long-established and recognised pedagogies. The keywords used were:- Flipped Classroom, Blended Learning, New Millennial Learners, Social Constructivism, Mastery Learning , and Blooms Taxonomy. As the Flipped Classroom teaching model is relatively new, current information was sourced from websites and blogs. However, it must be stressed that while these websites were not peer-reviewed, they contained valuable information which contributed towards further investigations of the pedagogies used. The data relating to the pedagogies underlying the Flipped Classroom were obtained as much as possible from original sources, using peer-reviewed Journals, Conference Papers and Books. Google Scholar Alerts assisted with sourcing the latest journal articles which were then located within the Trinity College Library e-journals using EBSCOhost, JSTOR, ProQuest and SAGE Premier.

2.2 The Flipped Classroom

The Flipped Classroom refers to a new teaching model which is the opposite of the Traditional Classroom. In the Traditional Classroom, teachers present the subject using Whiteboards, PowerPoint Presentations or Step-By-Step Instructions to students before they are ready to undertake any assignments. The assignments then are traditionally completed by the students individually working in a solitary environment at home without the assistance of the teacher.

In the Flipped Classroom teachers record their lectures and presentations and make them available on-line to students. The students watch these videos as part of their homework and complete their assignments within the classroom where the teacher is free to assist each individual student whenever they require. The teachers' role has changed from a presenter of information to that of a facilitator - from the "Sage on the Stage to the Guide on the Side".

2.3 Background and Context

The term of the Flipped Classroom began its life as "Educational Vodcasting" and was promoted by Jonathan Bergmann and Aaron Sams in 2007. These Science teachers decided to Flip their Classroom to optimise their time with students. In order to achieve this, they decided the best course of action was to video their lectures and make these videos available to the students to view at home.

Flipping the Classroom provides the teacher with more constructive time in the classroom. This method transforms the traditional classroom by switching it from teacher-centred to student-centred. Students view videos when and where they wish and can pause, rewind and review sections as many times as required. The teacher can reach every student rather than teaching to the middle level. On arrival in the classroom, students get assistance from the teacher when necessary while completing their assignments. Dixon states that *"the Flipped Classroom puts the homework first, focusing assignments on preparing students for the class"* (Dixon, 2012, p. 90).

Another prominent user of the Flipped Classroom method is Salman Khan who created videos initially as a tool to help his cousins to study Math; these have since developed into a website with over two hundred million lessons delivered. The lessons have expanded from Math to incorporate Science and Finance amongst other subjects. Students can access this website and the videos at home, but they can also be used in the classroom. Teachers can view the students' progress and evaluate those who requires assistance at any particular time (Khan).

Pitler, *et al.* describe the Flipped Classroom as a transformation of the way teachers communicate information and organise class activities (Pitler, Hubbell, & Kuhn, 2012) while Shibley states that the theory of the Flipped Classroom is that the students interact with content prior to attending class (Shibley I.A. Jr., 2012).

2.4 History

Although the Flipped Classroom claims its origin in 2007, a similar teaching method referred to the "inverted classroom" in 2000. Lage, Platt and Treglia describe this teaching method used for introductory economics in a Miami University as *"Inverting the classroom means that events that have traditionally taken place* **inside** *the classroom now take place* **outside** *the classroom and vice versa"* (Lage, 2000, p. 30). A training programme developed by Stanford University in the late 1970s for the engineering students examined how Tutored-Video Instruction (TVI) affected student learning and studied the effects of viewing the videos during class times against the videos being available to

students to view at their own convenience followed by discussions in the classroom (Howard, 2005). Previous to this, the Keller Plan referred to classes where the student read the unit material and learned the answers to the study-guide questions before class. The student then attended the class and took a written quiz consisting of a subset of the study questions (Robin, 1976, pp. 313-354). Eric Mazur, a teacher of Applied Physics in Harvard University states that teachers should *"use the valuable and scarce commodity of classroom time to work with your students on their understanding"* (Chen, 2010, p. 121). Mazur placed lecture notes on-line which the students read before coming to class. He then challenged them with multiple choice questions on an interactive white board with the use of clickers. When the students had difficulties with the questions he encouraged peer discussion while he and his teaching assistants circulated among the groups to guide their conversations. Howard Gardner, the theorist of multiple intelligence, also hosted his videos on the server in Harvard for his students to view before class as he valued the class time for interaction with the students, rather than lecturing (Chen, 2010). The students were encouraged to come to class with questions about the videos. Flipping the Classroom ensures that there is more face-to-face contact time to engage the student and guide them towards new knowledge.

2.5 Pedagogies of the Flipped Classroom

2.5.1 Blended Learning

Blended learning is a teaching and learning approach which combines face-to-face time with on-line multimedia instruction (Bonk & Graham, 2005; Seel, 2012; Thorne, 2003). Blended Learning enhances and increases learning opportunities for students by making material available to them in a variety of formats. The benefits of this approach are the asynchronous nature of multimedia, enhanced by the face-to-face synchronous interactive time spent with the teacher. When these two approaches are *"thoughtfully integrated, the educational possibilities are multiplied"* (D. R. Garrison & Kanuka, 2004, p. 97). Blended learning restructures the traditional class-time contact hours by rethinking the course design in order to optimise student engagement (Garrison & Vaughan, 2008).

2.5.2 Differential Learning

Differential Learning refers to the way students learn according to their own learning styles. A learning style *"is a preferred way of thinking, processing and understanding information"* (Allen, Scheve, & Nieter, 2010, p. 9). Each individual student has their own pattern of thought and their own way of learning. *"Learning styles are individual preferences for where, when or how a student obtains and processes information"* (Heacox, 2002, p. 8). The ubiquitous accessibility of the Flipped Classroom videos affords accommodation of the differing learning styles of students.

2.5.3 Social Constructivism

Social Constructivism refers to the interaction of individuals endeavouring to make sense of the world around them. New knowledge needs to be accommodated with existing knowledge in order to develop new ideas and opinions. This is possible through social interaction and verbalisation of different thought processes with others. Richardson states *"individuals create their own new understandings, based upon the interaction of what they already know and believe, and the phenomena or ideas with which they come into contact"* (Beck & Kosnik, 2006, p. 2).

This social constructivist approach to learning through a VLE is supported by discussion boards and online forums. Allowing students to access lecture videos prior to the class stimulates interaction and develops concepts within the classroom setting through discussions. Constructivism encourages student participation through these discussions and problem solving. Social Constructivism involves a process of learning from the more-knowledgeable other (or advanced student) which helps students move to the next stage of the learning process.

Vygotsky refers to the more-knowledgeable other as the guide who encourages and supports the individual to help them to come to their own understanding of a subject (Chandra & Sharma, 1997). Although the Flipped Classroom changes the role of the teacher from the "Sage on the Stage to the Guide on the Side" the role of the more-knowledgeable other is not exclusively that of the teacher, but may also refer to other students within the class. Flipping the Classroom encourages interaction among students as there is less time spent presenting and more time allowed for communication. The teaching method also allows for the Zone of Proximal Development (ZPD) which allows for the teacher to step in when the student requires assistance with accommodating new knowledge with prior understanding. This scaffolding supports students to progress to the next step in the learning process which incorporates Mastery Learning.

2.5.4 Mastery Learning

Mastery Learning, sometimes known as Learning for Mastery (LFM) is a theory developed in the late 1960s by Benjamin Bloom. This learning theory allows students enough time to understand concepts and skills (Hartas, 2010) and enables students to master one unit before continuing onto the next unit. In this way, it is possible to build on prior knowledge while accommodating new knowledge to construct new concepts. This theory supplied feedback to students at regular intervals, which, in turn increased the confidence of the student and encouraged collaborative work among students. Motivation increased as the students viewed assessments as learning tools that provided a second chance to succeed (Robert E. Slavin, 1987b).

The Keller Plan, so-named after its creator Professor Fred S. Keller is also known as the Personalised System of Instruction (PSI). This Personalised System of Instruction provides a flexible teaching and learning environment which introduces a personal and social aspect where the role of the teacher is that of manager of the individual students (Cohen, 2007).

The Flipped Classroom is a combination of both the Learning for Mastery and the Personalised System of Instruction methods. The Learning for Mastery method refers to group-based mastery learning where students are given the same lecture followed by a test. Where a student does not meet the criteria of the test they then receive corrective instruction. This corrective instruction may come from the teacher or other students who have achieved the criterion level. The Personalised System of Instruction offers individualised teaching strategies based on the needs, interests and abilities of the student (Cohen, 2007). Slavin maintains… *"mastery learning holds that instructional time and resources should be used to bring all students up to an acceptable level of achievement"* (R.E. Slavin, 1996, p. 239).

One of Slavin's criticisms of Mastery Learning is the time lost instructing the class by giving extra time to students who have not grasped a concept (Moore & Stanley, 2010). While this may have been true of the time, the technologies are now available whereby instruction time is not lost, but enhanced by videos made available to students. Students who have grasped a concept may move on independently and others who may need assistance can review the video when required. The teacher needs to manage the classroom in such a way as to be available to students when they require assistance. Assessments also need to be tailored to each unit to be mastered, and feedback is essential to motivate the student. Palardy states that, *"Mastery learning should be highly individualised, with a great deal of focus placed on each student's extent of achievement, rate of progress, and style of learning* (Taylor & MacKenney, 2008, p. 29).

Adopting the mastery system ensured that each student needed to meet minimum requirements in order to reach certain objectives. The students revisited the subject until the minimum requirements were met. This ensured that the student fully understood each section and was ready to move on to the next unit. Bergmann maintains that this method is beneficial to each of the student requirements rather than the traditional classroom method which is a one-size-fits-all method. Rather than teaching to the middle level, all students receive the instruction, they require. *"Every kid gets a different education"* (J. Bergmann, 2010).

2.6 Learning Styles of the New Millennial Learners

Today's students, known as the New Millennial Learners (NML), born in the 1980s are a generation who have grown up with digital technologies. Frand quotes ten attributes which reflect the values and behaviours of the information-age mindset of New Millennial Learners. These state that *Computers aren't technology*: as computers were around when the New Millennial Learners were born; *Internet better than TV:* the internet provides more instant, streamlined information than the television; *Reality is no longer real:* as images can be manipulated; *Doing rather than knowing:* the ability to deal with information is more important than knowing a lot of facts; *Nintendo over logic:* the students prefer to physically test a programme rather than read a manual; *Multitasking way of life:* Students can multi-task. It is normal for them to be online and watching TV simultaneously (Pedró, 2006); *Typing rather than handwriting;* students recognise the benefits of typing over handwriting; *Staying connected:* Instant messaging with friends; *Zero tolerance for delays:* As information can be accessed immediately; *Consumer/creator blurring:* where beta programmes are released, the consumer assesses and contributes towards the end-product (Grady, 1998).
The learning styles of these students are influenced by their interaction with today's technologies. Brown & Fallon state that presentations can increase motivation in students and that "*visual representations of information construct a multimodality approach to teaching and learning so that individual learning styles can be addressed"* (Brown & Fallon, 2010, p. 143). Veenema and Gardner (1996) argue that multimedia presentation of course materials gives *"maximum opportunities for students to draw on their own distinctive blend of intelligences, thereby… giving them new venues for demonstrating their understandings…"* (Lage, 2000, pp. 30-43).

Although NML's are familiar with and use social networking and other tools it is important to show that these technologies have benefits beyond communication alone. Teachers, therefore, need to adapt to new emerging technologies and effectively incorporate the chosen educational resources to educational activities (Tech & Lytras, 2010). The educational experience needs to be transformed so that it is meaningful to the New Millennial Learner (Grady, 1998). Face-to-face, along with computer-mediated instruction, is a blend of learning used in the Flipped Classroom. Naik's definition refers to Blended Learning as *"…the combination of different training 'media' technologies, activities and types of events to create an optimum training program for a specific audience* (Naik, 2007, p. 53). Blended Learning uses a multitude of e-learning tools which encompasses many of the Web 2.0 technologies available today. *"The challenges of the new millennium require that students be adaptable and analytical, and that they have the skills to identify and use the best tools in a rapidly changing environment"* (Solomon & Schrum, 2007, p. 1).

The creation of videos alone is insufficient to teach New Millennial Learners, and should be used only as a tool to enhance and convenience the presentation of information. Students welcome technologies that make course notes or documents available and that improve productivity, but show a preference for face-to-face teacher over computer-mediated communications. The OECD reports that from the student perspective, *"technology is useful because of the convenience and control it provides rather than for its transformative power"* (Pedró, Organisation for Economic, Development, Centre for Educational, & Innovation, 2012, p. 117). The Flipped Classroom makes use of technology to further convenience students and enhances their time in the classroom constructively. Shibley and Wilson state that Flipping the Classroom helps students to interact with the content prior to class. *"Technology before class can be at the lowest levels of Bloom's Taxonomy"* (Shibley I.A. Jr., 2012, pp. 1-12) and should be so recognised. These lower levels of the classification of Blooms Taxonomy provide a basis for building on the knowledge and understanding of subjects presented to the students. In order to succeed in Flipping the Classroom this information should be built upon constructively in the classroom by applying and analysing the subjects. Much like Vygotsky builds on previous knowledge, Bloom's taxonomy also builds on skills on a tiered level, acknowledging that a better understanding of the lower levels of thinking makes it easier to reach the higher levels of synthesis and evaluation (Moore & Stanley, 2010).

2.7 Flipped Classroom Activities

One of the elements of the Flipped Classroom is the extra time available now that the presentation is delivered outside the classroom. This shift away from presenting material to interactively constructing material with the students is a new element which needs to be structured and aligned with the learning styles of the New Millennial Learners. Brown (2005) identified nine characteristics of the New Millennial Learners and has structured a table which aligns these characteristics with learning theory principals along with learning space and technology application (Hartas, 2010). (Appendix 1).

Adaptable to enable different sized groups to work together.

Flexible to provide spaces for individuals, one-to-one, small group and large group activities and to allow for technologies within the classroom.

Multi-dimensional to allow for different types of activities to occur simultaneously and finally…

Accessible to allow open access to students according to their needs (Hartas, 2010).

As most classrooms are structured in a hierarchical tiered system, with the teacher at the top, the design of classrooms need to be changed to accommodate this shift in teaching practices. Students expect hierarchical classroom environments that place them at the lower level with their teacher above. *"This implicit structure informs everything about the way a student relates to the class, where they sit, how they prepare, and their attitude about the semester… Think about the physical organisation of a classroom – desks organised around a single expert, sometimes even in an elevated "theatre" style"* (Pacansky-Brock, 2013, p. 14).

2.8 The Role of the Teacher

The teacher uses this extra time in the classroom to support students in order to reach these higher levels of synthesis and evaluation. Flipping the Classroom is not only about presenting information to the student prior to attending class, but needs to build on that knowledge within the classroom. *"Information Communication Technology (ICT) is seen as a supplement to teaching, not as a substitute for the personal interaction to which they are accustomed"* (Pedró et al., 2012, p. 118). The guidance of the teachers supports the student to realise their potential while they construct new knowledge. This builds on their confidence and motivates them to learn. The Flipped Classroom allows the teacher to engage more with the students to show enthusiasm and love of a subject. By using the Mastery Learning method, the teacher ensures that their assessments match what is needed for students to learn. "*Instead of teaching to the test, these teachers are more accurately testing what is taught. (Guskey, 1987b, p.228)* (Taylor & MacKenney, 2008, p. 30).

The teacher needs strong management skills in order to create multiple formative assessments. Slavin's definition of Mastery Learning is *"the organisation of time and resources to ensure that most students are able to master instructional objectives"* (Robert E. Slavin, 1987b, pp. 175-213). Formative assessments allow teachers *"to provide students with valuable feedback on their learning progress and to offer crucial guidance in correcting learning errors"* (Robert E. Slavin, 1987a, pp. 175-213). The teacher must initially spend time with the students until they develop their learning skills to be able to complete these assessments. In due course, the student may be able to complete self-assessments and realise their own potential and develop their own learning skills. This, in turn, will prepare them for future learning scenarios.

Becker and Watts (1995) explain that teachers need to consider using a variety of teaching methods to engage the students. *"Variety in the pace and format of undergraduate*

classroom instruction – across different class periods and even within a particular class – may well be the missing spice of go teaching and enthusiastic learning" (Lage, 2000, pp. 30-43).

2.8.1. Sage on the Stage to Guide on the Side

The role of the teacher changes from "sage on the stage" to that of "guide on the side" and the classroom changes from being teacher-centred to that of a student-centred environment. Students should be encouraged to actively participate in discussion. In this way the students can relate prior experiences with this new knowledge in order to process new meanings and knowledge. However the teacher is still responsible for presenting the course material in a way that will engage students and to make them interact with the material. *"the professor's role is to facilitate students' interaction with the material and with each other in their knowledge-producing endeavour"* (King, 1993).

2.9 Reluctance to change

The issue of the reluctance on the part of the teacher to change also needs to be addressed. Teachers tend to deliver their content in the same format as they have been delivering it throughout their career, albeit with small adjustments along the way. The Flipped Classroom is a paradigm shift which challenges the norm and which may invoke fear and trepidation in the mind of the teacher. This fear may be well founded as technology moves at a fast pace and it may not be always possible to keep abreast with new developments. Depending on the subject matter, it may be the first time that technology was being used in the delivery of the content. As Rao states, there may also be a reluctance on the part of the teacher as there may be a lack of knowledge and skills needed to make the change (Guskey, 2003). Administrators need to be aware of the feelings of teachers and support mechanisms need to be structured in order to address the issues that teachers may have about changing their teaching methods. Student learning is not directly influenced by administrators, but by teachers. However, the work practices put in place by administrators support the role of the teacher and can do much to establish the cultural climate of a school and "*by ensuring that the school is a true learning community that supports experimentation and values efforts to improve (Deal & Peterson, 1994)* (Guskey, 2003, p. 75).

2.10 Technologies of the Flipped Classroom

The technologies used by the originators of the Flipped Classroom included a web-cam and the

screen recording software Camtasia Studio. Camtasia Studio enables every action on a computer screen to be recorded and provides the tools needed to incorporate augmentations such as PowerPoint slides, webpages, YouTube videos, music and photographs (echSmith, 2012). These videos may be viewed on any computer or mobile device that has access to the internet. This makes lectures available to students wherever and whenever they wish to view them. It is possible also to enhance the presentations with effects such as highlighting text and zooming tools to capture the audience's attention. These videos can be hosted on video-sharing websites such as YouTube, where it is possible to store videos and make them visible only to people who have the links.

YouTube forms part of the Web 2.0 environment which is made up of many applications that allow people to interact online. Among these applications are Learning Management Systems (LMS), sometimes referred to as Virtual Learning Environments (VLEs). Within these VLEs are applications such as Blackboard and Moodle which promote collaboration and discussion through tools such as discussion boards and quizzes as well as the facility for students to upload assignments. These VLEs can be harnessed to provide a platform for teachers to upload their Flipped Classroom videos and enables them to communicate with students and interact either synchronously or asynchronously. Moodle is a VLE which *"supports a social constructivist approach"* (Weller, 2007, p. 102).

2.11 Summary

While new technologies emerge and enhance the learning environment, these technologies must fit in with proven pedagogies for learning to be achieved. The environment and layout of classrooms and hierarchical lecture halls may not always be appropriate for this method of teaching. While environmental changes can take place within colleges and educational organisations, the structure of the classroom also changes with the introduction of the Flipped Classroom. However, as new technologies emerge and are welcomed by educationalists, students still value face-to-face interaction with their teachers and other students. An Ipsos Mori poll in 2007 reported: *"the face-to-face teaching quality was felt to be the most visible sign of the university's value for money – it's what they believe they are paying for"* (Kerry, 2010, p. 113). Technologies may enhance learning, but will never replace the social constructivist learning environment of students and teachers meeting face-to-face.

The next Chapter will deal with the Design of the Learning Intervention and how it was constructed with regard to the literature. It will also outline the implementation processes for each cycle of the research.

Chapter Three – Design of the Learning Intervention

3.1 Introduction

This chapter outlines the design of the Flipped Classroom and its implementation within a Further Education College. Further Education Colleges provide post-Leaving Certificate courses to prepare students for the workplace and to act as a stepping-stone to third level universities. This Practical Action Research project followed a process of the creation of a Flipped Classroom Course followed by the implementation of this method through a pilot study and three cycles. The first part of the chapter deals with the theories found within the literature and their application in the construction of the Flipped Classroom. It also outlines the administrators' role in facilitating and supporting teachers willing to engage with this Blended Learning model. The second part of this chapter will describe the four phases of the implementation of the Flipped Classroom.

3.2 Flipped Classroom Course

The design of this project involved the creation of a Flipped Classroom Course hosted on Moodle. This course incorporated the medium of on-line videos as per the Flipped Classroom and demonstrated to potential participants the benefits of the Flipped Classroom teaching model. The course was accompanied by a leaflet introducing the Flipped Classroom. The objective of this course was to address issues arising from the literature concerning the reluctance of teachers to change their teaching practice and to promote assistance with those willing to implement this teaching method. The aim of this course was to address the following:-

- Gain Participants
- Provide information
- Encourage a change in teaching practice
- Overcome reluctance to change and…
- Assist with the implementation of this new teaching method

In order to gain participants it was necessary to provide information relating to the Flipped Classroom teaching model. This information covered the following topics:-

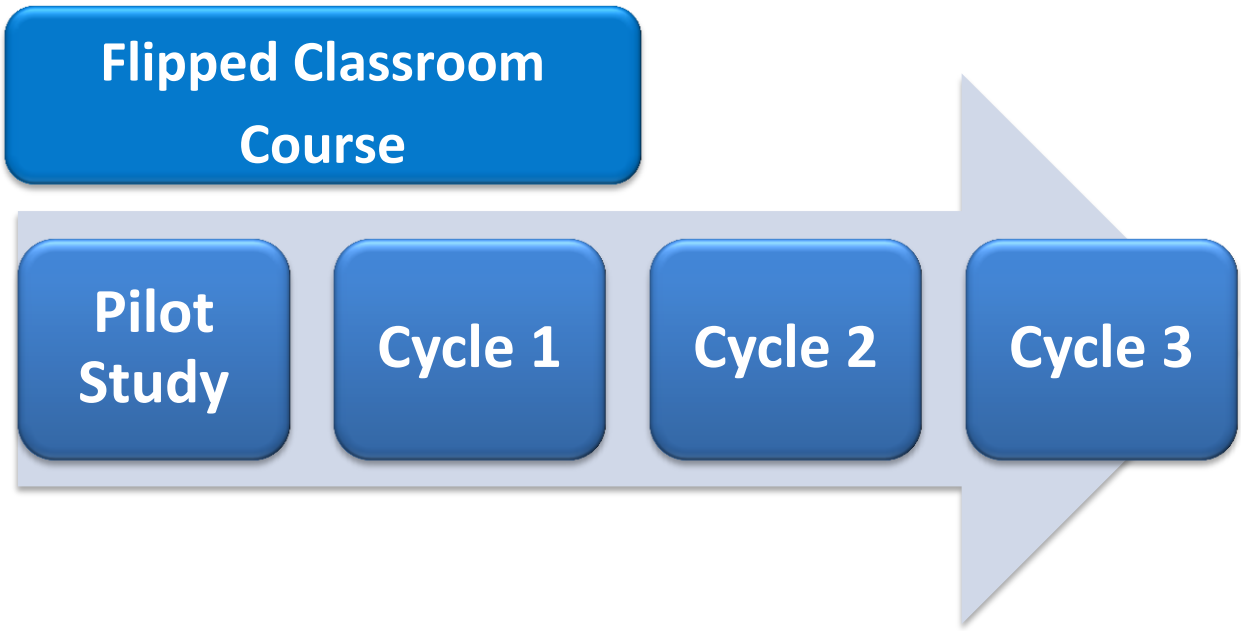
1. The history of the Flipped Classroom providing information on:-
    a. ***What*** is the Flipped Classroom?
    b. ***Who*** instigated the Flipped Classroom?
    c. ***Why*** this teaching model was implemented and…
    d. ***How*** it is implemented.

2. The pedagogies employed within this model.
3. The Benefits of the Flipped Classroom to both teachers and students.
4. How to plan and construct the Flipped Classroom.
5. How to align Preparation Activities with Classroom Activities and…
6. Frequently Asked Questions.

The literature shows that teachers may see no need to change their teaching practices if they feel their current method is working (Lewis-Beck & Bryman, 2007). In order to gain participation of the Flipped Classroom the information provided outlined the benefits of this model to both the teacher and the student by incorporating this Blended Learning model. These videos were also accompanied with an explanatory leaflet outlining a brief introduction to the model.

The reluctance of teachers to adopt new teaching methods may be associated with a lack of knowledge and skills on the part of the teacher (Guskey, 2003). Planning, constructing and designing the videos is time-consuming so in order to accommodate the teacher in implementing this method, the researcher, in collaboration with the teacher began constructing the videos.

Once teachers agreed to participate, the Flipped Classroom Course was then followed by a Pilot Study and three Cycles. Two further cycles were created but not implemented.



3.3 Subjective Norm - Early Adopters of the Flipped Classroom

The early adopter who constructed the Flipped Classroom discussed the production and roll-out of their videos with colleagues in the staff social area. As a consequence a number of teachers then showed an interest and began approaching the administrator about constructing their own Flipped Classroom. It seems that discourse in the social area is more effective than e-mails.

People identify with others whose opinions and values matter to them and this can then cause a change in behaviour. When colleagues saw how effective the Flipped Classroom was for this teacher's subject, they then began to reflect on their own teaching methods and how this model would fit in with their subjects. This is known as the subjective norm and *"refers to the perceived social pressure to perform or not to perform the behaviour"* (Ajzen, 1991, p.188) (Krueger & Casey, 2000). Teachers then began to think about updating their material and believed that this would be a good opportunity to do so while embracing a new teaching method. Ajzen states that that *"a person's behaviour is strongly influenced by his confidence in his ability to perform that behaviour (Ajzen and Madden 1986, pp. 456-457)* (Khosrowpour & Information Resources Management Association International, 1996, p. 254). Teachers saw the benefits of this model and began constructing their own Flipped Classroom.

3.4 The Role of the Administrators

There is a need for administrators to design support mechanisms to encourage and facilitate teachers willing to engage with new methods. Student learning is not directly influenced by administrators, however, they can provide assistance in establishing the cultural climate of the school to be one of a true learning community which supports experimentation (Guskey, 2003). The support mechanisms put in place included the facilitation of teachers in the construction of their Flipped Classroom. This facilitation came in the form of advice on the construction and how the content could be made engaging for the students.

3.5 Overview of the process

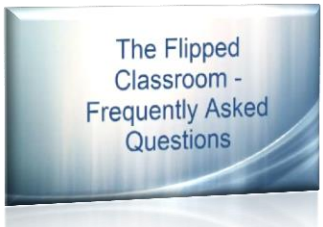
The design of the learning experience of the Flipped Classroom consisted of a course hosted on Moodle, the Virtual Learning Environment within this college. This course consisted of a series of short-duration videos. The design of this course took into account the elements which would need to be integrated into teachers Flipped Classroom in order for the successful transfer to the students. This course consisted of five short-duration videos and was broken down as follows:--

Part 1: The History and the Teaching Methods

Part 2: The Benefits

Part 3: Planning and Constructing

Part 4: Classroom Activities



Part 5: Frequently Asked Questions

See Appendix 2a-2e for YouTube Analytics

These videos presented an outline of each section and also contained relevant YouTube clips to consolidate the material. The style of the videos conformed to that of Bergmann and Sam's theory that the videos should be short and relate to one topic per video. These theories fit in with Frand's characteristics of the New Millennial Learner as these learners have zero tolerance for delays and that they are a YouTube generation (Coghlan, 2010; David & Sutton, 2004). In designing the Flipped Classroom, due regard was taken of these characteristics to ensure the engagement of these students and to create an effective learning experience.

The videos were narrated which assist with the auditory/verbal processing channels of individuals. Clark and Mayers refer to the multimedia principle that instructional messages need to be delivered with both words and relevant images in order to be successful (Clark, 2011). The modality principle states that it is preferable to use spoken rather than printed text as a way of reducing the demands on visual processing. Separate channels are used for visual/pictorial or auditory/verbal when processing information, and become confused when large amount of text and graphics are presented together. However, printed text can be included when used as an organiser with narration accompanying it (Pacansky-Brock, 2013). Clark recommends using an informal format to present information to students. The Personalization Principle, which refers to conversational language can be effective as the learner accepts the instructor as a conversational partner who is trying to explain something (Kumar, 2011). This was further enhanced by a "talking head" of the presenter within the videos (Shank P., 2009).

3.6 Software

The videos contained in the lesson were constructed using Camtasia Studio, a screen recording software program provided by TechSmith (TechSmith, 2012). Camtasia Studio enables the user to capture
step-by-step screen instructions, record PowerPoint Presentations and develop a video using the various tools available within Camtasia. These videos can be further enhanced by using a web-cam and incorporating a recording of the instructor's image and voice, thereby building on the relationship between the instructor and the student. Photographs, images and videos as well as web-links can be incorporated to maintain the students' attention as well as optimising the multitasking skills of the student (TechSmith, 2012).

This program is used in Training, Business and Teaching situations and puts the information in the control of the learners. This control enables the user to pause, rewind and replay as many times as necessary. This, in effect, means that each and every student, regardless of their level, can be reached. This program has further enhancements such as the zoom tool and cursor effects to bring the attention of a specific area to the user.

The method of the Flipped Classroom also addresses the learning styles of New Millennial Learners and teachers were encouraged to adopt this method in order to align with the learning styles of their students. These New Millennial Learners are adept with technology and this knowledge and experience of technology should be harnessed in order to engage the students (Grady, 1998).

3.7 Implementation

All staff were enrolled in the class hosted on Moodle and an explanatory leaflet clarifying the Flipped Classroom teaching method accompanied an e-mail outlining the steps to be taken to begin Flipping the Classroom. They were supplied with instructions on how to view the videos and what action to take once the viewing was completed. These videos invited the teachers to adopt this teaching model and outlined the support mechanisms that were in place to facilitate that change. There was an open-ended invitation to talk to the administrator who offered assistance in planning and constructing their first Flipped Classroom.

The explanatory leaflet (Appendix 3) attached to the e-mail compared the Traditional Classroom to that of the Flipped Classroom and outlined the benefits to both the teacher and the student of this model. The components of the Flipped Classroom were outlined and were accompanied by Hints and Tips for first time construction. It further encouraged teachers to adopt this model by stating that they already had existing resources which could be incorporated into their first Flipped Classroom and suggested that they should start the process with one class and build on it thereafter.

As the Flipped Classroom teaching model allows for more time within class to spend with students a section on Preparation Activities for the students was aligned with Classroom Activities. These Preparation Activities listed a suggestion of actions for the teachers to instruct students to have ready for class. Classroom Activities would then build on these Preparation Activities in place of the usual presentation of the subject by the teacher at the beginning of the class.

They were provided with details on how to contact the administrator who would support them in constructing their first Flipped Classroom. The Frequently Asked Questions video addressed questions previously asked by teachers who had discussed this model.

3.7.1 Four Phases of the Practical Action Research

This research followed an iterative process which consisted of four phases initiated with a pilot study trailed by three cycles. Each cycle was altered based on the data emerging from the previous cycles.

3.7.1.1 Pilot Study

Course:	Care of the Person with Special Needs
Subject:	Special Needs Assisting
Content:	Autism
Artefact:	PowerPoint Presentation consisting of narration by the teacher, text and images. YouTube Clips (4 x 10 minute videos)
No. of Students:	19 participants
Course Year:	1st year
Context of Students:	Not computer literate
Motivation:	Low
Assignment:	No
Questionnaire:	No
Focus Group:	Yes

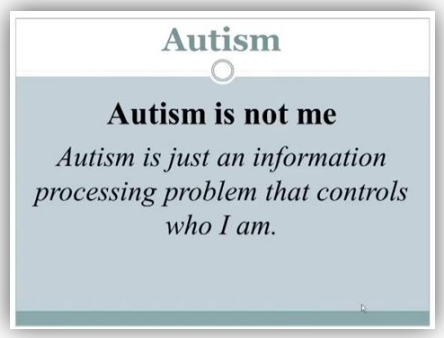
The aim of the Pilot Study was to initiate the process of the research and to test logistics and gather data which would be used to improve the process for further cycles. This was a course from the Social Care Department, entitled Care of the Person with Special Needs. The chosen subject was Autism. Technology was not previously used within this class; however the teacher saw the benefits of this new teaching model and embraced it enthusiastically. The students enrolled on this course would not necessarily be computer literate as it was not necessary for their course and their skills would lie in a different domain. The support mechanism was put in place for this teacher with the construction of their Flipped Classroom.

A demonstration video was created using the teacher's existing PowerPoint Presentation on Dementia to show how existing resources could be used. This was shown to the students to get their reaction and through this discussion the teacher agreed to adjust certain aspects of the presentation to make it easier for the students to absorb the information. Issues arising from this meeting included access to Moodle.

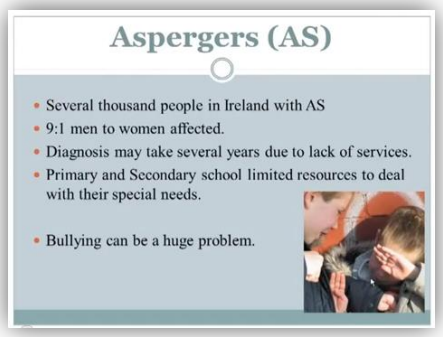
The teacher provided information in the form of text for the next presentation. This PowerPoint Presentation was recreated with the enhancements of graphics relative to the subject and was then e-mailed to the teacher to add narration. The teacher recorded the narration using a Smart Android

Phone whilst playing the PowerPoint Presentation. This presentation was then broken down into four segments of no longer than ten minutes duration to make it easier for the students to navigate and choose the areas which were of relevance to them. These short-duration videos were broken into the following topics:-

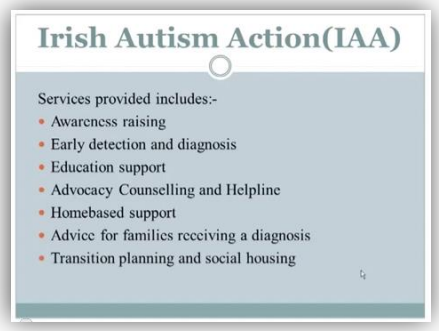
Part 1 – Autism



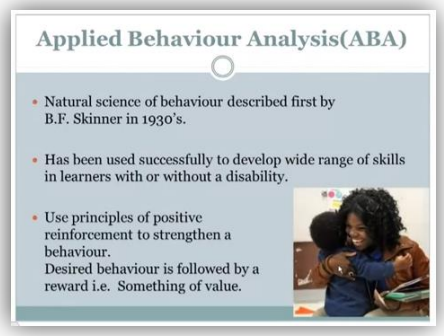
Part 2 – Aspergers



Part 3 – Support Services



Part 4 – Applied Behaviour Analysis



This presentation was further enhanced by YouTube clips sourced by the researcher and the teacher. The teacher was encouraged to be in the video as a "talking head" but declined. However, the narration discussed the topic as would normally happen with the class and expanded on certain areas.

As this was the Pilot Study, the students were given access to the video for two days, after which a Focus Group was held with the teacher present. This Focus Group was aimed at getting feedback from all aspects of the Flipped Classroom in order to begin implementation and planning of Cycle One of the Action Research.

Researchers Role

The researcher's role in this study was to construct the video incorporating the PowerPoint presentation with images and narration by the teacher.

3.7.1.2 Cycle One

Course:	National Diploma in Media and Office Management and Secretarial Studies
Subject:	Desktop Publishing
Content:	Double-sided Leaflet
Artefact:	Step-by-Step Instructional Process Skills (36 minute video)
No. of Students:	17/19 MND participants 19/23 BOS participants
Course Year:	1st year
Context of Students:	Computer literate
Motivation:	High
Assignment:	Yes
Questionnaire:	Yes
Focus Group:	Yes

The initial Cycle involved a computer-literate teacher on the Business Studies and the National Diploma in Media courses within the college. This teacher welcomed the challenge to create the video which dealt with Desktop Publishing, and designing a double-sided leaflet in particular. The software was installed on the office computer and good quality headphones were supplied as these were needed to record the narration of the step-by-step procedural instructions accompanying the video. A demonstration was carried out by the administrator and a discussion was had about the different aspects of the programme and what would best suit the subject. A support mechanism was put in place as to when and how to seek assistance and was used on a number of occasions.

Cycle 1 – Creating a Double-sided Leaflet in Publisher

As it was the first time to work with any video and sound-editing software package the project took approximately thirty hours to produce. However, as the teacher became familiar with the process the production time was dramatically reduced for further videos.

The teacher did not wish to be visible on the video but instead narrated the step-by-step instructions. This narration expanded on the subject and provided additional relevant information for the students to consider when constructing their own design. It outlined topics such as design, topography and the use of graphics. This video presentation was aligned to an assignment which the students had to complete and was implemented with the two courses as they covered the same topic. The teacher embraced this technology, related to the advantages and said that videos would be implemented in the future for other subjects.

Classroom Activities

The classroom activities consisted of students working on the assignment which was aligned with the video. The students carried out this work whilst consulting the video. Each student worked at their own pace and the teacher was available to those who required extra assistance.

Researchers Role

The researcher's role in this cycle was one of support and guidance of the software used to create the video. This teacher was computer-literate and required minimal instruction.

3.7.1.3 Cycle Two

Course:	Childcare
Subject:	Early Childhood Care & Education
Content:	Patterns of Play
Artefact:	Video with teacher's video and narration, including images and YouTube Clip Very little text. 1 x 10 minute video.
No. of Students:	27/39 participants
Course Year:	1st Year
Context of Students:	Computer literate
Motivation:	High
Assignment:	Yes
Questionnaire:	Yes
Focus Group:	Yes

Cycle Two of this Action Research was again related to the Social Care Department, albeit with a different teacher and a different set of students. The course was entitled Early Childhood Care and Education and the subject was Patterns of Play.

This teacher agreed to appear in a video presentation and recorded this on a personal phone. This video was then e-mailed to the administrator who incorporated it into video using Camtasia software. Images deemed relevant to the subject were added to the video and the teacher requested a particular YouTube video to be incorporated. This YouTube video appeared in the middle of the video where the teacher had made reference to the particular subject.

Cycle 2: Patterns of Play

Classroom Activities

Classroom activities were aligned with the assignment within the video. Students contributed to the discussion about the topic and expanded further as to how they could implement this information on their work experience programme.

Researchers Role

The teacher supplied a PowerPoint presentation from which images and information were used. The researchers' role was constructing the video containing these images and words and also incorporating a YouTube video which the teacher had sourced. A two-minute video was created and shown to the teacher to ensure the content delivery. Once this was approved the full video was presented to the teacher who gave the final clearance for the video to be implemented. The researcher ensured access to Moodle and communicated instructions to all students.

3.7.1.4 Cycle Three

Course:	Higher National Diploma in Media (Incorporating On-line Journalism)
Subject:	Politics and Current Affairs
Content:	The European Union
Artefact:	1 x 10 minute video
No. of Students:	10/12 participants
Course Year:	2nd Year
Context of Students:	Computer literate
Motivation:	High
Assignment:	Yes
Questionnaire:	Yes
Focus Group:	Yes

Cycle Three involved a teacher and students on a Higher National Diploma course in Media. These were the first 2nd year students to take part in this research. Although this teacher wanted to take part in the research and test the Flipped Classroom teaching model, they were reluctant to appear in the video. They were also reluctant to record their own voice narrating the subject and asked the researcher to do so. This was declined and the researcher encouraged the teacher to narrate the video themselves, as they are they experts on their own subject and the students would be aware it was not their teacher speaking. After much encouragement this teacher conceded. It was felt that it was quite difficult to narrate without an audience, so the researcher sat in with the teacher while the narration was recorded.

This video was a ten minute introduction to the European Union and contained important names, dates and quotes which the students would have to refer to in their assignment. These were added in the form of photographs and text in order to improve recall.

Cycle 3: The European Union

Classroom Activities

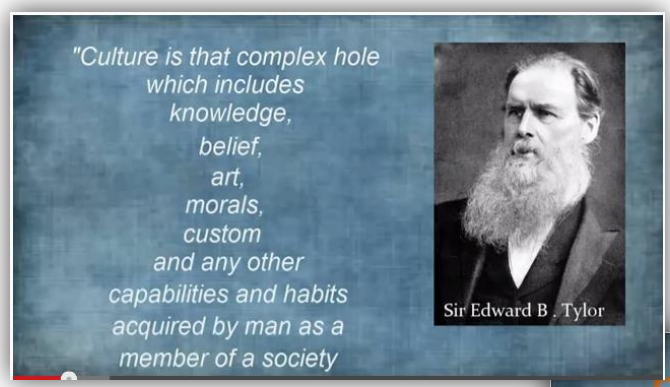
As this video was an introduction to the European Union, classroom activities involved discussion on the topic while building on the key-terms, dates and events within the video and further expanded on these in preparation for an assignment.

Researchers Role

The researchers' role was to assist the teacher to narrate the content for the video. The importance of content relating to dates and events was outlined by the teacher and images relating to these were sourced by the researcher. As with previous cycles the video was presented to the teacher who gave the final clearance for the video to be implemented. The researcher ensured access to Moodle and communicated instructions to all students. Content and its presentation within the video were agreed in collaboration with the teacher.

3.7.1.5 Cycle Four

Cycle Four of this Practical Action Research consisted of four videos created in collaboration with the teacher and related to Culture. However, these were not permitted to proceed as the Head of the Department did not agree with their use. Ethical issues are central to conducting research and participants may withdraw from the study at any time (Creswell, 2003). Reasons for withdrawing from research must be respected by the researcher.



The researchers' role in the construction of these videos consisted of supplying recording equipment and enabling the teacher to record in a quiet area within the college.

This cycle was not implemented, however the teachers' objective was to familiarise the students with important key-terms and outline the topic in preparation for further class discussion.

3.8 Summary

This chapter outlined the design of the learning interventions and how they were constructed with regard to the literature. It also charted the implementations of the four phases consisting of a Pilot Study and each cycle of the Practical Action Research into the Flipped Classroom.

Chapter Four – Research Methodology & Implementation

The previous chapter described the design of the artefacts. This chapter will discuss the methodology of Practical Action Research, its relevance for this study and will outline the research design and the data collection instruments. The information contained within this chapter provides relevant information to increase replicability (Lewis-Beck & Bryman, 2007).

4.1 Action Research

The purpose of this research was to explore teachers and students perceptions of the Flipped Classroom teaching model and its implementation within a Further Education college. Another aspect of this research was to study the factors affecting the implementation of this model from an institutional perspective.

As this research involved a number of different courses, subjects and teachers a Multiple Case Study could have been used, however the methodology of Practical Action Research was chosen for a number of reasons. This methodology provides cyclical iterative processes which involve Planning, Acting, Observing and Reflecting before undertaking the next cycle. Using this cyclical iterative process, information which emerged from each cycle was modified and implemented into the next cycle for further testing of the design. A Pilot study was implemented to test the logistics and to gather data prior to the iterative process of the research. As the process developed, a deeper understanding of the practice of the Flipped Classroom emerged which resulted in the production of guidelines and procedures which would be advantageous for future users of this teaching model.

This methodology is used by individuals within a community rather than seeking expert external advice and takes a practical approach when implementing changes to make improvements in an educational setting. Educationalists use Action Research when seeking to solve a local problem or improve a situation within their own school or community (Cohen, 2007; Creswell, 2012). Hinchey states that *"Action research is a process of systematic inquiry, usually cyclical, conducted by those inside a community rather than outside experts; its goal is to identify action that will generate improvement the researchers believe important"* (Hinchey, 2008, p. 4).

The researcher is an administrator in the computer department and had access to all areas; was known to the staff and could act as a gatekeeper to the college. This proved to be beneficial as there was a trust already established between the gatekeeper and the participants of the research. A gatekeeper's role is essential in providing access to target participants (Krysik, 2013). *"Social access crucially depends on establishing interpersonal trust. Gatekeepers play a significant role in research…*

" (Cohen, 2007). The researcher collaborated with the teachers in each cycle to make adjustments for their particular subjects for future implementation.

Action research has been used in the past by its originator Kurt Lewin when seeking improvements for disadvantaged groups regarding housing, employment and prejudice. Another type of Action Research is Participatory which involves teachers looking inwardly, self-reflecting with a view to improving their own practices. Practical Action Research may be carried out by administrators in an educational setting with a view to gathering data and improving the way the system operates. Researchers using this methodology *"seek to empower, transform and emancipate individuals from situations that constrain their self-development and self-determination"* (Creswell, 2012). Therefore it was identified that the design of Practical Action Research would provide the best procedure with which to answer the research questions:-

1. **What are teachers and students perceptions of the Flipped Classroom in a Further Education College?**
2. **What factors play a role in the implementation of the Flipped Classroom model from the perspective of an educational institution?**

Planning:	**Identifying a problem** **Informing participants** **Organising an action**
Acting:	**Trialing the action** **Collecting data** **Questioning participants**
Observing:	**Analysing data** **Reporting to participants** **Sharing information**
Reflecting:	**Evaluation the action** **Implementing a new plan** **Revisiting the plan**

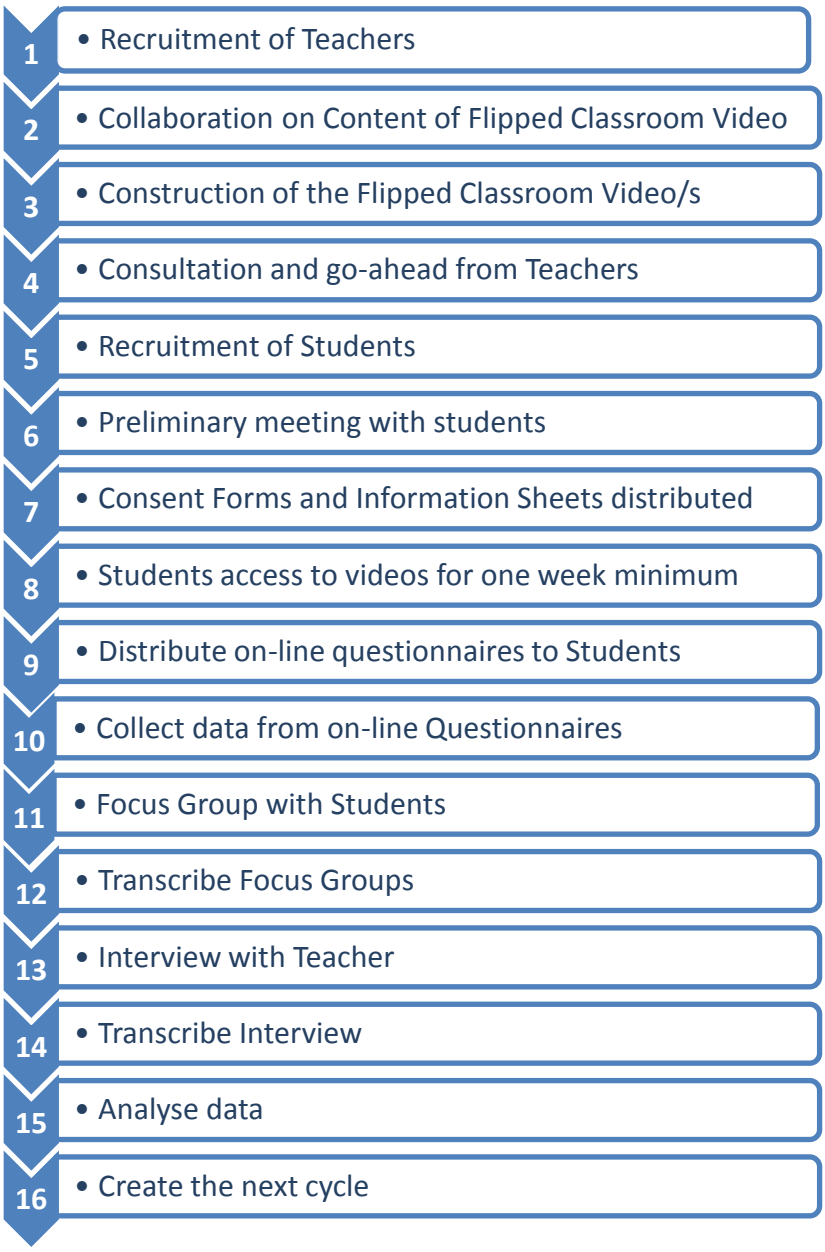
Action Research follows a four-stage process of Planning, Acting, Observing and Reflecting. Each stage of the process follows a systematic progression towards the construction of the next step. This

cyclical process is then conducted for a number of iterations until the teaching model has been implemented with the approval of all the relevant participants and it has reached a natural conclusion.

4.2 Research Design

4.2.1 Protocol

The Protocol for this Practical Action Research study followed this 16-point format for each cycle:-



4.2.2 Preliminary Meetings

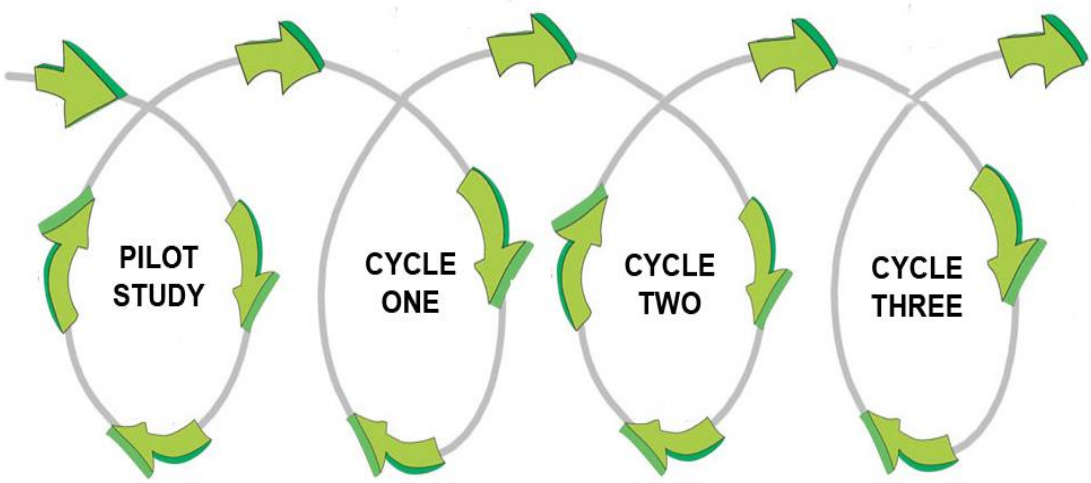
As each class agreed to take part in the research, an initial meeting was set up explaining the research and its procedures to the participants. At these meetings the Information Sheets (Appendix 4) were distributed along with the Consent Forms (Appendix 5), which were signed and collected. As some of these classes had never used Moodle before, the system of logging on was explained. This procedure developed with each cycle to address access issues. These problems were associated with the initial setting up of students on Moodle and the researcher then developed a process of checking the logon details of each student and e-mailing these details directly to the student. Further communication in the form of e-mails followed in the middle stages to ensure the students could logon and to encourage communication regarding troubleshooting. Dates for on-line post-questionnaires and focus groups were discussed within this meeting.

4.2.3 Pilot Study and Cycles

The Pilot Study and each cycle followed the process of collaboration with the teacher on the content and the format of delivery. Some teachers felt comfortable recording themselves visually and appearing within the video, however, others felt uncomfortable and declined to do this. It was requested that the researcher narrate the subject, but this was declined as the teacher was the expert and should deliver their own content. Teachers were provided with information regarding activities to incorporate in the video and how to build on these activities within the classroom.

This section will cover both the positives and negatives of each cycle which went on to build on the Guidelines and Procedures for future use. The research followed the iterative path of a Pilot Study followed by three cycles. The Pilot Study and each cycle involved unique teachers and students and related to a variety of subjects. For this reason it was challenging to modify and implement an exact replication within each cycle; however the process of each cycle developed an understanding of the teaching method and adjustments were made and implemented in future cycles.

Four Phases of Practical Action Research



Factors affecting each phase of the process

Factors	Pilot Study	Cycle One	Cycle Two	Cycle Three
Computer Literacy	Low level of Computer literacy ✗	Computer literate ✓	Computer literate ✓	Computer literate ✓
LMS Access	Issues with Logging onto Moodle ✗	Logon to Moodle ✓	Logon to Moodle ✓	Logon to Moodle ✓
Video and Audio	Narration by teacher ✓	Narration by Teacher ✓	Video of teacher included ✓ Quality of video was poor ✗	Narration by Teacher ✓
YouTube Content	YouTube Videos included ✓	Video too long ✗	YouTube Videos Included ✓	
Images	Good use of relative images ✓		Good use of relative images ✓	Good use of relative images ✓
Presentation of Content	PowerPoint Presentation ✗ Too much text ✗	Step-by-Step Process ✓	Relevant words and images ✓	Dates and processes included in the form of text ✓
Class Time	Issues with viewing video detracted from class time ✗	More time within class to work ✓	More time within class for discussion ✓	More time within class for discussion ✓
Assignment	No assignment	Assignment included ✓	Assignment included ✓	Assignment included ✓
Time	Not enough time to view video ✗	One to two weeks to view video before next class ✓	One week to view video before next class ✓	Three weeks (Easter Holidays) to view video before next class ✓

4.3 Data Collection

4.3.1 Questionnaires

On-line post-questionnaires (Appendix 6) were distributed to student participants of the research. These are easy to administer and provides both direct responses and attitudinal information, however, there are disadvantages in that some respondents may not answer honestly and analysing is time-consuming (McKernan, 1996, p. 125). These questionnaires collected information as to the participants' perceptions of their experience of the Flipped Classroom and contained both open and closed questions.

4.3.2 Focus Groups

"Focus groups are a way of listening to people and learning from them" (Morgan, 1999, p. 9). In order to learn from the students and communicate their perceptions of the Flipped Classroom, focus groups were held with each group after they had experienced one class. Focus groups can be used when testing out new programs and ideas, improving existing programs and evaluating outcomes (Krueger & Casey, 2000). Within focus groups the researcher takes a less direct approach and allows the participants to create a conversation about the experience whilst listening and prompting when necessary. As Morgan states: *"It is **your** focus, but it is **their** group"* (Morgan, 1999, p. 10).

One of the drawbacks of focus groups is that of group dynamics. One participant may have the stronger voice and may dissuade others from participating. Participants may be too shy, lacking confidence or unwilling to take part in the group discussion. It is up to the researcher to observe and control the Focus Group by giving every participant an opportunity to speak. It is also the responsibility of the researcher to keep the group focused by using appropriate questions.

4.3.3 Individual Interviews

Face-to-face interviews were held with individual teachers, the principal and vice-principal in a suitable quiet setting and were recorded. These interviews were semi-structured with some pre-set open questions in order to cover certain aspects of the experience, but also to entice the participant to give their own opinion freely. Seidman states *that "the root of in-depth interviewing is an interest in understanding the lived experience of other people and the meaning they make of that experience"* (Seidman, 2013, p. 9) and is *"focused on what the interviewee has to say rather than confirming any hypothesis the action researcher might have*" (Coghlan, 2010, p. 75).

4.3.4 Recording Hardware and Transcribing Software

Two devices were used for recording the focus groups and individual interviews. These included a TASCAM voice recorder and a Samsung Galaxy S2 android phone.

4.4 Researcher Bias

The researcher was known to the teachers and students as an administrator working in the Computer Department. The role of the researcher was explicitly distinguished when conducting the research. Coghlan states that multiple role identity both complicates and focuses the research project (Coghlan, 2010).

In order to reduce researcher bias, open-ended and unstructured questioning in both the focus groups and the interviews were used. The researcher emphasised at the beginning of both focus groups and interviews that the Flipped Classroom was an experiment and that the researcher did not have an alternative agenda.

4.5 Reliability and Validity

Lincoln and Guba (1985) refer to reliability in qualitative research as the consistency and dependability of the data collected (Merriam, 2009). Validity refers to the objectivity of the research instruments and that they measure what they are meant to measure (Markula & Silk, 2011) and that the data measured accurately. In order to ensure reliability and validity comparable questions were set for each individual Cycle of the Action Research process. Reliability and validity was ensured through the triangulation of the data collected.

4.6 Triangulation

Triangulation of the collected data included the focus groups, individual interviews with teachers and the post-questionnaires from each Cycle of the research. *"Data triangulation involves data that are collected over a period of time, from more than one location and from, or about, more than one person"* (Hitcock, 1995, p. 324).

4.7 Procedure

4.7.1 Participants Profile and Location

The participants of this research were a purposeful sampling from a group of students attending a Further Education College. In this qualitative data collection, purposeful sampling was intentionally chosen as it applies to both sites and individuals because these individuals have experienced the new teaching model (Creswell, 2003, 2012; Kumar, 2011). Further Education Colleges provide post-

Leaving Certificate courses to prepare students for work or to act as a stepping-stone to further education in third level ITs, Universities and other colleges.

The participants were on a variety of courses which included the following:-

Course	Subject	Content	Level
Care of the Person with Special Needs	Special Needs Assisting	Autism	FETAC Level 5
National Diploma in Media	Desktop Publishing	Double-Sided Leaflet	BTEC National Diploma in Media
Office Management and Secretarial Studies	Desktop Publishing	Double-Sided Leaflet	FETAC Level 5
Childcare	Early Childhood Care & Education	Patterns of Play	FETAC Level 5
Higher National Diploma in Media	Politics and Current Affairs	The European Union	HND in Media

4.7.2 Ethics

Ethical approval was granted from Trinity College Ethical Committee (9/11/2012) (Appendix 7) and the Board of Management of the College (21/12/2012).

See Research Ethical Application Form (Appendix 8),

Consent Form for College Principal (Appendix 9) and…

Consent Form for the Board of Management of the College (Appendix 10)

The information presented to both ethics committees comprised of the following:-

- An Information Sheet outlining the nature of the research, the data collection methods, storage of the data pertaining to the Data Protection Acts 1998 and 2003
- A Consent Form for the participants
- Links to the on-line Student Questionnaire

Information Sheets and Consent Forms were distributed to each teacher and student groups partaking in the research. These Consent Forms were collected prior to the beginning of the activity. All participants were informed that they could opt out of the research at any given time.

4.8 Summary

As new technologies emerge and teaching practices change, Practical Action Research outcomes may not present new 'findings' in theoretical progress, but rather provide outcomes in the forms of guidelines and procedures in implementing new practices, changing behaviour patterns and making improvements within an organisation. *"Action Research has the potential to go 'beyond an analysis of the status quo to directly consider questions of "what might be" and "what can be"."* (Jupp, 2006).

Chapter Five – Findings and Analysis

This study was designed to explore the perceptions of teachers and students of the Flipped Classroom teaching model and its implementation within a Further Education College.

The objective of this chapter is to present the findings and analyse the data. The data was collected by on-line post-questionnaires, interviews with the teachers and focus groups with the students. This qualitative data was analysed using coding and theming (Samples of Coding and Theming Appendix 11) of findings to streamline the data and make it coherent. Coding is a cyclical process which evolves as analysis progresses (Saldaña, 2013). As unexpected findings began to emerge, the data was re-analysed to further explore these findings.
The research questions are:

1. ***What are teachers and students perceptions of the Flipped Classroom in a Further Education College?***
2. ***What factors play a role in the implementation of the Flipped Classroom model from the perspective of an educational institution?***

5.1 Data Sources

The data sources included:-

- On-line post-questionnaires with open and closed questions
- Focus Groups with the students
- Semi-Structured Interviews with the teachers involved
- Semi-Structured Interviews with the Principal and Vice-Principal

5.2 Data Analysis

Jennings (1995) states that data analysis includes what the researcher has observed, heard and read so that sense can be made of what has been learned (McMurray, Scott, & Pace, 2004). Data was collected and analysed after each cycle in order to improve the implementation of this model. However, all the data was collectively analysed at the final stage to show the outcome of the research as a whole (Johnson, 2004) .

5.3 On-line Questionnaires

The on-line post-questionnaires were e-mailed to participants after they had access to the Flipped Classroom video for one week. The questionnaires for each cycle were collected prior to each Focus Group, so that students would not be influenced by others' attitudes. The data from the on-line questionnaires was coded and themed and then cross-checked with the emerging data from the Focus Groups.

How many times did you view the video?

By making the video available to students before coming to class, the teacher no longer had to teach to the middle level, but could reach both the higher level and lower level students. The amount of times a student viewed the video could relate to their level of ability of the subject. It also related to the subject and the fact that some students were more computer literate than others. Therefore each cycle varied as each cycle related to a different subject and content type. The relevance of having an assignment attached to the video showed the level of interest in viewing the video.

Cycle 1

Cycle one was a 36-minute video of step-by-step instructional processes in Desktop Publishing. These students were computer literate and the different levels of ability can be judged by the amount of times they viewed the video. Observational data showed that these students referred to the video while constructing their leaflet within class**.** See Appendix 12 for YouTube Analytics.

Cycle 2

Cycle two referred to students in the Social Care Department who were studying Early Childhood Care and Education. The video referred to Patterns of Play and contained a YouTube video. The duration of this video was 10 minutes and contained a video and narration by the teacher and included an assignment. See Appendix 13 for YouTube Analytics**.**

Cycle 3

Cycle three was a ten minute introduction of The European Union and was part of the Higher National Diploma in Media course, covering Politics and Current Affairs. This video was narrated by the teacher and included images, photographs of historical events and text relating to the forming of the European Union, which the students were required to know for an assignment. See Appendix 14 for YouTube Analytics.

It was found that each cycle differed in the amount of times the students viewed the videos. As Cycle 1 was a 36 minute step-by-step instructional video which had an assignment it was expected that the students would refer to this while carrying out their work. However, 41% of students viewed it only once showing that there was a high level of computer literacy within this class, with 45% viewing it 2-5 times and only 9% viewing it between 5-10 times. Fifty per cent of the Cycle 2 students accessed the video between 2-5 times with the other 50% viewing it between 5-10 times, therefore all students within this cycle viewed the video more than once. Cycle three students were also split 50/50 viewing the video once and between 2-5 times.

The purpose of this question was to establish both the computer literacy of the students and that the videos allow for differential learning across a diversity of subjects.

The analysis of data in subsequent questions is presented with the codes emboldened and the number of utterances in parenthesis.

Do you think this was a good way to learn?

Analysis of this open-ended question through theming and coding demonstrated that students had a positive experience of the Flipped Classroom. Key amongst these themes related to the **control *(14).*** This control enabled the students to stop, start and rewind the videos as many times as required. Students were able to access the videos on work-breaks while others viewed them on their smart phone before attending class. Many stated that it was **easier *(6)*** to **learn *(5)*** as it was an innovative and creative way of learning, which enabled them to take notes and learn visually. Students **self-paced *(6)*** themselves while acknowledging that **class-time *(2)*** was freed up to work on their assignments. One student acknowledged that the **teacher *(1)*** was able to spend more quality time with each student.

> *"Easier to learn visually than just off a sheet or a small talk, because you can look back at things quickly in the video if need be."*

See Appendix 15: Positive comments coding table.

Negative comments

Negative comments related that there was too much unnecessary **information *(1)*** within the video and another that while they felt it was a good way to learn that would still require direct instruction from the **teacher *(1)***.

> *"Sometimes you still need help and it's good to have a teacher there if you get stuck or need ideas."*

See Appendix 16: Negative comments coding table.

What do you feel are the advantages to this teaching model?

The theme referring to **control *(11)*** appeared within the answers to this question with the students again referring to the pace at which they learn. The comments included the time saving ability of the videos which frees up class-time can be used for information on assignments. The **ubiquitous *(7)*** nature of the videos enabled easy access for students which suited their time schedules and enabled them to **learn *(3)*** at any time. The students were able to **work *(5)*** through their assignments at their own pace and the availability of the videos was beneficial if they were to **miss a class *(3)*** and they felt there was only so many times they could ask the **teacher *(1)*** a question. Dixon states that this model prepares the students for class… *"the Flipped Classroom puts the homework first, focusing assignments on preparing students for the class"* (Dixon, 2012, p. 90).

> *"This method allows you to spend more time in class implementing the knowledge acquired while watching the video at home. This leads to more production in class and speeds up the whole process of learning how to create many useful things."*

See Appendix 17: Advantages coding table.

What do you feel are the disadvantages to this method of teaching?

Analysis of the data emerging from this question showed that students were under pressure and lacked the **time *(3)*** to watch the video as they had so many assignments to complete. It was stated that some students may not have internet **access *(2)*** while the key theme of **teacher *(6)*** referred to students working better in class than watching a video or others having low attention span and requiring direct instruction from the teacher.

> *"You have to make time during the week outside of college to sit down and watch the video in full and take notes. It can be very hard to find the time especially if you have other assignments to do."*

See Appendix 18: Disadvantages coding table.

Would you like the Flipped Classroom teaching model to be applied to other subjects you are currently studying?

Ninety-four per cent of students from cycle one, 80% from cycle two and 60% from cycle three stated that they would like this model used for other subjects that they are currently studying. This question was followed up within Focus Groups where students recognised that this model would be beneficial for step-by-step processes in programmes like Word Processing, including Tabs and Mail Merge. Another student mentioned that it would be good to have a video on how to Reference materials.

5.4 Data from Interviews and Focus Groups

Differential Learning

The triangulation of data from multiple perspectives of teachers' interviews and students' focus groups were analysed, coded and themed. Emerging key themes related to the ubiquitous and accessible nature of the videos which put control of the learning into the hands of the students. **Differential learning *(38 Teachers) (27 Students)*** was accommodated by the videos in that students could pace themselves and refer back to the video when required. Teachers recognised that the videos were beneficial for weaker students who could review the video as many times as they needed and build on the **confidence *(3)*** of the student. *"Learning styles are individual preferences for where, when or how a student obtains and processes information"* (Heacox, 2002, p. 8). The different learning styles of the students were accommodated by these videos.

> *"You can stop and rewind and pause it… 'cos everybody has their own speed, you know?"* **(Student)**
> *"Because when they go to class then they look like they know what they're talking about and in turn it's going to give them confidence."* **(Teacher)**

See Appendix 19: Differential Learning (Coding table and Data samples)

Learning through Technology

Students use **technology *(36 Teachers) (43 Students)*** to aid their learning stating that they preferred it over reading books and newspapers while researching. A reference was made to YouTube videos to aid their learning as they have dyslexia. Teachers recognised that 21st century students are accustomed to technology and therefore are willing to change their teaching practices to meet the needs of their students. The multimodality approach to learning can address the needs of New Millennium Learners (Brown & Fallon, 2010) and while teachers use YouTube videos to make it more interesting for the students, none had thought of creating their own videos.

> *"Yeah, 'cos I work better with looking at something on a computer screen and kinda taking things in or listening to something and having it there. I felt it went in better in my head than it would have if she stood in front of the class."* **(Student)**

> *"… particularly with the weaker students, I can see that as being very useful and helpful… something they can look at on their smart phone."* **(Teacher)**

See Appendix 20: Technology (Coding table and Data samples)

Time in the classroom

Both teachers and students found the **time in the classroom *(17 Teachers) (16 Students)*** was more productive. This Blended Learning approach enables students to reach the higher levels of Blooms taxonomy of synthesis and evaluation (Moore & Stanley, 2010). Flipping the Classroom results in more constructive face-to-face contact time spent with the teacher and other students. The students take ownership of their own learning as they are equipped with knowledge and key-terms before class-time. This preparation empowers the student to take part in group discussion and begin work on their assignments by the time they come to class. Mazur states that teachers should *"use the valuable and scarce commodity of classroom time to work with your students on their understanding"* (Chen, 2010, p. 121).

See Appendix 21: Time in the classroom (Coding table and Data samples)

> *"Yeah... Cos you're more ready as soon as you come in you have a good idea of what you're doing you could get straight into it."* **(Student)**
>
> *"It gave me more time to go around to them individually and help them out."* **(Teacher)**

Assignment

The key theme of **assignment *(8 Teachers) (19 Student)*** was discussed with students stating that they would not look at the video unless there was an assignment aligned with it. Students found the videos useful to refer back to for ideas when it came to assignment time. There was less time-wasting within class clarifying the requirements for assignments which lead to a more productive time within the class. The teacher later referred that she received less e-mails relating to queries on assignments since releasing the video.

> *"Several people had done that (the assignment) so were able to contribute to the conversation... even people who didn't very much engage with it before heard other people in the class talk and they got more out of it than if it had been just me."* **(Teacher)**
>
> *"Yeah, I probably would look at it when I'm doing me assignment and I'm stuck on something I'd look at it for ideas."* **(Student)**

See Appendix 22: Assignment (Coding table and Data samples)

Positive comments

Analysis of **positive *(41 Teachers) (64 Students)*** data emerging from these two sources related to the

facility of the work going beyond the classroom, the students having more time to consume information and being able to access it anywhere. There was an awareness of the part of the teacher that some students may be unable to attend class because of work or personal issues and felt that access to these videos provided an education for all students as they could catch up on missed classes.

> *"It gives you know knowledge like before you come to class so that you're informed when the teacher starts talking so you can have a more informed discussion about whatever the thing is about…and then you can expand on it… you're getting more work done and more areas covered because it can be expanded on from what you've seen."* **(Student)**
>
> *"It meant I could focus on that little particular bit of the course that was giving them trouble rather than give the whole lesson for the whole three hours."* **(Teacher)**

See Appendix 23: Positive Comments (Coding table and Data samples)

Negative comments

Data relating to **negative comments *(10 Teachers) (35 Students)*** concerned time, access to the videos and being unable to ask questions directly of the teacher at the time of viewing.

> *"It's obviously time-consuming in terms of doing the video, but I don't think there are any major disadvantages to me."* **(Teacher)**
>
> *"It was a one-way communication process and maybe that weakened it a little bit."* **(Teacher)**
>
> *"You can't ask questions of a video either, if you get confused over something."* **(Student)**

See Appendix 24: Negative comments (Coding table and Data samples)

5.5 Research Question One

This section will answer the first research question which is:-

1. ***What are teachers and students perceptions of the Flipped Classroom in a Further Education College?***

The data was analysed to establish the teachers' and students' perceptions of the Flipped Classroom teaching model. This data will be presented with common themes which emerged from both teachers' and students' perspectives.

Teachers' and students' perceptions of the Flipped Classroom teaching model

The perceptions of both the teachers and students were wholly positive and both groups related to the ubiquitous nature of the videos. This self-paced control empowered students to take charge of their own learning and provided them with the confidence to advance their education. Teachers welcomed the accessibility of videos which enabled students from different socio-economic groups to access their education outside class-time.

It was acknowledged that New Millennial Learners are conversant with technology and that it should be employed in an innovative way in order to engage today's students. The multimodality of the videos benefited both groups and it was accepted that visual aids were central when making connections with subjects within the classroom. Teachers recognised that the affordances of the Flipped Classroom model would allow for differential learning among their students.

Both teachers and students welcomed the additional constructive time within class which permitted students to contribute to group discussions and work on their assignments confidently. Teachers were assured that each and every student received the same level of education. The Flipped Classroom teaching model allows higher level students to continue working while lower level students welcomed the individual one-to-one tuition with the teacher. Students accessed the video to review concepts for assignments while teachers were confident that the content was structured and delivered in the required format for assessment.

The benefits of this teaching model were acknowledged by both groups for other subjects with the early adopters now planning and constructing videos for the next academic year.

Time and Technology

Data analysed showed emerging negative themes relating to time and technology for both students and teachers. Undertaking and implementing new teaching methods can be challenging at any time, however, in the middle of the academic year it can be a trial for both groups. As students were under pressure to complete assignments, some saw viewing the videos as time taken away from assignment work. Teachers have deadlines to meet and are not afforded the luxury of time to investigate and engage with new technologies. While teachers acknowledged the positive aspects of the Flipped Classroom they also referred to the amount of time it would take to establish this teaching model in the future. Teachers eager to engage this method requested training and assistance with the technology in order to introduce it in the next academic year. Comments regarding technology and its use referred to only engaging with it if it was useful… " *I think It would use it not maybe for everything because I think variety is the name of the game"*. Lage states that *"Variety in the pace and format of undergraduate classroom instruction – across different class periods and even within a particular class – may well be the missing spice of go teaching and enthusiastic learning"* (Lage, 2000, pp. 30-43).

Dependency on the teacher

An unexpected theme emerged which related to the dependency of the students on the teacher. Emotive feelings of fear and anxiety were expressed by students who mistakenly thought the videos would replace the teacher. While accepting the videos, students valued the face-to-face time with the teacher stating that they could never be replaced. One student stated: *"As long as the presentation doesn't replace the actual teacher."* It was important to the students that their teacher had created the videos themselves and spoke of establishing and continuing the connection with the teacher. *"Well, I think it's establishing the connection. It makes it more personal."*

Students valued the information supplied by the teacher as it would meet the exact requirements of the assignments. Most students stated that they would not source videos relating to their subject independently. While students showed a preference for the video over hand-outs, others requested hand-outs to supplement the videos. Some found the video easier to understand than hand-outs as the language of the teacher was easier to understand.

This dependency on the teacher demonstrates a lack of independent learning. The majority of these students have come directly from secondary school and may not be accustomed to independent learning. The Flipped Classroom teaching model may equip these students with the control of self-directed independent learning which would benefit them in further education.

5.6 Research Question Two

This section will answer the second research question of:-

2. ***What factors play a role in the implementation of the Flipped Classroom model from the perspective of an educational institution?***

The data collected through interviews with the College Principal and Vice-Principal were analysed. From an institutional perspective there was acknowledgement of the way today's students learn through technology and recognised that while teachers use technology they may be somewhat behind the students. The Flipped Classroom teaching model was seen as an innovative use of technology which would address the needs of the students.

The college has undergone extensive upgrading of the infrastructure of the computer network and improvements are constantly being employed. The College Principal is committed to incorporating technology into each and every classroom in the future. While improvements to the network are highly commendable and always welcomed, the current lack of support for teachers locally engaging with technology can only be viewed as a setback. The institution recognises innovative teaching methods and is currently engaging with Universities and supporting the role of trainee teachers. There is a wish to develop this further in order that new teaching practices can be introduced to existing members of staff.

The moratorium on hiring new teachers leads to the matter of training existing staff to upgrade their ICT skills. The administrator played a role in implementing the Flipped Classroom and has made assurances of continuing support to all staff. New adopters of technology create a transformation within the college by encouraging others to adapt to new methods. Ajzen states that that *"a person's behaviour is strongly influenced by his confidence in his ability to perform that behaviour (Ajzen and Madden 1986, pp. 456-457)* (Khosrowpour & Information Resources Management Association International, 1996, p. 254). Although the subjective norm of perceived social pressure to perform plays a major role in changing the cultural climate of the college, this change will take time.

5.7 Guidelines and Procedures

Arising from this Action Research process the following set of Guidelines and Procedures have been devised for teachers who wish to adopt this innovative teaching model in the future.

Flipping the Classroom – Guidelines and Procedures	
Department Head	Before conducting any change in teaching practice, please check with the Department Head and collaborate with any new teaching implementations.
Recording Software	Camtasia Screen Recording software which is available from TechSmith. Please talk to the technicians regarding Software and Hardware.
Video Hardware and tips	Webcam (either integrated or if not integrated preferably use a USB connection for better quality). If using a Webcam ensure that the angle is correct and sit in front of a neutral area, i.e. be aware of what else is in the video, clear the background. A Video Camera or a Mobile Phone can also be used.
Audio Hardware and tips	When recording be aware of peripheral sounds which may interfere and distract the attention of the viewer away from the content. Eliminate any static or background noise. Be aware of your surroundings, USB headset microphone are best as the microphone is always the same distance from your voice. Be aware not to have it too close to your mouth as to record breathing sounds. Be yourself... even if you make a mistake, the student's don't mind... Turn it into a positive. Audio is even more important than video... Callouts can be added at a later stage if you wish to emphasise something or have forgotten to mention something.
Content	Content should be well researched and a script prepared and practiced. Ensure that content is relevant to the time and the programme being used. Remember this content can be archived and used for a number of classes or for next year's class if the information is still relevant. This is an ideal opportunity to update or revamp any material you may have.
Teacher	Teacher should narrate the content as they are the expert. If possible and if the teacher is willing, a video of the teacher can be incorporated into the video, either full screen, or as a small screen in the corner. It is possible to appear either at the beginning, the end, or all the way through the video. This adds a personal touch.
Images	Relevant images can be used to add to the subject but must be of a good quality.
YouTube Videos	YouTube video clips can be incorporated into your own video. These can be used to enhance your own content or to emphasise a point.
Students	Students should have access to the Network and to Moodle. They should also be enrolled on the particular course where the video is stored. Please check this with the administrator of Moodle. Encourage students to use the college e-mail account and communicate with them on a regular basis to ensure they are watching the video.
Storage of Videos	Videos will be hosted on the Moodle Learning Management System. It is possible to track the analytics of the students on Moodle to assess if the students are accessing the video. There is no limit on the space need for storage of these videos.
Videos	Videos should be no longer than ten minutes and if possible even less. Break long videos into sections of ten minutes each. Incorporate relevant YouTube videos to accentuate a point but be aware of the length of these videos and how they will impact on your video.
Feedback from Students and other Teachers	Encourage feedback from the students within the video by asking them questions. Maybe they would like other subjects to be covered by this teaching model. Get feedback from other teachers to ensure that you have covered everything and haven't left anything out.
Other Teachers	Work with other teachers within the same domain. It is a very useful tool to use two people, perhaps one posing questions that the students might ask.
Assignments	Align an assignment with the video to ensure that the students have an incentive to view it. Incorporate a task for the students to have performed before the next class. Incorporate a quiz within the video.
In-Class Time	Incorporate activities/assignments in the video that can be aligned with classroom activities. See "The Flipped Classroom Teaching Method – A Brief Introduction".
Administrator in Computer Department	Remember that the Administrator is there to help you with any issues you may have and is on hand to assist and offer support.

5.8 Impact

As a result of this study the researcher has been requested to present these Guidelines and Procedures at workshops promoting the Flipped Classroom Teaching Model on behalf of the City of Dublin Vocational Educational Committee (CDVEC). These workshops form part of the Continuing Professional Development (CPD) of teachers within the Further Education sector to encourage and promote the use of ICT within courses which in turn will meet the needs of New Millennial Learners.

Chapter Six – Discussion and Conclusion

The Flipped Classroom teaching model may be the first step in incorporating Blended Learning within the classroom by combining on-line multimedia instruction with the face-to-face time with the teacher in the classroom (Bonk & Graham, 2005; Seel, 2012; Thorne, 2003). Rethinking the course design with the introduction of this model increased the contact time between the teacher and students who require extra attention (Garrison & Vaughan, 2008). Students accessing the videos were able to take control of their own learning which improved confidence. This control was found to be beneficial for shy students, those with dyslexia and foreign-national students.

Differential Learning was accommodated by the videos while the multimodality approach to teaching and learning addressed individual learning styles which provided new venues for demonstrating understandings (Brown & Fallon, 2010; Lage, 2000) and recalling key terms. Students interacted with the material at a deeper level during conversations in class. Taking the presentation out of the class meant that teachers no longer had to teach to the middle level of the class, but could reach each and every student every day (J. Bergmann, Sams, A., 2012).

Students benefitted from the ubiquitous access afforded by the videos and could consult them during work-breaks. This model engaged students that are bored with the traditional format of education but could be supplemented with hand-outs to accommodate all learning styles.

Incorporating information and concepts about assignments within videos ensured that students interacted with the content prior to attending class (Pitler et al., 2012; Shibley I.A. Jr., 2012). This interaction was pivotal when content is being discussed during class and students were able to contribute to discussions. Students also benefitted from the social constructiveness atmosphere of the classroom with information being shared by their peers.

The administrator played a pivotal role in assisting and supporting the teachers to implement this new teaching practice. Learning environments can be created which encourage experimentation with different models to avoid stagnation of teachers while engaging students. Administrators can do much to establish the cultural climate of a school "*by ensuring that the school is a true learning community that supports experimentation and values efforts to improve (Deal & Peterson, 1994)* (Guskey, 2003, p. 75).

This model is especially beneficial for step-by-step instructional processes but may also be used for other subjects. Technology breaks down barriers between teachers and students but should not be

over-used as it becomes predictable and boring. Delivering content in different formats and changing teaching practices from time to time keeps the learning environment dynamic.

The purpose of this study was to determine the perceptions of teachers', students and the institutions attitudes towards the Flipped Classroom teaching model. In answering the research questions it was found that the perceptions of the teachers and the students were consistent in their positive opinion. The college authorities wholly recognised the innovative use of technology to engage today's students and teachers will be encouraged to partake of any Continuing Professional Development (CPD) workshops in the future.

Practical Action Research is an iterative process and by engaging with this methodology the negative aspects of the Flipped Classroom can be addressed in the future.

6.1 Further Research

This study incorporated a number of diverse subjects and was found to be very successful in the step-by-step process of instruction. Other diverse subjects could be further investigated to see the effect of this method. In order to implement Mastery Learning with the Flipped Classroom, it would be advisable to have the videos created previous to the beginning of the academic year. The scope of this research did not fully implement the Mastery Learning element and would be included in further research.

6.2 Limitation

As Practical Action Research is a cyclical process with each cycle dependent on the previous one for implementation and improvement, time was a major limitation in this study. It was a requirement of this research to accommodate teachers willing to engage with the teaching model as lessons plans were already in place for the academic year. Cycle Five was prepared for this Action Research but this time limitation excluded it from this study, however it will be utilised in the next academic year.

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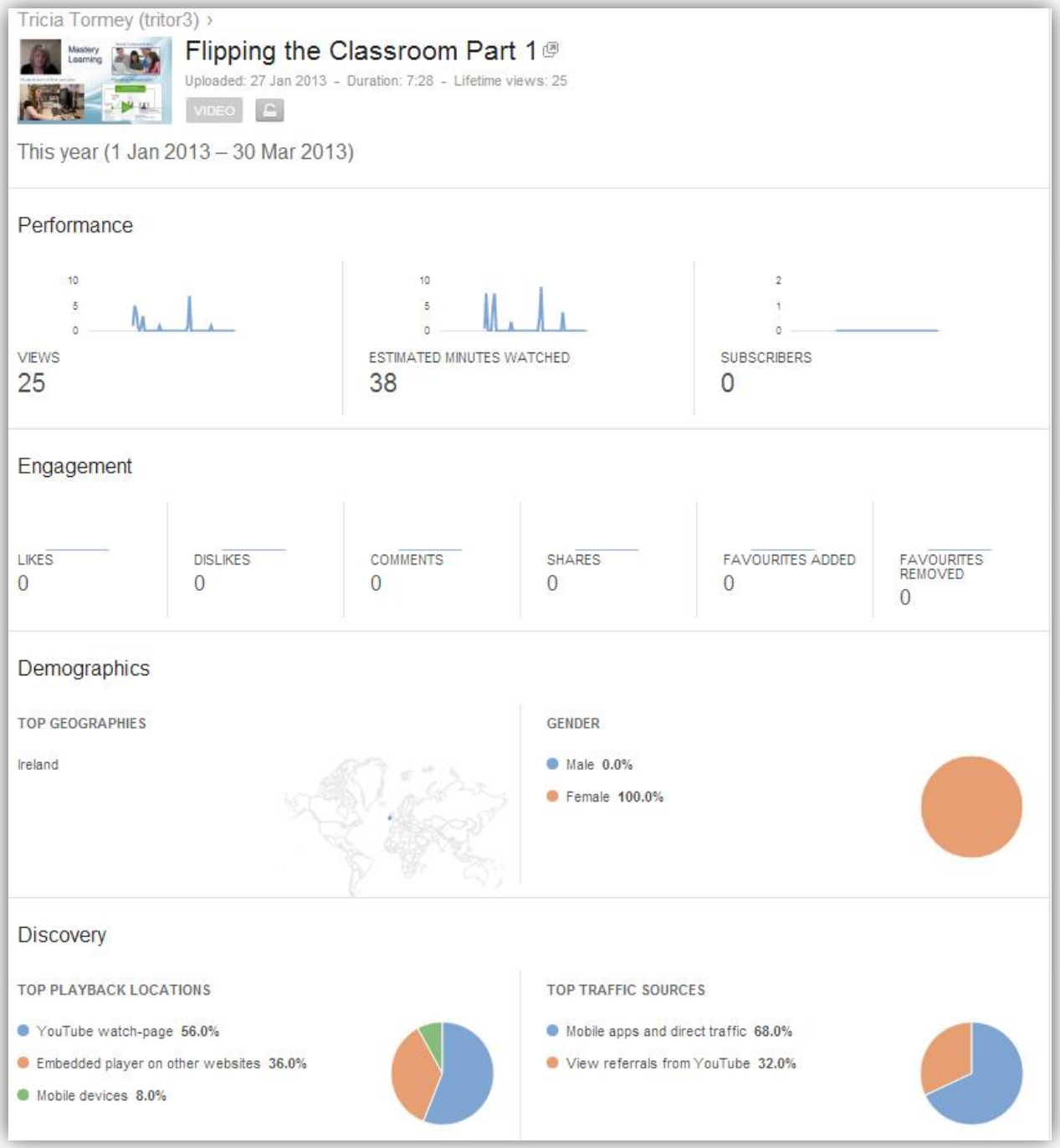
Appendices:

Appendix 1: Aligning Millennial Traits, Learning Theory Principals, Learning Space & Technology Application

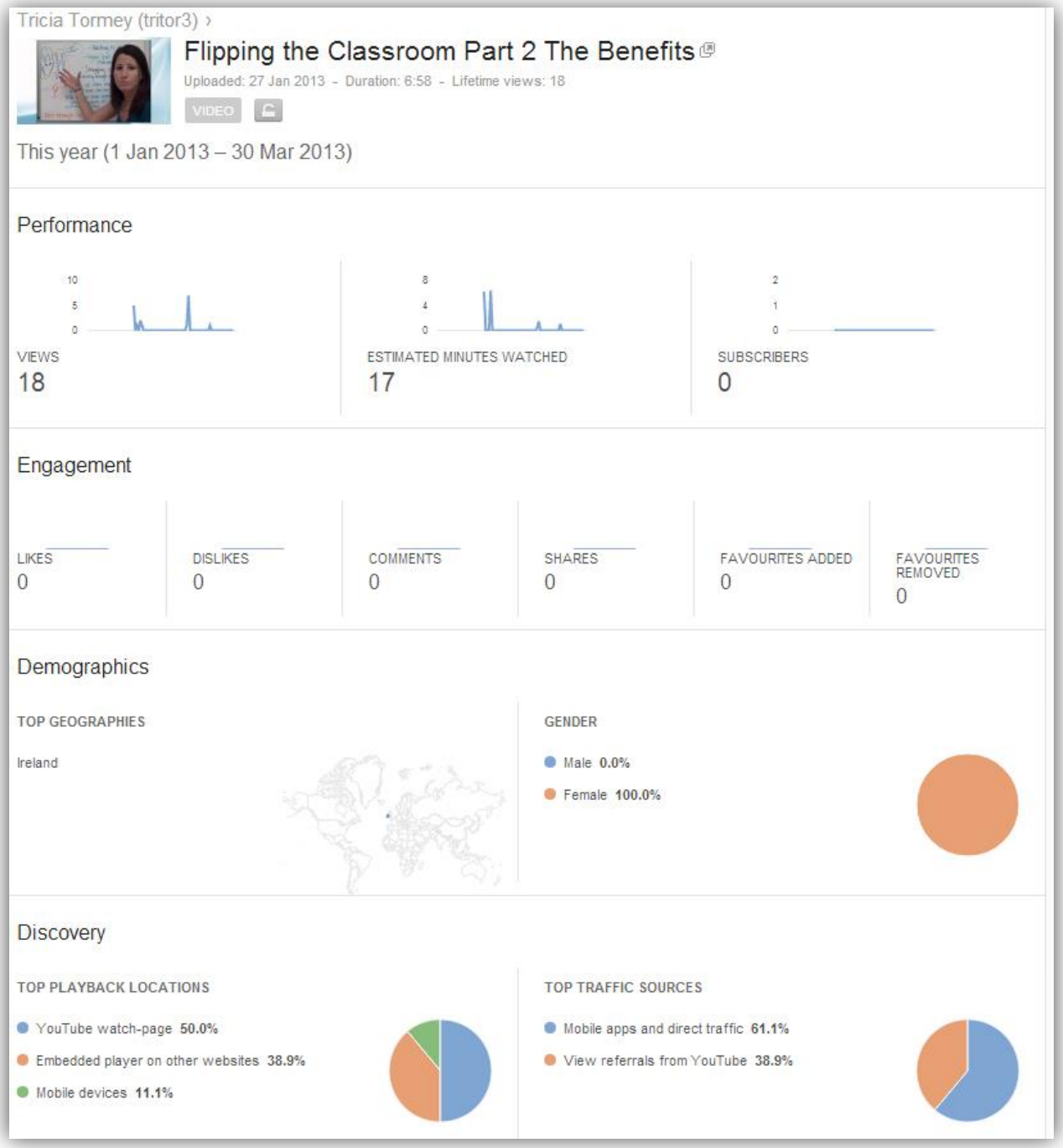
Millennial Generation Traits	Learning Theory Principles	Learning Space Application	Technology Application
Group activity oriented	Collaborative, cooperative, supportive	Small-group work spaces	IM chat; virtual whiteboards; screen sharing
Goal and achievement oriented	Metacognition; formative assessment	Access to tutors, consultants, and faculty in the learning space	Online formative quizzes; e-portfolios
Multi-taskers	Active	Table space for a variety of tools	Wireless
Experimental; trial-and-error learners	Multiple learning paths	Integrated lab facilities	Applications for analysis and research
Heavily reliant on network access	Multiple learning resources	IT highly integrated into all aspects of learning spaces	IT infrastructure that fully supports learning space functions
Pragmatic and inductive	Encouraging of discovery	Availability of labs, equipment and access to primary resources	Availability of analysis and presentation applications
Ethnically diverse	Engagement of preconceptions	Accessible facilities	Accessible online resources
Visual	Environmental factors; importance of culture and group aspects of learners	Shared screens (either projector or LCD); availability of printing	Image databases; media editing programs
Interactive	Compelling and challenging material	Workgroup facilitation; access to experts	Variety of resources, no “one size fits all”

Source: Brown (2005) (Hartas, 2010)

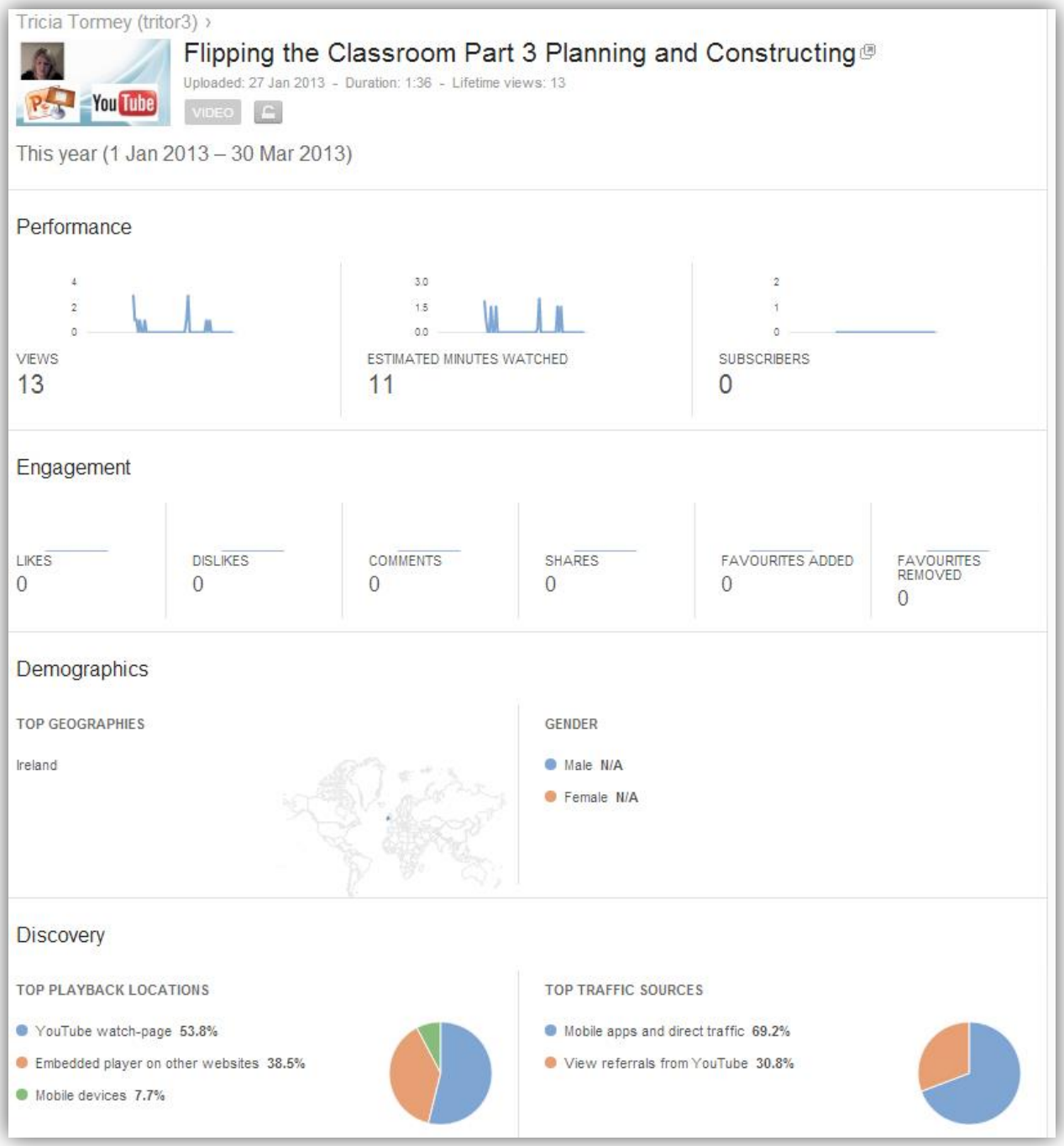
Appendix 2a: YouTube Analytics Flipping the Classroom – Part 1



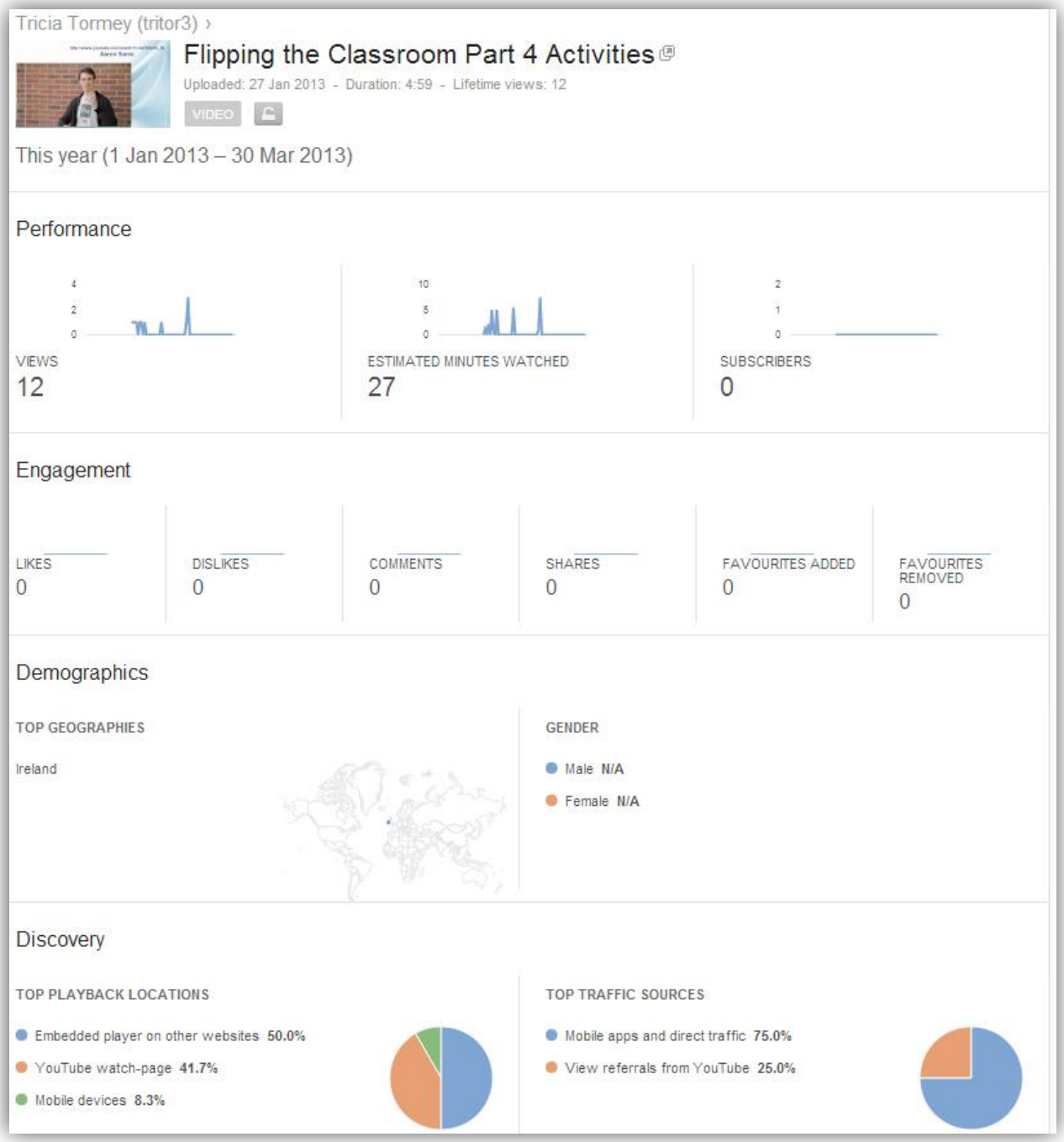
Appendix 2b: YouTube Analytics Flipping the Classroom – Part 2 – The Benefits



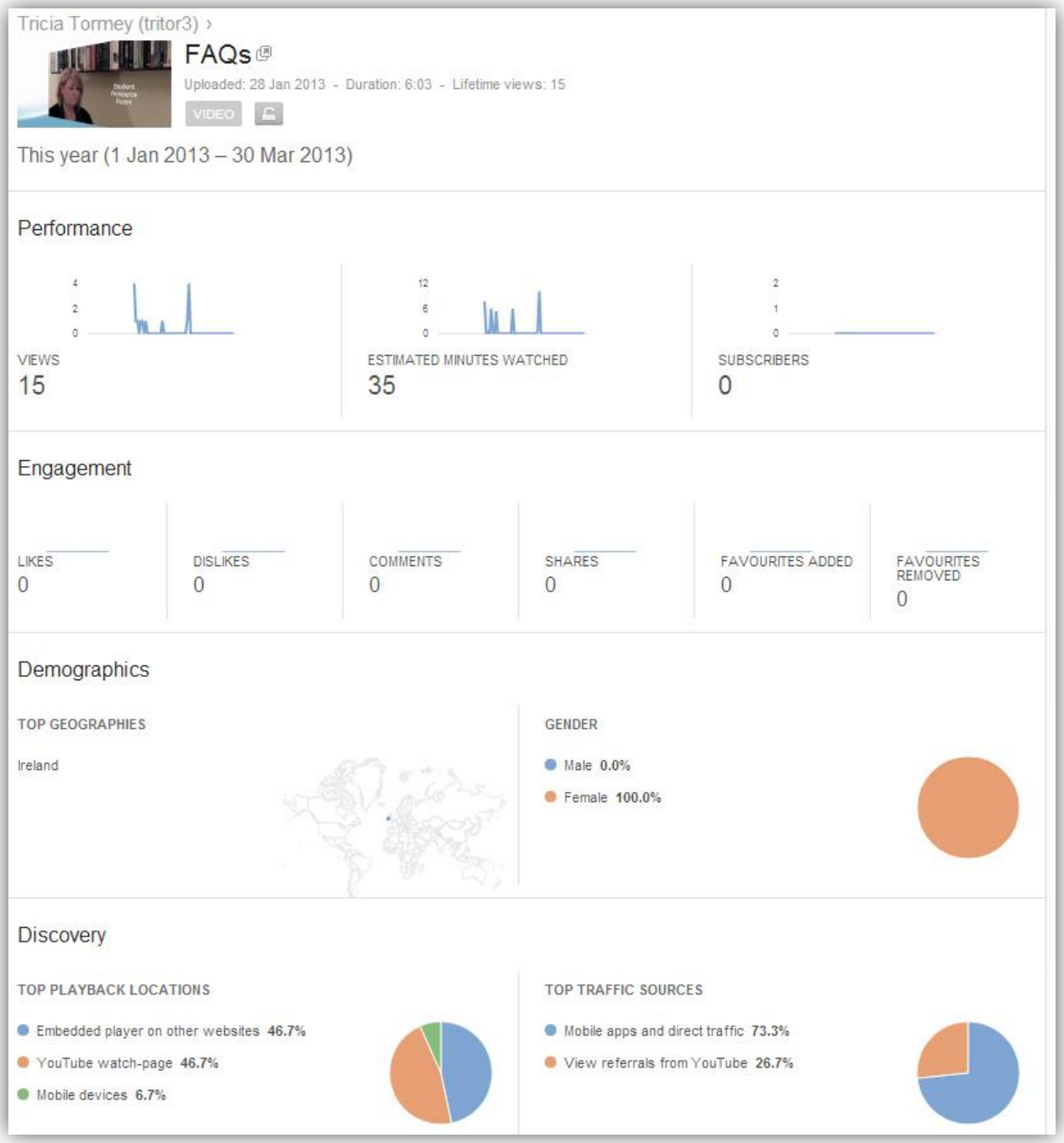
Appendix 2c: YouTube Analytics Flipping the Classroom – Part 3 – Planning and Constructing



Appendix 2d: YouTube Analytics Flipping the Classroom - Part 4 – Activities



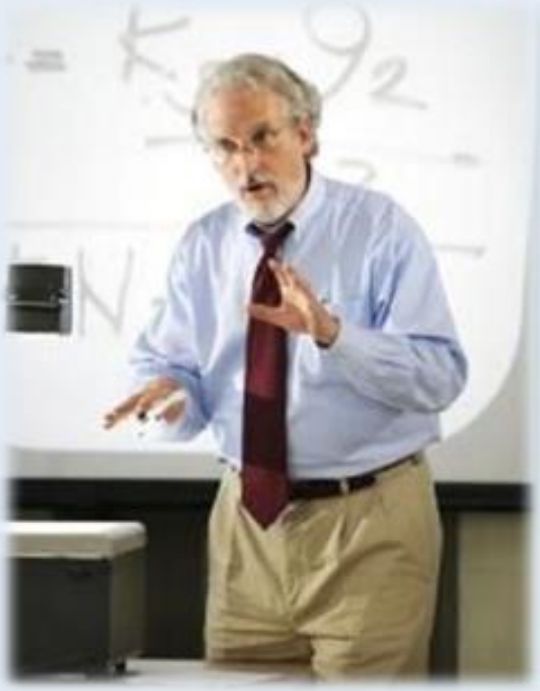
Appendix 2e: YouTube Analytics Flipping the Classroom – FAQs



Appendix 3: Explanatory Leaflet for Teachers

The Flipped Classroom Teaching Method

A BRIEF INTRODUCTION



TRADITIONAL CLASSROOM vs FLIPPED CLASSROOM

TRADITIONAL CLASSROOM

In the traditional classroom teachers give a presentation that may last 20-30 minutes. In this scenario the teacher is active and the students are passive.

Due to class timetables the teacher needs to deliver the presentation and there may not be much time for questions from the students. So the teacher teaches to the middle level students in the class, the higher level students may be bored and the lower level students could miss out.

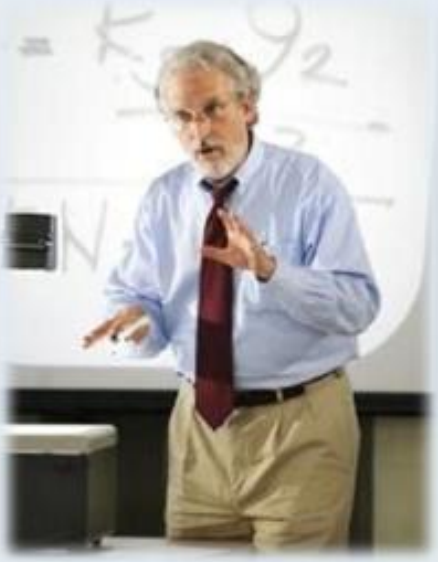
This presentation may then be followed by discussion with the students or they may begin to work on the subject.

This direct instruction is delivered to the students in class.

The students then complete their assignments outside of class time.

These assignments may be carried out in isolation with no immediate guidance from the teacher.

SAGE ON THE STAGE



GUIDE ON THE SIDE

FLIPPED CLASSROOM

In the Flipped Classroom, direct instruction is delivered through a video which is hosted on Moodle. Moodle is a secure environment which uses User Access Controls. This ensures that the video is viewed by a particular group of students with usernames and passwords.

The students view this video in their own time, either on their home PC or on any mobile device. The students can pause, rewind and watch this video as many times as they need and when they come to class they are prepared for the subject. The teacher no longer teaches to the middle level student, but reaches each and every student. The higher level student can move ahead and the lower level student can go over sections that they do not understand.

Assignments can then be completed in class with guidance from the teacher in a constructive learning environment. This also leads to a more collaborative working environment where the students learn from their peers.

In the Flipped Classroom, both the students and the teacher are active.

PLANNING DOCUMENT FOR THE FLIPPED CLASSROOM

Course Details:

Teacher:

Topic/Week:

Subject:

HINTS AND TIPS

The video should incorporate either a talking head or narration by the teacher.

This continues the relationship between the teacher and student and further builds on constructive time in the class.

The students must be aware that it is ***you*** who is delivering the content rather than an anonymous person from YouTube.

In general it is better that the video is no longer than 10 minutes. This ten-minute video can be broken into two five minute segments with a section in-between asking students to reflect on something.

Ask questions within the video.

Tell the students what they need to have ready for the next class.

Encourage the students to source their own videos. YouTube clips may be included but must relate to and clarify the subject you are delivering.

COMPONENTS OF THE FLIPPED CLASSROOM

Establish clear learning objectives.

Determine which of these objectives are best achieved through direct instruction.

Assure students access to videos.

Incorporate engaging learning activities to be done in class.

RESOURCES

You may already have a lot of resources which can be used for your Flipped Classroom.

Try to incorporate these into your first Flipped Classroom. This will give you an opportunity to try something new with existing material.

It is best to start small and build on your lessons gradually as you become more proficient presenting material in this format. This allows for any changes or improvements which can be made in future videos.

Checklist:

PowerPoint Presentations
Prezi Presentations
Step-by-Step Screen Instructions
YouTube Videos
Websites
Podcasts
Books
Images
Music
Sounds
Screenshots

Preparation Activities:

In order to engage the students with the material in the video, it is good practice to incorporate some activities connected with the subject.

These preparation activities can be embedded into the video and will help students to engage with the material before they come to class.

These activities will then form part of the constructive time spent with the students in the class.

SUGGESTED PREPARATION ACTIVITIES:

Have five questions about the video.

Prepare an outline of your assignment.

Find other sources online.

Write an entry in a Blog.

Complete the quiz on Moodle.

Post a question to the Forum.

Prepare for a Group Discussion.

Read a Chapter of a Book.

Find Literature on the subject.

Write a Reflective Journal.

Form a team and assign roles.

.....

Classroom Activities:

The classroom activities will follow on from the Preparation Activities set for the students.

This face-to-face constructive time with the teacher is important to consolidate the information which was delivered in the video and helps to develop further on a concept.

SUGGESTED CLASSROOM ACTIVITIES:

Answer questions arising from the video.

Discuss issues arising from questions.

Form Small Groups and discuss subject.

Students present results of discussion.

Debate the subject.

Form working groups.

Share extra materials sourced.

Discuss outline of assignments.

Students make Presentations.

Students work on Assignments.

Construct Mind Maps

.....

Are you ready to Flip?

A teachers' life is a busy life, especially when assignments are due and the students' work needs to be graded.

Because of this it is difficult to implement new teaching methods within an already established routine.

For these reasons I will be the facilitator of your Flipped Classroom.

Look at the Flipped Classroom Video Document. This document outlines the information you need to think about in preparing your Flipped Classroom.

Then look at the document regarding the Preparation Activities for the Students and the Classroom Activities that follow on from that.

Then come and have a chat and I will help you plan and construct your first Flipped Classroom.

I will work in conjunction with you on all aspects of the Flip.

Appendix 4: Participant Information Sheet

TRINITY COLLEGE DUBLIN
INFORMATION SHEET FOR PARTICIPANTS

Project Title: An investigation into the introduction of the Flipped Classroom through a Virtual Learning Environment in a Further Education College (working title)

Introduction:
This research is being conducted by Patricia Tormey in the School of Computer Science and Statistics and forms part of a Masters Degree in Technology and Learning. The purpose of this exploratory case study is to investigate how The Flipped Classroom teaching method can be incorporated into a Virtual Learning Environment, (Moodle), within a Further Education College.

Background:
A video and a PowerPoint Presentation have been embedded into Moodle which gives a short introduction to The Flipped Classroom. The video and PowerPoint Presentation explain the concept of the Flipped Classroom, its origins, users and the pedagogy and learning theories on which it is based. Teachers will be invited to participate in this research by applying this teaching method for a trial period to be agreed between the researcher and the teacher.

You will be invited to an initial meeting where the researcher will outline the details of the study and what it entails. Information Sheets and Consent Forms will be distributed.

Questionnaire:
If you decide to participate in this study you will be provided with a link to an online questionnaire.

Main Activities:
On completion of this online survey the researcher will facilitate you in applying the Flipped Classroom to your lectures. The Flipped Classroom teaching method involves creating videos which are available to the students online through Moodle. There are many elements that may be incorporated into this video, including a video of the presenter, a PowerPoint Presentation, notes and videos from YouTube. The students view this video at home and when they arrive in the classroom they are ready to complete assignments or start discussions relating to the topic.

Questionnaire:
On completion of the trial period of the Flipped Classroom you will be provided with a link to an online post-questionnaire.

Interviews:
On completion of the online post-questionnaire you will be requested to attend a face-to-face, semi-structured interview. These interviews should last approximately twenty minutes and will be recorded. This recording will then be transcribed and relevant sections used in the research. All data collected will be anonymised and the information encrypted and stored in compliance with the Data

Protection Acts 1988 and 2003.

Focus Groups:

On completion of the online post-questionnaire it is hoped to hold a focus group meeting to gather information about the study. These focus groups will be semi-structured in their questions and will be informal. The group meetings will last no longer than twenty minutes and will be recorded. This recording will then be transcribed and relevant sections used in the research. All data collected will be anonymised and the information encrypted and stored in compliance with the Data Protection Acts 1988 and 2003.

Debriefing will take place at the end of the study, once all the data have been collected and analysed. This debriefing will take the form of a meeting with individual teachers to assess how the teaching method worked for them and the findings that came from the research. The researcher will visit each class to give an overview of the findings and to have a question and answer session with the students.

Your participation is completely voluntary and you may withdraw from this exploratory case study at any time without penalty. If you do decide to withdraw from the research you must inform the researcher by email (ptormey@tcd.ie). All collected information from your participation in the project will be removed immediately and will not be included in the research documentation.

There are no anticipated risks to your involvement in this research.
All questions are OPTIONAL and any question may be skipped.
You may opt out of this questionnaire at any stage by clicking on the EXIT THIS SURVEY button on the top right-hand corner of your screen.
In the extremely unlikely event that illicit activity is reported I will be obliged to report it to appropriate authorities.

Appendix 5: Participant Consent Form

TRINITY COLLEGE DUBLIN
INFORMED CONSENT FORM

Lead Researcher: Patricia Tormey

Introduction:

This research is being conducted by Patricia Tormey in the School of Computer Science and Statistics and forms part of a Masters Degree in Technology and Learning. The purpose of this exploratory case study is to investigate how The Flipped Classroom teaching method can be incorporated into a Virtual Learning Environment such as Moodle within a Further Education College.

Background:

A video and a PowerPoint Presentation have been embedded into Moodle which gives a short introduction to The Flipped Classroom. This video and presentation explains the concept of the Flipped Classroom, its origins, users and the pedagogy and learning theories on which it is based. Teachers will be invited to participate in this research by applying this teaching method for a trial period to be agreed between the researcher and the teacher.

Procedures of This Study:

Questionnaire:

If you decide to participate in this study you will be provided with a link to an online questionnaire.

Main Activities:

On completion of this online survey the researcher will facilitate you in applying the Flipped Classroom to your lectures. This will involve working in consultation with you in the design and presentation of the lesson or lessons you wish to deliver.

Questionnaire:

On completion of the trial period of the Flipped Classroom you will be provided with a link to an online post-questionnaire

Interviews:

On completion of the learning experience you will be requested to attend a face-to-face, semi-structured interview. These interviews should last approximately twenty minutes and will be recorded. This recording will then be transcribed and relevant sections used in the research. All data collected will be anonymised and the information encrypted and stored in compliance with the Data Protection Acts 1988 and 2003.

Focus Groups:

On completion of the online post-questionnaire it is hoped to hold a focus group meeting to gather information about the study. These focus groups will be semi-structured in their questions and will be informal. The group meetings will last no longer than twenty minutes and will be recorded. This recording will then be transcribed and relevant sections used in the research. All data collected will be anonymised and the information encrypted and stored in compliance with the Data Protection Acts 1988 and 2003.

Debriefing:

Debriefing will take place at the end of the study, once all the data have been collected and analysed. This debriefing will take the form of a meeting with individual teachers to assess how the teaching method worked for them and the findings that came from the research. The researcher will visit each class to give an overview of the findings and to have a question and answer session with the students.

The participation of the teachers is completely voluntary and they may withdraw from this

exploratory case study at any time without penalty. If you do decide to withdraw from the research you must inform the researcher by email (ptormey@tcd.ie). All collected information from your participation in the project will be removed immediately and will not be included in the research documentation.

There are no anticipated risks to your involvement in this research.

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You may opt out of the online questionnaire at any stage by clicking on the EXIT THIS SURVEY button on the top right-hand corner of your screen.

In the extremely unlikely event that illicit activity is reported I will be obliged to report it to appropriate authorities.

Publication: This research project forms part of a Masters Degree in Technology and Learning in Trinity College, Dublin. On completion, the findings of this research will be published and presented to a body of examiners in Trinity College, as well as external examiners. All data collected, including audio recordings will be anonymised and will not be identifiable to any individual. All data collected will be stored in compliance with the Data Protection Acts 1988 and 2003.

DECLARATION:

- I am 18 years or older and am competent to provide consent.
- I have read, or had read to me, a document providing information about this research and this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction and understand the description of the research that is being provided to me.
- I agree that my data is used for scientific purposes and I have no objection that my data is published in scientific publications in a way that does not reveal my identity.
- I understand that if I make illicit activities known, these will be reported to appropriate authorities.
- I understand that I may stop electronic recordings at any time, and that I may at any time, even subsequent to my participation have such recordings destroyed (except in situations such as above).
- I understand that, subject to the constraints above, no recordings will be replayed in any public forum or made available to any audience other than the current researchers/research team.
- I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights.
- I understand that I may refuse to answer any question and that I may withdraw at any time without penalty.
- I understand that my participation is fully anonymous and that no personal details about me will be recorded.
- *<If the research involves viewing materials via a computer monitor>* I understand that if I or anyone in my family has a history of epilepsy then I am proceeding at my own risk.
- I have received a copy of this agreement.

PARTICIPANT'S NAME: _____

PARTICIPANT'S SIGNATURE: _____ Date: _____

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

RESEARCHERS CONTACT DETAILS: ptormey@tcd.ie **Mobile: 086-3438973**

INVESTIGATOR'S SIGNATURE: _____ Date: _____

Appendix 6: Questionnaire for Participants

The Flipped Classroom Post-Questionnaire for Students

The Flipped Classroom Post Questionnaire for Students

Participant Information Sheet

Project Title: An investigation into the introduction of the Flipped Classroom through a Virtual Learning Environment in a Further Education College (working title)

Introduction:
This research is being conducted by Patricia Tormey in the School of Computer Science and Statistics and forms part of a Masters Degree in Technology Enhanced Learning. The purpose of this exploratory case study is to investigate how The Flipped Classroom teaching method can be incorporated into a Virtual Learning Environment, (Moodle), within a Further Education College.

Background:
A video has been embedded into Moodle which gives a short introduction to The Flipped Classroom. This video explains the concept of the Flipped Classroom, its origins, users and the pedagogy and learning theories on which it is based. Teachers will be invited to participate in this research by applying this teaching method for a trial period to be agreed between the researcher and the teacher.

As students within these classes you will be invited to take part in this research. The researcher will visit the classroom and outline the details of the study and what it entails. Information Sheets and Consent Forms will be distributed.

Questionnaire:
On completion of the trial period of the Flipped Classroom you will be provided with a link to an online post-questionnaire.

Focus Groups:
On completion of the online post-questionnaire it is hoped to hold a focus group meeting to gather information about the study. These focus groups will be semi-structured in their questions and will be informal. The group meetings will last no longer than twenty minutes and will be recorded. This recording will then be transcribed and relevant sections used in the research. All data collected will be anonymised and the information encrypted and stored in compliance with the Data Protection Act 2003.

Debriefing:
Debriefing sessions will be conducted on request once the focus groups have been completed.

Your participation is completely voluntary and you may withdraw from this exploratory case study at any time without penalty. If you do decide to withdraw from the research you must inform the researcher by email (ptormey@tcd.ie). All collected information from your participation in the project will be removed immediately and will not be included in the research documentation.

There are no anticipated risks to your involvement in this research.

All questions are OPTIONAL and any question may be skipped.

This questionnaire contains 17 questions and should take no longer than 10 minutes to complete.

You may opt out of this questionnaire at any stage by clicking on the EXIT THIS SURVEY button on the top right-hand corner of your screen.

In the extremely unlikely event that illicit activity is reported I will be obliged to report it to appropriate authorities.

Page 1

The Flipped Classroom Post-Questionnaire for Students

***1. Participant Consent Form**

Project Title: An investigation into the introduction of the Flipped Classroom through a Virtual Learning Environment in a Further Education College (working title)

Project background: The purpose of this research project is to investigate how the Flipped Classroom can be introduced to a Further Education College through a Virtual Learning Environment (Moodle). The Flipped Classroom will incorporate technologies such as a Virtual Learning Environment (VLE) (Moodle) and Camtasia Studio.

Procedures: Before participating in this study you will be informed in person about the research. Information Sheets and Consent Forms will be distributed and and after the research you will be invited to complete a post-questionnaire online.

Publication: This research project forms part of a Masters Degree in Technology Enhanced Learning in Trinity College, Dublin. On completion, the findings of this research will be published and presented to a body of examiners in Trinity College, as well as external examiners. All data collected, including audio recordings will be anonymised and will not be identifiable to any individual. All data collected will be stored in compliance with the Data Protection Act 2003.

Declaration:

- **I am 18 years or older and am competent to provide consent.**
- **I have read or had read to me the information sheet and consent form.**
- **I have had the opportunity to ask any questions and have them answered to my satisfaction and I understand the description of the research that is being provided to me.**
- **I understand that I may ask any questions about the research project before, during and after my participation.**
- **I understand that I am under no obligation to take part in this project and that a decision not to participate will not affect my position now or in the future.**
- **I understand that I have the right to withdraw from this research project at any stage and that doing so will not affect my position.**
- **I agree that the information collected as part of this research may be available to others and understand that my identity will not be revealed.**
- **I understand that if I or anyone in my family has a history of epilepsy then I am proceeding at my own risk.**
- **I understand that any information relating to me will not be identifiable unless prior**

The Flipped Classroom Post-Questionnaire for Students

written permission is sought.

• I agree to be observed during this procedure.

• I understand that any recordings (i.e. audio, video or photographs) will not be identifiable.

• If I decide to withdraw from the project, all collected information from my participation will be removed and will not be included in the research documentation.

• I understand that I may request a debriefing session after the research has been carried out.

• I understand that any information I provide is confidential.

• I understand that any illicit activity on my part will be reported to the relevant authorities.

• I have received a copy of this agreement.

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

RESEARCHERS CONTACT DETAILS:

Patricia Tormey
e-mail: ptormey@tcd.ie
Mobile: 086-3438973

Please indicate your consent

◯ I consent to filling out this questionnaire

◯ I do not consent to filling out this questionnaire

The Flipped Classroom Post Questionnaire for Students

2. Did you watch the video/s relating to your subject?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

◯ Yes

◯ No

The Flipped Classroom Post Questionnaire for Students

The Flipped Classroom Post-Questionnaire for Students

3. How many times approximately did you look at the video/s?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Once
- ◯ 2-5 times
- ◯ 5-10 times
- ◯ more

Other (please specify)

4. Do you think this was a good way to learn about the subject?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Please feel free to add more information here

5. If you feel this was a good way to learn about your subject, please give a brief reason why...
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

6. If you feel this was NOT a good way to learn about your subject, please give a brief reason why...
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

The Flipped Classroom Post-Questionnaire for Students

7. Do you feel there are advantages to this method of learning?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Other (please specify)

8. If you feel there are advantages to this method of learning please list them here.
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

The Flipped Classroom Post Questionnaire for Students

9. Do you feel there are disadvantages to this method of learning?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Other (please specify)

10. If you feel there are disadvantages to this method of learning please list them here.
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

The Flipped Classroom Post Questionnaire for Students

The Flipped Classroom Post-Questionnaire for Students

11. Would you prefer to see the teacher present the information in the class rather than look at the video?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Other (please specify)

The Flipped Classroom Post Questionnaire for Students

12. Do you feel you learned more from the combination of the video and the teacher?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Other (please specify)

13. Do you feel you learned in a better way from the video than from the teacher?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Other (please specify)

14. Have you ever sourced videos on the internet to help you with your studies?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Other (please specify)

The Flipped Classroom Post-Questionnaire for Students

15. If you have never previously sourced videos on the internet to help with your studies, would you look for them after your experience with the video in the Flipped Classroom?

Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Other (please specify)

The Flipped Classroom Post Questionnaire for Students

16. Do you feel you had more time in the class to work on/discuss the subject?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Any other source

The Flipped Classroom Post Questionnaire for Students

17. Would you like the Flipped Classroom teaching method to be applied to other subjects that you are currently studying?
Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised.

- ◯ Yes
- ◯ No

Other (please specify)

Appendix 7: Ethical Approval

Patricia_Tormey_Research Documentation Inbox x

Patricia Tormey 07/11/2012

Hello, Attached please find my Research Ethical Application Form which has be...

Research Ethics <research-ethics@scss.tcd.ie> 09/11/2012

to me

Dear Patricia,

Thank you for your application. It has been reviewed and approved by the SCSS Research Ethics Committee. You may now proceed with this study.

We wish you success in your research.

Kind regards

Gillian

Appendix 8: Research Ethical Application Form

School of Computer Science and Statistics
Research Ethical Application Form

Details of the Research Project Proposal must be submitted as a separate document to include the following information:

1. **Title of project:**
   An investigation into the introduction of the Flipped Classroom through a Virtual Learning Environment in a Further Education College (working title)
2. **Purpose of project including academic rationale:**
   The Flipped Classroom refers to a teaching method where lectures are delivered to students in their own environment via video and assignments are completed in the classroom. This innovative method of teaching changes the dynamics of the learning environment. Rather than the traditional format of the classroom where the teacher stands in front of the students and presents a lecture, the lecture will already have been presented via video. This frees up time for the teacher to develop concepts within the classroom through discussion with the students. Assignments can then be completed within the class time and the teacher is on hand to help any student that requires assistance. Dixon states that *"the Flipped Classroom puts the homework first, focusing assignments on preparing students for the class"* (Dixon, 2012). Using this format it is possible to address the different learning abilities of each student. The stronger students can be encouraged to work through the concept at a deeper level, and the teacher can assist the middle and lower level students as required. The purpose of this study is to investigate if this innovative teaching method can be introduced into a Further Education Organisation and what the benefits may be. The Flipped Classroom teaching method is a transformation of the way teachers disseminate information and organise class activities (Pitler et al., 2012).
3. **Brief description of methods and measurements to be used**
   This research will be an exploratory case study as this allows for in-depth exploration of real-life events, small group behaviour and organisation and managerial processes (Kirk & Miller, 1986; Koshy, 2009). The methodologies will include both quantative and qualitative data. Quantative data will be collected from the real-time information procured from Moodle analytics. While quantative data provide statistical information, qualitative data will be used to analyse the effect of a Flipped Classroom both on the lecturer and the students. This information will be gathered via pre- and post-questionnaires, semi-structured interviews and Focus Groups.
4. **Participants - recruitment methods, number, age, gender, exclusion/inclusion criteria, including statistical justification for numbers of participants**
   The participants of this exploratory case study will be teachers within the college (both male and female). The invitation to take part in this research will be extended to teachers who are familiar with working within a Virtual Learning Environment, i.e. Moodle and those that have just attended an introductory course on Moodle. The teachers will be invited via e-mail. The rationale of the research will be outlined in this e-mail. Also within this e-mail is a link to a video and a PowerPoint Presentation hosted on Moodle which will explain the teaching method s of the Flipped Classroom. It is hoped that six to eight teachers will wish to partake in this research.
   In consultation with the teachers, a class of their students (approximately 20 per class) will be invited to take part. The researcher will visit these classes and will explain the rationale behind the research. These are post-Leaving Certificate students attending a Further Education College. Only students aged 18+ will be invited to take part. These students are both male and female. The rationale

behind the number of participants is a contingency plan to allow for unforeseen circumstances, i.e. ill-health, etc.

5. **Debriefing arrangements**

   Debriefing will take place at the end of the study, once all the data have been collected and analysed. This debriefing will take the form of a meeting with individual teachers to assess how the teaching method worked for them and the findings that came from the research. The researcher will visit each class to give an overview of the findings and to have a question and answer session with the students.

6. **A clear concise statement of the ethical considerations raised by the project and how you intend to deal with them**

   There are no ethical considerations to mention. However, the researcher declares a conflict of interest in that she works as an administrator in the Computer Department of the organisation. All participants will receive information sheets and consent forms which state that they can refuse to partake of the research and may also opt out of the research at any stage of the study.

7. **Cite any relevant legislation relevant to the project with the method of compliance e.g. Data Protection Act etc.**

   In compliance with the Data Protection Acts, 1988 and 2003, all data collected shall be anonymised and used solely for the purpose of this research study. It will be stored electronically and protected using encryption software.

Appendix 9: Consent form for College Principal

Consent Form

Research Project: An investigation of a flipped classroom in a Further Education organisation through the use of a Virtual Learning Environment

The College Principal has been provided with an outline of the research that will take place in the college, how data will be collected and stored and how the research can be contacted.

The Principal understands that she may withdraw the college from this research at any time should she wish to do so for any reason and without penalty.

Name of College

_____

Signature of College Principal

_____

Date _____

Statement of Researcher's responsibility: I have explained the nature and purpose of this research investigation, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the College Principal understands my explanation and has freely given informed consent.

Researcher's Contact Details_____

Researcher's Signature_____

Date:_____

Appendix 10: Consent Form for the Board of Management

Consent Form

Research Project: An investigation into the introduction of the Flipped Classroom through a Virtual Learning Environment in a Further Education College (working title)

The Board of Management has been provided with an outline of the research that will take place in the college, how data will be collected and stored and how it can contact the researcher.

The Board of Management understand that they may withdraw the college from this research at any time should they wish to do so for any reason and without penalty. All collected information from college's participation will be removed and will not be included in the research documentation.

Name of College:

~~~ College of Further Education

_____

Signature of Board of Management Chairperson:

_____

Date _____

Statement of Researcher's responsibility: I have explained the nature and purpose of this research investigation, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the Board of Management understands my explanation and has freely given informed consent.

Researcher's Contact Details_____

Researcher's Signature_____

Date:_____
~~~

Appendix 11: Samples of Coding and Theming:

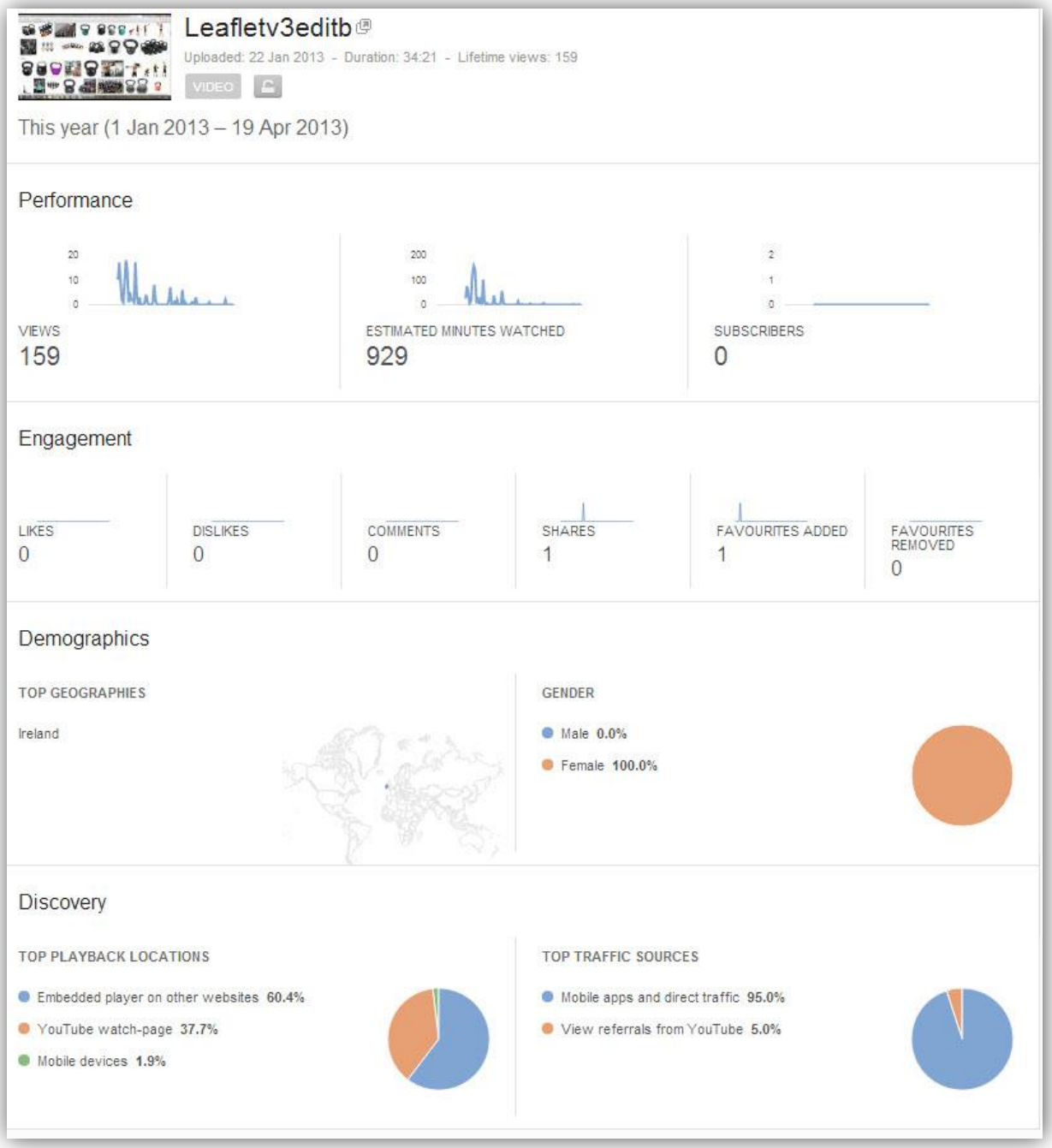
Sample of coding and theming with questionnaire returns.

Code: VIDEO		
Themes		
Ability to Understand	**Stop, Pause and Rewind**	**Go at your own pace**
I'm dyslexic so it's harder for me to read stuff off paper, so to see a video…	If you need clarification on a certain topic in class you can refer back to the video	
The video was good for me because English is not my first language and my friend helps me translate	It's a good way because you can consult the video any time you need to. Whereas a teacher is not always available	
It gave me a chance to understand the subject more	Everybody know what they have to do and always they can come back to video if they forgot something	
Can't ask questions	Because you can go back to it at any point if you're unsure about something and can pause, rewind etc at any stage, you can go at your own pace.	
You can't ask questions		
You'd want to ask questions but you couldn't cos computer screen's not gonna answer you back like	Can rewind to parts that I wanted to hear or see again, could go at my own pace	
	I watched the video twice, I thought this was a good way of learning. I could work at my own pace which was great. I could stop and start the video at any time and follow each step	

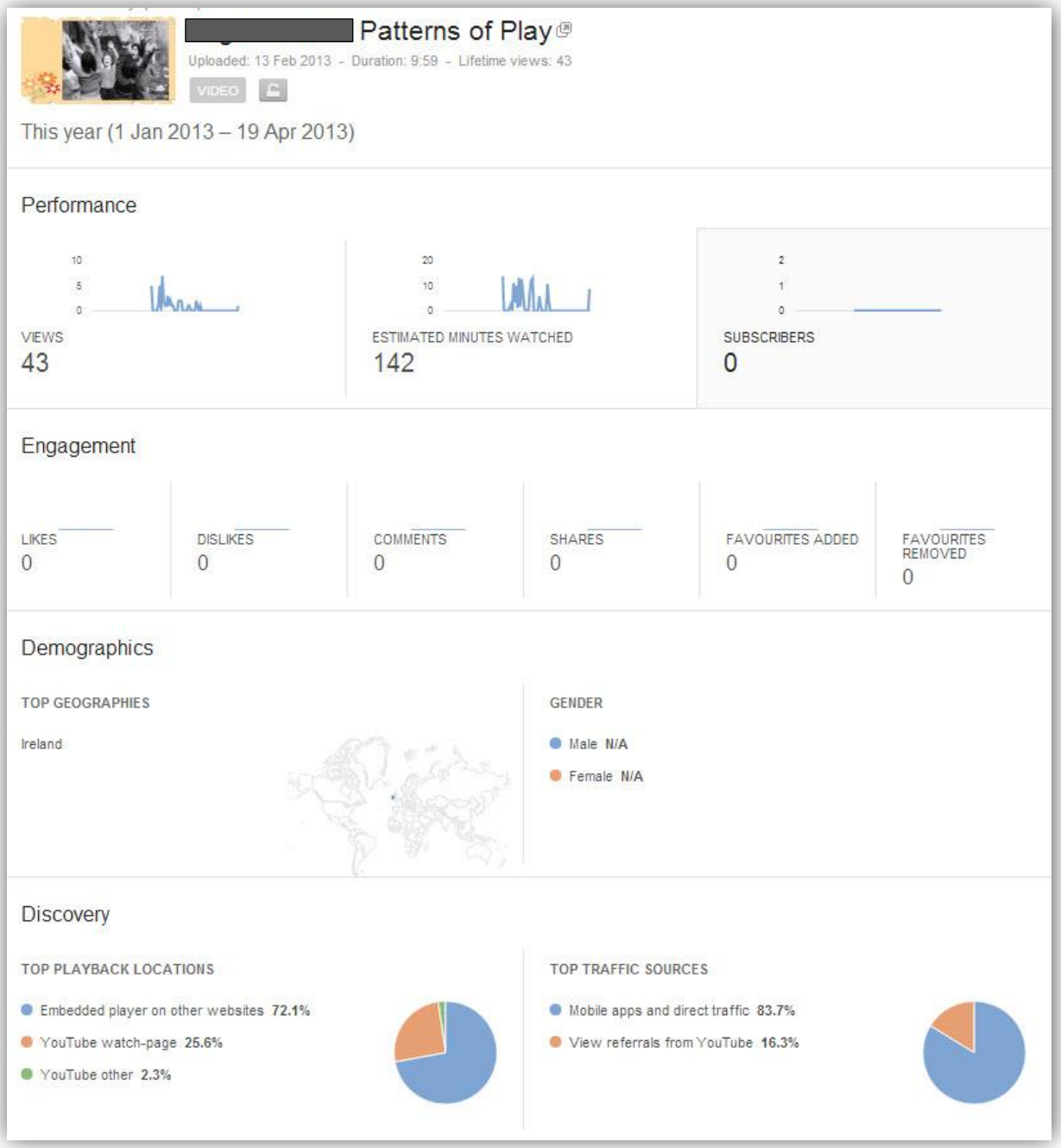
Sample of coding and theming with interviews:

R: So thank you very much for doing the interview… so a few questions here.	
R: How do you feel about implementing new teaching methods in general?	
T: I've no problem with implementing new teaching methods if I feel there're useful.	NEW TEACHING METHODS (NTM): No problem Only if useful
R: Em. Em.	
T: If there not, what's the point… so if I don't buy into the concept… I'm not going to do it… but if I feel it could be useful, I will.	(NTM) : Buy into the concept
R: What do you feel about the administrators' role in facilitating the teacher if you've to implement new teaching methods… So say about me, do you feel that there should be an administrator or a facilitator within the college that will help teachers…	
T: Yeah. I mean initially, I think you need that… you need somebody that you can go and ask advice of.. em… in relation to various things.. or if you're stuck, you know, to move on, or if there's some issue.. move on, so I think it's important initially to have an administrator and then after that you can probably get to grips with it yourself but initially there would probably be lots of questions,	ADMINISTRATOR (AD): Need somebody Ask advice If you're stuck Some issue Important initially Lot of questions
R: Yeah. So there should be some training involved if you wanted to pursue it any more.	
R: So, how did you think the students got on with the Flipped Classroom?	
T: I think it worked very well… they were able to go at their own pace, and they were able to go back and have a look at say something they missed or they weren't sure of or they couldn't remember… and so even if they were at home doing it they could just go on-line and look at the video and find out what they needed to know.	FLIPPED CLASSROOM (FC): Worked very well STUDENTS (STU): Go at their own pace Go back Weren't sure of Go on-line and look

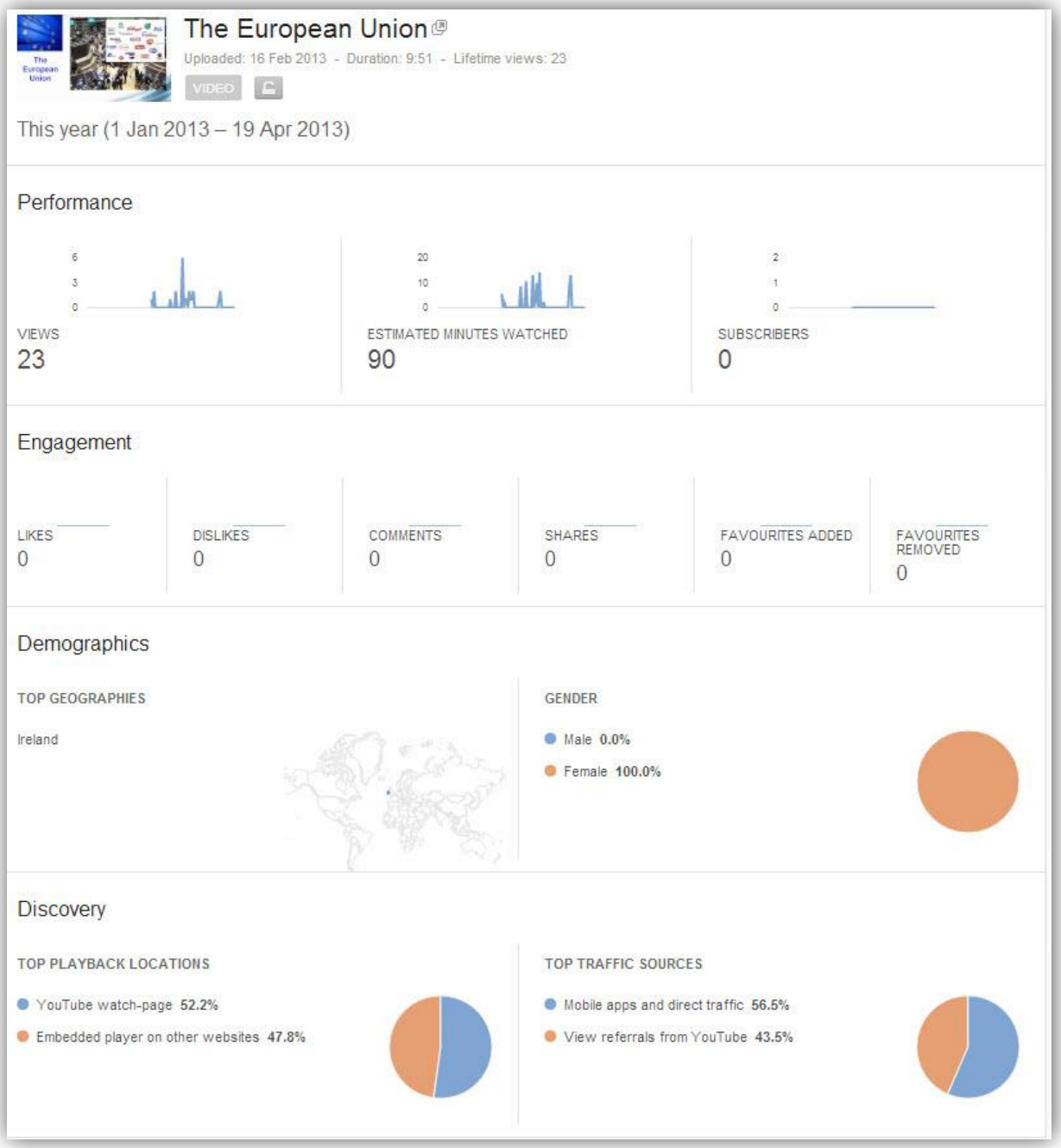
Appendix 12: YouTube Analytics – Cycle 1 - Leaflet



Appendix 13: YouTube Analytics – Cycle 2 - Patterns of Play



Appendix 14: YouTube Analytics – Cycle 3 – The European Union



Appendix 15: Positive comments Coding Table

Pause, Rewind and Refer back to the Video (14)	Refer back to the video; **Stop and start the video;** Can come back to the video; **Can go back and watch the video as many times as you want;** I could pause and rewind it; **Refer back to the video;** Can rewind to parts that I wanted to hear or see again; **go back on certain things whenever you need to;** you can look back at things quickly in the video if need be; **watch the video as many times as needed, pause it, rewind it, etc. at their own ease and speed;** I feel this was a very good way of learning because it means you can go back as many times as you want and if you're stuck you can go back and watch the video again; **If you don't understand in class least u can look over the video in parts you don't understand;** Yes, as you get information from home; **It's beneficial because it's in your own setting and you can watch it more than once if you don't understand something.**
Easy (6)	Easy to follow; **Easier;** Helped get through assignments easier; **Easier to learn visually;** Easier to write notes; **Easy to access.**
Learn (5)	good way of learning; **is very creative and innovative;** easier to learn visually; **good way;** easier to learn visually.
Work (6)	**work at my own pace which was great;** start your work as soon as you enter the class room and you can get a lot more done; **it worked;** could go at my own pace; **I was able to work through my assignment while looking through the video;** I think it worked perfectly.
Teacher (1)	Also, this allows the teacher to spend more quality time with each student.
Class-time (2)	Get more done when you're in class, and you can always log back in to see the video in the future if you forget anything and you can pause it to take notes; **I think it frees up class time to work on other things like assignments and also the videos can be left on Moodle so you can use them for study.**

Appendix 16: Negative comments Coding Table

Information (1)	Went into too much unnecessary detail at times.
Teacher (1)	Although the method of learning had the advantage of pausing/replay a particular section, any questions I personally thought relevant to the subject matter would still require a direct communication.

Appendix 17: Advantages Coding Table

Control (11)	Can be consulted as many times as necessary; **It can be paused, so you can do your assignment step, by step while consulting the video;** can be watched over and over until you get it, whereas looking back over particular steps are an advantage; **being able to rewind, fast forward to the information you require. go through and stop it as you go along;** the video is great as you can go back rewind and forward any information you may needed; **again that I could pause and rewind and take notes at your own timing;** In the future we can come back and watch again; **This method allows to spend more time in class implementing the knowledge acquired while watching the video at home. That leads to more production in class and speeds up the whole process of learning how to create many useful things;** 1.Saves time. 2. You can do it at home; You can always go back and watch for tips; You can watch it as many times as you like; **Frees up class time, can be used for studying, can be used for information on assignments;** The method has the advantage of setting a self-pace at self-convenience regarding time.
Ubiquitous access (7)	**anytime learning. easily available. clear and concise;** Can access at any time Very clear Very straight forward Works very well for me; **it was clear and easy to use;** Its easy to access; **A new way of learning Work at my own pace;** clear and concise; **It is clear and concise.**
Learn (3)	anytime learning; **A new way of learning Work at my own pace; -learn at your own pace -you have something to go to if you forget something -it is a change from learning in the classroom;** it is compared with private studies and whenever we have time to access we can by just using the internet and not having to travel to college to study
Work (5)	**The way the tutorial was done you could do your own work along with it easily enough. I found this an advantage;** Works very well for me; **Can leave more time in class for doing the project. Also lets you get to grips with the project at your own pace;** Work at my own pace; **Yes you can work at your own pace**
Teacher (1)	a teacher can only be asked so many times before they lose patience!
Miss a Class (3)	Yes because you may miss a class or happen to miss something the lecturer said so it's good to have as a back-up; **The video is always there if you need, if you miss a day you can catch up on your work. It can be reused again in a teachers' perspective;** Help from home. Any questions can be asked in the next discussion;

Appendix 18: Disadvantages Coding Table

Teacher (6)	If it's not also explained to a certain extent in class some students might not be able to get to grips with it. There is also a lot of scope for these videos to go wrong. If something is ambiguous in the video or if there's a technical fault within the video it screws up more as the student can't ask a video to clarify something.
	Sometimes you still need help and it's good to have a teacher there if you get stuck or need ideas.
	Direct contact regarding Q&A brings forward relevant issues which may not be addressed at the time of making. Insights to subject matter most usually come through communication.
	If you are unsure about something in the video, there is no-one around to help you understand the issue.
Time (3)	You have to make time during the week outside of college to sit down and watch the video in full and take notes. It can be very hard to find the time especially if you have other assignments to do.
Access (2)	Some people may not have access to this information; some people may work better in class than watching a video. Might not have internet access all time, network could be down, sound could be broken on speakers.

Appendix 19: Differential Learning Data samples.

(Utterances 38 x teacher, 27 x students)

DIFFERENTIAL LEARNING	
Teacher	**Student**
"... they were able to go at their own pace, and they were able to go back and have a look at something they missed or they weren't sure of or they couldn't remember... and so even if they were at home doing it they could just go on-line and look at the video and find out what they needed to know."	*"You see that's the problem because he goes really fast sometimes and we miss notes so with that you could pause it and take notes and play it again, whereas here he writes it and then he wipes it and then he writes it and then... with the video though you can get a brief notion of what he's talking about so when he does start writing notes you've seen it so you know what he's talking about."*
"Not everybody learns the same way and I think today people definitely need different ways of learning the material and we need to make it more stimulating and more visual."	*"You can stop and do something."* *"Pause it... cos everybody has their own speed, you know."*
"People learn at different paces, you know... some people will learn fairly quickly. They're computer literate or they just have a natural affinity for computers, so they will learn it quickly, whereas others, they will need to go over and over it maybe three or four times before they grasp what they're supposed to be doing."	*"But you can always go back. Cos you tune out after about five minutes when somebody's talking so if you watch video you can pause it at any time and then go back to it if you want."*
"Weaker students don't feel disadvantaged because they can actually sit at home and bring themselves up to scratch so when they go to class they look like they know what they're talking about it, in turn it's going to give them confidence. And the confidence may actually help them in the future to grasp something a lot quicker because they think 'Oh yeah, I can do it'."	*"When the teacher is explaining it your attention is split between the teacher and you trying to do it simultaneously and if you're lost for a second or two, you know, you kind of keep asking questions again. It was a good way – you know, you can stop, rewind..."*

Appendix 20: Technology Data samples.
(Utterances 36 x teacher, 43 x students)

TECHNOLOGY	
Teachers' Reaction	**Students' Reaction**
"I think today we live in a world of stimulation. When we look at the advertising campaigns, everything that comes from the environment to us, the technologies that now exist… I mean the world has become a smaller place and I think that the students today have grown up in that world. They're called Generation Z, the digital era, they were born in 1995 so anybody born in those years has come into this digital era and they've known nothing but technology."	*"It's easier in the way like that if you're going to research something for a project, or an assignment, you don't have to go through a load of books or newspaper articles… on the internet and even the scholar sites as well so you know it's proper…"*
"It's another way of just giving them, if you like - access to material." *"If that's what will bring them into the kind of 21st century and that's the support they need… then obviously I'm going to do what they need."*	Referring to YouTube: *"Well, I think they are… probably because I'm dyslexic anyway, so it's harder for me to read stuff off paper, so if I see a video it gets in my head quicker, so I've used YouTube a lot to look up things."*
"I didn't use this kind of technology. I was using YouTube and videos and things just to make it more interesting."	*"Yeah, I think technology is great, but I think you kinda have to have the time to understand it, you know, to move forward, you know you have to move with the kids,"* (Mature student)
"All I'd use was other people's YouTubes and stuff like that. I'd never thought of it… It wouldn't even have occurred to me to record myself and even put it on a DVD and bring it in and play it… it just didn't even occur to me… so it gave me a whole new idea, which is brilliant.	

Appendix 21: Time in the classroom Data samples.

(Utterances 17 x teacher, 16 x students)

TIME IN THE CLASSROOM	
Teacher	**Student**
"They seemed to enjoy the experience and they were happy… they were actually very comfortable with the whole concept of watching the video and then asking me more detailed questions or I'd go around and help them."	*"Cos you're more ready as soon as soon as you come in, you have a good idea of what you're doing you could get straight into it."*
"Because sometimes what happens is the students that were in on that particular day you show it… so you might do it about four or five times… so those other four times are wasted in a way, because you could be going round to them individually … the ones that have been there throughout the whole thing have got to listen to this over and over and over again… so it's like Groundhog Day for them. And I think it can be slightly irritating for them because you have to spend your time bringing these others up to speed who couldn't be bothered to come in and I think it's fairer this way." *"It gave me more time to go around to them individually and help them out that way… and also I felt it was useful that students that had missed the particular lesson could just go online and look at it and I didn't need to keep repeating it."*	*"You probably feel a bit more prepared when you come in. You sorta know what you're doing and if you're not sure, instead of disturbing someone else or waiting on the teacher to come around you could just watch the video again."* *"I actually found it easier this way, cos you kinda felt like you were getting a one-to-one, whereas there, if you turned around for a minute and took your mind off it you were suddenly lost and it requires a lot of concentration, so I felt that doing it this way, for me, was better. Well, I mean it's good that she's here… but I actually preferred it without the teacher."*
"… that was something they seemed to be struggling to understand… they just didn't get what those words meant… and then they were able to watch that at whatever speed they wanted, or how many times they needed to see it so rather than somebody sitting in here and not knowing what I'd talked about they were able to look at it again and again until they got it… and you would have a lot of students who wouldn't ask. They wouldn't know what you were talking about and they wouldn't ask you to explain it. But this way they could play it back and listen to it again."	*"It gives you knowledge before you come to class so that you're informed when the teacher starts talking so you can have a more informed discussion about whatever the thing is about…and then you can expand on it… you're getting more work done and more areas covered because it can be expanded on from what you've seen."* *"Or you're just being shy and asking… you know, so you're just trying to catch up or whatever."*
"They were more familiar with the phrases I think and the ideas and just to explore them further."	

Appendix 22: Assignment Data samples.

(Utterances 8 x teacher, 19 x students)

ASSIGNMENT	
Teachers' Reaction	**Students' Reaction**
"... they all seemed to get it then, which is brilliant and from teaching this in other places I know that that's the thing I'm asked about... a lot."	*"What I mean like, if I had to do an assignment at home like, that would be... and it was on a subject like that or whatever... I'd find... I would find that now... very helpful... definitely now.*
"So what would normally happen is that they would e-mail me when I'm at home... so I could get maybe five, six e-mails in the evening of assignments that I have to go through... so I'd go through all of those and then the next evening they're back again... so that's constant and it would be over the weekend or whatever. So this way, they could ask me those questions in class... because they had the groundwork done... so it meant I got a much less e-mails at home, asking me... so that was a great benefit for me."	*"That's like what I was saying like, if you had an assignment and you're getting stuck, you could just go in to Teacher and listen to her little voice..."* *"The other thing I think it would be helpful for is when you're doing assignments... to review... cos that's like the whole class, right there, like you're not looking for your notes... ah I have the notes for that... but what else did he say, what was that other thing he said?"*
"Several people had at least done that... (the assignment) and so several people were able to contribute to the conversation. Even the people who didn't even very much engage with it before, but by hearing other people in the class talk about it they got more out of it than if it just had of been just me."	*"It gave you hints and tips for an assignment because I got stuck and then she was talking through things and I got ideas."* *"When you're doing your assignment and you YouTube an independent video on the topic and you might give the teacher something that, yeah, they know, but it mightn't be something they want to hear from you, where if they did the Flipped Classroom they're telling you nearly what they want to hear back in their assignments... you know you're getting more of what they want so if you're giving what your examiner is asking for, it's better all round."*

Appendix 23: Positive Comments Data samples.

(Utterances 41 x teacher, 64 x students)

REACTION TO THE VIDEO – POSITIVE COMMENTS	
Teachers' Reaction	**Students' Reaction**
"The work goes on beyond the classroom and I think this facilitates that. I think the Flipped Classroom facilitates that."	*"I was interested and I was saying I could relate to this at home, somebody talking to me."*
"The way we learn has changed… the way we consume our materials have changed, I think for the younger generation, they like the visual." *"The greater advantage of the FC from what I can see is they have more time to consume the information."*	*"No, I'd rather look at a video… because when you're reading nothing's going in half the time, only little bits are, the bits you find interesting, if you know what I mean?"* *"You can go back and watch the whole thing again. You know, and that would be great for all the different parts. Especially like, politics, there's a lot of dates and a lot of names to remember."*
"Where I see that working is that, it's something that you can record, they can then access it… sitting on a bus, coming into college…" *"So they can also stop, start, stop start as they want… and move on as they want you know as they picked up some of it."*	*"You can go back and watch it whenever you want."* *"If you're in class you kinda go off topic whereas that took ten minutes and it would have taken longer to do it in class and you actually concentrate."*
"… for people who may not be able to come to all the classes, but want to still keep learning if things can be done on the computer for them or in another medium that they can access it." *"The advantages are… I mean everything people will say, they can access it in their own home, so if they're sick, they're not in, they're minding their baby brother, they're even working, which is what the reality of their lives is, if the ones who got used to it… they can access their education outside of here."*	*"If you're not in you would have an idea of some of the work… like if there was no video you wouldn't have a clue then…what do be doing because you'd be behind probably."* *"It's good if you were out sick for a week or so. And to look back on the videos and catch up… sort of saying, or to remind you."* *"Or you're just being shy and asking… you know, so you're just trying to catch up or whatever."*

Appendix 24: Negative comments Data samples.

(Utterances 10 x teacher, 35 x students)

REACTION TO THE VIDEO - NEGATIVE COMMENTS	
Teacher	**Student**
"The disadvantages I suppose were that we couldn't make people go onto it and watch it."	*"I didn't like the writing... I didn't like that whole writing thing... for me it's either the writing or the person talking... I couldn't be doing with the two."* *"I watched it for a few minutes... I can't watch something once I don't like it."*
"You would have feedback from the students and you would have questions and answers, it didn't cater for that, it was a one-way communication process and maybe that weakened it a little bit."	*"You can't ask anything. Like if you're stuck you can't really ask..."* *"She mightn't ever be in front of you though, you know, like in the video where if she's just talking to you, you'd want to ask questions but you couldn't, 'cos computer screen's not gonna answer you back like."*
"It's obviously time consuming in terms of doing the video, but I don't think there are any major disadvantages to me."	*"I struggled last night for time to actually fit that in and watch it."* *"I just can't be doing with that. I like coming into class and I like lists, getting my notes on paper and listening to your class... to me... now I'm not a computer person."* *"But if you're not on the train or the bus and you don't have a 3G phone."*