Abstract

Research indicates that teenagers and young adults of second level school age in Ireland are increasingly immersed in world of technology. Online video accounts for much of their time spent online, and is often used for education purposes. While Irish government initiatives such as the Digital Strategy for Schools (2015 – 2020) aim to encourage integration of technology in the school system, exposure to technology continues to occur predominately outside the school setting. This study begins by examining this context, paying particular attention to the growth of online video. Following this the educational value of video is discussed, along with strategies and tools for its integration in the classroom. In the methodology section, the process of integrating digital video into eight second level classes is explained, including trainee teachers involvement. Findings presented indicate that second level students predominantly value the use of digital video as a learning tool due to its motivational value, ability to explain concepts and provision of examples and real world scenarios.

Keywords: Online video; Digital Video; Second level teaching; Digital learning, Secondary Schools Teaching.

Introduction & Context

The pervasiveness of digital technology in modern society (Martin, 2005) is particularly prevalent with teenagers and young adults who make up the second level school population in Ireland. Digital media permeates every facet of their lives through mobile phones, laptops and tablets, with text, audio and video files being created and shared with ease. This cohort of students, often referred to as 'digital natives' (Prensky, 2009; Buckingham, 2007), engage with technology on a daily basis through social media and online video sites such as YouTube (Guzzetti *et al.*, 2010). At present, the impact of technology on learning continues to occur mainly outside of the school setting (Collins & Halverson 2009). However recent government initiatives such as the Digital Strategy for Schools (2015 – 2020) aim to encourage the deeper incorporation of ICT throughout the school system in Ireland. Bourgonjon *et al.* (2010) showed that students' attitudes towards technology in education were affected directly by its relevance to learning opportunities.

This suggests that teachers must review and develop their own pedagogy, in order to allow students to actively engage with digital technology and to utilize it as an effective learning tool. This study involved a team of trainee second level teachers from a range of subject disciplines integrating digital video in their classrooms, to investigate its impact on the student learning experience.

The use of online video by teenagers and students in second level education has increased dramatically in recent years (Redecker et al, 2009; Purcell, 2010) with the average teen spending roughly three hours per month watching online video. Kyncl (2016) predicts that by 2020, online video will account for 90% of all internet traffic. Contrary to popular belief, students are engaging with online video for their studies, with 38% of all views on YouTube relating to educational content (Redecker et al, 2009; Purcell, 2010). As teachers, the researchers involved in this study wanted to investigate ways of taking online video from the periphery of their teaching practice and exploit the medium to its full potential (Stoddard, 2015).

A growing body of research supports the integration of video in classroom settings, indicating that it can be used in a variety of ways to improve the overall learning experience for students. For example, digital video storytelling encourages students to create a video story and share it with others According to Jenkins et al. (2009), "digital storytelling is one mode of twenty-first century learning. When designing, shooting and evaluating the videos, the students acquire knowledge that is related to their video topics" (Niemi & Multisilta, 2016).

There are a number of characteristics of video which contribute to its motivation and engagement value (Koumi, 2013). Jonassen (2000) argues that students display increased motivation and engagement when learning is supported by video content "due to the multimodality of the videos" (p. 208). The multi-media nature of the format is capable of drawing on a wider variety of students' intelligences (Gardner, 2000), such as verbal/linguistic and visual/spatial, providing greater opportunities for engagement with material being presented. This symbol-rich medium which contains elements such as moving images, narration and sound effects (Koumi, 2006) can "have a strong effect" on students "mind and senses" (Berk, 2009:2) and has been shown to grab and hold students' attention and keep them focused on content (Choi & Johnson, 2010). The motivational and engagement value of video is also linked to the emotional connection it can create between students and content under study. Soini (1999) defines emotional involvement as "Feelings of personal, emotional connectedness to a subject" (p. 84). Video can allow students to witness and experience emotions associated with various situations (Koumi, 2013), communicating deeper interpersonal aspects of scenarios (Berk, 2009) which can promote social thinking and awareness of different social perspectives (Allen, 2005). These emotional aspects can motivate students to engage with and discuss different belief systems and motivations, piquing curiosity and interest in topics (Alessi & Trollip, 2001).

Research also indicates that video has cognitive value. Cognition is "the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses" (Oxford

Dictionaries, 2014). Koumi (2013) defines the cognitive value of video content as "adding value through explaining complex processes, using real world examples, and demonstrating key skills" (p. 3). Denning (1992) noted that video is a powerful tool in breaking down complex ideas and explaining them to students, this is especially relevant when visual representations are used to explain complex concepts (Donnelly *et al.,* 2011), where these can "convey concepts in ways that the book or lecture simply cannot" (Mardis, 2009:250). For example, Jackman and Robert (2013) suggest that video supports students' initial understanding of key concepts when compared to print and still image formats. Hoover (2006) also found that using video clips prompted engagement and questioning which reinforces the class's understanding of the topic.

Video also has the potential to have a positive impact on experiential learning. Kolb's (1984) concept of learning style is based on his theory of experiential learning, referred to as the Experiential Learning Model (ELM). Kolb's work reflects Lewin's theories (dialectical tension between analytical thinking and concrete experience), Piaget's research (developmental studies), Dewey (experiential learning), and Jung (ideas of types and non-preferred modes of learning) (Kolb, 1976). Experiential Learning Theory (ELT) defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (Kolb, 1984, p. 41). Koumi (2013) defines experiential learning as "vicarious experiences which are achieved by showing or documenting phenomena that would otherwise be inaccessible" (p. 32). Experiential learning, in the context of video, is concerned with opening up learning environments and bringing in the outside world, the unreachable areas, the impossible experiments and the past. This facilitates a change in learning from thinking abstractly about concepts, to environments where students can experience things for themselves.

Video can be used as a tool as part of a constructivist pedagogy. Schell and Janicki (2012, p. 28) explain that "constructivist proponents believe that the process of determining the correct answer for oneself, or at least formulating an idea and thinking about the question, is a very important aspect of the learning process." "In the constructivist learning environment, students are encouraged to actively engage in learning: to discuss, argue, negotiate ideas, and to collaboratively solve problems; teachers design and provide the learning context and facilitate learning activities" (Ruey, 2010, p.707 citing Palinscar, 1998). The use of video in the classroom can also be linked to Vygotsky's (1978) Zone of Proximal Development and the use of tools and symbols in social learning processes.

Allen (2005) maintains that video makes events, people and concepts more alive to students, which can ignite emotion and promote abstract and long-term thinking. Moskovich and Sharf (2002) argue

that this connection with the outside world aids in the "concretisation" of student learning by enabling "students to make the connection between theory and real life situations" (p. 61 – 62). Not only is the valuable in itself but researchers such as Stephen (2015) suggest that these experiences also improve student understanding of text book content. In addition, video can provide students with alternative viewpoints and perspectives from which to draw upon. For example, Hakkarainen *et al.* (2007) used videos as case studies for students taking part in an online management course. They found that almost 87% of students felt the video content helped them to "understand the different perspectives related to the topics under study" (p. 106). YouTube and other forms of digital video can help include and introduce diverse and alternative perspectives in the classroom (Fleck et al, 2014; Berk, 2009; Hakkarainen et al, 2007).

While authors such as Morain & Swarts (2012) suggest that students turn to sites such as YouTube to engage with subject content, others such as Zhang *et al.* (2006:25) and Snelson (2008:235) argue that its value in classroom scenarios depends heavily on how video is integrated into lessons. Moskovich & Sharf (2012) and Berk (2009) identify key strategies for active engagement with video as: Linking video content to overall learning objectives; preparation questions to guide students' attention to certain aspects or themes; pausing and replaying sections for in-depth discussion; building in reflective activities; facilitating group discussion; and designing follow-on activities which encourage deeper understanding and integration of content. Mitra *et al.* (2010) and Jonassen (2000) suggest linking strategies which connect student learning to other knowledge such as: existing knowledge and skills; real world context and practical examples; related contexts and possibilities; and provide access to experts in the field. The teachers engaged in this study endeavoured to put some of these strategies into practice and analyse the results.

Many previous studies have examined the use of video as a means to increase student engagement in lectures at third level institutions and provide alternative sources of information for students. However, little research has been conducted at second level in Ireland. This paper aims to examine the impact of video as a learning tool in a variety of second level classrooms, drawing on the perceptions of both students and teachers from a range of subject areas.

Methodology

The research is presented through a qualitative case study which uses practice, student questionnaires and teacher reflection as methods and triangulation as a tool to "secure an in-depth understanding of the phenomenon in question" (Flick, 2002, p. 227). The case study using qualitative methods can record the perspectives of stakeholders and participants, engaging them in the process while simultaneously representing different values and interests in the case under study (Simons, 2009, p. 18).

Sample

This sample was purposeful in that the research was carried out by trainee teachers on placement as part of a Professional Masters in Education. Purposive or purposeful sampling describes the process of selecting research participants on the basis of their relevance to the research (Gibson and Brown, 2009, p. 56). Teachers were given a choice in topics for research and eight teachers on placement in seven second level schools in Ireland chose to explore the use of video in the classroom. The teachers participated in two workshops provided by the researcher on how to use video in class. They were given a background into why video is useful, how it should be used, and the kind of learning it can promote. They were shown strategies of integration, and selecting and managing content building on research by Moskovich & Sharf (2012) and Berk (2009).

Students were completing their coursework as part of a range of subjects during the normal school day. Classes were compulsory and taught by their respective teachers over three to four 40 minute classes per week. The various samples were: First year geography, 28 students; First year history, 23 students; First year geography, 25 students; First year French, 22 students; First year business studies, 30 students; Fourth year business studies, 25 students; Second year religious education, 25 students; Third year history, 27 students.

Description of process

Throughout the term a commitment was made to provide students with video segments in their classes. In order to do this, teachers conducted searches on popular video sites, such as YouTube (http://www.youtube.com) and TED (http://www.ted.com). Once a number of videos were located, they were viewed in full multiple times, and evaluated in terms of their content quality, relevance to subject, and relevance to students. This involved finding content that provided different perspectives, viewpoints, and information for students; or contained information that was visually stimulating, or would prompt discussion. Videos were used as a support to student learning and were as varied in their content as the curriculum being covered by individual teachers at the time. For example, the geography curriculum being covered investigated how rivers are formed and as

such, videos depicting river formation were used; the history teacher was covering ancient Egypt and as such, videos on ancient Egypt were used; the French teacher was covering everyday life in France and as such, videos depicting life in France were used.

After appropriate content was located, teachers prepared to use them in class. This involved a number of stages. First, important sections of the video were selected which could be highlighted to emphasise key points, or encourage discussion. Once important sections were selected, content was sequenced with lesson plans, and integrated into the introduction, development, or conclusion of a topic or class. Following this, a number of pre and post questions were developed. These questions formed an integral part of how videos were incorporated into the class. For example, during a history class on the bronze age, students were first given an overview of the bronze tools, then shown a video of casting a bronze sword. This was followed by discussion questions which encouraged students to gain a better understanding of the process and the tools involved. Additionally, post questions were used to check understanding. Similarly, during a geography class, students were shown a video on 'why rivers curve' then asked to write down on a question sheet where the erosion and deposition took place.

Instruments

Data collection was carried out using two data collection tools. First, data was gathered from students using a written questionnaire. Data gathered was a mixture of qualitative and quantitative information. No personal details were elicited from students and questionnaires were kept anonymous. The questionnaire contained questions under four themes adapted from the literature (Moskovich & Sharf, 2012; Berk, 2009) to gain students views on the effectiveness of video in the classroom. The themes were: Content; Learning; Engagement; and Integration. Under each of the themes a number of statements were presented to students who rated their level of agreement (1=strongly disagree, 2=disagree, 3=don't agree or disagree, 4=agree, 5=strongly agree) and provided qualitative data to support their answer. For example, under the content theme, question statements included "videos were easy to understand" and "videos were relevant to the topic". Under the learning theme, question statements included "Watching video helped me understand the topic more than only using the book" and "Watching video helped me to see what the things we read about in class mean in real life". Under the integration theme, question statements included "Watching the video at the beginning of a topic helped to improve my understanding of the topic", "Watching the video with questions helped to improve my understanding of the topic" and "Pausing the video and discussing it, helped me to see how it related to the topic". Following each of the question statements, students were provided with a rating scale and space to explain and elaborate on their answer.

Semi-structured reflective journals were developed alongside the questionnaires given to students. These were used to gather the teacher's thoughts on the integration of video in the classes. Teachers were asked to make note of any reflections they had in terms of the 'content' they had selected, the 'learning' achieved, the level of 'engagement' and how successful the 'integration' was. For example, teachers were encouraged to reflect on the content of videos by asking "Was the content suitable for the students and topic? Was video the most suitable method to teach this aspect of the topic?" Under engagement teachers were encouraged to reflect by noting "Students were attentive during the video? Students were interested during video? Classroom Management was good/bad during video?" Under integration, teachers were encouraged to reflect by noting "Was the timing and sequence of the video in the lesson suitable? Were the questions assigned with the video a suitable challenge? Was the approach used to integrate the video effective i.e. worksheet, introduction, conclusion?" These teacher reflections formed an integral part of the research process (Glaser & Strauss, 1967) and are used to support the findings presented from student responses.

Procedure

Students attended their classes as part of their normal school day. Questionnaires were distributed at the end of term and reflective journals were completed by teachers throughout the term. Out of the 205 students, 197 completed questionnaires were returned, giving a response rate of 96%. All eight teachers who took part in the study completed reflective journals.

Data analysis

The data collected for this inquiry was analysed in two ways. Numerical data in the student questionnaires were analysed using simple statistical analysis. Qualitative data from students and teachers' reflective journals was analysed using the constant comparative method (Glaser and Strauss 1967 in Maykut and Morehouse 1994:126). This process involved analysing the data for patterns in the keywords and phrases present in student responses and teachers' notes. As categories emerged, rules of inclusion were developed to ensure consistency in each category. If a piece of data did not meet the rules for inclusion, a new category was created. This process was repeated until clear categories were present.

Findings and discussions

Key themes and findings are now presented using qualitative and numerical data from questionnaires and teachers' reflections, followed by overall conclusions and recommendations. Findings are presented using the themes contained in the questionnaire distributed to students and are supported by statistical data collected, student comments and teacher reflections.

Content

In this section, students' impressions of the video content used in classes will be presented and discussed, along with teachers' reflections. This section considers students' ratings and comments on how easy video content was to understand and how relevant they felt it was to the topics.

Part of this project focused on developing teachers' understanding of how to select and use the correct content for students in their respective subject areas, ensuring that content was suitable for their audience and relevant to the topic at hand, following guidelines set out by Berk (2009). Feedback from the students in each of the classes indicates that teachers were successful in this regard. As shown in Figure 1 the vast majority of students either agreed or strongly agreed with the statements "videos were easy to understand" and "videos were relevant to the topic"
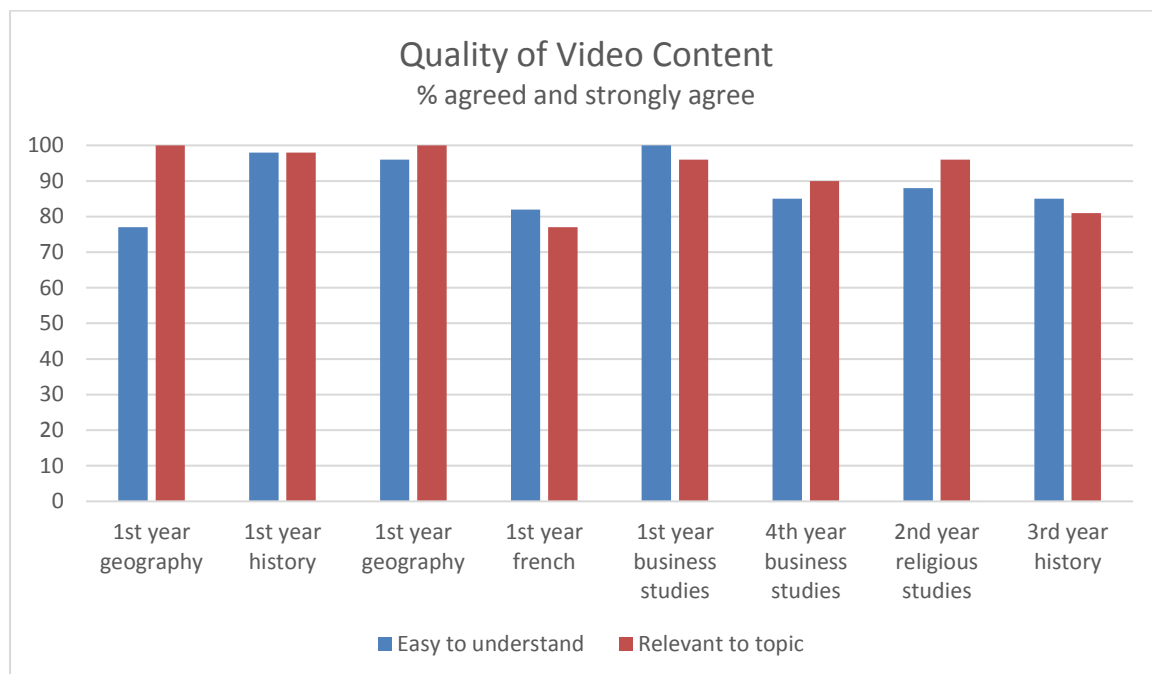

Figure 1 – Quality of video content

In terms of understanding, students' feedback included the visual nature of video, the provision of examples, and the ability to repeat sections. Many students said that videos were easy to understand due to their visual nature. For example, a student from the 1st year geography class said that 'sometimes just learning about it in class is harder to understand but when you watch videos you get to visually see what's going on', while a 1st year history student said 'videos really help me to learn and help see what is going on in that time', suggesting that the ability to visualise content improved understanding. This data supports Gardner's (2000) theory of multi intelligences and that the multimedia nature of video content draws on a wider variety of student intelligence such as verbal/linguistic and visual/spatial providing opportunities for deeper engagement.

Other students said that the provision of examples helped them to understand. For example, a student from the 1st year French class said 'They help us in class by showing you and giving examples of what we are doing'. Similarly, a student from the 4th year business studies class said that 'showing us how entrepreneurship works on video made it easier to understand, because it shows what it is rather than telling us'. These comments indicate that examples help students to understand theory in practice. These findings support Koumi's (2013) assertion that video can support experiential learning and Allen's (2005) finding that video makes events, people and concepts more alive to students. Others said that repetition was an important factor in helping them to understand. For example, a student from the 1st year geography group said the videos helped because the section of the video could be replayed and they could 'keep going over the words'. Other students said that video was an alternative to text-heavy approaches. Excerpts from the teachers own reflections support much of the student comments outlined above. For example:

> I noted that students generally paid greater attention to the video content than to textbook content. Moreover, video facilitated the process of repetition (a key aspect of language acquisition) (1st year French teacher)

> My reflections highlighted how digital video worked effectively in teaching the topic of the consumer as I documented how the video allowed the key tips to be "broken down into meaningful parts" to pace the delivery of information thus making it easier for students to follow (1st & 4th year Business teacher)

In terms of relevance, students' feedback was very focused on the links between the video used and the topic being discussed in class. As can be seen from Figure 1, the vast majority of students across the subject groups felt that videos were relevant. For example, a student from the 1st year geography class said 'they were about what we were learning', while students from the history class said the videos 'were always on topic' and the teacher had 'clearly identified objectives'. Similarly, a student from the religious studies class said that the video helped them to 'work with the topic'. This data suggests that the evaluation of content is important in ensuring students see its relevance to topics, and that the teachers in the study were successful in this regard.

The data above demonstrates that when teachers employ basic strategies for the integration of video into the classroom, their students recognise the quality of the content and how it links to the topics under discussion. This finding supports contentions by Zhang et al. (2006:25) and Snelson (2008:235) that the value of video in classrooms depends on how effectively it is integrated into lessons.

Learning

In this section, students' impressions of video as learning tool are presented and discussed, along with teachers' reflections.

Learning value of video
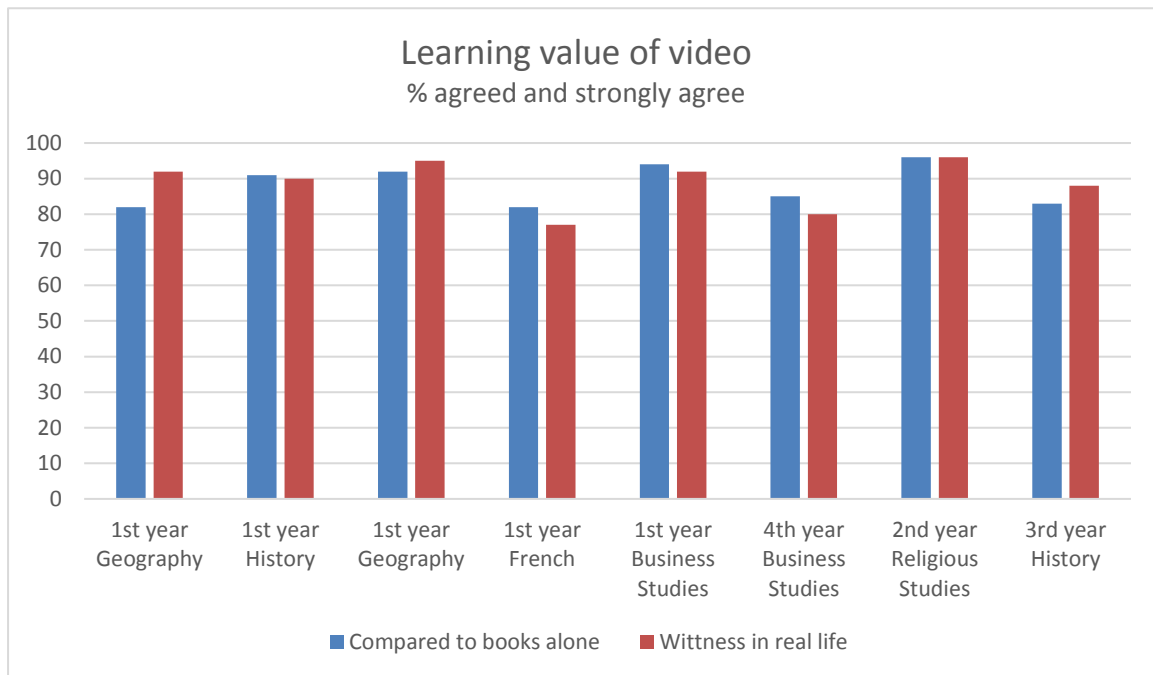#### % agreed and strongly agree

Figure 1 - Learning value of video

Students were asked to respond to the questions: "Watching video helped me to understand the topic more than only using a book", and; "watching video helped me to see what things we read in class mean in real life". As can be seen from figure 2, the vast majority of students agreed with these statements. In terms of video helping students to understand more than the book alone, a range of student comments shed some light on the reason for their choices. The most prominent theme present in student responses was that video helps them to understand topics more by allowing them to visualise information. For example, a student in 1st year geography said 'I think that both help me but videos make it easy to visualise in my head', similarly a student in 4th year business studies said 'it's sometimes hard to understand the examples written in the book and it's easier to remember what happened in the video'. Students also said that video helped them to understand content because it brings it to life. For example, a student in 3rd year history said that 'it brings it to life, when they act it out in the video'. Specific to students from the 1st year French class, was the ability to hear the language and see the language being spoken. For example, students said 'the videos show how the words are pronounced in French' and 'it's nice to see the language being used rather than

reading'. Excerpts from the teachers own reflections support much of the student comments outlined above. For example:

> I asked students to close their eyes and raise their hands to try receive a more accurate representation of who understood the concept of convection currents generating from the earth's core, the results of which were quite poor with the minority of the class raising their hands. I then played a YouTube clip taken from the BBC documentary film 'Earth The Power Of The Planet'. The clip had excellent visuals about the earth's inner workings and structure. I again asked for a raise of hands and the results were very impressive with the majority of the class maintaining they understood following the visual aid (1st year geography teacher)

In terms of video enabling students to see what topics mean in real life, students again provided a range of comments. The majority of comments mirrored the questions by stating video provided them with real life examples of their subjects. For example, a student from the 1st year French group said 'yes because I saw how a French school worked', a student from the 4th year business group said video provided 'a better understanding of business and provides examples of real life situation' with another emphasising the point by saying 'there is no point in learning something in class if you don't know how to use it in real life, especially in business studies'. Many students also commented on the positive impact of the visual nature of videos. For example, a student from the 1st year geography group said 'the moving images helped me to understand how these things move'. Excerpts from the teachers own reflections support much of the student comments outlined above. For example:

> I observed how a 3 minute YouTube clip could communicate so much more than a textbook, as in the example of the video of the teenager making crepes. During that particular lesson, not only did the students learn the relevant vocabulary, but they were able to watch a French family interacting naturally within a home setting and to hear what French sounds like within that context. Thus, one brief video clip incorporated linguistic, cultural and social elements (1st year French teacher)

The above data suggests that video content helps student learn in a range of subjects. The visual nature and the ability of video to provide real life examples, helps students to visualise information and bring subjects to life by providing examples from which they can learn. Student comments further suggest that they were able to "concretise" the learning and "make the connection between theory and real life situations" (Sharf, 2002).

Engagement

In this section, students' impressions of the engagement value of video is presented and discussed, along with teachers' reflections.
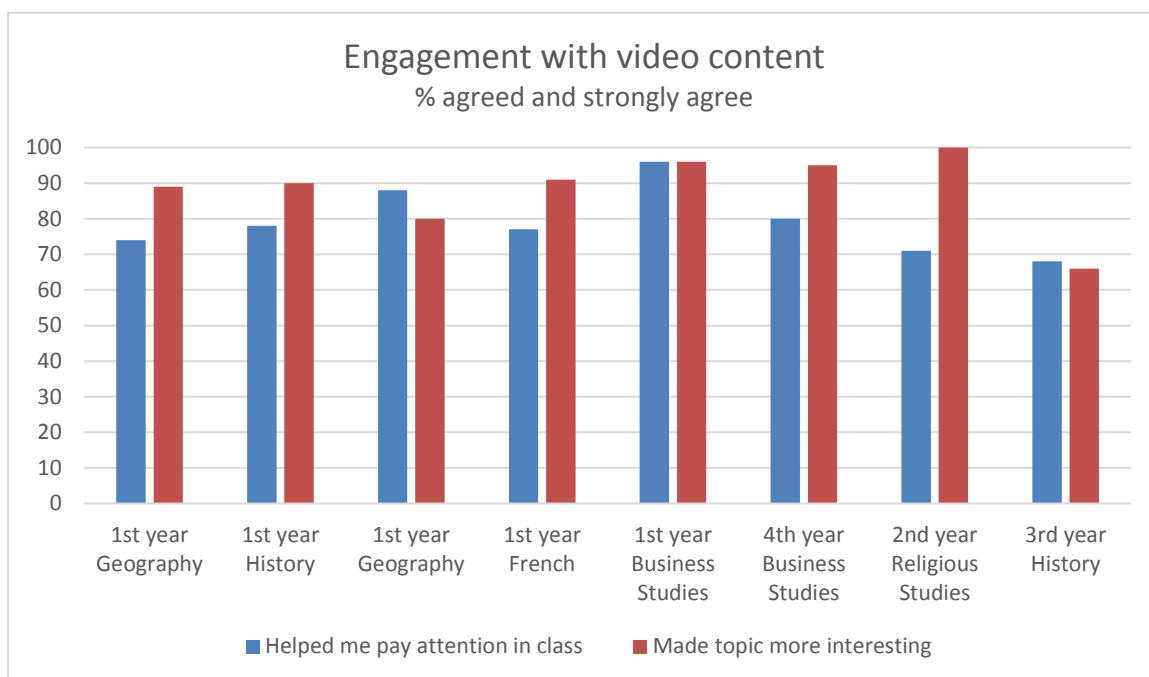
Figure 2 - Engagement with video content

In this section, students were asked to respond to the questions: Watching video helped me to pay attention in class, and; watching video made the topic more interesting. As can be seen from Figure 3 above, the pattern remains the same as in previous sections i.e. video had a positive impact on the engagement of students in class across the subject domains. Students stated that video helped them to pay attention in class. They commented that video was more interesting and enjoyable, which made it easier to pay attention. This data appears to support Kuomi's (2006) assertion that video as a symbol rich medium can have a "strong effect" on students "minds and senses" (Berk, 2009:2). Students from the 1st year history group talked about wanting to know 'what will happen next' indicating that the narrative aspect of video was important in keeping their attention. Students also mentioned that they were less likely to get distracted when watching video content, with a 4th year business student saying "watching videos help me pay attention in class normally when you are using the book you get distracted with others around you and when you are watching videos you pay more attention". Others mentioned that the entertainment value helped them to pay attention, saying "I strongly think that it helps I feel like when I watch something catchy or entertaining I don't forget, rather than sitting down reading and underlining everything!" This sentiment of increased attention was noted in the French teachers own reflections saying:

My personal reflections during class corroborate this, as I observed that some of more easily-distracted students were much more engaged by video than by textbook or by audio material. During classes where video was employed, there were almost no instances where I had to remind students to stay on task (1st year French teacher)

For the second statement "watching video in class made the topic more interesting", many of the student comments echo what has been said previously. Students said that video made the topic more interesting because the "animations and narrating make it more interesting", because "it was cool to see what was happening instead of reading it", because "it was fun to watch" and "I feel like when I watch something catchy or entertaining I don't forget, rather than sitting down reading and underlining everything".

A Religious Studies teacher noted in his reflections:

[Engagement] This can be a difficult issue to address in the classroom setting. Pupils' taste in video cannot be accounted for, but it should certainly be considered. It should be noted that in the teacher reflections during the lessons with video there were no classroom management issues. It was repeatedly noted that pupils were paying attention to the video and were not distracted or focussed on anything but the video. In the lesson given on 8 January, it was even noted that while classroom management was an issue during the lessons, pupils 'quietened down' and 'paid attention' as the video was shown (1st year Religious Studies teacher).

However, not all reflections were positive, and some teachers experienced some problems with attention depending on the type of videos that were shown to the group:

The majority of the time the videos were received successfully but there were times when it was noticeable that students were not engaging with them. This was usually down to a fault with the video. It was either too advanced for some of the students or just not that exciting: 'The last video was too fast for the students....I stopped the video as I could see that the students were struggling. It is a good video but maybe a bit too complex and fast for most of the students'. There also seems to be an optimal time limit for holding the concentration of the majority of the class while watching a video. It would appear that once you go over five minutes it is harder to keep everyone's attention.

The data above shows that the vast majority of students and their teachers found that using video content helped them to pay attention in class and made the topics more interesting. However, some teachers noted issues which indicate caution is advised when using video. It is essential that videos

are relevant to the cohort and the kind of video selected will not only be interesting to them but will also contain an appropriate level of challenge and difficulty. The notes of caution advised by teachers echo Berk's (2009) suggestion that if video is to be "used as a teaching tool, criteria must be established for what is appropriate and acceptable in a teaching-learning context" (p.6). He further suggests three types of criteria (a) the students' characteristics, (b) the offensiveness of the video, and (c) the video structure.

Integration

In this section, strategies of integration of video will be analysed and discussed, drawing on data from student questionnaires and teachers own reflections. Figure 4 below presents the experience of the students from eight class groups of watching and pausing video during subject lessons.
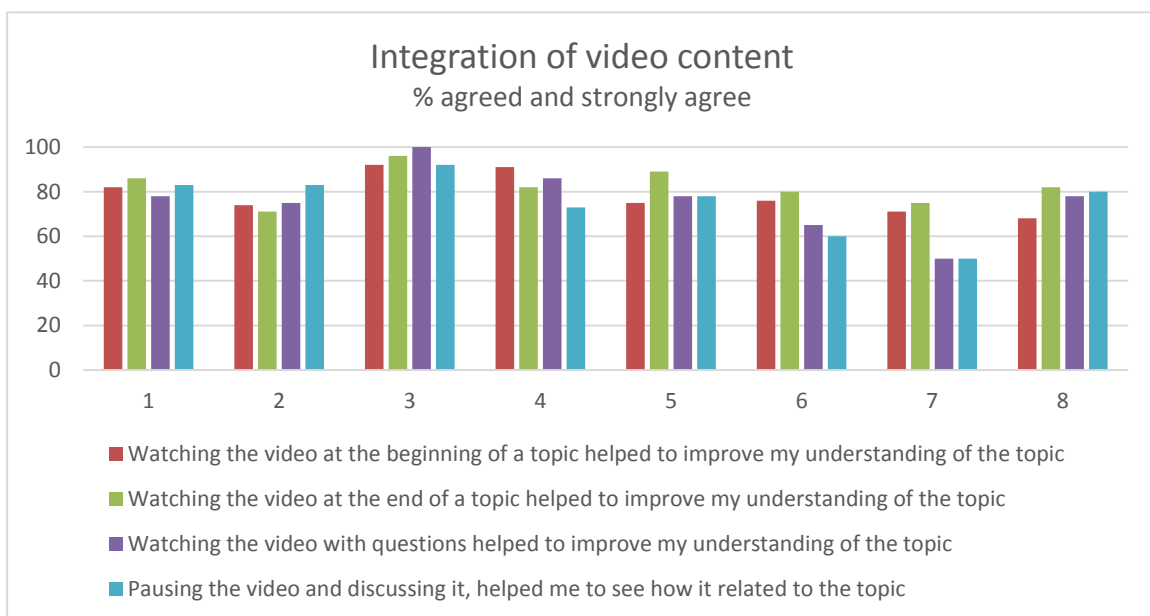

Figure 3 - Integration of video content

In this section, students were asked to respond to the questions: Watching the video at the beginning of a topic helped to improve my understanding; Watching the video at the end of a topic helped to improve my understanding; Watching the video with questions helped to improve my understanding; Pausing the video and discussing it helped to improve my understanding. As can be seen from Figure 4 above, students provided a variety of responses, which will now be elaborated upon using excerpts from their qualitative responses. Students predominately agreed that watching video at the beginning of a topic improved their understanding. Their comments indicate the playing video at this time prepared them for learning about a specific topic. For example, a student in the 3rd year history class said "it gave me an insight [into] what the chapter was going to be about".

Similarly, a student from the 1st year geography class said: "the start is always confusing so this way is easier", suggesting that video helps to clarify they key points before beginning a topic. Students also agreed that watching video at the end of a topic improve their understanding. Their comments indicate that playing video at this time helps to summarise information and clarify the key points. For example, a student in the first year geography class said "it helps me to remember" while a student from the 2nd year religious studies group said "it summarises the topic in a few minutes". The majority of the groups responded very positively to the use of questions alongside video. A student from 1st year geography commented that "It made me remember what I was learning", a 1st year history student said "it tested me to see if I understand" and a 1st year French student said "it makes me pay more attention when there are questions". However, the religious studies students responded significantly less favourably to this question. This less positive response can be attributed to the difficulty in concentrating on the video and questions at the same time. For example, one student said: "I couldn't concentrate on what was going on in the video". Finally, there was general consensus among the groups on the value of pausing video for discussion. For example, a student from the 1st year history group said "if you don't understand something you would if the teacher paused it and discussed it in [their] own words". Similarly, a student from the 1st year French class said "if I don't understand I can ask".

The data above shows that each of the integration strategies has their merits. Using video at the start and end of a lesson can help students to prepare for learning and summarise learning respectively. The use of questions can work well to promote engagement, listening and concentration on the topic. However, students' comments indicate that this should be done in such a way that allows students time to write answers or respond to questions without having to watch content at the same time. This may be alleviated by the inclusion of the final integration strategy, which involves pausing and discussing topics and issues raised during a video. Students appear to appreciate the ability to ask questions, clarify issues and gain the teachers input during these moments. The use of video as a teaching strategy supports Mayer's (2001) research into a cognitive theory of learning in that "the contiguous presentation of verbal and visual material as in videos with integrated dialogue or narration is most effective for novices and visual learners".

Conclusions and recommendations

The purpose of this study was to work with a team of teachers across a range of subject areas to investigate the value of video content with second level students in Ireland. Data was gathered from students and their teachers around the four key areas of content, learning, engagement and integration. Findings indicate that when teachers select appropriate content, students recognise its

relevance and how it links to the topics under discussion. Findings also suggest that video can help students learn in a range of subject, brining subjects to life through visualisation and real life examples. Comments from students and teacher reflections also support the engagement value of video, with data indicating that video content helps students to pay attention in class and makes content more interesting and engaging. Video content works well as an introduction and conclusion to topics across subject areas, however attention need to be paid to how and when questions are used, with pausing video for discussion being the preferred option.

Limitations

This study was conducted with seven teachers, across eight class groups, covering seven different subject areas. The intention was to conduct a pragmatic study of the use of digital video in second level classrooms, gathering student and teacher impression of the impact. However, larger scale studies may be needed if claims are to be made about the value of video in wider contexts. It was not possible to access student results which restricted the researcher's ability to judge the effect of video as a teaching strategy on educational achievement. The teachers own subject areas were chosen so that the use of video could be implemented and evaluated in practice. A study which includes a broader range of subjects, encompassing students from a wider range of levels in the second level system may yield different results and experiences. Finally, academic literature on the use of online video in the second level school system in Ireland is sparse. As research in this area progresses, new alternative themes for study may emerge which were not addressed in this paper.

References

Alessi, S., & Trollip, S. (2001) Multimedia for learning. Boston: Allyn and Bacon.

Allen, M. (2005). 'It is as it was': Feature film in the history classroom. *The Social Studies,* 96 (2), pp.61-67.

Berk, R. A. (2009). Multimedia teaching with video clips: TV, movies, YouTube, and mtvU in the college classroom. *International Journal of Technology in Teaching and Learning*, 5(1), pp.1-21.

Bourgonjon, J, Valcke, M, Soetaert, R & Schellens, T. (2010). Students' perceptions about the use of video games in the classroom. *Computers & Education,* 54 (4) pp.1145–56.

Buckingham, D. (2007). Digital Media Literacies: rethinking media education in the age of the Internet. *Research in Comparative and International Education*,*2*(1), 43-55.

Choi, H. J., & Johnson, S. D. (2010). The effect of context-based video instruction on learning and motivation in online courses. *The American Journal of Distance Education,* 19(4), pp.215-227.

Collins, Allan and Halverson, Richard. (2009). Rethinking Education in the Age of Technology: The Digital Revolution and Schooling in America. New York: Teachers' College Press.

Denning, D. (1992). Video in theory and practice: Issues for classroom use and teacher video evaluation. Victoria: InNATURE productions.

Department of Education and Skills (2015). Digital Strategy for Schools 2015-2020 – Enhancing Teaching, Learning and Assessment. Available from: https://www.education.ie/en/Publications/Policy-Reports/Digital-Strategy-for-Schools-2015-2020.pdf [accessed 01/02/2016].

Donnelly, D., McGarr, O., & O'Reilly, J. (2011). A framework for teachers' integration of ICT into their classroom practice. *Computers & Education,* 57(2), pp.1469-1483.

Fleck, B. K. B., Beckman, L. M., Sterns, J. L., and Hussey, H. D. (2014). YouTube in the Classroom: Helpful Tips and Student Perceptions. *The Journal of Effective Teaching,* 14(3), pp.21-37.

Flick, U. (2002). Qualitative research-state of the art. *Social science information*, 41(1), pp. 5–24.

Gardner, H. (2000). Can technology exploit our many ways of knowing? In D. T. Gordon (Ed.), The digital classroom: How technology is changing the way we teach and learn. pp. 32–35. Cambridge, MA: President and Fellows of Harvard College.

Gibson, W. and Brown, A., (2009). Working with qualitative data. London: Sage Publications.

Glaser, B.G., & Strauss, A.L. (1967). The discovery of grounded theory. Chicago, IL: Aldine.

Guzzetti, B., Elliott, K., Welsch, D. (2010). DIY Media in the Classroom: New Literacies Across Content Areas. New York: Teachers College Press.

Hakkarainen, P., Saarelainen, T., & Ruokamo, H. (2007). Towards meaningful learning through digital video supported, case based teaching. *Australasian Journal of Educational Technology,* 23(1), pp.87 – 109.

Hoover, D. S. (2006). Popular Culture in the Classroom: Using Audio and Video Clips to Enhance Survey Classes. *The History Teacher*, 39 / 4, pp.467–478.

Jackman, W. M., & Roberts, P. (2014). Students' Perspectives on YouTube Video Usage as an E-Resource in the University Classroom. *Journal of Educational Technology Systems,* 42(3), pp.273-296.

Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robinson, A. J. (2009). Confronting the challenges of participatory culture: Media education for the twenty-first century. Chicago, IL: The MacArthur Foundation and London: The MIT Press.

Jonassen, D. H. (2000). Computers as mindtools for schools: Engaging critical thinking. Upper Saddle River, NJ: Prentice-Hall.

Kolb, D.A. 1976. *Learning style inventory*. Boston: McBer and Company.

Kolb, D. 1984. *Experiential learning*. Englewood Cliffs, NJ: Prentice Hall.

Koumi, J. (2006). Designing Video and Multimedia for Open and Flexible Learning, New York: Routledge Falmer.

Koumi, J. (2013). Designing video and multimedia for open and flexible learning (second edition). Routledge.

Kyncl, R. (2016). YouTube's CES Keynote: Four Reasons Why Digital Video Will Win the Decade Youtube. Las Vegas: Youtube.

Mardis, M. A. (2009). Viewing Michigan's digital future: Results of a survey of educators' use of digital video in the USA. Learning, *Media and Technology,* 34(3), pp.243-257.

Martin, A. (2005). DigEuLit–a European framework for digital literacy: a progress report. *Journal of eLiteracy*, *2*(2), pp.130-136.

Mitra, B., Lewin-Jones, J., Barrett, H., & Williamson, S. (2010). The use of video to enable deep learning. *Research in Post-Compulsory Education*, 15(4), pp.405-414.

Moskovich, Y., & Sharf, S. (2012). Using films as a tool for active learning in teaching Sociology. *The Journal of Effective Teaching*, 12(1), pp.53-63.

Niemi, H. & Multisilta, J. (2016) Digital storytelling promoting twenty-first century skills and student engagement, *Technology, Pedagogy and Education,* 25(4), 451-468,

Niemi, H., Harju, V., Vivitsou, M., Viitanen, Kl, Multisilta, J. and Kuokkanen, A. (2014). Digital Storytelling for 21st-Century Skills in Virtual Learning Environments. *Creative Education*, 5, pp.657-671.

Oxford Dictionaries. (2014) Oxford University Press, n.d. Web. 20 April 2014.

Prensky, M. (2009). H. sapiens digital: From digital immigrants and digital natives to digital wisdom. *Journal of Online Education*, *5*(3), pp.1-9.

Purcell, K. (2010). The state of online video. Washington, DC: Pew Internet & American Life Project.

Redecker, C., Ala-Mutka, K., Bacigalupo, M., Ferrari, A., & Punie, Y. (2009). Learning 2.0: The impact of Web 2.0 innovations on education and training in Europe. Final Report. European Commission-Joint Research Center-Institute for Prospective Technological Studies, Seville.

Ruey, S. 2010. A case study of constructivist instructional strategies for adult online learning. *British Journal of Educational Technology,* 41(5), pp. 706–720.

Schell, G.P., and Janicki, T.J. 2012. Online Course Pedagogy and the Constructivist Learning Model. *Journal of the Southern Association for Information Systems*, 1(1), pp. 26-36.

Simons, H. (2009). *Case study research in practice*. London: Sage.

Soini, H. (1999). Education Students' Experiences of Learning and Their Conceptions about Learning Disabilities: Tow*ards a Comprehensive Theory of Learning.* Oulun yliopisto.

Stephen, S. (2015). Enhancing the learning experience in finance using online video clips. *Journal of Financial Education*, 1(1), pp.103-115.

Stoddard, J.D. (2012). Film as a 'thoughtful' medium for teaching history, *Learning, Media and Technology*, 37:3, pp.271-288, [online] Available at: ttp://dx.doi.org/10.1080/17439884.2011.572976 [Accessed on 20/12/15].

Vygotsky, L. (1978). Mind in society. Cambridge, MA: The MIT Press

Zhang, D., Zhou, L., Briggs, R. O., & Nunamaker Jr, J. F. (2006). Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. *Information & Management,* 43(1), 15-27.