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Investigating Digital Literacy: How Undergraduate Students Collaborate To Integrate Video into Their Coursework

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Abstract

This paper reports on a study aimed at examining how undergraduate students source and integrate online video into a group assignment. The paper investigates how groups used the sharing and commenting features of a video retrieval system (VRS) to accomplish this task. Participants were 56 undergraduate students enrolled in an education degree. The data in the study were obtained through reflective pieces and online interactions. Findings show that when provided with the tools, strategies, and context to do so, students sourced and shared a range of content related to their work, communicating effectively around digital video. Students used the features of the video retrieval system to recommend content to their group, and share opinions on how video content was relevant to their assignment. Students also demonstrated an ability to understand, synthesise and integrate content as it related to the design, development, and delivery of their group presentations.

Keywords: Collaboration; Digital literacy; Online video; Video retrieval systems

Introduction

The ubiquitous availability of digital content online has increased interest at policy and academic levels in how students source, interact with, and integrate digital content into academic work. The popularity of online video in particular is well documented, with more than 82% of 18 – 29 year olds regularly visiting the online video sharing platform YouTube [1]. While research into students self-reported digital literacy skills is readily available [2-5], studies which examine digital literacy in practice are less common. This paper addresses this gap by investigating how small groups of undergraduate students collaborate to source and integrate online video into an academic task, with the aid of a custom video retrieval system. In order to fully investigate this area, this study begins by examining a number of interrelated themes.

Theoretical Framework

The internet and web technologies are transforming the way we work and learn [6]. In this context, digital literacy is recognised as an essential skill for 21st century living [7] and lifelong learning [8]. Digital literacy is concerned with an individual's ability locate digital content online, evaluate content in terms of its relevance and quality, and integrate this content into their work [9,10]. This is encapsulated well by [11] original definition of digital literacy as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers" (p. 1). Authors such as Kim [12] suggest that digital literacy is also concerned with the skill of using digital tools to collect and share content, and construct new meaning based on the information located. Similarly, Churchill [13] asserts that a key component of digital literacy is the ability to use digital content to address an authentic problem. Discussions on what it means to be digitally literate draws on other strands of research, with some [14] arguing that digital literacy conflates to a number of 'literacies of the digital'. These include ICT literacy – basic computer skills; Media literacy – interpreting media practices; Information literacy – locating, evaluating and using information; New literacies – understanding information presented on social media sites and mobile devices; and Critical literacy – evaluating the purpose and motivations of media productions. A variety of framework exists in the literature which bring together definitions of digital literacy

and associated constructs. Kurtz and Peled [15] propose seven domains of digital literacy: Information collection – gathering and locating information effectively and efficiently in an electronic context; Information evaluation – evaluating the quality, relevance, and usefulness of digital resources; Information management –the ability to organise, store, and retrieve data; Information processing – the ability to design or create new knowledge from information already acquired; Teamwork – sharing information, collaborating and communicating with others; Integrity awareness – ethical use of information gathered; Social responsibility – understanding how to behave in digital contexts. Ng's [16] digital literacy framework draws together three intersecting dimensions of digital literacy: Technical – the operational ICT skills to use technology for learning; Cognitive – the ability to locate, evaluate, and create information using digital tools; Social-emotional – using digital tools to communicate and socialise. In the context of this study we understand digital literacy as the ability to access digital information, evaluate information in terms of its relevance and quality, understand multiple forms of information, synthesise and integrate information, and collaborate and share information in digital settings.

Previous research indicates that video has a broadly positive impact on the student learning experience [17-22], particularly when used to support traditional teaching [23-25]. The multi-modal nature of video can improve motivation and engagement by holding student interest and attention [26,27], stimulating multiple senses [28,29], and developing an emotional connection with topics [30]. The nature of video means that complex concepts can be viewed multiple times and sections can be repeated [31,32]. Video allows students to slow down difficult content, speed up easy sections [33,34], and even pause or stop the video to take notes or reflect on content [35]. Real world examples and demonstrations can be introduced [36], where ideas can be witnessed rather than explained, and can be broken down step-by-step for the viewer [37]. Video has the power to provide students with access to phenomena that would otherwise be inaccessible. Natural and historical events can be viewed, when they may otherwise remain hidden [38]. Students can be exposed to alternative viewpoints and opinions, which can have a positive impact on their understanding [36]. Notwithstanding the potential learning benefits of video, attention must be paid to the way it is used in the teaching and learning process [39]. Work completed by a wide range of authors [40-43] suggests that realising the learning value of video involves linking video to authentic learning tasks where students' attention is guided towards specific aspects or themes. These tasks should involve reflection on video content, establishing links to current knowledge, and provide students with opportunities to integrate video content into their work.

This study aims to bridge a gap identified by authors such as Churchill [13], Lankshear and Knobel [44,45] and Bhatt et al. [46] by capturing and analysing digital literacy in practice, while simultaneously deepening our understanding of how students can use video content to support their academic work [42].

Methodology

To address the aim of the study outlined above, students were tasked with creating a group presentation, the design of which was to be informed by video content made available through a custom video retrieval system. The system contained sophisticated video search functionality and custom video sharing features designed to support students in their task. Following completion of their work, students were asked to reflect on their experiences with using these features and with using video content to support the development of their presentations. Figure 1 summarises this process and further details are now presented for the reader.

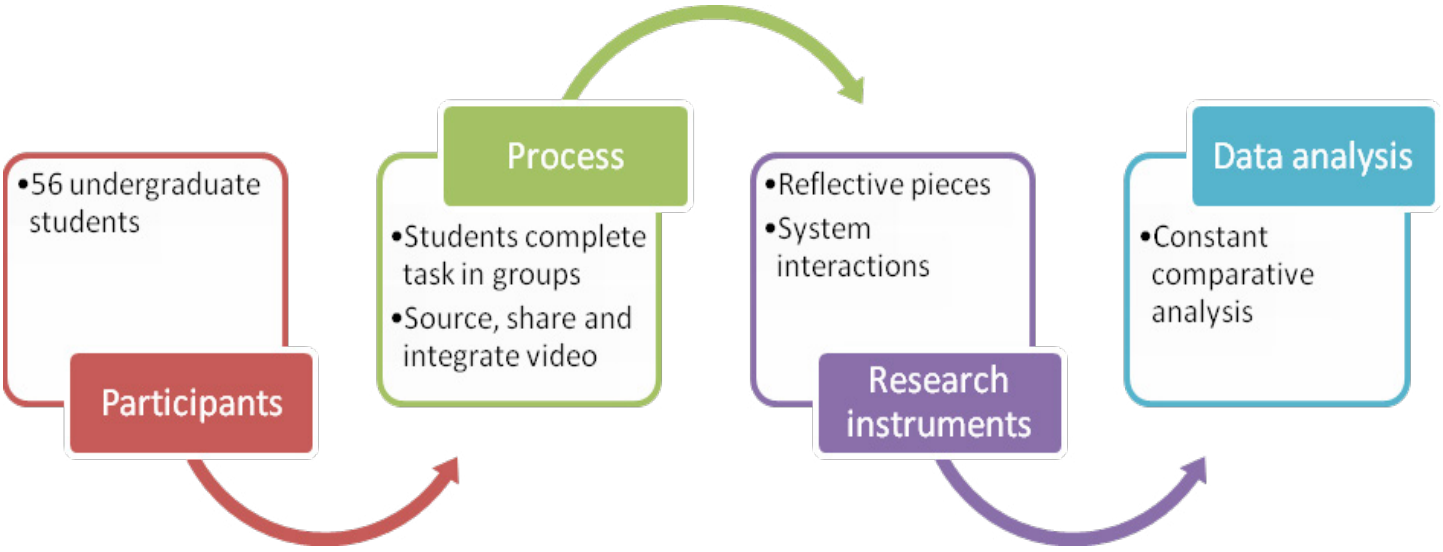

Figure 1: Research process.

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Participants

This study was conducted in the Institute of Education at Dublin City University. Participants (n=70) were studying for a B.Sc. in Education and Training. The module being undertaken was 'Social and Personal Development with Communication Skills', which is delivered during semester one of first year. The aim of the module is to support independent learning, encourage social interaction, develop critical thinking and reflective skills, and help students to recognise their own strengths and weaknesses as they relate to academic life. Module topics included 'goal setting', 'time management', 'learning styles and learning strengths', 'creativity and creative thinking', 'communication skills', 'conflict management' and 'stress management'.

Description of process

In order to investigate digital literacy in practice, a group assignment was developed which encouraged students to work together to source and integrate online video into their work. Students were required to complete a group assignment on one of the following module topics: personal learning & goal setting; learning strengths & learning styles; time management; creativity; stress management. To accomplish this, students sourced material from academic books and journals, and lecture notes. However, when dealing with the design and delivery of their presentations, students were asked to rely exclusively on video content that was hosted on a custom video retrieval system (VRS), and on lecture notes. Over 120 videos were made available on the VRS, from which students could obtain information on the design and development of their presentations. This content was drawn from a number of sources: University video; TED talks; training material; television content; YouTube channel content. Video content was reviewed by the researcher to ensure relevance and quality.

The VRS included a number of technical features which aimed to improve both the sourcing of relevant video content and the use of this content for group work. Video search was powered by a combination of content-based analysis and video segmentation, whereby the actual content of the video (not just the title and related metadata) was analysed and returned as a list of relevant segments. In contrast to sites such as YouTube where users are presented with entire videos as search results, students in this study were presented with a list of short, relevant video segments (Figure 2).

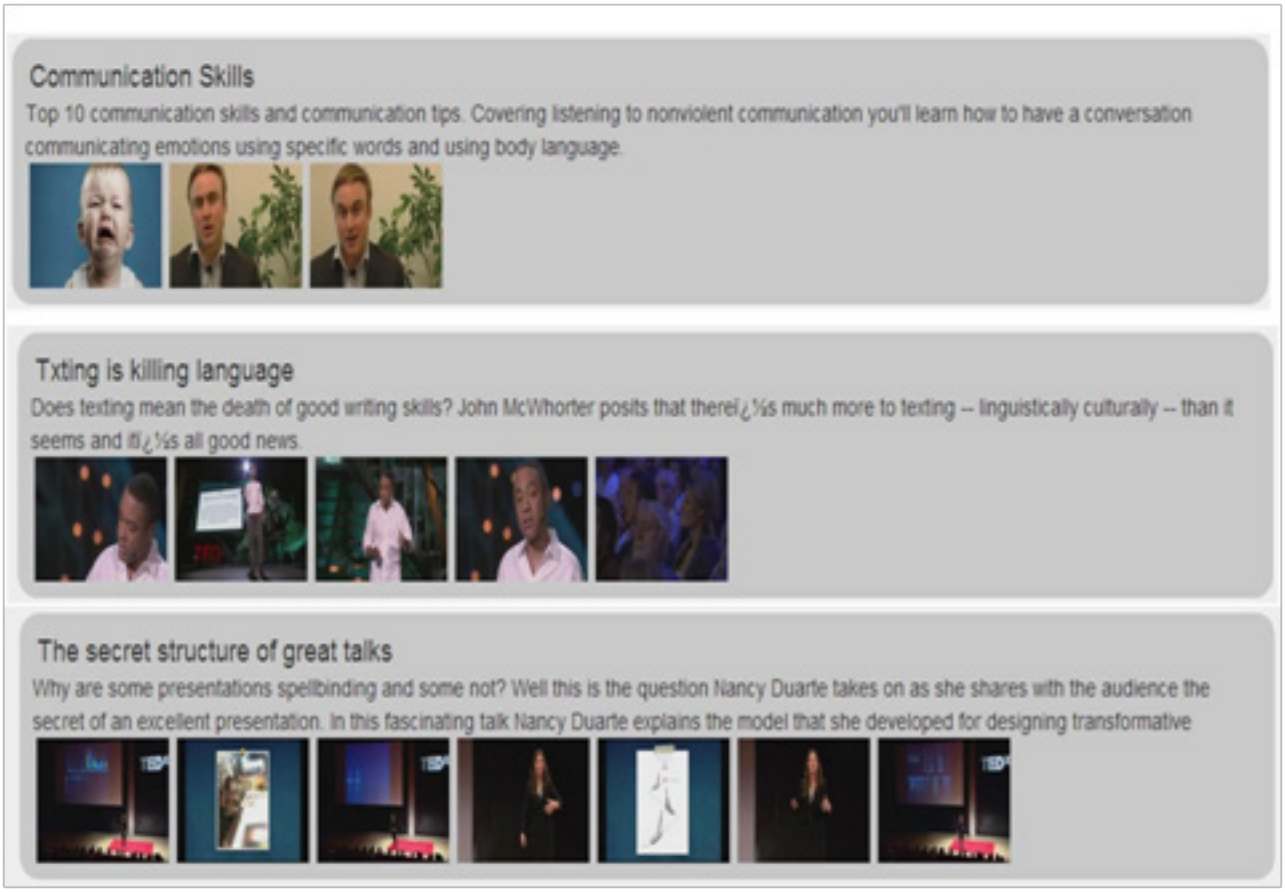

Figure 2: Video segmentation.

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The VRS also included a custom group system whereby once students were assigned to a group, they could then freely share video segments with their group, and comments and replies would only be visible to other members of that group (Figure 3). This, it was felt, would encourage the group to recommend content to each other and foster a sense of group achievement.

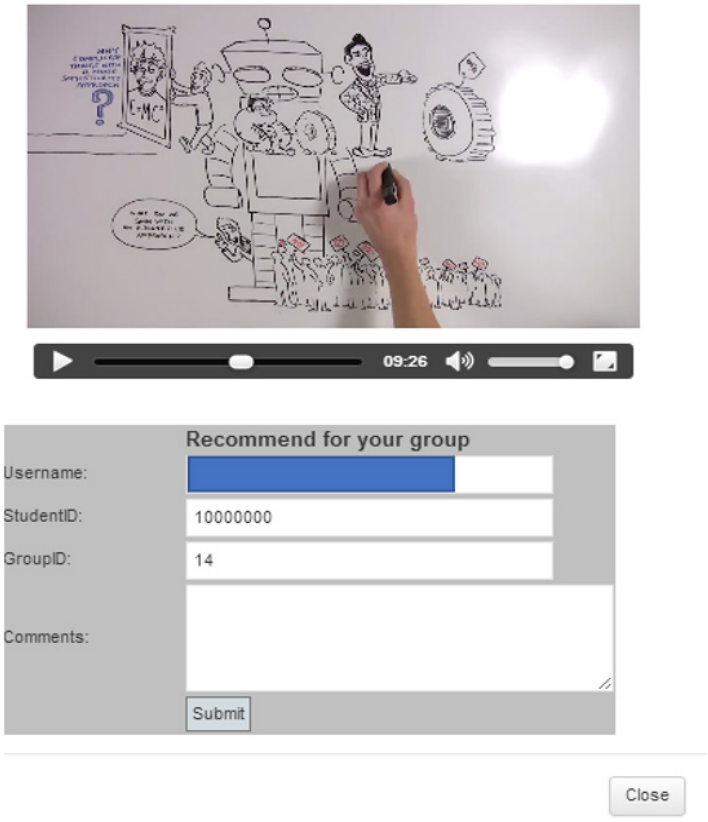

Figure 3: Commenting and sharing.

The assignment had a two goals: encouraging students to link theory to practice by engaging with video content on communication skills, then using this to inform the development of a group presentation; investigating the features of the VRS and how students use them to source, share, and comment on video segments, in order to accomplish their task.

Research procedure

Three approaches were used to collect data from students and to analyse their interactions. Students completed 500 word reflective pieces at the end of semester, which discussed the benefits, drawbacks, and potential improvements in using the VRS for a group assignment. Reflections also included detail on how information taken from the content on the VRS informed the design, development and delivery of their presentations. Second, submitted presentations were reviewed, noting which video references were used and how these linked to the development of the presentation. Third, sharing, commenting and interactions which took place on the VRS were analysed for the kinds of communication that took place. Out of the 70 students, 56 reflective documents were submitted, giving a response rate of 80%. All groups submitted their presentations for the module.

Data analysis

Reflective documents were analysed using the constant comparative method [47], which involved identifying patterns in the phrases and words used by students in their reflections. As themes emerged, rules of inclusion were drawn up to maintain consistency across categories. If a reflection, or partial reflection, did not meet the rules, a new category was formed. This process was repeated until clear categories were present.

To ensure credibility and viability of the findings from this study and the categories which contributed to them, the authors drew on [48] work. First, data was checked for internal and external plausibility, ensuring consistency within categories and cohesion among separate categories. Second, the inclusivity of data was checked, ensuring the findings drew sufficiently on the data and information that was available. Third, data analysis, coding and categorisation records were kept so that the processes could be reproduced by another competent judge.

Findings and discussions

Findings are now presented using data drawn from student reflections, system interactions and submitted presentations. This is followed by overall conclusions and recommendations.

VRS segment sharing and commenting features had a positive impact on students' ability to use online video for a group assignment

Authors such as Kim [12], Kurtz and Peled [15] and Ng [16] highlight information sharing and communication with others as important aspects of digital literacy. Data collected from student reflections (comments = 86) and group interactions (interactions = 70) on the VRS suggest that the video segment sharing and commenting features enabled students to work effectively with video for their group assignment. Student comments on sharing video segments (n=39) suggest that the video sharing feature of the VRS allowed them to gather content that may not have been found if they were working alone. Students said that 'P02 – each member could recommend videos they felt were effective' and that 'P43 – sharing was a bonus as I was able to view videos that other group members suggested that I might not have found myself'. Analysis of the interactions which took place on the system reveals that sharing of video segments accounted for the majority of the interactions (n=46) and took a number of forms. Students mainly (n=28) used the sharing feature to share a segment of video along with a comment (see table 1) highlighting the reason they felt the video clip was relevant. For example: P01 shared a segment from 'Improve your public speaking and communication skills' along with the comment 'This is very good to help with the narration and presentation' and P61 sharing a segment from '4steps to great

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speaking' along with the comment 'This video showed me ways of giving a good speech for a presentation'. Some (n=14) also shared content with a short personal message (see table 1). For example: P20 shared a video segment from '4 steps to great speaking' with the comment 'I recommend watching', while P27 shared a segment from 'Effective listening skills' along with the comment 'I think this video could help us a lot'. A total of ten shares were completed with no comment whatsoever.

Category	P no.	Video	Comment
Video segment share with comments and personal messages	P01	Improve your public speaking and communication skills	This is very good to help with the narration and presentation
	P61	4 steps to great speaking	This video showed me ways of giving a good speech for a presentation
	P07	Allan Pease body language	This is very good to understand if people are listening and interested in your presentation
	P03	Understanding body language	Helps to portray a message on more than one level
	P20	4 steps to great speaking	I recommend watching
	P27	Effective listening skills	I think this video could help us a lot

Table 1: Video segment share with comments and personal messages.

Students commented (n=17) that the commenting features of the VRS allowed them to 'P67 – communicate with other members in my group' and to 'P19 – make a more informed decision' on what to view. The commenting feature enabled students to express opinions and ideas on video segments and how they related to the task at hand. Students said that they were able to 'P19 – elaborate in their own words on the reasons they chose and tagged the video' and explain why they 'P29 – found that specific video useful', it also enabled them to 'P41 - get different individual views and opinions on the video segment' which were shared by other group members. Analysis of the system interactions (see Table 2) shows that sharing of opinions and deeper views on the segments accounted for 20 interactions. These contained deeper, more opinion-based information. Examples such as P30, who shared a video segment from 'Allan Pease body language' with the comment 'I found this video to be a good recommendation because he speaks about controlling the conversation and being more welcoming about other people's opinions on what we should do' and P21 sharing a segment from 'The 3 pillars of persuasion' along with the comment 'Here's another one by the same guy – it's interesting because it's about persuasion which is an important part of the communication process'.

Category	P no.	Video	Comment
Video segment share with opinions	P30	Allan Pease body language	I found this video to be a good recommendation because he speaks about controlling the conversation and being welcoming about other peoples opinions on what we should do
	P21	The 3 pillars of persuasion	Here's another one by the same guy – it's interesting because it's about persuasion which is an important part of the communication process
	P3	Killer presentation skills	Excellent at explaining the fear of presenting and how to contain anxiety with good humour

Table 2: Sharing opinions.

Some comments (n=11) suggested that students began using the VRS to delegate work and engage in minor social interactions. Students said that they 'P06 – could divide up search terms' and 'P02 – work as a team to complete the presentation'. In doing this, they were able to 'P36 – work on our given topic in our own time' where each member of the group was 'P43 – working together to find a variety of videos that suited'. Analysis of system interactions (n=4) shows attempts at organising group meetings, and personal messages (see Table 3). P05 replied to a video suggestion with the comment 'Really interesting video J'. P35 replied to a video share saying 'I agree A this will be very helpful'. P18 shared a video segment with the comment 'Hey guys I found this video very useful for speaking tips for practicing our voice overs, maybe have a watch before our meeting tomorrow'.

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Category	P no.	Video	Comment
Video segment share with social interactions	P35	4 steps to great speaking	I agree A this will be very helpful
	P05	The 3 pillars of persuasion	Really interesting video J
	P35	Killer presentation skills	Hey guys I found this video very useful for speaking tips for practicing our voice overs, maybe have a watch before our meeting tomorrow

Table 3: Social interactions.

This data suggests that the video sharing and commenting features of the VRS had a positive impact on students' ability to work with video content as a group. Sharing video segments improved their ability to source digital content [9,10] by enabling the group to access a range of content that may not have been gathered if students were working alone. The ability to comment on video segments facilitated effective communication using digital technologies [12]. Students used the tools to justify their recommendations and share opinions and insights with other members of their group. These interactions provide evidence of students' ability to collaborate [15] with one another to complete an authentic task [13] using the tools made available to them.

Student integration of online video

An integral aspect of digital literacy is using digital content to construct new meaning [12] and understanding how to use this information can be used to address an authentic problem [9,13,49]. Data contained in student reflections (Figure 4) indicated they were successful in sourcing and integrating a range of content which informed their presentations, including: designing and delivering presentations; preparation; delivery techniques; and the importance of teamwork.

Learning about how to design presentations was the most prominent area present in student reflections, with 40 comments. This was spread across a number of related themes. The importance of using visuals in presentations was mentioned by many (n=19), who said they learned about 'P10 – the colour scheme we should use', 'P02 – the importance of images', and 'P34 – how to lay out the presentation'. Comments (n=16) also related to structuring presentations, with students saying they learned about the importance of providing 'P22 – clear and concise information' and how to 'P20 –plan and structure our presentation'. Students also appears to have learned about considering the audience's perspective, with comments (n=5) saying they needed to 'P52 – keep the audience interested' and P26 – the best way to design a presentation is to look at it from the point of view of the viewer', and that they wanted to 'P10 – to appeal to the audience in every way'. These comments suggest that in the context of designing presentations, students were able to understand and synthesise multi-modal information [9,50], then adapt and re-use this for their own work [49]. Similar evidence is present in student comments (n=27) about the importance of the voice. They were able to identify key information [10] about 'P47 – how to use your voice while presenting', noting that confidence is displayed by 'P02 – eliminating any filler words such as "uh" or "um"', using 'P18 – the power pause' and using the voice to 'P21 – deliver with intensity' in order to 'P55 – maintain interest and attention'.

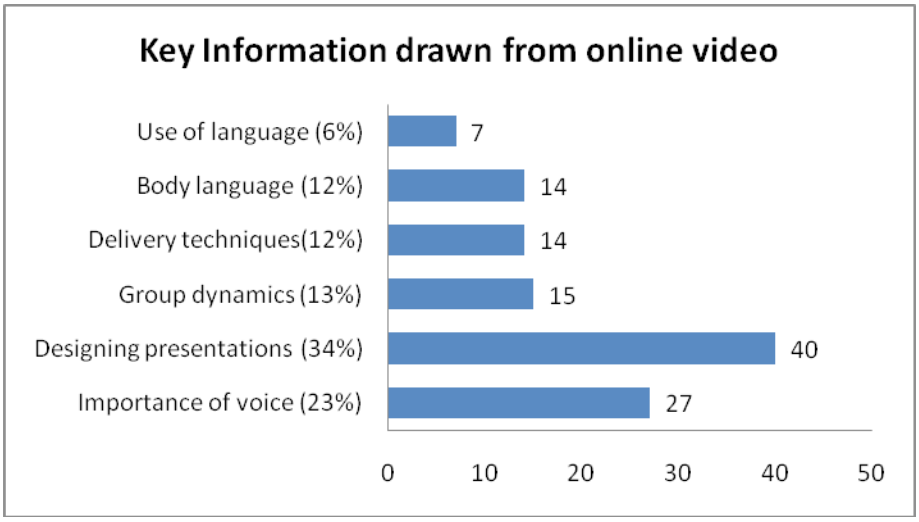

Figure 4: Key information drawn from video content.

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Interestingly, comments (n=18) suggest that students used what they learned from video segments and applied it to dealings with their own group. Comments (n=9) spoke about the importance of listening, for example: 'P21 – listening skills are of huge importance when working in a group and we must take in every member's views and opinion even if we do not agree with them'. Other comments (n=6) focused on body language and suggested a greater awareness of how this can impact on the way in which members of the group interact with each other. Comments also stressed the value of 'P05 – keeping eye contact with each member of the group' and being mindful of finger pointing as 'P15 – pointing at someone can be perceived as an aggressive, domineering gesture'. Others said that 'P28 – when I was presenting my ideas to the group, I noticed them smiling, this made me feel good showing me that my opinions were understood'. These comments show that in addition to using the information obtained for the task at hand, students were able to reflect on this information [10] and apply it to their own contexts.

Reflective documents also contained comments (n=14) which suggest that students learned about effective presentation techniques. This ranged from general information such as timing, rehearsal and learning styles, with comments such as: 'P05 - When preparing the presentation it was important to consider how long the presentation had to be and how many slides were needed' and 'P14 - I made sure for the presentation to reach out to all learning styles of those who may potentially view it'. To more specific areas such as stage presence, eye contact, and humour, with comments such as: P16 - the act of walking around and "owning the stage" demonstrates to the selected audience confidence coming from the speaker'; 'P52 – The use of eye contact with the audience is important because it creates a connection and keeps their attention'; and 'P18 – it is important not to take myself too seriously. People enjoy light heartedness and like to laugh so telling an interesting anecdote or a joke can benefit my communication with people'. In a related theme, students' reflections contained a number of comments (n=14) on the impact of body language on the delivery of presentations. They mentioned areas such as posture and hand gestures, saying the 'P10 – presence of the speaker on the stage' is important and that 'P60 – we can use our hands while talking to engage the audience', indicating that they are now 'P30 – more aware of the way my arms and hands were behaving'.

The final theme present in student reflections was the use of language, with six comments. They spoke about the importance of being prepared, saying 'P43 – it is important to practice recording yourself' so that language is clear and understandable. They learned about the 'P16 – misuse of slang words and jargon', being sure to P24 – separate facts from opinions' and how P23 – clear, simple language' is important when presenting to a large audience.

In the context of digital literacy, this data clearly suggests that, when provided with the tools and strategies to do so, students are capable of sourcing, synthesising, adapting and reusing [11,13,16] the information contained in video segments, for use in developing their group presentations. Analysis of the submitted presentations supports these assertions, with their work containing a range of references (n=41) used to support various areas such as: designing and delivery a successful presentation (n=12); the power of the voice (n=8); body language (n=7); and developing an argument (n=4). It appears that when provided with an authentic task, and the means with which to accomplish it, students are readily able to extract relevant information about key knowledge and skills related to presentations. Their comments also indicate that in addition to applying these to the task at hand, they understood their relevance to other scenarios and situations.

Conclusion

This research presents findings across two main themes: First, the impact of video segment sharing and commenting features on students' ability to use video content for a group task. Findings in this theme suggest that when given an authentic task with a clear focus – the video segment sharing and commenting features of the VRS had a predominantly positive effect on their use of digital video. Evidence contained in student reflections and the interactions on the system suggests that they were able to locate and share a range of content related to their presentations, allowing the group to access a wider range of videos. Students also shared the reasons for choosing content, shared opinions and ideas, and event delegated work – thus displaying effective communication using the tools provided. Second, student use of online video to inform the development of a group presentation. Findings in this theme indicate that when provided with a structured, authentic task, students could extract and understand video content as it related to the development of their presentations. Their comments showed evidence of their capacity to source and synthesise information about designing, developing and delivering presentations, and how to apply this knowledge in their own work. Comments also indicated learning on a more general level, with students indicating they learned skills from the videos, reflecting on the meaning and applied this to contexts outside the given task.

Limitations

This study was conducted with a cohort of university students taking part in the B.Sc. in Education and Training, with a sample size of 70 students. The intention was to conduct an in-depth study of how students use online video to inform the development of their assignment work, and how they communicate and share online video for the same purpose. However, larger scale studies may be needed if definitive claims are to be made about the communication strategies adopted by students and the learning derived from video segments. The researchers' teaching area was chosen so that online video could be implemented and evaluated in practice. A wider study with a more diverse range of students from alternative subject disciplines may yield different results and experiences. Video content in this study was provided by the researcher in a central location, using a custom VRS. Future studies could focus on examining how students integrate content from other video repositories, and use the communication tools available there. Finally, academic literature on how students collaborate to

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integrate online video into academic work is relatively uncommon. This means that as research in the area progresses, new alternative themes for study may emerge which were not addressed in this paper.

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