

# Consuming versus Authoring: Reflections on Video Assignments for Usable Security

Joseph Maguire<sup>1</sup>[0000-0002-3718-7679], Steve Draper<sup>2</sup>[0000-0002-9564-9317], and  
Rosanne English<sup>3</sup>

<sup>1</sup> School of Computing Science, University of Glasgow, Glasgow, United Kingdom  
joseph.maguire@glasgow.ac.uk

<http://www.dcs.gla.ac.uk/~joseph>

<sup>2</sup> School of Psychology, University of Glasgow, Glasgow, United Kingdom  
steve.draper@glasgow.ac.uk

<http://www.psy.gla.ac.uk/~steve>

<sup>3</sup> Department of Computer and Information Sciences, University of Strathclyde,  
Glasgow, United Kingdom

rosanne.english@strath.ac.uk

**Abstract.** This paper reports on two cases of introducing assignments into two different computing courses related to Usable Security that required students to create and submit videos. Analysis of these cases of (perhaps hasty) teaching innovation is used to offer a classification of the types or styles of videos submitted by these students. On reflection, the innovators may have been influenced by the delusion that digital natives come pre-trained in new digital media. Educational precedents however tell us that being a fluent reader does not by itself make you a fluent writer, and imply that being a big consumer of videos does not mean you have any experience of authoring them. This analysis led us to draw on current practices for supporting students' academic writing to offer four practical recommendations for educators wishing to improve on these learning designs reported.

**Keywords:** usable security, video, education, human computer interaction

## 1 Introduction

The world of YouTube, Netflix and the BBC iPlayer primes an individual for the effective consumption of digital video, and the recent explosion in hardware and software has resulted in a vibrant ecosystem of tools for the creation and consumption of digital video. This has not escaped many universities and educators, and it has led many to investigate its potential beyond film and television, including educators. The potential for video presentations by digital natives [5] is that they could do video presentation with little expense or anxiety.

The ability to give a persuasive presentation is an important attribute of many graduates [1]. Nevertheless, physical presentations are a potentially expensive assessment approach, e.g. booking space, coordinating audience and speakers etc. Digital video presentations present an opportunity for assessors as they can require students to capture content and upload it for assessment purposes. The added benefit is that students can rehearse and refine content until they are confident in it – rather than the one shot they have with a traditional presentation.

The educational rationale is quite simple: learners could use video presentations to demonstrate comprehension or insight into a specific problem or challenge. An example could be development of an authentication interface. In this paper we report on the use of video presentations by students across two security courses in computing science.

The contributions of this paper are:

- Reflections and observations on using video presentations by students on security courses in computing science.
- A classification of styles of student-produced videos
- Recommendations for possible guidance for using video presentations for assessment.

## 2 Background

Presentations are valuable in facilitating assessment of a higher cognitive ability [2]. Furthermore, in terms of performance, in presentations versus written assessments individuals tend to perform better and receive higher scores [4]. Moreover, presentations are an authentic assessment task that help students develop communication skills. Such communication skills are also recognised as an important graduate attribute by many universities [1].

Despite these benefits, presentations are often underused. One possible explanation for this is that presentations are expensive to coordinate for assessors. In this digital age it is a natural progression to consider submission of a digital video presentation instead of a traditional, physical presentation. The educational rationale for such digital presentation is that students benefit from critical rehearsal, re-expression and application of material already delivered in the course as well as complementing it with their own insight and material. Students can keep refining the presentation until they are satisfied with the artefact.

The expectation is that students will reflect on how to structure and tailor the presentation to meet the needs of the audience, in this case the assessor. This assumption itself is not revolutionary, Piaget argued that expression is curtailed when learners discuss concepts with teachers so as not to bore them, but when discussing concepts with peers they are far more likely to use fuller descriptions. Furthermore, students are effectively learning by teaching when developing content for the consumption of others, not dissimilar to the ongoing education of surgeons - “*see one, do one, teach one*”.

Nevertheless, such activity does not necessitate the use of video and could simply be delivered as a traditional oral presentation. However, the assumption is that digitally native students are not only sufficiently competent to produce videos, but can do so more creatively. This is in part because students can continually rehearse, refine and alter the video before deciding it is ready for dissemination. There is also the added benefit that the video itself could act as an artefact for on-going use by peers to support revision of course content.

For these reasons, we explored the use of video presentations as a form of assessment through two case studies on security courses across two institutions. One assessment for a usable security course, the other a technical security course. As students are predominantly digital natives, these assessments were set without guidance on creating digital presentations.

### 3 Early Efforts

The initial pilot of using digital video as part of in-course assessment was to explore the use of video presentations with ‘non-technical’ students enrolled on a philosophy course exploring cyber space, circa 2007 [3]. The task was to produce a video presentation and distribute the video as a podcast. The class comprised of 24 students, instructed to form teams of two or three to produce a ten-minute presentation on a course-specific topic of choice.

A significant challenge of the early effort was devising a marking scheme to ensure that students focused on content, rather than technical wizardry - a challenge that is recognised and appreciated by many educators who have explored the use of digital video in higher education [6].

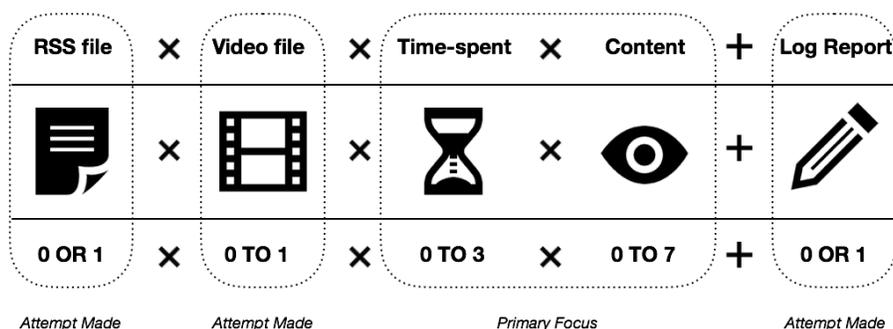


Fig. 1. Marking scheme for video assignments

Consequently, the marking scheme was devised to emphasise the importance of content and reduce the significance of technical aspects. Figure 1, on page 3, illustrates the marking scheme. The marking scheme comprised of five components: *RSS feed*, *video-file*, *time-spent*, *content* and *log report*. The final score is

achieved by multiplying the first four components and adding the final component. The interplay of components affords emphasis on video content and less focus on technical concerns.

The technical elements of creating an RSS feed and video file had a *score* of either 0 or 1. A team simply had to submit a RSS feed and video file to attain 1 mark in each case. The RSS file and video file could be technically flawed and a team would still attain 1 mark for each component, but teams had to make an attempt. Teams would only receive a score of 0 in either case if they made no real attempt. Consequently, teams were not punished or rewarded for technical brilliance, they simply had to demonstrate an understanding of the technical elements of a video podcast.

The remaining components of *time-spent* and *content* had scores of 0 to 3 and 0 to 7 respectively. The interplay of components affords the marking to recognise a team may have spent considerable energy researching and producing content, but the content itself is still not optimal. A team could demonstrate time spent by optionally including additional material with their submission (e.g. scripts, bibliography, notes). Therefore, a marker could award a low score for content, but a high score for time-spent, essentially signally to the student that while they may have research and considered content, the end presentation could be improved in various.

However, while we felt the marking scheme was concise and concrete the resulting artefacts from teams were mixed. It was not clear what teams found more challenging: technical video production or creating an effective presentation. Upon reflection and in conversation with students it became obvious that higher scoring teams had actually completed a similar, novel assessment in a previous course, that of creating a web resource for other students. This suggests that rather than being a native skill, it may depend on practice. The conclusion from this early effort was that unique, unrepeated assessment types will probably led to poorer results.

## 4 Case Studies

The following two case studies explore the use of video in two cyber security courses across two different institutions. The primary motivation in both cases was to gain deeper insight into student comprehension and further investigation of specific topics.

### 4.1 Usable Security

The first case study was the use of video presentations to demonstrate the development and creation of a proactive password interface for minors. The assignment expected students to produce a 10-minute video presentation that outlined the key challenges of the specific context, the devised interface and potential test cases for evaluation. The class comprised of approximately 80 students and they were expected to form teams of no more than three members, but no less

COMPOSITION			SPEAKER ROLES			TONE		
<i>Description</i>	<i>Benefits</i>	<i>Ⓔ</i>	<i>Description</i>	<i>Benefits</i>	<i>Ⓔ</i>	<i>Description</i>	<i>Benefits</i>	<i>Ⓔ</i>
	<i>Concerns</i>			<i>Concerns</i>			<i>Concerns</i>	
<b>Lecture.</b> Teams would typically capture knowledge, speakers using but less so for a smartphone communicating camera giving the merits of a lecture with an artefact, e.g. supporting an interface. slides in a Speakers often theatre or group struggled to in-study facility.	Optimal for delivering knowledge, but less so for communicating the merits of an interface. Speakers often struggled with the artefact or supporting slides or material.		<b>Instructor.</b> The approach The speaker was beneficial would adopt for nervous students that were of teacher not confident in and methodical the material or cally progress the areas being through a script discussed, but or series of such a style was bullet points. not engaging or distinct. The approach does require some coordination between members.			<b>Formal.</b> The approach The majority is generally of speakers optimal for adopted a formal tone when conveying and delivering the virtues of presentation. a particular The approach interface or often exhibited solution. How-planning, but ever, speakers also had the were often not potential be engaging and disjointed as often lacked students would imagination in work on silo-ed terms of how to segments. stimulate the audience.		
<b>Narration.</b> A very common Teams would and relatively typically capture a video presentation stream and then type. The type narrate over the often lacked recording, e.g. coherence and screen recording exhibited lacking. It was also of planning as common for students to capture a traditional capture seg-slide-deck and narrate.	and relatively easy to capture a video presentation type. The type narrate over the often lacked coherence and exhibited lacking. It was also of planning as common for students to capture a traditional capture seg-slide-deck and narrate. stitch video together more than in other types. The videos would also often have distracting watermarks due to students using shareware.		<b>Free-form.</b> The approach The free-form has the potential to be loosely structured video with only the speaker considerable seemingly practicing and gressing through experience. The the presentation reality is that with little this style often structure. The was exhibited approach often by weak teams exhibited a lack rushing to meet of planning deadlines. and coordination with speakers rambling through concepts and ideas.			<b>Conversational.</b> The approach The speaker arguably only would attempt worked well for to have a conversation with in language ability, i.e. native A challenge English speakers for a video. While it is presentation, highly engaging, but effective in it often just engaging the demonstrated a audience with team that was short sentences not prepared and a clear and was working structure. to fill the time requirement of the assessment.		
<b>Advertorial.</b> The approach Teams would was often produce a video effective at as a 'sales-pitch' demonstrating or marketing the effectiveness of the would extol artefact and is the virtues and also good at benefits of the demonstrating artefact they consideration of produced. The context and the videos would intended audiotypically be ence. However, technically the advertorial advanced and of approach often a high-quality failed to demonstrate critical thought and teams would neglect to cement aspects in evidence.			<b>Storytelling.</b> The approach Speakers is optimal at adopted an demonstrating approach of key consideration of the and providing problem area or of examples intended audito to justify the ence. However, approach to it can be time designing the consuming and artefact. The speakers would concern is that often spend this suggested considerable the artefact was time delivering informed by a aspects of stories, rather often of little than addressing relevance. a core problem.			<b>Humour.</b> The approach There was a can be effective tendency for at team bonding some teams to and relaxing inject humour the audience, into presentation but is challenge in various lenging when ways. The the speaker is humour was unable to gauge often that of viewer reaction. comical voices, The humor-composure, ous aspects of awkward si-recordings could lences or parody be a source of - rather than irritation, but telling jokes. did demonstrate an effective, bonded team - humour often was not a feature of disjointed presentations.		
<b>Filmed dialogue.</b> The approach Team can be effective, have a structured and considerable planned dialogue.								

Table 1. The different presentation compositions, speaker roles and tones observed in the video submissions.

than two members. Those individuals that were unable to form a team were randomly allocated to one.

Teams were permitted to produce a workload report that indicated division of labour and individuals were also allowed to make private personal assessments of each other. The marking scheme was not tailored specifically to presentation or video challenges, but did emphasise aspects such as *clarity of speech* and *use of visuals aids*. Teams *were not* provided with any specific guidance on how to produce videos, suggested tools or any strict guidance as to format. A brief suggested structure was provided. Nevertheless, the expectation was that students were *digital natives* and higher practised ‘readers’ of video, they would be skilled at production than those students a decade prior.

Unfortunately, the artefact produced only cemented the notion that students were not digital natives. The reality is that while some teams produced excellent work, many submissions were uninspiring. Table 1, on page 5, outlines some of the different presentation compositions, speaker roles and tones observed over the case studies.

The most common presentation *composition* was that of a *narration*. Teams often produced either a standard slide-deck or screen recording with accompanying narration. The narration was often not coordinated with the visuals and often felt wooden and scripted. The second dominant presentation type was that of a *lecture* that comprised of oration, body language and slide-deck. The artefact can be likened to the output of lecture solutions, such as Echo360. However, such capture was often of low-quality - typically comprising of a team presenting in front of a smartphone capturing the team within a lecture theatre or private study facility. A less popular but interesting style was that of *advertorial*. The style was not unusual given the assignment and was creative and engaging. The only problem with the approach was that the speaker would frequently miss the opportunity to cement ideas and solutions in research evidence, feeling it did not fit the with ‘*advert-like*’ nature of the video.

The *tone* of the presentations for the most part was consistent among teams with most adopting a very formal tone. There was also little variation on *speaker role*. It was the case that some teams would adopt a more instructor style. The approach is valuable when speaking with diverse audiences and useful to keep shy and unprepared speakers on-track as they can use bullet points as a crutch. The distraction of the style was that speakers often did not engage with the artefact and often did not fully communicate its benefits.

The overall quality of the submitted artefact was disappointing. The result in part can be explained by the lack of guidance on video presentations issued to the teams of students. Nevertheless, the experience could also be due to the nature of the course and assignment. Consequently, we decided to contrast the experience of the video assignment on a usable security course with that on a technical security course.

## 4.2 Technical Security

The second case study was the use of video presentations to propose a defence strategy for a vulnerable web site. The class comprised 94 students, who self-organised into 30 teams of three and one team of four. Those students who did not self-select a team were allocated one at random. The video was to be a maximum of 12 minutes long and had a proposed structure which focused on reflection, critical analysis and synthesis of the material taught in the context of the provided website.

This emphasis on deeper understanding was also reflected in the marking scheme where 50% of the mark was allocated to depth of understanding and critical analysis. A further 25% was allocated to presentation quality, which was on the basis of organisation, reasoning and coherence rather than aesthetics. The final 25% was allocated to the attack stage.

The artefacts produced were all of the narration composition outlined in Table 1 where a video stream was captured and narrated over. The benefit of the narration type was that it was easy for students to capture, both collaboratively and remotely. Within this, there were two styles; those demonstrating the attacks in real time and those presenting a slide deck. We classify narrating over slides as an example of an instructor role and those who demonstrated attacks in real time as an example of free form role as presented in Table 1 .

Those demonstrating the attacks in real time were generally unsuccessful in using the time permitted to their advantage as there were often large gaps in narration. We believe this is likely as a result of familiarity with this sort of demonstration as it is used in assessment elsewhere and it is not normally expected that students provide an accompanying narrative. Those presenting using a slide-deck favoured heavy use of bullet points, which were often read from the screen. Again, arguably this is due to the familiarity and comfort with this approach though surprising for presumed digital natives.

Those presenting narration over a slide deck often presented more synthesis of material, but struggled to critically present a choice for best approach to defence. It echoed the approach taken in the classes on this topic where the attacks and all defences were presented.

The tone used was mostly formal with some submissions incorporating humor. For example, one submission included a ‘bloopers reel’ after the presentation. In these submissions it was clear that the team had worked together closely as their voices were often heard in a conversation over this part of the video. In contrast, those who did not attempt humor were often clearly portioned between the team and pieced together at a later time. This was evident from the difference in audio quality and in lower quality submissions it was evidenced in material being revisited with no clear overarching narrative.

## 5 Discussion

Upon reflection it seems obvious that by not providing sufficient support and guidance some teams were not able to attain the expected high-quality outputs.

However, we were unconsciously misled by the notion that individuals that consume video are sufficiently skilled to produce slick, creative and engaging video presentations.

The *immediate* recommendation to any educator considering video is to dismiss the idea that individuals are digital natives or have any real practice or skill in producing digital video merely because they consume hours of digital content. In addition to this immediate recommendation we have a further three recommendations for those educators considering video assignments.

The *first* recommendation is to introduce peer-review for video assignments. The motivation is that it is difficult enough for a student to devise a single solution to a problem, rather than consider the myriad of potential solutions that may be possible, never mind identify the optimal one. The inexperienced author of such videos would be best served by seeing how other novices are approaching the assignment. The use of peer-review can be performed in stages. The minimum stage would be for students to observe others draft videos, merely to have insight into how other novices are tackling the problem. The next stage would be for the student to review a the draft video. The final stage would be for teams to articulate what they found optimal or strong in the draft video.

The *second* recommendation is to provide students with sample artefacts. It is not enough to promote *creativity* without any guidance as to what is possible. A blank page is not so much inspiring as intimidating. Sample artefacts give students insight into what can be done, and what looks good (at least to them). These sample artefacts could be artificial, produced by the lecturer in advance. Artificial samples could be contrasted with authentic submissions from previous cohorts, if available. Ideally, these videos could be labelled using the categories outlined in Table 1, on page 5. These sample artefacts would again help students in understanding the expectations of the video presentation.

The *third* recommendation is to consider that video production is a skill and learning a skill requires a different pedagogical approach to learning facts. Consequently, such skill training should happen beyond a single course and form part of a wider curriculum. Assessors should decide in advance the important aspects and expectations of video assignments. This would avoid delivering the same bad habits repeatedly across multiple courses as well as cement an awareness in students that some presentation styles and tones fit certain situations, not all.

## 6 Conclusion

The reality is that we assumed good *readers* made good *writers*. The vast experience of written assessments makes it clear that this is not case. The recommendations offered in the discussion section are drawing heavily from those to improve writing. Specifically, we are arguing that students should peer-review, inspect samples and attend specially designed skills session as part of curriculum. On the other hand, an accomplished writer will also be well-read. Therefore, it

may be valuable to consider guidance on effective consumption of content so as to further support effective authoring.

## References

1. Biggs, J., Tang, C.: Teaching for Quality Learning at University. Open University Press McGraw-Hill Education, 3rd edition edn. (2007)
2. Kerby, D., Romine, J.: Develop oral presentation skills through accounting curriculum design and course-embedded assessment. *Journal of Education for Business* **85**(3), 172–179 (2009). <https://doi.org/10.1080/08832320903252389>
3. Maguire, J., Stuart, S., Draper, S.: Student generated podcasts: Learning to cascade rather than create. *Learners in the Co-creation of Knowledge* p. 67 (2008)
4. Mark Huxham, F.C., Westwood, J.: Oral versus written assessments: A test of student performance and attitudes. *Assessment and Evaluation in Higher Education* **37**(1), 125–136 (2012). <https://doi.org/10.1080/02602938.2010.515012>
5. Prensky, M.: Digital natives, digital immigrants part 1. *On the Horizon* **9**(5), 1–6 (2001). <https://doi.org/10.1108/10748120110424816>
6. Vasilchenko, A., Wilde, A., Snow, S., Balaam, M., Devlin, M.: Video coursework: Opportunity and challenge for hci education. *Proceedings of the 2018 ACM International Conference on Advanced Visual Interfaces* (2018). <https://doi.org/10.1145/3206505.3206596>