Usability of an Active Video Watching System for Soft Skills Training

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Abstract. This paper reports an empirical study on the usability, including acceptance, of the Active Video Watching system (AVW) for learning advanced presentation skills. The AVW provides a Personal Space for individual learners to link their personal experiences while watching the selected videos. The comments collected can be used by the individuals to reflect on their own thoughts or to be shared with other learners in the Social Space. This sharing environment enables the learners to see if their own views concur or differ from the others. The tutor can also obtain an overview quickly to decide on an appropriate learning intervention if needed. The paper presents the initial results, focusing on the usability of AVW Personal Space and Social Space. Implications for improvement and plans for further analysis of the data are outlined.

1 Introduction

Soft skills (such as communicating, negotiating, problem solving, collaborating) are key 21st Century skills, and are crucial to improve employability in the knowledge economy. This research investigates the use of augmented social interactions with videos to facilitate soft skills development by promoting reflective learning linked to real world experience. Within the EU project ImREAL[1], an Active Video Watching (AVW) system was developed. The prime objective is to support reflective experiential learning by providing personal and social spaces for interactive watching and annotating of videos. AVW was trialled in real contexts with students and tutors in several studies. This showed positive reactions from the tutors as a potential addition to their teaching tools for soft skills, such as communication, negotiation, leadership. Specifically, tutors appreciated the opportunity to reuse existing videos from YouTube as part of their soft skills training practice. Using videos for teaching is particularly appealing for the millennial learners who are technology savvy and use a vast amount of interactive media in social contexts, as a means of conversation and expression. Video-based learning is seen as one of the main strategies to provide engaging learning environments for millennials (together with gamification and mobile learning) [2].

Pedagogically, it remains a challenge for tutors to find an effective way to embed these learning resources within the context of ill-defined domains [3], and enable learners to be critical and reflective. This paper uses part of the results from a follow on study with postgraduate students from several universities using AVW as an informal learning tool for advancing their presentation skills. The study examines how learning can be scaffolded [4] by using a video sharing space such as the AVW and the extent of supporting the four modes of overt engagement: Interactive > Constructive > Active > Passive, as espoused from the ICAP framework [5].

The chosen soft skills domain is delivering a pitch presentation. Increasingly, researchers are asked to present their work in a short, sharp and engaging manner. This is also crucial in businesses where a new product or a proposal has to be presented to customers or funders. Pitch presentations are being used as a form of public engagement vehicle, which aim to excite, persuade, and opening up opportunities. This can be at odds with the usual presentations for research dissemination which would examine the rigour of approach, grounded in the past for credibility, and the technicalities of the techniques employed. The overarching purpose of the learning material used in AVW is to help postgraduates acquire new skills for a pitch presentation, and use this opportunity to reflect on their own presentation skills.

There are assumptions in this approach:

- past experience may be recalled while watching a video that is useful for personal reflection – i.e. when using the AVW Personal Space;
- sharing these experiences may be useful for opening up the learner's mind when there is dissimilarity amongst the experiences, or improving the learner's confidence when similar experiences were voiced by others – i.e. when using the AVW Social Space.

This paper examines the validity of these assumptions with the use of the AVW by surveying the learners on the acceptability and usefulness of the features provided by the personal and social spaces in the AVW. The work is part of an ongoing collaboration between the University of Leeds (United Kingdom), the University of Canterbury (New Zealand), and the University of Adelaide (Australia), which aims at scaling up the deployment of AVW for soft skills training, and its potential in the development of interactive personalised nudges for self-regulated learning.

2 The Active Video Watching System (AVW)

The AVW is a controlled video watching environment for the facilitation and collection of video comments from the learners, and ultimately more beneficial for reflective activities and assessments. The technical platform for AVW development was .NET, SQL Server, AJAX, Visual Studio 2010 and Telerik web controls; and using YouTube APIs.

AVW enables a tutor to:

- Create an interaction space for active video watching aligned with the purposes of their training;

- Upload selected videos from YouTube and add short video descriptions;
- Define main aspects that can direct the learners' attention to specific points related to the videos. Each aspect is presented with a term, or short phrase, for scaffolding learner's experience. Aspects guide a learner to associate a comment with a particular learning concept in the video. The system automatically captures not only the comment but also the place in the video (i.e. the time elapsed from the start) when the comment is made; and
- Approve the learner comments for sharing with others.

The tutor can also download the interaction data from the AVW as an XML file that includes the comments tagged with the aspects and the timing in the video when a comment was made. The file can be processed for further analysis to get deeper insights into the learners' experience with AVW. In the previous trials of AVW, the tutors did not use this data. Researchers within the ImREAL project processed some of the data to identify the focus of attention for individuals or group of learners [6].

The main functionality of the AVW from a learner's perspective is explained in the following sections.

2.1   Personal Space

A learner can access one or more videos within his/her 'Personal Space'. While watching a video, the learner can pause at any time to record a comment (see Fig. 1). Each comment will be time-stamped when the video is paused for the text entry with any associated aspect (from the list of aspects defined by the tutor). For example, the pitch presentation study presented below uses the following aspects to put self-regulation context around the comments the learner makes on tutorials for soft skills:
- "I am rather good at this";
- "I did/saw this in the past",
- "I didn't realise I wasn't doing this"; and
- "I like this point".

The learner can exit and re-enter a video anytime, and previously made comments can be viewed at the bottom of the page.

2.2   Social Space

Comments made by learners will only appear in the Social Space after the tutor has approved their release. Learners can enter the social space and glance through the comments made by others (anonymised) together with own comments for each video (see Fig. 2).

Fig. 1. AVW - video watching and comment page for a tutorial in Personal Space

The learner can sort the comments according to:

- elapsed time – for identification of interesting places in the video that have attracted a number of comments, and to check similarity or otherwise with own comments (e.g. see around 33 secs in Fig. 2, the learner felt it was interesting, concurring with another learner who said "very nice visual");
- aspect – to see the extent and kind of experiences shared around the same learning concepts.

The learner can also 'rate' each comment, according to the prompts setup by the tutor, for further reflection (see popup box in Fig. 2).

In addition to reading/rating the comments, the learner can click on 'view video snippet' and watch the part of the video that the comment refers to.

Fig. 2. AVW - Social Space to share comments anonymously on an example presentation

3 Experimental Study with AVW

This study was conducted to understand how learners would use both the Personal Space and Social Space for informal learning of how to deliver a 'pitch' presentation.

Participants: Email invitations were sent to the mailing lists of PhD communities in English speaking countries that the authors had access to, with the expectation that general presentation skills were already acquired.

Set up: Learning objects were a set of eight videos, carefully selected from YouTube that covered different aspects of presentation skills – four tutorials and four examples. Criteria for their selection were: (i) appropriate content (covering the spread of opening and closing, structure, delivery, and visual aids; or examples of pitch presentations); (ii) reasonably short (no longer than 10 minutes); (iii) with a balance of gender for the presenters; and (iv) two good examples and two not as good.

Wording for aspects for reflection are designed to encourage the learners to put their comments within selected learning context. For the tutorials, the aspects provided were: "*I am rather good at this*" , "*I did/saw this in the past*", "*I didn't realize I wasn't doing it*", and "*I like this point*" to stimulate learners to recall /relate to their own experiences. For the example videos, the aspects provided were: "*Delivery*", "*Speech*", "*Structure*", and "*Visual aids*" – concepts that were covered in the tutorials.

In the social space, the ratings provided were: "*This is useful for me*", "*I hadn't thought of this*", "*I didn't notice this*", "*I don't agree with this*", and "*I like this point*" – to promote deeper level of reflection.

Data collection methods: Three survey questionnaires were designed to collect user data, and to set learning tasks for pre- and post- test analysis.

Survey I: participant's profile such as demographic information, background experiences, motivation and attitudes; then a series of questions relating to participant's knowledge of presentations; and his/her action plan for preparing and presenting a pitch presentation.

Survey II: same questions for participant's knowledge of presentations and an update of action plan for preparing and presenting a pitch presentation; NASA-TLX instrument [7] to check participant's perception of cognitive demand when using AVW Personal Space; Technology Acceptance Model (TAM) [8] to check the participant's perceived usefulness of Personal Space for informal learning of presentation skills; and questions on usability of the AVW Personal Space.

Survey III: same questions for participant's knowledge of presentations and an update of action plan for preparing and presenting a pitch presentation; NASA-TLX and TAM for the Social Space; and finally questions on usability of the Social Space.

Procedure for participants:
- complete preliminary learner profile and baseline survey I;
- phase 1: use of personal space to view and comment on the eight videos;
- complete post-personal-space survey II;
- phase 2: use of social space to view other comments and rate if appropriate;
- complete post-social-space survey III.

4　Results and Analysis

50 participants accepted the invitations. 38 completed both phases of the study that spanned across 2 weeks. A prize draw was provided to compensate the time spent by participants who completed the study. Participants were PhD students mainly from New Zealand and the UK, with some from other parts of the world.

AVW usage overview: Table gives an overview of the usage of AVW in both the Personal Space (where the participants watch videos and made comments) and Social Space (where the participants read and rated comments by others).

Table 1. Summary of the number of user comments and ratings in the study.

Video	Video Length	Comments [Personal Space]	Comments with ratings [Social Space]	Ratings [Social Space]
Tutorial 1	2.54'	97	95	603
Tutorial 2	7.37'	124	123	382
Tutorial 3	6.55'	121	118	402
Tutorial 4	6.22'	94	91	261
Example 1	3.23'	82	82	272
Example 2	8.28'	100	98	281
Example 3	6.48'	106	103	283
Example 4	3.25'	66	62	222

This paper discusses one part of the surveys, namely the degree of technology acceptance and perceived usefulness of the AVW – i.e. on the use of Personal Space, the Social Space, the aspects and ratings for learning advanced presentation skills.

4.1 Technology Acceptance – Quantitative Analysis

The following scale was used for the TAM questions: 1. extremely likely; 2. quite likely; 3. slightly likely; 4. neutral; 5. slightly unlikely; 6. quite unlikely; 7. extremely unlikely. Table 2 summarises the means and standard deviations of the replies.

Table 2. Summary of users' answers to the usability and acceptance questions.

Questions	Personal Space		Social Space	
	Mean	SD	Mean	SD
Q1: I think I would like to use the AVW frequently	3.03	1.59	3.68	1.85
Q2: I would recommend the AVW to my friends	2.76	1.51	3.53	1.98
Q3: Using the AVW would enhance my effectiveness when developing soft skills	2.50	1.18	3.08	1.76
Q4: I would find the AVW useful in my studies/job	2.46	1.19	3.26	1.84
Q5: I would find the AVW easy to do what I want it to do	2.76	1.34	3.42	1.72
Q6: My interaction with the AVW would be clear and understandable	2.73	1.41	3.28	1.58
Q7: I would find the AVW easy to use	2.49	1.48	3.13	1.49
Q8: If I am provided the opportunity, I would continue to use the AVW for informal learning	2.47	1.33	3.50	1.90
Q9: Using the AVW would enable me to improve my soft skills quickly	2.59	1.33	3.24	1.84
Q10: Using the AVW would improve my performance considering the development of soft skills	2.47	1.11	3.24	1.81

The figures showed that personal space was more acceptable than the social space. However, with the comparatively high standard deviations, the responses were mixed. Qualitative analysis on the comments from the participants gives some explanations.

4.2 Perceived Usefulness – Qualitative Analsysis

Questions were asked to target at specific features of the AVW, the general feedback are summarised below.

Personal Space

Usefulness of pausing a video to write a comment

Positive: Can write down the thought straight away before you forget it, link it to a point in time in the video; a good way to produce a personalized summary of a video; It keeps the listener active and alert; It consolidates the thought behind the comment, and forces the user to articulate it, which makes it more memorable.

Negative: Does not allow selecting multiple aspects to a comment.

Usefulness of specifying aspects when composing comments

Positive: Helps identify the category for the comment; it is easy for reviewing comments.

Negative: More than half of the participants did not find this useful; more so for the aspects in the tutorials.

What was seen as most exciting about the Personal Space in AVW

- "someone has already gathered fairly good tutorials, saving me the time to search youtube"
- "Ability to move through lessons at own pace"
- "Simplicity and rich and it makes me feel like this is my world immediately I login in. And I can equally makes some comments by editing which is very awesome"
- "I have absolute control, making useful comments intermittently"

What disapointed users about the Personal Space in AVW

Several participants pointed at interface issues, indicating that there was a need for some training to use the system effectively. A number of participants replied "nothing" when asked what disappointed them.

As a whole the users appeared positive and excited about the Personal Space, seeing this as an enabler to write their thoughts on the videos, see personal summaries to make meaning from the video, keeps them active and engaged. However, the self-regulation scaffolds, i.e. the aspects used for video annotation, were not perceived as very useful (especially for the tutorials). Further analysis of the interaction with the videos is required to find out what proportion of the comments did not have aspects associated with them, what aspects could have been missed. It has to be noted though that the experiment followed a rather opportunistic approach, mimicking the interaction with videos in widely used social platforms, e.g. YouTube, and did not provide any specific explanation for the aspects and how to use them. Our goal is to investigate whether such 'organic' un-structured way of video watching, which can be scaled easily in a variety of informal learning contexts for soft skills, would provide means for user engagement and can trigger self-regulation processes. Our further analysis (see below) is aimed at gaining deeper insights into this.

Social Space

Usefulness of reviewing the comments on the videos made by others

Positive: Just skimming through the comments would be useful; it is seen as a means to check if there is anything missed; Good to get different views /opinions; Reinforce learning; "More useful than I originally thought".

Negative: Rating were not useful for some participants; Too many comments to go through; Some participants did not find the Social Space useful.

Usefulness of rating the comments of others

Positive: Good as optional, tended to agree with other's comments; helped to reflect further.

Negative: some participants did not notice the ratings; about a third of participants did not find it useful.

What was seen as most exciting about the Social Space in AVW
- "Share of different knowledge"
- "Some of the comments were very funny"
- "Ability to rate/categorise comments"
- "The videos and the reflections were very helpful"
- "Easy to use"

What disapointed users about the Personal Space in AVW
- "The user interface - page refreshing to the top"
- "Asynchronized communication with other viewers, rating without discussion, actually, there is no communication at all"
- "Too much repetition, too many useless comments"
- "Comments are not grouped by similarity"
- "Very crude tool to try to manage complex learning processes"

The participants' opinions about the usefulness of the AVW Social Space were less positive than for the Personal Space. This can partially be explained with the lack of guidance to explain what the pedagogic value would be. Despite this, it is reassuring that many participants saw the Social Space as a means to reinforce learning, see alternative points, ensure that something is not missed. There is clearly a need for further improvement which requires computational means to rank/order the comments and to bring the most relevant comments to the users (e.g. based on their profile or interaction behaviour). Despite the unenthusiastic views on the ratings, there is high number of ratings provided (see Table 1). Further analysis of the ratings and comments can shed light how to facilitate the rating process to realise its value for self-regulated learning (e.g. the learners can be nudged to read/rate comments).

5   Conclusion and Future Work

The study sheds light on the validity of our assumptions and points at the need of further analysis.

The ability for learners to pause a video and make comments in the AVW Personal Space helped notes to be made about their experience with the videos at different points. These comments could be retrieved easily for later use. The passive form of scaffolding, in the form of aspects, did not seem to achieve their aim to trigger recall of past experiences effectively. However, further analysis on individual learner's comments can be used to get deeper insights into the learners' engagement and to investigate whether individual differences have an effect on this. This will allow designing appropriate strategies for personalised intervention.

The use of the AVW Social Space for shared experiences was valued only by some participants although the amount of ratings was quite high. This may be due to the lack of meaningful learning task being set and/or lack of training on how the features could be used (as the usability requires improvement). The overwhelming volume of comments call for some form of intelligent filtering for individual learners. One possible way forward is to analyse learner's comments on the videos to identify appropriate comments to be selected in the Social Space. This could be based on learner's sentiments, topics covered, or number of reflection words.

Overall, the intellignet scaffolding can provide mentor-like features to trigger self-regulated learning for developing of soft skills from active video watching contexts.

References

1. Thakker, D., Despotakis, D., Dimitrova, V., Lau, L., & Brna, P. (2012). Taming digital traces for informal learning: a semantic-driven approach. In *21st Century Learning for 21st Century Skills* (pp. 348-362). Springer Berlin Heidelberg.
2. Arelando, E., The Millennials Are Coming! Proven Engagement Strategies. *Learning Solutions Magazine*, June 2013.
3. Mitrovic, A., & Weerasinghe, A. (2009). Revisiting ill-definedness and the consequences for ITSs. Artificial intelligence in education: Building learning systems that care from knowledge representation to affective modelling, 375-382.
4. Bannert, M., & Mengelkamp, C. (2013). Scaffolding hypermedia learning through metacognitive prompts. In *International handbook of metacognition and learning technologies* (pp. 171-186). Springer New York.
5. Chi, M. T., & Wylie, R. (2014). The ICAP framework: Linking cognitive engagement to active learning outcomes. *Educational Psychologist*, *49*(4), 219-243.
6. Despotakis, D., Dimitrova V., Lau, L. Thakker, D., Ascolose, A., & Pannese, L. ViewS in User Generated Content for Enriching Learning Environments: A Semantic Sensing Approach. In *Proceedings of AIED 2013*, Memphis, USA.
7. Hart, S. G. (2006, October). NASA-task load index (NASA-TLX); 20 years later. In *Proceedings of the human factors and ergonomics society annual meeting* (Vol. 50, No. 9, pp. 904-908). Sage Publications.
8. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.