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Adding Interactive Mode to Active Video Watching

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Abstract: Presentation skills are crucial for tertiary students and graduates but are difficult to teach. We augmented active video watching (AVW) approach with the possibility of interactions among students, and conducted an experiment with AVW-Space, an online platform which supports video-based learning. The participants watched and commented on videos first. In the second phase, the participants reviewed, rated, and responded to their peers' comments. We found that students who interacted with other students and responded to their comments increased their conceptual understanding of presentation skills.

Keywords: Active video watching, interactive learning, presentation skills

1. Introduction

Presentation skills are essential for tertiary students as they play a crucial role in their further education and careers (Wats & Wats, 2009). However, they are challenging to teach and teaching such competencies demands a substantial investment of time, needs extensive practice, and requires continuous feedback from instructors (Anthony & Garner, 2016).

Video watching is one of the common methods of teaching transferrable skills (Conkey et al., 2013; Mitrovic et al., 2016). Although learning from videos has many advantages, such as providing flexible, self-controlled learning opportunities, and raising students' motivation (Sablić et al., 2021), the main disadvantage of Video-Based Learning (VBL) is the lack of interaction between the system and the learner, or between learners (Yousef et al., 2014). Lack of interaction results in low-quality learning due to limited engagement (Mitrovic et al., 2019).

Active Video Watching (AVW) was proposed recently as a means to promote self-reflective learning (Dimitrova & Mitrovic, 2022; Mitrovic et al., 2017). AVW-Space is a controlled VBL-environment, which allows teachers to integrate YouTube videos into their teaching spaces. Students can watch and comment on videos using teacher-specified micro scaffolds for reflection. Students are also able to review and rate the comments written by their peers in the system's social space in order to reinforce their learning. In this paper, we investigate and show the importance of supporting interactions between students in AVW. To provide direct interaction between students, we modified the reviewing/rating phase: Students can Like/Dislike comments, but also respond to comments, as well as previously written responses in two nested levels (level 1: respond to comment, level 2: respond to response). We present some preliminary results of the study in the next section.

2. Methodology and Results

Following ethics approval, we collected data from a mandatory first-year course for all engineering students at the University of Canterbury in 2023. Participants had two weeks to complete Survey 1, watch eight videos about presentation skills and make comments on them. Survey 1 consisted of questions on demographic, training, and experiences with presentation

skills; they were also asked to write as many phrases as they could on giving presentations in terms of *structure*, *delivery and speech*, and *visual aids* (one minute for each question). At the end of this phase, we selected 238 (anonymized) comments which were provided to the whole class to review, rate, and respond. At the end of the study, students were invited to complete Survey 2, which contained the same questions on giving presentations, and additionally open-ended questions about the usefulness of reviewing, rating, and responding to others' comments.

Out of 746 students who completed Survey 1, we excluded responses of participants under 18 since they were unable to give informed consent. Also, we eliminated records of students who did not watch any videos. Of the remaining 647 participants, 69.55% were male, 29.68% were female, and 0.77% did not specify. Most participants (96.75%) were in the 18-23 age group, and (86.55%) were native English speakers. We received 493 valid responses for Survey 2. We classified the participants post-hoc based on their observable learning behaviours using the ICAP framework proposed by Chi and Wylie (2014). ICAP identifies four learning modes with increasing levels of engagement: Passive, Active, Constructive, and Interactive. In this paper, Passive students were those who have not written any comments or responses. The participants who wrote some comments are classified as Constructive if they wrote at least two high-quality comments (i.e., comments which show reflection on past experience, and planning for future presentations), while the remaining ones are classified as Active (Mohammadhassan et al., 2020). We distinguished interactive students as those who wrote at least one response to comments/responses. Table 1 presents the summary of students' activities in AVW-Space.

Table 1. *Summary of Activities for Students Completing both Surveys – Mean (Std)*

	Passive n=12	Active n=289	Constructive n=125	Interactive n=67	Total n=493
Days	1.67 (.89)	3.03 (1.88)	**4.23** (3.00)	3.16 (2.29)	3.32 (2.32)
Sessions	2.25 (1.48)	3.67 (2.53)	**5.22** (4.66)	4.04 (3.15)	4.08 (3.33)
Videos	8 (3.59)	**11.40** (4.01)	10.21 (3.17)	10.48 (3.78)	10.89 (3.83)
Comments	0	10.31 (5.49)	**21.25** (12.29)	15.90 (10.16)	13.59 (9.80)
Ratings	5.25 (9.62)	15.28 (16.40)	**27.07** (27.97)	14.54 (12.84)	17.92 (20.24)
Responses				**5.07** (5.97)	
Review pages	2.58 (3.42)	8.96 (2.50)	**9.09** (2.54)	8.84 (2.22)	8.82 (2.68)
CK1	12.75 (3.60)	13.65 (5.75)	**14.87** (5.96)	14.37 (6.10)	14.04 (5.82)
CK2	13.25 (3.93)	13.72 (6.12)	15.86 (6.68)	**17.30** (8.73)	14.74 (6.75)
CK2-CK1	+ 0.50	+ 0.07	+ 0.99	**+ 2.93**	+ 0.70
T-test, α=.05	t=-.40, p=.35	t=-.19, p=.42	t=-1.58, p=.06	t=-2.75, p=.004	t=-1.73, p=.04

Bold-styled numbers show the highest values in each measure. ANOVA with the Bonferroni correction identified significant differences among different categories of students in all activities ($p<.05$). Constructive students used the system on significantly more days and wrote/rated significantly more comments compared to others. In terms of watching videos, Active students were significantly different from Constructive ones. Also, there were significant differences among Passive students and the others in all measures. All groups acted significantly differently in terms of writing comments ($df=3$, $F=160.47$, $p<.001$).

Students' responses to the conceptual knowledge questions from Surveys 1 and 2 (CK1 and CK2 respectively) were analyzed using the ontology developed by (Dimitrova & Mitrovic, 2022). The scores represent the number of ontology concepts mentioned in responses. Using the paired t-test on CK1 and CK2 for all student categories, we found that the only significant increase from CK1 to CK2 scores was for Interactive students, which indicated a considerable growth in CK score compared to other groups. ANCOVA analysis (Dependent Variable=CK2, Covariate=CK1, Fixed Factor=student groups) reported that CK1 ($F=128.05$, $p<.001$) and student groups ($F=6.10$, $p<.001$) have significant effects on CK2.

In Survey 2, we asked students about the usefulness of replying to the comments made by other students. Out of 490 responses, 390 (79.59%) were positive (e.g., "it gives others' ideas that they might not consider"), 36 (7.35%) cases were neutral, and the remaining 64 (13.06%) were negative ("Not useful").

3. Conclusions

In this study, we adopted the AVW approach, and added interactive components in social space for students to acquire presentation skills. Having watched and commented on videos, students reviewed, rated, and responded to their peers' comments. The obtained results show significant differences in the amount of improvement among different student groups. Students who took advantage of the interactive mode of learning in AVW, interacting with other students, considerably enhanced their conceptual knowledge of presentation skills.

References

Anthony, S., & Garner, B. (2016). Teaching soft skills to business students: An analysis of multiple pedagogical methods. *Business and Professional Communication Quarterly*, *79*(3), 360-370.

Chi, M. T., & Wylie, R. (2014). The ICAP framework: Linking cognitive engagement to active learning outcomes. *Educational psychologist*, *49*(4), 219-243.

Conkey, C. A., Bowers, C., Cannon-Bowers, J., & Sanchez, A. (2013). Machinima and video-based soft-skills training for frontline healthcare workers. *GAMES FOR HEALTH: Research, Development, and Clinical Applications*, *2*(1), 39-43.

Dimitrova, V., & Mitrovic, A. (2022). Choice architecture for nudges to support constructive learning in active video watching. *International Journal of Artificial Intelligence in Education*, *32*(4), 892-930.

Mitrovic, A., Dimitrova, V., Lau, L., Weerasinghe, A., & Mathews, M. (2017). Supporting constructive video-based learning: requirements elicitation from exploratory studies. Artificial Intelligence in Education: 18th International Conference, AIED 2017, Wuhan, China, June 28–July 1, 2017, Proceedings 18,

Mitrovic, A., Dimitrova, V., Weerasinghe, A., & Lau, L. (2016). Reflective experiential learning: Using active video watching for soft skills training. Proceedings of the 24th international conference on computers in education,

Mitrovic, A., Gordon, M., Piotrkowicz, A., & Dimitrova, V. (2019). Investigating the effect of adding nudges to increase engagement in active video watching. Artificial Intelligence in Education: 20th International Conference, AIED 2019, Chicago, IL, USA, June 25-29, 2019, Proceedings, Part I 20,

Mohammadhassan, N., Mitrovic, A., Neshatian, K., & Dunn, J. (2020). Automatic assessment of comment quality in active video watching.

Sablić, M., Mirosavljević, A., & Škugor, A. (2021). Video-based learning (VBL)—past, present and future: An overview of the research published from 2008 to 2019. *Technology, Knowledge and Learning*, *26*(4), 1061-1077.

Wats, M., & Wats, R. K. (2009). Developing soft skills in students. *International Journal of Learning*, *15*(12).

Yousef, A. M. F., Chatti, M. A., & Schroeder, U. (2014). The state of video-based learning: A review and future perspectives. *International Journal on Advances in Life Sciences*, *6*(3), 122-135.