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JOURNAL	International Journal of Innovative Technologies in Economy
p-ISSN	2412-8368
e-ISSN	2414-1305
PUBLISHER	RS Global Sp. z O.O., Poland
ARTICLE TITLE	INTERACTIVE LECTURE: THE ROLE OF VIDEOS AND GAMES IN FOSTER STUDENTS' TEAMWORK SKILLS
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ARTICLE INFO	Tan Ming Kuang, Riki Martusa, Henky Lisan Suwarno, Yuliana Gunawan. (2024) Interactive Lecture: the Role of Videos and Games in Foster Students' Teamwork Skills. <i>International Journal of Innovative Technologies in Economy</i> . 1(45). doi: 10.31435/rsglobal_ijite/30032024/8114
DOI	https://doi.org/10.31435/rsglobal_ijite/30032024/8114
RECEIVED	19 February 2024
ACCEPTED	27 March 2024
PUBLISHED	29 March 2024
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INTERACTIVE LECTURE: THE ROLE OF VIDEOS AND GAMES IN FOSTER STUDENTS' TEAMWORK SKILLS

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DOI: https://doi.org/10.31435/rsglobal_ijite/30032024/8114

ARTICLE INFO

Received 19 February 2024

Accepted 27 March 2024

Published 29 March 2024

KEYWORDS

Interactive Lecture, Videos, Games, Teamwork.

ABSTRACT

Teamwork is a vehicle to help an organization achieve a competitive advantage. How to create the foundation of teamwork is becoming important for every organization worldwide. Therefore, the concept of teamwork is learned at every level of organization, including enterprises and schools. Because this concept is important, how to learn teamwork is developed by academics. Then we introduce a method to learn teamwork, i.e., an interactive lecture approach. This method gives a fun way to deliver the concept of teamwork to students. The purpose of this study is to analyze the implementation of an interactive lecture approach to help students acquire the concepts of teamwork. The study employs an experimental method with a pre- and post-test design without random assignment. The participants are forty-two students enrolling in a bachelor program at a private institute of technology in Cambodia. This study suggests that interactive lectures combining lectures, videos, and games have the potential to be an effective method to convey the concepts of teamwork. This finding supports learner-centered and multimodal learning theories and the importance of using various modes and media in a learning process.

Citation: Tan Ming Kuang, Riki Martusa, Henky Lisan Suwarno, Yuliana Gunawan. (2024) Interactive Lecture: the Role of Videos and Games in Foster Students' Teamwork Skills. *International Journal of Innovative Technologies in Economy*. 1(45). doi: 10.31435/rsglobal_ijite/30032024/8114

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Introduction.

Teamwork is an important issue in every organization. Teamwork is the collaboration of a group consisting of individuals with different characteristics to achieve a specific target (Levi, 2017). But the turbulence of the environment influences the organization's ability to achieve a competitive advantage. Because the members of the team must be facing various complexity problems from the environment, If the team engages in innovative ideas, they create a more effective work process (Ancona & Bresman, 2023). This study aims to investigate whether the interactive lecture approach influences how students learn about the teamwork concept.

The study of Meguid & Collins (2017) give empirical evidence that interactive lecture to help students in focusing attention and clarifying information. The traditional lecture is defined as the

lecturer sending information to the students, i.e., note-to-note without their mind either (Barkley & Major, 2018). Because the process of lecturing is ineffective, But interactive lectures create a way of learning by making students more attentive and active (Shi, Irwin, & Du, 2023). Therefore, we employed this interactive lecture to deliver the concept of teamwork toward the students of Kirirom Institute of Technology in Cambodia.

Cambodia is a developing country in which it lies between two economic power countries, i.e., Vietnam and Thailand. But Cambodia has comfortable regulations for foreign direct investment (Tan, 2022). Furthermore, the Royal Government of Cambodia, through the Ministry of Education, improves education with various projects, from preschool to higher education (Heng & Sol, 2023). Accordingly, this study implements the experiment scenario with the students of Kirirom Institute of Technology in Cambodia. We conjecture that there are differences in the learning process of Cambodian students between pre- and post-experiment, i.e., the implementation of an interactive lecture approach.

The interactive lecture approach gives students an experience of how to be more active learners than passive ones (Barkley & Major, 2018). Furthermore, the games and video are able to make the interactive lecture more powerful. The games give the student the feeling of an ideal learning environment with their built-in permission to fail, encouragement of out-of-box thinking, and sense of control (Kapp, Blair, & Mesch, 2014). Then the video gives the students learning through their visuals and imagination. They were able to study better in terms of comprehension and retention of the learning content (Hung, Kinshuk, & Chen, 2018).

A number of prior studies have investigated the interactive lecture approach with the various determinant (Meguid & Collins, 2017; Hung *et al.*, 2018; van der Meij & Dunkel, 2020; Shi *et al.*, 2023). Study of Meguid & Collins (2017) examine the student perception of lecturing approach, I.e. traditional versus interactive lecture in computer science students at UK. They employ survey data to assess the opinion of undergraduate dental students on the use of the Audience Response System as a technology learning method for interaction at the end of their first semester in 2015/2016. The result shows that the interactive lecture improved the student's understanding and critical thinking. Then Hung *et al.* (2018) utilized the experiment method to examine the usage of collective intelligence in interactive lecture among undergraduate and postgraduate students at a southern university in Taiwan. The experiment uses a subject design in which the students are divided into three groups, i.e., embodied interactive lecture, non-embodied interactive lecture, and conventional video lecture. The result indicates that the students who employed embodied interactive lectures performed better in comprehension and retention of learning contents than the other two counter groups. The other prior study utilized the experiment method to examine the impact of video-based learning in statistics courses (van der Meij & Dunkel, 2020). The participants of the experiment are students in the master's program in International Business Administration. The study finds that the students who used video-based learning performed better than the other groups. But a few studies examine the interactive lecture approach using the teamwork concept, particularly in developing countries, i.e., Cambodia. Therefore, this study proposes to state the research question of whether interactive lecture approaches with video and games are able to improve the understanding of students related to the concept of teamwork.

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Materials and Methods.

This is a causal study employing the experimentation method to address the proposed research question. Experimental design applies a non-random assignment with a pre- and post-test. Forty-two students enrolling in a bachelor program in tourism management (14%) and software engineering (86%) from a private institute of technology in Cambodia participated in this study. The majority of respondents are male (71%); the rest are female (29%).

Research procedures consist of three phases. First, students filled out the questionnaire, asking about their demography, their understanding of disruption in the business environment, and the concept of teamwork. Next, students attended a class that taught changes in the business environment and how teamwork skills are critical to coping with uncertainty. The instructor employed interactive teaching methods, such as videos and games, to promote students' understanding. Specifically, students participated in four games with different learning goals. The first game aims to help students understand the significance of teamwork in achieving organizational goals. The students were asked to create a picture of a house using a different colored piece of paper. The challenge was that each student only has one colored piece of paper, making this task impossible to complete without

collaborating with their classmates. The second game aims to help students understand the importance of a clear goal for a team. Like in the first game, the students working in a group created a picture of a house using a piece of paper, but the instructor always complained that the picture did not meet the standard required. The third game aims to help students learn how to deal with frustration and conflict that can arise in a team environment. A group of five students was once again asked to create a house from paper cut-outs. Four students were instructed to work, while one student was assigned to submit the team's work to the instructor and receive praise. The last is an auction game designed to help students gain insight into the concept of synergy. The auction was played under two conditions: competition and collaboration. In the competitive environment, students were encouraged to outbid each other to obtain money worth US\$0.7 by making the highest bid. In the collaboration environment, students worked together to obtain the money by making the lowest bid so that their team could achieve a higher profit compared to the profit obtained in a competitive situation. Finally, students once again filled out the questionnaire. All the questions are the same as the pre-test, except for additional questions regarding the evaluation of training.

This study uses a paired sample t-test to investigate whether there is an improvement in teamwork comprehension after students participate in the interactive class. Twelve survey questions used a 5-point scale, where 1 = strongly disagree, 2 = disagree, 3 = moderate, 4 = agree, and 5 = strongly agree, to evaluate students' understanding of the concept of teamwork. The first five questions focus on the significance of teamwork skills to cope with changes in the business environment, while the last seven questions focus on the critical elements for developing teamwork skills.

Results.

Figure 1 graphs the performance of the students from the pre-test to the post-test. Table 1 presents the mean, median, standard deviation, and outcomes of paired sample t-statistics for the twelve-survey question. The survey reveals that students' understanding of teamwork concepts has improved after implementing an interactive lecture. Table 1 shows that all but question item number four increased significantly, indicating that students participating in interactive lectures demonstrated a higher level of understanding of the concept of teamwork. Students show a higher level of improvement, particularly for item questions 1, 2, 3, and 10, while showing a lower level of improvement for item question number 4.

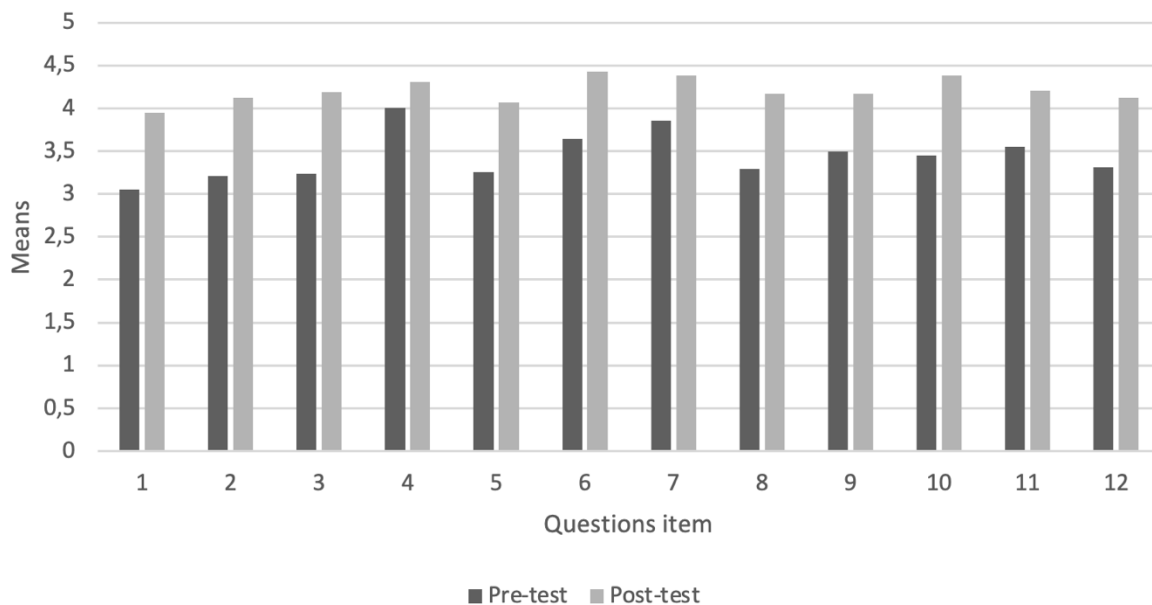


Figure 1. Means of each question items at two measuring points.

Table 1. Means, median, standard deviations, and paired-sample t test.

Survey Question	Pre-Test (a)	Post-Test (b)	Improvement (b – a)	T-Stat
I understand the external forces that shape change in the business environment	3.05 (3, 0.99)	3.95 (4, 0.79)	0.90	0.000
I know several examples of companies that have experienced changes in how they run their business due to changes in the business environment.	3.21 (3, 0.95)	4.12 (4, 0.63)	0.91	0.000
I understand disruption in the changing business environment	3.24 (3, 0.69)	4.19 (4, 0.67)	0.95	0.000
I understand the impact of technological change on today's business environment	4.00 (4, 1.01)	4.31 (4, 0.75)	0.31	0.057
I understand changing consumer behaviour in today's business environment	3.26 (3, 0.8)	4.07 (4, 0.68)	0.81	0.000
I understand the important role of teams in facing changes in the current business environment	3.64 (4, 1.01)	4.43 (5, 0.67)	0.79	0.000
I understand the difference between individual mentality and team mentality	3.86 (4, 0.95)	4.38 (4.5, 0.73)	0.52	0.001
I understand the concept of synergy in a team	3.29 (3, 1.02)	4.17 (4, 0.85)	0.88	0.000
I understand how to make a team run effectively	3.50 (4, 0.86)	4.17 (4, 0.82)	0.67	0.000
I understand the impact of an organization without a team	3.45 (4, 1.04)	4.38 (4, 0.62)	0.93	0.000
I understand how to develop effective teamwork	3.55 (4, 0.83)	4.21 (4, 0.78)	0.66	0.000
I understand the inhibiting factors in developing effective teamwork	3.31 (3, 0.9)	4.12 (4, 0.74)	0.81	0.000

Discussion.

This study is based on the research question of whether interactive lectures with videos and games can enhance students’ understanding of the concept of teamwork. This study reveals that the interactive lecture approach is effective in helping students comprehend the concept of teamwork. Students learn the notion of teamwork through discussions, games, and videos in the classroom. The results of pre- and post-tests demonstrate that students generally agree that their understanding of the significance of teamwork in navigating the dynamic business environment enhances after participating in the interactive session. This finding is aligned with the literature on learning and instruction, indicating that teaching methods that have a high level of interaction between students, materials, and instructors improve the acquisition of knowledge and retention (Kapp *et al.*, 2014).

Students’ feedback on the learning activities is also positive. The majority of participants (94%) found that the materials were beneficial and of high quality. Some students provide comments on the strengths and weaknesses of the training.

Student 1: *Strength: to understand the topic, Weakness: please give the explanation of the activity.*

Student 2: *Strength: I listen and get much information, Weakness: I may not do participate well because of the game confusion.*

Student 3: *Strength: I believe it teaches us what it is like to work in a turbulent environment both individually and in a team, Weakness: The game only shows a brief showcase of in real life environment but not into much detail.*

They assessed that the primary strength of the training lies in the comprehensible delivery of the materials, providing valuable learning experiences. However, the instructor needs to improve their explanations regarding the activities conducted and ensure that instructions for simulation games are easily understood by participants. Additionally, simulations should be further developed to provide a more realistic representation of workplace situations. These comments are consistent with the literature on games and simulation, suggesting the importance of clear debriefing for the effectiveness of educational games (Hyas, 2005; Sitzmann, 2011).

Other students also provide positive comments, as follows:

Student 4: I know how to work in team effectively and use it in real life.

Student 5: No suggestions as for a result the workshop is perfect.

Student 6: *Strength: The content of the presentation is very clear, It's easy to understand, It was fun because of all the games. Weakness: none.*

Student 7: *Strength: Know the importance as a team. Also know ways how to work as a team and how to prevent problems from happening in the group. Thank you for teaching us this lesson!*

Overall, the interactive lecture was implemented successfully. Some students did not identify any weaknesses in the training provided, considering that the material was effectively delivered using an engaging method and provided knowledge and skills that can be applied in real-world situations.

This study has several limitations. First, the use of convenience sampling. The participants in this study are students from a private institute of technology in Cambodia, which has cooperated with the researchers' institution. As a result, it is not appropriate to extrapolate the study's results to populations or situations that diverge considerably from the sample in terms of demographic composition and educational environment. Future studies should employ the random sampling method to improve the generalizability of the study. Second, there is no control group. Since the number of participants is relatively small and it is unlikely to create another group with no learning condition due to schools' policies, this study only runs an experiment with one treatment group (i.e., a group with a learning condition). This could make it difficult to draw definitive conclusions about the causal relationship between interactive lectures and learning outcomes. This is controlled through pre- and post-test design. The future study should use a control group to enhance the causal relationship between the variables being investigated. Lastly, students' perceptions. This study evaluates the achievement of learning outcomes by asking students whether they feel they have learned after participating in the interactive lecture, rather than assessing the specific knowledge they have acquired. The future study could employ a more objective approach to measuring learning outcomes based on students' understanding of the concept of teamwork.

Conclusions.

Interactive lectures combining lectures, videos, and games have the potential to be an effective method to convey the concepts of life skills. This study found that students benefit from the use of interactive lectures to acquire knowledge on teamwork skills. The interactive features of videos and games may increase the student's involvement in a learning process that helps them understand the concepts easily.

This study has implications for theory and practice. This study supports learning theories emphasizing student-centered and multimodal learning, in which lectures deliver information using various modes or media. This study suggests that the lecturer should redesign their lecture to be significantly more interactive by combining brief lectures with video presentations, group interactions, and the use of educational games.

Acknowledgements.

We are grateful to Universitas Kristen Maranatha for their generous support of this study.

Declaration of Interest Statement.

The authors declare no conflict of interest.

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