

*Evaluating the Use of White Board Animation in  
the Learning Process*

*Evaluación del uso de la animación de pizarra en el  
proceso de aprendizaje*

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**Resumen:** Un gran desafío para los formadores y profesores de hoy en día es atraer y retener la atención de los estudiantes y participantes. En la era de las redes sociales y los teléfonos inteligentes, los estudiantes tienen varias cosas que pueden distraerlos durante el proceso de aprendizaje y la responsabilidad de encontrar formas de involucrarlos de manera efectiva recae en el maestro. Con base en una revisión de la literatura sobre desarrollos tecnológicos, los investigadores del presente estudio proponen el uso de multimedia de animación de pizarra como una herramienta para mejorar la experiencia de aprendizaje. En el presente estudio se evalúa la efectividad de esta técnica a través de un diseño de grupo control pretest postest y la muestra conformada por estudiantes del curso de maestría en administración de empresas. Los hallazgos brindan evidencia empírica que respalda el uso de videos de animación de pizarra para complementar el aprendizaje en el aula.

**Palabras claves:** Educación superior, aprendizaje, reacción, animación de pizarra

**Abstract:** A big challenge for the present-day trainers and teachers is to attract and retain the attention of the students and participants. In the era of social media and smartphones, students have several things that can distract them during the learning process and the responsibility to find ways to engage them effectively falls on the teacher. Based on a review of literature on technological developments, the researchers of the current study propose the use of whiteboard animation multimedia as a tool to enhance the learning experience. In the current study, the effectiveness of this technique is evaluated through a pre-test post-test control group design and the sample comprised of students of the master's in business administration course. The findings provide empirical evidence supporting the use of whiteboard animation videos to supplement classroom learning.

**Keywords:** Higher education, Learning, Reaction, Whiteboard animation

## Introduction

The learning process has the potential to increase the learner's interest and patterns of engagement with course material and guide in encouraging and empowering them to take responsibility for their own learning (PARK, 2003). It also encourages learners to become self-reflective, in terms of gaining the ability to self-evaluate. Digital teaching technologies are continuously evolving, and they have the potential to offer new learning experiences. However, adopting new formats is often costly, and their efficacy is unknown.

Involving students in active learning, multimedia may give a living experience for them. Materials can be delivered using electronic storage devices. It provides pupils with both explicit and implicit knowledge through multisensory perception. In a meaningful scenario, multimedia motivates and piques curiosity in learning. Students' interest in smart classrooms with multimedia technology is growing around the world resulting in demands for high-end technologies for interactive teaching and learning (TENG ET AL., 2020). Therefore, educators must continuously train themselves and enhance their

teaching methods. This can also be applied by integrating online and offline tools. Whiteboard animation multimedia is one such tool.

Whiteboard animation multimedia is extremely popular in the marketing and advertising context and has been known to increase customer engagement. The use of pictures, text, music and animation has been found to capture the interest and engage the viewers (Karthiga, 2019). Although there has been a lot of recent research on the development of whiteboard animations, there is still dearth of knowledge about how learners interact with this form of animation (Türkay, 2016). In the current study, the researchers evaluate the effectiveness of whiteboard animation in the context of higher education.

### **The need for innovative teaching techniques**

Understanding and appreciating the concepts behind how learners learn is required for developing effective multimedia animation methods that enhance learning (ALESSI & TROLLIP, 2001). Multimedia technologies are primarily incorporated in a learning module to help students pay more attention, become more motivated, and retain more information (YAP, 2016). Weimer's Learner-Centered Teaching model outlined important ways to assist educational institutions in achieving such transformations in a more methodical manner by providing teachers with explicit criteria to adopt and execute multimedia animation that embedded traditional teaching with multimedia learning and online learning. The model does so by rating a pedagogy or andragogy in terms of their effects on learner knowledge and motivation (YAP, 2016). The analysis of multimedia animation suggests that the use of this technology would lead to a change in the patterns of reactions.

Multimedia-based instructional content is expected to enhance a learner's interaction with the course material by reducing the effort required to process the information (De Sousa et al., 2017). Researchers have promoted the use of multimedia in education, given that

they help in knowledge retention and more information can be shared faster and in a manner that makes it interesting to students (EKINCI ET AL., 2009). ABDULRAHAMAN ET AL. (2020) conducted a systematic review of literature in the area of multimedia enhanced learning and concluded that the use of multimedia significantly enhanced the learning environment. Studies in their review had used a range of multimedia tools, however, in the current study, the researchers attempt to evaluate the effectiveness of one specific type of multimedia, whiteboard animation multimedia.

To evaluate the effectiveness of whiteboard animation in the learning process, the researchers have chosen the first two levels of the Kirkpatrick model: reaction and learning. PRASLOVA (2010) understood that institutions of higher education receive critical comments for assessments of educational efficiency. Selecting relevant indicators of educational efficiency of multimedia programs has been a tough process, especially when effectiveness criteria are not well defined. By adapting an organizational training assessment framework, the Kirkpatrick's four level model, the need for a comprehensive and systematic strategy to match criteria for educational effectiveness with specific measures of performance is achieved. The reaction, learning, behaviour, and results criteria make up the four-level model (KIRKPATRICK, 1959). The application of this paradigm gives a rich background for comprehending the individual indicators' roles in the overall assessment mosaic. It also gives rich and multidimensional feedback to higher education institutions on the success of their efforts to serve their many constituents.

Reaction is defined as a hierarchical notion, with correlations between different reaction characteristics explained by overall pleasure (enjoyment, relevance, and technology satisfaction) (BROWN, 2005). It is a reflection of how much the trainee liked the program and would eventually results in more willing participation from the trainee and others, through word-of -mouth (ALLIGER ET AL., 1997). In the current study, the researchers

have measured overall reaction, as well as reaction to the technology used, level of enjoyment and perceived level of relevance (BROWN, 2005)

The second level of learning evaluation is the increase in knowledge, termed as learning. It is also common to measure changes in attitude as a part of the second level of evaluation (WARRETT AL., 1999). This level is considered critical as research suggests that a change in the cognitive level must take place for perceptible change at the behavioural or organizational level. LEPINE ET AL., (2000) also found that there is a significant and positive impact of learning on behavioural change and training transfer.

### **The design of innovation**

The objective of the current study was to evaluate the effectiveness of whiteboard animation in the learning process. For the same, students of a Master of Business Administration course at a leading college in Bengaluru, Karnataka were chosen as the sample. The researchers chose a for the study.

### ***The development of the improvement experience***

The module on ‘History of Management’ was chosen for the current study. The control group attended a regular lecture style class, aided by a PowerPoint presentation. The experimental group attended a class where the whiteboard animation video was used. The video was designed on the Doodly application and covered the same amount of content as the PowerPoint. The sessions were for an hour each. Both groups first underwent 10-mark pre-test, followed by the module and closing remarks or summarization by the teacher. In the last ten minutes, they were asked to complete the post-test and record their responses to the survey. Figure 1 presents a screen shot of the video created through Doodly.

*Figure 1: Screenshot from the video*



### Choosing the participants

The participants of the current study belonged to the age group of 21 to 24. The students of the first year of the MBA program were invited to participate in the study. They were then randomly assigned to two groups, a control group and an experimental group. After the data was cleaned and incomplete responses were removed, the final data set comprised of 43 responses in the control group and 46 responses in the experimental group.

### Data collection and Instruments

The level of learning was calculated as a difference in the scores in the pre-test and post-test. Both tests comprised of ten multiple choice questions and each correct answer received 1 mark. There was no negative marking for incorrect answers.

Reaction to the program was measured using the scale provided by Brown (2005). The scale measures three dimensions of reaction, Enjoyment, Reaction to the technology used and Relevance. The scale was chosen as it is one of the few scales that measures the reaction to the technology used. Some of the statements in the scale were “The technology allowed for easy review”, “The content of this lecture seems very interesting to me” and

“The lecture was relevant to my education”. The scale showed high reliability with a Cronbach’s alpha score of 0.92. Data analysis was carried out using SPSS.

*The assessment of the improvement*

The objective of the study is to evaluate the effectiveness of whiteboard animation multimedia when used in the learning process. Table provides the descriptive statistics of the variables.

*Table 1: Descriptive Statistics*

			Std.		
	N	Mean	Deviation	Skewness	Kurtosis
Reac	89	4.039	.606	-.717	1.081
Pre-test	89	5.48	2.375	.258	-1.008
Post-test	89	8.24	1.446	-.840	.225
Learning	89	2.75	2.052	.398	-.212
Valid	N	89			
(listwise)					

The mean value for reaction (Reac) was found to be 4.04, suggesting that most participants were happy with the program. The difference in the pre-test and post-test scores were used to calculate the change in declarative knowledge or learning. The mean score learning was found to be 2.75. The skewness and kurtosis values for all the variables were found to be within the range of +3 and -3, thereby suggesting that the data could be treated as normally distributed and parametric tests could be used for the analysis. The researchers then proceeded to analyze the correlation between the variables. For the same, the intervention was dummy coded as a variable WhiteB. A value of 1 was used to



indicate the use of whiteboard animation, while 0 indicated that the video was not used. The correlation between the use of whiteboard animation multimedia and the dependent variables of learning, reaction and its dimensions, has been provided in *Table 2*.

*Table 2: Correlation*

	Rt	Re	Rr	R	Learning
WhiteB	.295**	.303**	.221*	.313**	.346**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

The correlation analysis revealed that overall reaction and learning were significantly and positively correlated to the use of the whiteboard animation multimedia. The dimensions of reaction; reaction to the technology used, relevance of the module and level of enjoyment were also found to be significantly correlated to the use of whiteboard animation. To evaluate the effectiveness of the technology, a comparison of the mean scores of the control group and experimental group was done. The results of the analysis have been presented in *Table 3*.

*Table 3: Comparison of the mean scores*

WhiteB	N	Mean	t	Sig	Mean Difference
Rt	C 43	3.82	-2.875	.005	-.367
	E 46	4.19			
Re	C 43	3.79	-2.969	.004	-.470
	E 46	4.26			
Rr	C 43	3.92	-2.109	.038	-.299
	E 46	4.22			
R	C 43	3.84	-3.079	.003	-.378
	E 46	4.22			
Learning	C 43	2.02	-3.436	.001	-1.412
	E 46	3.43			

The comparison of the mean scores for reaction suggest that the experimental group (E, mean= 4.22) rated the program significantly higher than the control group (C, mean=3.84). The experimental group also rated the program higher on the dimensions of technology, relevance and enjoyment. The difference in the mean scores was found to be statistically significant ( $p<0.05$ ). The experimental group was also found to report higher levels of learning (3.43) as compared to their counterparts in the control group (2.02). This difference was also found to be statistically significant with  $p<0.05$ . Thus, there is statistical evidence to conclude that the use of whiteboard animation multimedia resulted in higher levels of learning and a more positive reaction to the module.

### **Understanding why the technique works**

The present study focuses on evaluating the impact of whiteboard animation multimedia on the learning outcomes among college students. The use of multimedia in the process of teaching college students is popular because it increases the attention span of the students and helps in improving the learning outcomes (ABDULRAHAMAN ET AL. 2020). The aim is not to replace hands-on teaching but to use multimedia technology in enhancing the learning experience (ALMARA'BEH ET AL., 2015).

The use of different techniques in learning processes can enhance the level of interest and engagement among the students (PARK, 2003). The use of multimedia gives a different dimension to the classroom teaching and smart classrooms are becoming popular, globally. The use of technological tools increases curiosity among the students and creates a more interactive session (TENG ET AL., 2020).

In order to establish the effectiveness of whiteboard animation multimedia, the current study compared two different methods of teaching. One group of participants were taught with the help of whiteboard animation (experiment group), while the other group (control group) was taught with the help of simple power point presentation. The correlation

analysis revealed that overall reaction and learning were significantly and positively correlated to the use of the whiteboard animation multimedia.

The first learning outcome that was evaluated was the level of learning or increase in declarative knowledge. The mean score of learning was found to be significantly higher for experimental group as compared to the control group. This can be attributed to better engagement. PEDRA ET. AL. (2015) suggested that whiteboard animation engages the participant with a first-person experience of involvement, which in turn improves the knowledge retention through active interaction. TÜRKAY (2016) also studied the learner experience in terms of retention, enjoyment and challenges a participant faces while using whiteboard animation. It was found that the use of whiteboard technology has a positive impact on retention, engagement and enjoyment. According to SWELLER (2005) learner learns better when the technique involves a combination of words, written and spoken text, pictures and video and since multimedia involves a combination of all these elements, it is likely to have a positive impact on the learning process.

The second learning outcome that was measured was reaction. The mean score for reaction was also found to be significantly higher for the experimental group. On the dimensions of technology, relevance and enjoyment also the experimental group rated the module higher. Thus, there is statistical evidence to suggest that whiteboard animation multimedia resulted in a more positive reaction to the module. These results are in the line with another study by van der MEIJ ET AL. (2021). In their study, they compared the effectiveness of a whiteboard animation multimedia and a regular PowerPoint presentation. While performance in the post test was similar for both groups, the reaction was significantly more positive for the animated video.

The whiteboard animation looks similar to chalk board teaching, and this could be a reason for higher engagement levels among the learner (TÜRKAY, 2016). In a study by BHATTI (2015) it was found that the students indicated that chalk board teaching was more interactive than traditional slide-based teaching. However, to make learning environment more effective the use of multimedia components must be blended with other pedagogies (BARAK, 2011). Introducing these techniques in the classrooms would enable students to connect with the theoretical knowledge better (KOSCIANSKI 2012).

In the world of smart phones and social media, it is the need of the hour to identify and design instructional content than can attract the attention of the students and retain it by making the learning process fun, interactive and effective. Findings suggest that the use of whiteboard animation multimedia enhances the classroom learning experience. It not only catches the attention of the students but also enable them to retain the concepts.

### **Conclusion**

Whiteboard animation multimedia is gaining in popularity. While its primary usage, currently, is for marketing and advertising, in the current study the researchers explore the possibility of using whiteboard animation videos in the learning process. A video was created using the Doodly software and used in a class for first year MBA students. The control group participated in a regular lecture, aided by PowerPoint slides, while the experimental group attended a session aided by the animated video.

The increase in declarative knowledge was measured using the post-test and pre-test scores, while reaction was measured through a survey. The results suggest that the experimental group scored significantly higher, in terms of learning and their reaction to the program was significantly more positive. Thus, the findings suggest that whiteboard

animation multimedia can be used as an effective tool to enhance the learning experience for students of higher education.

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