DOI: 10.7763/IPEDR. 2014. V 78. 18

A Study of Visual Design in PowerPoint Presentation Slide and Its Relationship with Postgraduate Learner Engagement and Satisfaction

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Abstract. This paper aimed to examine the utilization of visual in PowerPoint presentation slide and influence on learner engagement and satisfaction. The study grounded with cognitive theories of multimedia learning, ARCS Model and CRAP model in developing the PowerPoint presentation slide. The study adapted repeated measure method on 21 postgraduate learners. The learner is presented visually non-designed and visually designed slide of two lecture session. Data collected through self-report questionnaire and observation during the lecture session. Data from the study were analyzed using repeated measures analysis of variance (RM ANOVA) and descriptive statistic. The result of the study revealed no significant relationship between visual design of presentation slide on learner engagement and satisfaction, but the mean score of learner engagement and satisfaction is higher for the session with visually designed slides. The findings provide useful insight for instructors into the need for enhancing the knowledge and technical skill in developing of visual design for presentation, and researchers to further establish the study of visual design in presentation slide. Furthermore, findings of the study reveals relationship of lecturer teaching style on learner engagement and satisfaction.

Keywords: Visual Design, PowerPoint Presentation Slide, Engagement, Satisfaction

1. Introduction

Technology had improved learning in term of efficiency, flexibility through multidimensional approach and learner performance; hence, the learner has access to larger quantity and better quality of information [1][2][3]. Teaching and learning environment is never being segregated from multimedia [2]. Today, in an instructional event, mode (text, narration and picture) for delivering the content is remain unchanged, but due to the advancement of the technology, the medium for delivering the media was shifted to be a more technological environment. Presentation slide as a delivery medium is used to emphasize key point, show complex image and reveal the organization of the presentation [4] which generates higher comprehension in the learner [4][5][6]. Visual aid such as PowerPoint presentation slide enhances the flexibility of presentation, further increase the effectiveness of the presentation [7] and enhances learner attitudes towards the instructor and the presentation session [4].

Some researcher suggested that teaching tools can be poorly executed [4][8]. Furthermore, there is a broad account of study found that people are having a bad experience from PowerPoint presentation [9]. According to [5], presenter often faced difficulty in designing presentation slide using PowerPoint; it takes much effort to change typography, color and layout. In the later study by [10], users of PowerPoint have been often lack of experience to design an effective presentation slide. It is also found that the principle for designing PowerPoint presentations is not apprehended with certainty, in the result, this might cause negative impact on the learning process [12].

It is suggested from prior study to determine the functional aspect of non-text information and visual in presentation to improve the communication process through design of visual stimuli in term of the learning process [12][13]. According to Chen [12], "Learning is improved by well-communicated visual". Visual in presentation function as supporting towards speaker narration and integration of visual and verbal information which focus audience attention, increase interest and enhance retention [7]. Visual are not solely

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images, but also integration of text explanation, guidance and message which is literally through the appeals to the human eye.

The method of visualizing learning material will define the engagement of teacher and learner in the process of teaching and learning [15]. Visual effectively direct learner attention towards important information, giving learner support in organizing it into meaningful way [14][16] and reducing processing effort [14]. Effective use of visual imagery can increase learner learning process in term of comprehension and recall of the class material, engagement and improve attitudes about the classroom experience [17] and learner participation in a lesson. Is it suggested that PowerPoint presentation with no concern about the visual design can cause learner disengagement [18]. Learners who engaged in learning activity learn more, retain more, and enjoy the learning activity more that those who are not [19]. Thus, result in greater educational outcomes [20].

The study suggested the link between the presentation and learner satisfaction [21]. Satisfaction is a feeling of fulfillment response from judgment towards the product or services [22]. The user had expectation originate from the belief of performance or quality that a product or service will provide [22]. The stage of satisfaction will result in the intention of the learner either to stay or quit which in turn lead to learner retention. Learner satisfaction and motivation are higher with multimedia learning environment [2]. Learner reacts positively towards used of technology in teaching and learning process. But on the other hand, some learner and instructor having bad experience in multimedia learning, it shows that not everyone benefits from the advance of technology itself.

The research study is grounded with three theoretical areas: (1) learning theory: Cognitive theory of multimedia learning by Richard Mayer [23], (2) Motivational theory: ARCS model by John Keller [24], (3) Graphic design principle: C.R.A.P model by Robin Williams [25]. These theories are a significant part of the study in bridging between learning theory with motivational theory and visual design principle of implementing effective, functional and motivated instructional material-presentation slide. This paper aimed to examine the utilization of visual in PowerPoint presentation slide and influence on learner engagement and satisfaction.

2. Methodology

2.1 Research Design

By using repeated measurement method, the samples in this study were 21 postgraduate students who enroll in a coursework postgraduate program in one of the public universities in Malaysia. The study is conducted in two fold. During the development stage, the content of the lesson is provided by the subject lecturer and the visual design of the presentation slides is developed by the researcher based on the guideline and recommendation by expert personals from several sources[26][27][28]. Visual design guideline adapted in this study is based on the concerns of slide layout, typography, graphic and color usage. 2 presentation slides are developed for the study. First Presentation slide is visually non-designed, second presentation slide is visually designed. During experimental stage, data collection is conducted before treatment (visually non-designed presentation), during (observation in both presentation sessions) and after treatment (visually designed presentation).

2.2 Data Collection and Measures

Data was collected using self-report questionnaire survey and observation during the presentation session to identify the effect of the visual design in presentation slide towards learner engagement and satisfaction. Two instruments were used in the study. First, an evaluation form for expert to review and validate of the visual design and motivational design of PowerPoint presentation slide. Second, a self-report survey questionnaire which is adapted from Instructional Material Motivation Survey (IMMS) by John M. Keller, Student Academic Engagement Scale (SAENS) by Rupayana D. D., and Principle Experience Sampling Method (ESM) by Northwestern University, and Faculty Survey of Student Engagement (FSSE) by The Trustees of Indiana University. Both instruments were validated by expert and undergoes a pilot test with postgraduate learners. Descriptive statistical analysis was used to compare the mean score for engagement and satisfaction in both controlled and treatment conditions. Further, repeated measures ANOVA was used

to statistically analysis the significance of visual design on learner engagement and satisfaction. Open-ended responses from survey questionnaire are analyzed using text mining method to extract the key concepts from the respondent and grouped them into categories. The result of the statistical and text mining analysis is externally validated with the data of observation collected during the presentation session.

3. Result and Discussion

3.1 Repeated measure ANOVA

The repeated measure ANOVA data analysis examines the effect of the visual design of presentation slide on learner engagement and satisfaction.

Table 1: Within-Subjects Effects for Learner Engagement and Satisfaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Engagement					
Designed slide and non-designed slide	2.381	1	2.381	3.257	.086
Satisfaction					
Designed slide and non-designed slide	.214	1	.214	.417	.526
Error	10.286	20	.514		

Table 2: Descriptive Statistics (Overall)

		Mean	Std. Deviation	N
engagement	non-designed slide	3.52	.981	21
	designed slide	4.00	.775	21
satisfaction	non-designed slide	3.90	.831	21
	designed slide	4.05	.740	21

*Note. Maximum engagement score = 5. Maximum Satisfaction score = 5.

Table 1 illustrates the within-subject effects of learner engagement and satisfaction for visually designed slide and visually non-designed slide. It is reported that there was no significant effect of the visual design of presentation slide on learner engagement ($F(1, 20) = 3.257$, $p = .086$) at a significant level of 5%. Likewise, there was no significant effect of the visual design of presentation slide on learner satisfaction ($F(1, 20) = 0.417$, $p = .526$) at a significant level of 5%. However, to refer to Table 2, it shows that the mean of learner engagement and satisfaction was increased over a week after the visually designed slide was presented.

In providing the feedback on the overall satisfaction in the learning experience of each lesson, more than half participant commented for the open-ended survey question. In non-designed slide session, learner responses were of a few themes. Firstly, some learner thinks that the PowerPoint slide is “plain, blank without attractive design”, “dull”, “not good to be satisfied”, “very boring”, “the slide can be improved”, “must include some multimedia element to attract student”. While on the visually designed slide, learner commented that “I like the design of the presentation slides”, “the PowerPoint slide was very interesting and can attract my attention”, “very eye-catching”, “easy to understand”, “more creative, image layout is clear to read”, “layout and graphic are visually appealing”. It shows that learner were less satisfied with the visually non-designed slide session than visually designed slide session.

From the observation of learner in class, researcher found no significant differences between control condition and treatment condition. Learner engagement towards the lesson is at a similar level as observed. Learners’ responds towards the presentation slide were not differing from each other for both lecture sessions. Furthermore, from the observation, the visually designed presentation slide did not yield increment in learner engagement as in term of attention, enjoyment and effort. Learner did not show any significant different reaction towards the slide for both sessions. Furthermore, it was observed that visually designed presentation slide did not yield differences in the instructor and learner interaction.

However, it was noticed that learner commented on the open-ended question on the lecturer’s teaching style for both lecture sessions. One of the learners indicated that “the PowerPoint slides not influence my attention” and “the way she (lecturer) present and organized the notes attract me to focus on this lesson”. Besides, few learners think that the lecturer sharing of real life experience helped the lecture session to be more interesting. Some of the learner commented that “lecturer gave a lot of real life examples that make the lecturer interesting”, “lecturer has explained the lesson in a very understandable way.”, “the lecturer

motivates the lesson", "The lecturer used her experiences to explain the lesson", "I enjoyed the class presentation with sharing of experiences from lecturer", "the lecturer is good". From these comments, the learner may think that the way of the lecturer presented and explained the slide influence their motivation and satisfaction. Besides, during the presentation session, learners are observed to be more enjoyable when the instructor sharing of real life example or experience which related to the discussed topic. The researcher observed that learners tend to ask more questions and give respond such as laughter and discuss among themselves during and after the lecturer sharing of her experience. The interaction of learner and lecturer is more during the lecture post question about the discussed topic in both treatment and non-treatment sessions.

3.2 Visual Design of Presentation Slide and Learner Engagement

Some learner indicates that the visually non-designed slide is "dull" and one of the learner comments that he/she feels "sleepy" during the presentation session. On the other hand, some learner indicated that the PowerPoint slide did not affect their attention in the lecture session. As so, it seems the finding is from two sides of possibility where some learner is benefiting from the visual design of presentation slide and also some are not benefiting from it. And even some may think that the visual design on presentation slide do not influence the learning in a lecture session. Learner motivation should be one of the major concerns when design for learning [29][30]. It is suggested from this study to further explore on effective visual design in instructional purposes which include of the motivational element as a tool to engage the learner actively.

From the survey questionnaire, learners indicate that they are more enjoyable with the visually designed slide. Furthermore, they think that the presentation slide helped them to hold their attention on the lesson. Besides, learners also commented that the slide are visually appealing and help them to understand better in class. This finding supported prior study that visual in presentation slide help focus learner attention [7][14][16][31]. Visual design in presentation slide helps direct learner attention maybe due to the effective allocation of the limited working memory and reduce cognitive load [32].

3.3 Visual Design of Presentation Slide and Learner Satisfaction

Learner indicated that they are having greater enthusiasm for the subject after the introduction of visually designed presentation slide as compared to non-designed slide. Besides, they agreed which is more pleasure to learn with the visually designed presentation slide. Learners also commented that which is more satisfied with the lecture session with visually designed presentation slides.

Prior study shows that learner satisfaction is the quality of experience which benefits the education institution and the society [33]. The feeling of fulfillment [22] may come from the source of the service and facilitating goods by the university [33][34]. From the learner's response, teaching style of the instructor might be one of the major causes that yield learner satisfaction. Students tend to respond more actively on lecturer speech. They ask questions and discuss among themselves from the topic as discuss by the lecturer. Furthermore, the lecturer involve in the study having the approach of sharing the real life experience to help learners in understanding of the lesson. Some learners indicate that they are more satisfied of the lesson due to such approach. Where the learners think the lesson is more understandable and easier to relate to lesson content. Furthermore, learners feel that the lesson is interesting when the lecturer using the real example approach. The lecturer using the conversation approach where there is a discussion and sharing of experience between learner and lecturer might help learner to feel relaxed and more enjoyable. Furthermore, learner thinks lecture style affect their enjoyment [12] and lecturer playing the role as motivator in a learning session [35]. To consider an overall presentation quality, oral presentation should also be taken into account [3][36]. It is suggested from this finding to investigate how presenter and the teaching style might influence learner satisfaction and to which extend its help learner to engage in class.

4. Conclusion and Recommendation

This study demonstrates the effect of visual design in presentation slide towards learner engagement and satisfaction. It is suggested from the findings that further study of visual design in presentation slide and its relationship with learner engagement is important for a greater learning experience. The results indicate that postgraduate learners have a higher engagement and satisfaction level in a lecture session when presented a

visually designed presentation slide. Learner attendance in the lesson despite of physically and mentally is important in the learning process; learner engagement and the factor that leads to higher level of learner engagement in the lecture session should be comprehended. The findings provide useful insight for instructors into the need for enhancing the knowledge and technical skill in developing effective visual design for presentation, and researchers to further establish the study of visual design in presentation slide.

In the conclusion, future direction might give special attention to the study, which integrating effective visual design in presentation slide and the relationship with learner engagement and satisfaction in a lecture session. Besides, it is important to learn about how learner satisfaction will benefit the learner themselves, the institution and furthermore the society. Furthermore, from the finding of the study, it is also important to further investigate how teaching style might influence learner engagement and learner satisfaction towards the learning session.

5. Acknowledgements

I would like to express the deepest appreciation to my project supervisor, Dr. Mariam Mohamad, for kind supervision and guidance throughout this dissertation. In addition, a thank you to Dr. Zarina Samsudin who had helped me with data collection for this research project. I would also like to thank my parents and family in constant giving support mentally and financially through the postgraduate studies. Finally, appreciation to the help given by staff of Center for Instructional Technology and Multimedia, Universiti Sains Malaysia in succeeding this research project.

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