Enhancing Learning Ability among Students Learning of History Subject by using Digital Visual Representation (DVP)

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Abstract: The subject of History has been identified as an important subject offered in both primary and secondary education. As a subject that is related to individuals, people, and country, history subject have addressed matters in human life, such as politics, citizenship and nationality. However, the subject seems to be unpopular among students. Apart from the subject curriculum, teachers' approaches and strategies of teaching, and materials used in supporting teachers' instruction are among the factors contributing to this unpleasant situation. Considering above mentioned issues, the present study aims to examine students' acceptance and understanding after using the Digital Visual Presentation (DVP) as an interactive learning courseware in History subject. The study was conducted with 156 students from a school in Selangor, Malaysia. Students involved were grouped based on their cognitive styles, namely Field Dependent (FD) and Field Independent (FI). Descriptive and inferential statistical analysis were employed in analyzing the data obtained. The finding from the study indicates that students express positive acceptance toward DVP courseware. Finding also informs that students' understanding of the information shared increased after using DVP, regardless of their learning styles. On basis of these findings, best practices and guidelines for integrating technological-related materials, especially into the History subject are discussed.

Index Terms - **Digital Visual Presentation (DVP), History subject, cognitive styles, Field Dependent (FD), Field Independent (FI)**

I. CONTEXT OF STUDY

History subject is the study of significant past events, individuals, and locations in general. The importance of History subject can also be highlighted since it gives a lot of knowledge, and a sense of feeling to appreciate previous people, events, and ideas (Saad & Mosin, 2021). Offering History subjects in school also is valuable in developing students' intellectual, and physical development, spiritual and emotional (Chandran & Abd Razak, 2021). In the local context of Malaysia, since 2013, History subjects have become one of the core and compulsory pass subjects, in both primary and secondary levels of education. Identified as an important medium to cultivate loyal patriotism, the History subject is expected to present information about diversities in ethnic groups, cultures, religions, and linguistic affiliations (Chong & Yeo, 2016). The subject also could be viewed as a vital apparatus to foster national integration and unity.

Unfortunately, those aspiration does not translate positively into actions. The importance of learning History has always been overlooked by students. Apart from the negative connotation that History will create painful headaches among students, the subject is regarded as boring, tedious (Akengin & Cendek, 2017) and irrelevant subject (Chong & Yeo, 2016). A few factors that contributed to this frustration have been identified by previous studies. Apart from teachers' conventional way of teaching (Azor et al., 2020), students' rough-and-tumble way of learning, and limited creative resources (Haydn & Stephan, 2021), have made History an incomprehensive and monotonous subject. Although History subject has the potential to stimulate thinking, develop cognition and influence students' behaviour, conducive method and style of teaching have contributed to students' lack of interest and motivation to learn the subject (Syed Hussin, et al., 2020). Further, the History subject has been identified as a difficult subject to learn, and a dull and dry process of reading and memorizing historical events (Utomo & Wasino, 2020). Those mentioned issues has been raised a long time ago and are yet to be counteracted. Thus, an immediate intervention must be put into place in addressing this unpleasant situation.

II. DIGITAL VISUAL PRESENTATION (DVP) AND STUDENT'S COGNITIVE STYLES

Technology has been seen as a prominent tool to revolutionise learning as well as enhance pedagogies. Hence, over the last few decades, the Malaysian education system has experienced various changes. Those transformations were essential to fit the needs and demands of new generation students who are well adept with technologies. This situation has urged teachers to fully utilized the full potential of technology integration into their instruction. Teachers are also advised to develop their own creative, innovative and effective teaching materials (Nur Hazirah, et al., 2019). Digital Visual Presentation (DVP) is an example of teaching and learning materials that could be developed. As an interactive learning courseware, the DVP provides a perfect

combination of multimedia elements, such as text, graphic, animation, video and audio. Among the benefits of DVP that are suggested by scholars is improved learning, provide flexibility, improved problem-solving, increased positive emotions, and access to a vast variety of information.

Similar to other subject areas, History subjects have also benefited from DVP. Two main purposes for integrating multimedia learning environments in History instruction. First, multiple-source environments attempt to make History subjects more like real activities, and secondly, graphics should be used to make the context more engaging, vivid, and personally relevant for the student. In similar vein, Suryani and Ardianto (2020) informed that quality History subject teaching should utilize the power of visuals as examples in enhancing students' comprehension. The use of images, audio-visual and concrete examples may help students to understand the subject content better (Azor et al., 2020). Since students may not be able to visualize historic events that happen in the past, by utilization the full potential of multimedia elements, such as visuals, animation, audio and videos, will help them to recapture historic events (Nachimuthu & Sasi, 2021). Moreover, the interactivity futures that exist in the multimedia presentation will provide flexibility and autonomy for students to control their amount, pace and time of learning (Azor et al., 2020).

Another consideration that needs to be thought of in determining the effectiveness of the DVP learning courseware is its impact towards students' cognitive styles. Refers to the way students process information, cognitive styles are critical in understanding students' thinking, remembering, problem-solving and perceiving during the learning process (Chuang, Yeh & Lin, 2021). A theory of cognitive styles that has been widely used is the Field Dependent (FD) and Field Independent (FI) (Witkin & Goodenough, 1977). Table 1 shows differences in terms of characteristic for students with different cognitive styles.

Field Dependent (FD)	Field Independent (FI)
Comprehensive thinking	Discrete thinking
Require external assistance	Can be grasp inner motive
Approach the environment via a more global method	Approach the environment via analytical method
Require external goal and empowering	Can better develop self-defined goal and self-empowering
Learn more from explanatory introduction unit	Prefer explanatory meta-instruction unit
More capable and active in development of human relationship skill	More independent in development of cognitive reconstruction skill
Prefer group-cooperation learning	Prefer independent learning
Can see the whole picture of problem or an idea	Analyze separate variables without being effected by other factors

Table 1: Differences of Student's Characteristics based on their Cognitive Styles
Source: Witkin & Goodenough, 1977

Given these arguments and findings, this study is set out to examine the effect of Digital Visual Presentation (DVP), as interactive learning courseware and technological material in facilitating teachers' instruction and students' learning in History subject. The present study ought to determine whether the combination of multimedia elements and interactivity that formed the development of DVP can increase students' understanding of the information shared after using DVP, regardless of their cognitive styles. Due to limited local published research in a similar context, findings derived from this study hope to serve as a guide and reference for teachers, education designers, teacher's training institutions, and the government in the establishment of a standard of technology integration into teaching and learning History subject.

III. RESEARCH METHODOLOGY

A self-develop Digital Visual Presentation (DVP) courseware for History subject was created as an experimental tool of the study. As interactive learning courseware, it was properly designed and developed by utilizing the full potential of multimedia elements (text, graphic, animation, video, audio). In meeting the DVP courseware function as an effective learning material, steps outlined in Dick and Carey Model as an Instructional Design Model (IDM) were employed. Conversely, the topic of *Sejarah Alam Melayu* (Malay Natural History) was selected as a focus topic of the DVP courseware, based on students' difficulties of understanding, the teacher's limited resources of teaching, and its frequently asked question during the examination.

The study was conducted with 156 form-two students from one secondary school in Gombak, Selangor, a state in Malaysia. The study was conducted in three phases. The first phase is where students completed a cognitive styles test namely the Group Embedded Figure Test (GEFT), which classified students as either Field Dependent (FD) or Field Independent (FI) (Witkin & Goodenough, 1977). The second phase required students to sit for pre and post-tests. These tests were conducted in assessing improvement in students' understanding before and after using the developed DVP learning courseware. Conversely, a descriptive and inferential statistical analysis of SPSS (Statistical Package for Social Sciences) was employed in accessing students' acceptance, understanding and motivation after using the developed DVP learning courseware.

IV. RESEARCH FINDINGS

Three research questions were derived this present study. The first research question was carried out to determine student's acceptance of Digital Visual Presentation (DVP) as an interactive learning courseware in History subject, based on their cognitive styles (FD & FI). Two different analyses were conducted. The first test employed to determined student's acceptance, regardless their cognitive styles. As shown in Table 2, data obtained from one sample t-test revealed a highly significant different (t=82.45, p<.05) with a mean score of 4.48, and standard deviation of 0.387.

Table 2: Student's Acceptance of DVP in History Subject

	Mean	Std. Dev.	t	Sig.
Acceptance	4.48	.387	82.456	.000

n=156; p=0.05

In elaborating on this finding, a second analysis was carried out through a one-way ANOVA test. This test was used in determining if there are any significant differences or interactions between the means of the groups. As shown in Table 3, the p-value is higher than the acceptance value (0.05) and the F value of 2.47, thus informing that there are no significant differences in students' acceptance DVP, respective to their cognitive styles (FD & FI). This finding informs that students' acceptance of DVP as interactive learning courseware in History subject is high.

Table 3: Student's Acceptance of DVP in History Subject base on Cognitive Styles

	N	Mean	Std. Dev.	F	Sig.
FD	97	4.52	.374	2.478	.122
FI	59	4.33	.405		
Total	156	4.48	.387		

p=0.05

In regards to determining students' understanding after using the DVP as interactive learning courseware in History subject, a pre and post-tests analysis were carried out. In analyzing the data obtained, a descriptive analysis was first conducted. Five categories of marks different between pre and post-test were formed and presented in Table 4. As can be seen, the majority (n=53, 33.98%) of students have shown range improvement between 61 to 80 per cent. Improvement range of 41 to 60 per cent and more than 80 per cent were reported as second and third highest with a percentage of 25 per cent (n=39) and 19.23 per cent (n=30) respectively.

Table 4: Categories and Ranges of Improvement

Category	Range of Improvement (%)	No. (N)	Percentage (%)
Group 1	less than 20	11	7.05
Group 2	21 - 40	23	14.74
Group 3	41 - 60	39	25.0
Group 4	61 – 80	53	33.98
Group 5	more than 80	30	19.23

n=156

In comparing the score of the pre and post-test between two variables, Paired sample t-test was conducted. As can be seen from Table 4, it was found that the mean score for the pre-test is slightly lower (M=42.35) as compared to post test (M=55.96). Findings from Table 5 also indicate the t-value is 8.74 with a significant value lesser than the acceptance value (p<0.05). This result thus indicates that there is a significant difference between pre and post-test scores after students used DVP as interactive learning courseware in History subject.

Table 5: Student's Pre Test and Post Test Score Differences

	Mean	Std. Dev.	t	Sig.
Pre Test	42.35	12.36	8.742	.000
Post Test	55.96	14.55		

n=156; p=0.05

V. RESEARCH DISCUSSION

Generally, the present study concludes that the developed Digital Visual Presentation (DVP) as interactive learning courseware has provided a positive impact on students' learning process. Findings from the present study inform that student believes that DVP has helped them to enhance their learning ability in the History subject. It could be concluded that the integration of multimedia elements (text, graphic, animation, video and audio) has brought a positive impact on DVP toward student learning. The positive impact of an interactive multimedia presentation on students' learning of History subject was confirmed by Yulifar and Agustina (2020). Their study suggested that the developed interactive multimedia is practical to be used and implemented since it attracts students' attention and participation in the learning process. In a similar vein, Azor et al. (2020) recommended that the use of interactive multimedia in the learning process can also improve students' learning outcomes and be effective to be used as guidance for teachers and students in History subject.

The present study also suggested that the combination of multimedia elements that form the development of DVP has impacted students' better understanding of the information shared. Through its multi-sensorial features, the DVP uses lots of students' senses while dealing with the information presented. Students don't take much energy and effort to understand the information shared, thus increasing their interest and motivation. Moreover, Fatima (2021) informed that multimedia presentations have to take into account individual differences and different learning abilities. Findings from previous research also informed that positive characteristics of multimedia presentation have made learning History subject become more effective, interesting and significant (Suhendry et al., 2022; Nachimuthu & Sasi, 2021).

In regards to students' cognitive styles, the present study concludes that the use of DVP as interactive learning courseware in History subject has gave a positive impact on students' understanding irrespective of their cognitive styles and preferable way of learning. Information that was presented with multimedia and interactive features has imparted constructive effects on students' learning process. This statement is in line with a suggestion made by Nilson et al. (2018). Their study concludes that technology enables students to regulate and control their learning process in an environment which they are comfortable with. A similar conclusion was also reported by Bian, et al. (2020) and Chong and Yeo (2016).

VI. CONCLUSION

Considering findings obtained from this present study, it could be conclude that the developed Digital Visual Presentation (DVP) as an interactive learning courseware that utilized the full potential of multimedia elements and interactivity is valid, practical and effective on student's acceptance and learning outcomes, regardless of their individual differences. The DVP also have provide teacher new opportunities of presentation and mediation of the curriculum, encouraging students' interest in the curriculum and at the same time it allow students to better understand it. Considering student's habit of learning is essential in facilitating students ability to comprehend situation, focuses on mechanisms, and clarifying the inner relations. Students prefer certain methods of learning to suit their cognitive styles, thus required teachers to consider this unique situation before, during and after conducting their instruction. This situation also urged teachers to prepare teaching and learning materials that accommodate students different cognitive styles. Due to the positive impact of DVP on both students and teachers, the present study suggested that more training and professional development courses should be conducted among educational designers and teachers themselves in ensuring more related learning materials could be produced. On the other hand, the school authorities and the government should also play a major role in providing continues supports, allocation of budget, and sufficient infra and info structure in ensuring the success of this effort.

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