

Analysing the Relationship of Sequential and Global Learning Styles on Students' Historical Thinking and Understanding: A Case Study on Form Four Secondary Schools Students in Malaysia

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Abstract

This study ascertained on the relationship between students' learning styles, which are global and sequential learning styles with their historical understanding and thinking. The specific objectives of the study were to: describe the learning style of the students which are sequential and global; to find out whether students' historical understanding and thinking differ with their learning styles; and determine the difference between the learning style and their historical understanding and thinking. The participants of the study consist of 40 Form Four Secondary School students from a National School in Kedah State, Malaysia. The Index of Learning Styles (ILS) questionnaire was utilized to carry out the rationale of the study. The results demonstrated that generally the students are fairly well balanced in global and sequential learning styles presented in the ILS questionnaire. An assessment test of history essay writing was used to determine their historical thinking from four categories, which are a) chronological understanding, b) make interpretation, c) express opinions with a sense of empathy, and d) make rationalizations. The results show that there is a significance difference between the sequential learner and the global learner in chronological understanding. Overall, there is no significant difference between students' learning styles with the ability in making interpretation make rationalization and express an opinion with a sense of empathy. The results of this study can be used to gain insight into the construct of historical understanding and into how historical reasoning competencies can be measured. Besides, the results present some ideas about information organization of history contents to suit the preferences of students' different learning styles.

Keywords *history thinking, learning styles, correlation, history understanding*

INTRODUCTION

History subject is majorly concerned with the development of historical thinking skills. Students are required to explore the complexity of ideas and concepts using the sense of empathy (Lee, Peter, and Ashby, 2000; Siti Hawa Abdullah, 2008), historical thinking (Wineburg, 2001), and reasoning (Van Drie & Boxtel, 2008) when learning history. Understanding of the historical concept as the fundamental for learner to instil higher order thinking skill, enable them to reason about the pasts, and make reasoning by providing judgement point. The decrement in achievement in history learning scores is statistically significant, especially when students are asked to write higher-order thinking skill essay, such as make reasoning, rationalization and express opinion

(Jabar, 2006). While there is a commitment and initiative to support the critical thinking and creative thinking society in Malaysia, the traditional way in which formal schooling, could support this trend still in a debate. Students encountered with the problem in understanding, utilizing and relating the substantive concept and metaconcept in history learning (Lee, 2004; Lee, 2007; Lee & Howson, 2009; Shemilt, 2000). Students' different learning styles and lack of temporal discontinuity in connecting past and present would be the main factors in influencing the students' cognitive thinking. Yet, the research in examining students' learning styles and its effects on the students' historical thinking and understanding has been contentious.

The incorporation of different learning styles into teaching strategies (Omur & Tiffany, 2008), the metacognitive level of history learning (Beck, 2001), and its effect on the students' attitudes and academic achievement (Contessa & Ciardiello, 2005) have been studied by many researchers and scholars in instructional settings. However, there exists the criticism toward different learning styles in matching the instructional and assessment methods, and the inconclusive and insufficient evidence of the relationships among different learning styles in affecting cognitive processing (Godat, 2012). To further investigate this problem in Malaysia educational settings, this paper ascertained the relationship of historical understanding and historical thinking with sequential and global learning styles.

PROBLEM STATEMENT

A case study reported by (Jabar, 2006) in Malaysia educational setting showed that when students were asked to evaluate and express their opinion on a historical event, the scoring achievement is at a moderate level. This is also supported by Puteh, Maarof & Tak (2010) in which the historical thinking still lacks of emphasized in the classroom settings. Traditional approaches in learning that stress on recognizing and recalling specific information make knowledge less transferable (Spiro, Feltovich, Jacobson & Coulson, 1992), and may impede their historical reasoning and historical understanding. Besides, students encountered with the problems of getting the historical concept in continuous sequence (Mastermann & Rogers 2002; Wineburg, 2001). They are unable to see the relationship or causal effect of events. Consequently, this may not help students develop the abstract concept and content of a chapter and relate it to another topic or events within a chapter (Yang, 2006).

Besides, the chronological understanding of historical events has become dominant modes of instruction in the design of the history learning. In order to possess the chronological understanding of history, students are required to memorize and recall the biographical events. The influence of teaching and information representation is more significant on the development of chronological understanding of history than using another approach that involves students' thinking in broader contexts from different perspectives, for example, by using thematic approach. However, research had shown that global learner lack of ability in learning chronological as they use a holistic thinking process and learn in large leaps. They tend to learn material randomly without seeing connections. The big picture is important for them to see the connection between historical concepts. Since learning history is to require the students to possess chronological understanding and make the connection of causal-effect, dominant modes of chronological teaching may cause them difficulties in learn in a sequential manner. While for the sequential learners, they may know details about a specific theme, but may have difficulties in relate this theme to other broader aspects. Thus, this study ascertains the relationship of global and sequential learning styles with the historical thinking and understanding.

RESEARCH OBJECTIVES

This study intends to examine the relationship between the students' different learning styles (sequential and global) with the historical understanding and thinking. The student's historical thinking will be evaluated from 4 categories based on history syllabus of Form four secondary schools developed by the Ministry of Education (MOE) Malaysia, which are:

- a) Chronological understanding,
- b) Ability to make an interpretation,
- c) Express their opinion,
- d) Make rationalization.

The specific objectives of this study were to: describe the learning style of the students which are sequential and global; to find out whether students' historical understanding and thinking differ with their learning styles; and determine the difference between the learning style and their historical understanding and thinking.

RESEARCH HYPOTHESIS

The hypotheses are:

1. There is no significance difference with chronological understanding among global-sequential learner.
2. There is no significance difference with the ability to make interpretation among global-sequential learner.
3. There is no significance difference with the ability to express opinion among global-sequential learner.
4. There is no significance difference with the ability to reasoning among global-sequential learner.

LITERATURE REVIEW

The Students' Learning styles with Historical Thinking

The students' learning styles on how the information received, retained and processed consider as one of the fundamental factors in affecting students' active learning. Previous researches show that the students' learning styles influence the students' critical thinking (Myers & Dyer, 2006; Andreou, Papastavrou & Merkouris, 2014). Students' learning styles that match the instructions can help in improving academic achievement and their attitudes toward learning (Lovelace, 2005). Understanding of historical concepts such as the causal effect, chronological, continuity, and change help learners to develop intellectual capability skills such as chronological reasoning and historical thinking (Johnston, 2011). Historical thinking can be invoked in the inquiry process to master the subject knowledge, which basically includes examining the relationships pertaining to the causal effect of historical events, chronologies and periodization, models, principles, and rules. This implies that the chronological order that represents the causal-effect relationship of these events invokes learners' chronological thinking and thus may impact learners' critical and reasoning thinking.

The Sequential and Global Learning styles with Historical Thinking

For the learning of history subject, sequential learners learn better when learning with materials presented in a chronological order that help to enhance students' chronological historical reasoning. Sequential learners tend to organize the information step-by-step in linear or chronological order. However, the problem is, students may consist of global learners who lack good sequential thinking abilities (Felder & Soloman, 1997). They

tend to see the big picture or holistic view first before proceeding into more details. The learning process of global learners may be impeded by the instructions that fail to show the big picture on how the topics and the underlying subthemes are discussed (Myers & Dyer, 2006) in their study of learning styles found out that students who were sequential learners scored significantly higher on historical thinking than students with other learning styles. With corresponding to chronological understanding, sequential learners may learn better when a chronological pattern of organization arranges information according to the progression of time or particular segments of time. Thus, by assuming that when the materials are presented in a chronological and logical order that shows the dates and event occurrences, sequential learners perform better than the global learners.

RESEARCH METHODS

Based on the systematic literature review on the effect of students' learning styles on historical thinking, there is an identified need of empirical data on the effect of students' learning styles on the students' historical understanding and historical thinking. Thus, a quantitative approach with a correlation research design was conducted. Two instruments of Index of Learning Styles (ILS) by Felder & Soloman (1997) and historical thinking assessment were utilized to collect the data. 11 questions that relate to students' learning styles of understanding with the subscales of global and sequential are extracted from Felder & Soloman's ILS (1997) ILS in which the categorization of these subscales. The Malay version of ILS questionnaire was adopted from Rowinah (2012). This questionnaire was also validated by Zaidah binti Abd Umar and Zulkifli bin Senin (2008) and Nancy (2006) through pilot testings. This Malay version of ILS was translated by utilizing Brislin's method of translation (Zubaidah Begam binti Mohamed Zakaria, 2008). In this study, the researcher conducted the reliability test on the Malay version of ILS. The results showed the Cronbach Alpha value of more than .70. In line with previous studies (Felder & Spurlin, 2005; Litzinger, Lee, Wise & Felder, 2007), $\alpha = .5$ or greater was used as the level of acceptability. Thus, this ILS was acceptable to be implemented in this study. The researcher utilized the two sample t-test to analyse the significance difference between two variables. The data was analysed using Mann-Whitney U test since the variables are not normally distributed.

Participants

The researcher obtained subject demographic data of ethnicity, age, academic achievement of year 2012 and 2013 of Form Four secondary school classes from the school principle and two history teachers. The selection of the school and the population is based on the aspects such as a) locality of the school, b) national schools with students' composition of different ethnicities (eg: Malay, Chinese, Indian and the minority of Siamese), c) achievement in SPM examination, and d) computer and Internet accessibility. 120 Form Four secondary school students from four intact classes(average age = 16), from a national government secondary school in Kedah state, Malaysia were given index of learning styles (ILS) to be filled. Of all the 120 students, 61 of them are sequential learner, the rest are global learner. Among these 120 students, 20 global learners and 20 sequential learners were selected as the participants of this study. The reason these students were chosen was because the ability to think about the metacognition, which are necessary in answering the Index of learning style (ILS) and writing history essay. According to Piaget' Development Theory (1969) (Wood, Smith & Grossniklaus, 2001), the students with these age range are capable of deductive and hypothetical reasoning thinking to make rational judgment. Forty students are given three history essays to be answered in 1 hour 20 minutes in classroom.

FINDINGS AND RESULTS

Correlation between learning styles and Chronological Understanding

After the students filled the ILS, it was found that 17% (14 students) of the students have balanced sequential and global learning styles. Out of the 106 students, 61 of them are sequential learners while 45 of the students are global learners. 20 sequential learners and 20 global learners are selected randomly to participate in this study. There are 4 subcategories of history thinking, which each category have maximum 25 marks. Table 1 shows the rank table for Whitney-test. Table 2 shows the correlation of students' different learning styles with chronological thinking, ability to make interpretation, express the opinion and make rationalization.

Table 1 Whitney-test Ranks table for each categories with learning styles

	Ranks			
	Learning styles	N	Mean Rank	Sum of Ranks
Chronological understanding	Global	20	15.58	311.50
	Sequential	20	25.43	508.50
	Total	40		
interpretation	Global	20	22.03	440.50
	Sequential	20	18.98	379.50
	Total	40		
opinion	Global	20	21.18	423.50
	Sequential	20	19.83	396.50
	Total	40		
Rationalize	Global	20	23.15	463.00
	Sequential	20	17.85	357.00
	Total	40		

Table 2 Test statistics table for each categories

	Test Statistics ^a			
	rationalize	Chronological Understanding	interpretation	opinion
Mann-Whitney U	147.000	101.500	169.500	186.500
Wilcoxon W	357.000	311.500	379.500	396.500
Z	-1.468	-2.793	-.852	-.370
Asymp. Sig. (2-tailed)	.142	.005	.394	.711
Exact Sig. [2*(1-tailed Sig.)]	.157 ^b	.007 ^b	.414 ^b	.718 ^b

a. Grouping Variable: Learning Styles

b. Not corrected for ties.

The research questions and research hypothesis are stated as below:

RQ1: Is there any significance difference between students' learning styles with chronological understanding ?

H₀₁: There is no significance difference between students' learning styles with chronological understanding.
(H₀₁: $\mu_1 - \mu_2 = 0$)

An examination of the findings in Table 2 shows that the results of the Mann Whitney U test applied to the chronological thinking scores for sequential and global learner revealed a statistically significant difference at the level of $p < .05$ ($Z = -2.793$; $p = .005$). The rank average of the scores of the sequential learner was 25.43, while the global learner had a posttest score rank average of 15.58. This result indicated that the sequential learner attained higher scores in chronological thinking compared to global learner. This was supported by Felder and Soloman's (1991) study in which global learner lack of sequential thinking abilities. Furthermore, Omur and Koszalka (2008) in their study reported that sequential learner significantly scored higher than students with other different learning styles.

RQ2: Is there any significance difference between students' learning styles with the ability to make interpretation?

H₀₂ There is no significance difference between sequential and global learner with the ability to make interpretation

Table 2 shows the Whitney ranks test for the ability of sequential and global learner in making interpretation was not significantly different ($z = -0.854$, $p = 0.394$) at $p > 0.05$. The average ranks score for global is 22.03, whereas the average ranks scores for sequential learner is 18.98. Surprisingly, global learner possesses the higher level of ability to make interpretation than sequential learner although sequential learners possess higher chronological understanding than global learner. The hypothesis H₀₂ was failed to reject. Due to Felder & Soloman (1997), students who possess critical thinking skills are able to cooperate, make an argument in supporting their points, and may help them in making reasoning, which may in turn develop their historical reasoning. Few people have fixed learning styles in which some of them prefer to learn information organized in a chronological or thematic form.

RQ3: Is there any significance difference between students' learning styles with expression of opinion with sense of empathy?

H₀₃ There is no significance difference between the students' learning styles with the ability to express opinion with sense of empathy.

The Whitney-test shows that there is no significance difference between sequential and global learner in making rationalization. Based on the Table 1, surprisingly, the global learner possess the higher ability in making rationalization than sequential learner though the history learning content are mostly teach in chronologically, which by follow the period and conversion of time.

RQ4: Is there any significance difference between students' learning styles with the ability to make rationalization?

H₀₄ There is no significance difference between the students' learning styles with the ability to make rationalization.

The Whitney-test shows that there is no significance difference between sequential and global learner in making rationalization. Based on the Table 1, surprisingly, the global learner possess the higher ability in making rationalization than sequential learner though the history learning content are mostly teach in chronologically, which by follow the period and conversion of time.

RESEARCH FINDINGS AND DISCUSSION

The ability of students in presenting their point of view by giving logical reasons are fundamental critical and historical reasoning skills. The learning of history traditionally involves the retention of dates and events and the contents are sequentially organized, which show the occurrence of events. From the results, it can be seen that there were no significance difference between students' learning styles with the ability in making interpretation, make rationalization, expression of opinion. However, there exists the significance between students' learning styles with the chronological thinking. The sequential learner perform better at a statistically significance level in the chronologic modes compared to global learner. Simply, sequential learner perform better than global learner when they are asking to answer essay that require sequential thinking processes such as provide causal-effect, connect the past with present, and the date, time or significance history events are provided in essay or the questions. Their ability in think sequentially chronologically enable them to write the essay in an organize manner, systematic by following logical and orderly processes and procedures. This was supported by Jonhston (2011), who expressed that understanding of historical concepts such as the causal effect, chronological, continuity, and change help learners to develop intellectual capability skills such as chronological reasoning and historical thinking. Akdemir and Koszalka (2008) in their study also supported that sequential learner significantly scores higher than students with different learning styles. In contrast, global learner lack of sequential thinking abilities (Felder and Soloman, 1998) although the global learning styles tend to be considered as connected to creativity (Maksić, 2006). This also indicates that global learner might have the difficulties in learning sequentially to solve the historical questions. Although the sequential learner possess the higher scores than global learner in chronological understanding, it did not discourage the global learner perform better in history essay. Therefore, it can be concluded that traditional chronological learning is suitable for sequential learner but not benefits the global learning in making chronological understanding.

CONCLUSION AND FUTURE RECOMMENDATION

The most common way of organizing is chronologically in which contents are organized based on the periods of the past events. This requires the student possesses the historical knowledge before make reasoning. The link of historical events that shows how past events affect the later life helps the students to understand the topics precisely and make argument critically during collaboration. By organizing the lessons around open-ended questions and chronologically rather than the definitive text, students are able to see the causal-effect relationship of past events. They can think critically, craft the history in an explanative way, and summarize the content (Terrie, 2012). The majority of historians agreed that learning history includes an understanding of historical events, the time, and causal link between these events (Barton & Levstik, 2004). Historical thinking can be invoked in the inquiry process to master the subject knowledge, which basically includes examining the relationships pertaining to the causal effect of historical events, chronologies and periodization, models, principles, and rules. This implies that the chronological order that represents the causal-effect relationship of these events invokes learners' chronological thinking and thus may impact learners' critical and reasoning thinking.

Due to Silverman (2002), "nonsequential children have a very hard time adjusting to school. The school curriculum is sequential, the textbooks are sequential, the teaching methods are sequential, the workbooks are sequential, the teaching methods are sequential, the teaching methods are sequential and most

teachers learn sequentially.” Thus, it is important for the design of the information representation of historical content to equip students with the ability and desire to think critically by giving logical evidence, not only emphasized on time concepts but also discover the history knowledge in broader themes. The structured representation of learning contents may enhance students’ understanding and remembering, and hence will enable them to make reasoned judgement, analyze, interpret and make rationalization about the history topic.

For the future recommendation, the central questions of the effects of multimodal information representation on students’ historical understanding and historical reasoning provide valuable insights into organization of contents, teaching, and learning of history. Besides teaching the history chronologically, we suggest teaching of learning contents by thematically allows the students to think in a broader context and critically, especially when dealing with students’ different learning styles of global and sequential learning. These insights do not only deepen the conceptual and theoretical understanding of how historical reasoning can be enhanced, but also provide design guidelines for collaborating tasks such as essay writing and verbal communication in a peer learning environment. This may help students to elaborate, restructure, and present their ideas critically and effectively in essay writing if learn through well-organized knowledge structure.

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