The Effectiveness of the 21st Century Teaching History Module (21-Cthm) Towards High Order Thinking Skills

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The 21st century teaching history module (21-CTHM) can support student transformation and learning, and help develop their potential effectively. Secondary schools in Malaysia are still using conventional approaches in teaching and learning history. As a result, students are not interested in studying history due to their poor understanding of it. Thus, this research uses quasi experiment to test and understand the effectiveness of 21-CTHM in improving achievement. The achievement of study refers to Higher Order Thinking Skills in learning history among the students. The researcher carried out a study on the history subject at four secondary school under the Ministry of Education. The researcher involved 146 students as a sample by purposive and matching sampling. A total of 73 students were chosen as the treatment group and the rest acted as the control group for 14 weeks. The findings show the achievement of students' high order content knowledge. Test questions were also conducted to investigate students' higher-order knowledge, which involved three levels, namely application, analysis and evaluation. The results of the study using multiple ANOVA analysis showed that there were significant differences in application, analysis and evaluation in the control and treatment groups for the pre and post-test. The treatment group using the 21-CTHM achieved greater results in high order thinking skills than the control group, who used the conventional approach in learning history. The implication of this study shows activity and interaction among the members and teachers, Creative, innovative learning using advanced technology in 21-CTHM proves that student achievement increases not only academically, but also in terms of soft skills among the students.

Key words: *21st Century Teaching History Module, history knowledge, higher order thinking skills, secondary school*

Introduction

Over the past several years, soft skills, especially information and communication technology (ICT) skills, communication, collaboration, creative and critical thinking, which are known as 21st-century skills, have grown rapidly and are a necessity in the "Internet+" era (Trilling & Fadel, 2009). In the field of education, 21st-century skills have had a profound effect on the development and change of education, especially in Finland, Switzerland and Belgium (Dahalan & Ahmad, 2018). Due to the increased and extensive implementation of courses on the 21st-century teaching history module (CTHM-21) and higher-order thinking skills (HOTS) for teachers, various 21st-century teaching techniques have been developed by teacher experts trained in various fields. At the same time, teachers at schools obtain information on teaching techniques of 21-CTHM through workshops in schools. Researchers and teachers are confident that classroom practice based on 21-CTHM can encourage students to better communicate, collaborate, be creative, and think critically. Some researchers are also able to show the impact of 21-CTHM learning on other aspects, such as student-centred learning (Camacho & Legare, 2015; Moto et al, 2018).

21-CTHM learning can provide teachers with new alternative teaching techniques in delivering the content of their subjects (Bas et al, 2016; Cavus & Uzunboylu, 2009). Many efforts have been made to encourage teachers to use 21-CTHM as part of a new approach to education. However, 21-CTHM learning is still in its early stages. The research is still lacking in several aspects, such as the usefulness of the 21-CTHM technique in several respects such as teaching, time management, teaching materials, and ICT facilities. Although some studies are available on 21-CTHM about the perception and practice of 21-CTHM learning (Ibieta et al, 2017; Llopart et al, 2018; Thang & Koh, 2017), studies related to 21-CTHM, specifically in terms of students' higher-order knowledge in history subjects, using quasi-experimentation are still not widely implemented. This study was a quasi-experimental study that identified the differences between the students' knowledge of historical contents using common learning methods and 21st-century learning methods in historical subjects for secondary school students. In particular, it explored learning achievements involving higher-order skills, namely application, analysis, and evaluation. The introduction to the methodology and literature review related to 21-CTHM and HOTS are summarised in the next discussion.

21st Century Teaching History Module (21-Cthm)

The 21-CTHM module is based on the 21st Century learning high school curriculum for 2003 (Anderson & Krathwohl, 2001). This history teaching module focuses on four key competencies: soft skills, creative activities, technology and i-think. There are four components in soft skills: learning, innovation skills, information technology and media skills. The soft skills component utilises the Socratic thinking technique, comic book technique, mix and

match technique, and runner maze technique. Creative activities use the treasure chest technique, choose and bomb techniques, and history of source techniques. The technology component uses MIMS TV technique, movie analysis technique, vlog technique, QR code technique, and google form technique. Next, the i-think uses the tree map technique, double bubble map technique, four mind technique, flow map technique, hand 5 fingers technique, and brace map technique. All of these components are in line with Boyatzis (2008); Ang et al, (2016); Partnership for 21st Century Learning, (2015); Trilling & Fadel, (2009).

During the learning process using the 21-CTHM method, the students went through 14 21-CTHM modules, which combined the elements of collaboration, communication, analytical and critical thinking, and ICT skills. Each module implemented higher-order skills that involved applying, analysing, and evaluating, which were tailored to the subject of learning. This is an example of student activity. During learning, the students are divided into seven groups of about five students as they were instructed to complete the tasks in the group. The use of ICT was encouraged in the classroom to provide students with opportunities to explore information beyond textbooks. After the discussion, the students presented their findings and recorded the findings in the e-History group. Questionnaires were administered on the groups to extract the titles and evidence they collected in support of their arguments.

In this experimental study, the contents of the history subject are focused on early civilisation and Islamic civilisation. The history of early civilisation covers the early civilisation of southeast Asia while the Islamic civilisation relates to theme of the Medina government and the establishment of Islamic civilisation. 21- CTHM module is considered as the most suitable method in enhancing students' high-level cognitive thinking in application, analysis and assessment in history.

Higher Order Thinking Skills in Learning History

The HOTS of History in 21st century learning is the active process for mastering the contents of history by using the mind to give meaning to information, interpreting information logically based on evidence, and creating new ideas through learning activities, which are based on communication, collaboration, critical thinking and creative thinking to produce student excellence in life, their careers and in the nation as responsible citizens. In this study, the achievement and understanding of students refers to high order thinking skills (Limbach & Waugh, 2010; Mumford & McIntosh, 2017; Schiever & Shirley, 1991). Higher order thinking in this study focuses on application, analysis and evaluation. The aspect of application refers to the study of historical thinking such as brainstorming ideas, modifying, explaining, constructing and manipulating. Analysis refer to summarising, choosing, solving problems and categorising. The aspects of assessment refer to interpreting, deciding, probing, justifing, supporting, criticising, and debating. This finding is supported by Anderson and Krathwohl

(2001). All of these aspects are used in 21- CTHM and have been tested in improving students' understanding and knowledge in history. Gashan (2015), Cavus and Uzunboylu (2009), and Swart, (2017) have found that thinking skills and critical thinking skills in learning history are the key factors in student achievement.

Knowledge is derived from the cognitive processes of learning or experience to enhance human understanding in various fields (Jerome, 2017; Lehrer, 2018). Historical knowledge is defined as the cognitive process that students receive to enhance their understanding of the mastery of the content contained in the syllabus of History subject (Kalenda & Schwartzhoff, 2015; (Suraji, 2018). Five topics are covered in the subject of History, namely the Early Kingdom of Southeast Asia, the Advent of External Influences in Southeast Asia, The End of the Age of Ignorance in Makkah, The Propagation of Islam in Madinah, and Governance and Administration in Southeast Asia. Each of the topics involved is asked in the form of higher-order questions, namely application, analysis, and evaluation (The Malaysia Ministry of Education, 2001).

Content of History Subject Curriculum

The content of the history subject that has been used in this quasi experiment are the Early South East Asian Civilisation and Islamic Civilisation. The topics are based on the history textbook issued by the Ministry of Education (The Malaysia Ministry of Education, 2001). Early South East Asian Civilisation contains sub-topics such as the location of early civilisation, maritime societies, agrarian societies, economic activities, river interest, important monuments in Southeast Asia, Straits of Malacca, and the Ottoman empire. In Islamic civilisation, there are sub-topics such as Arab Jahiliyyah, the rise of Islam, Arab Community, Leadership, Hijrah, constitution of Medina and Islamic Caliphate. All of these sub-topics have been taught using 21- CTHM in order to enhance students' thinking skills in understanding of history.

The Purpose of the Study

This quasi experiment study aims to identify the effectiveness of 21-CTHM in enhancing high order thinking skills in terms of application, analysis and assessment in history learning. The study looks at the significant differences between treatment groups and control groups following the pre and post-tests in order to see how these aspects were different.

Methodology

This study utilised a quasi-experiment that has a treatment group and control group. The treatment group implemented 21- CTHM in teaching and learning history while the control

group implemented the conventional approach in teaching and learning. The aim of using 21-CTHM method is to improve higher order thinking among students with regard to the elements of analysis, application and assessment in historical learning. The sample of this study involved 146 respondents in 2 control classes (73 students) and 2 treatment classes (73 students) from four government schools. The experiments took 14 weeks to be completed. The study used a set of questions to measure the understanding of historical content and the effectiveness of 21-CTHM. The number of respondents for both groups in this study are: 18 Malay men, 38 Malay women, 24 Chinese men, 34 Chinese women, 20 Indian men, and 12 Indian women.

The data was analysed using a descriptive statistics and ANOVA analysis in order to determine the levels and the differences of the constructs studied. The descriptive analysis was interpreted according to Ahmad (2002). Mean scores between 1.00 and 1.99 are considered as weak, mean scores between 2.00 and 2.99 are considered as low, mean scores between 3.00 and 3.00 are considered as medium, and mean scores between 4.00 and 5.00 are considered as high. The differences were analysed based on higher order thinking skills in terms of application, analysis and evaluation for both of pre-and post-tests.

Results

The ANOVA analysis in Table 1 shows the details to see the differences in higher-order content knowledge for the history subject in terms of application, analysis, and evaluation in the control and treatment groups based on the post-test.

Table 1: ANOVA analysis on Higher-Order Content Knowledge for History Subject in Control and Treatment Groups Based on Post-Test.

Aspect	Type III Sum of squares	Df	Sum of squares	F	Sig.
Application	3.623	1	3.623	8.966	0.003
Analysis	5.760	1	5.760	8.207	0.005
Evaluation	14.493	1	14.493	16.805	0.000

Based on Table 1, the results showed that there was a significant difference in the level of historical knowledge in terms of high order thinking skill in the aspects of application and evaluation based on the control group and treatment group for the post-test analysis with the value of application (F = 8.966, sig = 0.003, p<0.05), analysis (F = 8.207, sig = 0.005, p<0.05) and evaluation (F = 16.805, sig = 0.000) in the control and treatment groups based on the post-test.

Therefore, to determine each higher-order content knowledge, Multiple ANOVA analysis was performed to see mean difference scores for each dependent variable in group-based variables.

Table 2 shows the mean score comparison and standard deviation for all these aspects of group-based variables.

Table 2: Mean Score and Standard Deviation Higher-Order Content Knowledge of History Subject in the Control and Treatment Groups Based on Post-Test.

Content Knowledge	Groups	N	Mean	Standard Deviation	Interpretation
Application	Control	73	4.27	0.55	High
	Treatment	73	4.58	0.70	High
	Total	146	4.43	0.65	High
Analysis	Control	73	3.83	0.74	Medium
	Treatment	73	4.23	0.92	High
	Total	146	4.03	0.85	High
Evaluation	Control	73	3.53	0.88	Medium
	Treatment	73	4.16	0.97	High
	Total	146	3.84	0.97	Medium

Based on Table 2, it was found that the control groups (mean= 4.27 and SD = 0.55) had a lower mean score compared to the treatment groups in term of application (mean = 4.58 and SD = 0.70). From the aspect of analysis, it was found that the treatment groups (mean = 4.23 and SD= 0.92) had a higher mean score compared to the control groups (mean = 3.83 and SD= 0.74). Meanwhile, from the aspect of evaluation, it was found that the control groups (mean = 3.53 and SD= 0.88) had a lower mean score compared to the treatment groups (mean = 4.16 and SD = 0.97). The above data analysis shows that the mean score of the treatment groups is higher than the mean score of the control group. The findings of the data were in line with those of Anderson and Krathwohl (2001), who explained that, hierarchically, application thinking skills are lower than analysis and evaluation thinking skills. This indicates that, after the 21-CTHM learning, the students from the treatment groups showed a higher mean score than the control group.

Level of High Order Thinking in Learning History for the Aspect of Application

The levels of content history knowledge considers the application, analysis, and evaluation for the group control and treatment control. The pre-test and post-test were analysed using descriptive statistical analysis involving frequency and percentages, as shown in Table 3.

Based on Table 3, it was found that the students in the control groups (f = 54.8 and % = 75.1) had a lower mean score compared to those in the treatment groups (f = 59.0 and % = 80.7) for the pre-test. For the post-test, it can be seen that the students in the control groups (f = 58.3 and % = 79.9) had a lower mean score compared to the students in the treatment groups (f = 67.2

and % = 92.0). Items with the highest mean score were those related to the occasion of the reopening event of Makkah city. Meanwhile, items with the lowest mean score were those related to the Islamic Caliphate. The analysis shows that the level of historical knowledge from the aspects of application has significantly improved after it was put into practice. The analysis of the data above showed that the results of the post-test for the level of content knowledge for history subject from the aspect of application achieved by the treatment groups increased by 4.8% compared to the control group, which increased by 11.3%, with a difference of 6.5%. This indicates that the 21st Century Teaching Module for History subjects is capable of enhancing students' content knowledge in terms of application. The findings were supported by Swart (2017) and Zenisky et al. (2014), who showed that 21- CTHM teaching techniques are able to stimulate students' creative thinking.

Table 3: Level Content of History Knowledge for the Higher Order Thinking Skill in Application Aspects

No.	Items	Control Groups				Treatment Groups			
		Pre		Post		Pre		Pre	Post
		F	%	f	%	f	%	f	%
1.	The locations of the world's early civilisations	60	82.1	63	86.3	65	89.0	70	95.8
2.	The importance of rivers in the life of human	62	84.9	65	89.0	66	90.4	71	97.2
3.	The Maritime community in Southeast Asia	65	89.0	66	90.4	64	87.6	67	91.7
4.	The natural characteristics of Prophet Muhammad SAW	44	60.2	49	67.1	50	68.4	65	89.0
5.	Propagation of Islam by Prophet Muhammad SAW	43	58.9	49	67.1	51	69.8	65	89.0
6.	The occasion of the reopening event of Makkah city	66	90.4	67	91.7	60	82.1	70	95.8
7.	The Migration	58	79.4	62	84.9	58	79.4	65	89.0
8.	Islamic Caliphate	41	56.1	46	63.0	58	79.4	65	89.0
	Total Mean	54.8	75.1	58.3	79.9	59.0	80.7	67.2	92.0

Level of High Order Thinking in Learning History for the Aspect of Analysis

Next, the details of level of high order thinking in learning history for the aspect analysis are shown in Table 4. Based on Table 4, it was found that the students in the control groups (f = 40.8 and % = 55.9) had a lower mean score compared to the students in the treatment groups (f = 45.3 and % = 60.8) for the pre-test. Besides that, for the post-test, it can be seen that the students in the control groups (f = 46.6 and % = 63.2) had a lower mean score compared to the

students in the treatment groups (f = 58.0 and % = 79.5). Items with the highest mean score were those related to the Maritime government. Meanwhile, items with the lowest mean score were those related to the economic activities of the Angkor and Funan government, and the propagation of Islam in Makkah. The analysis of the data also showed the result of the post-test for the level of content knowledge for the history subject from the aspect of analysis achieved by the treatment groups was 79.5%, while that of the control groups was 63.2%. The result showed that the percentage differences between treatment groups increased from the pre-test to the post-test by 18.7% compared to the control groups, which was by 7.3%, with a difference of 11.4%. The data is in line with Edwards (2016) and Casey (2016), who found that sufficient resources were acquired during the learning of history to facilitate the process of analysing sources as evidence. As a result, students are able to clearly compare, contrast, and organise historical information.

Table 4: Content Knowledge for the Analysis Thinking Level in History Subject

No	Items	Control Groups				Treatment Groups			
		Pre		Post		Pre		Pre	Post
		f	%	f	%	f	%	f	%
1	The agrarian government	22	30.1	30	41.0	29	39.7	54	73.9
2	Economic activities of the Kingdom of Angkor and Funan	20	27.3	29	39.7	28	10.9	54	73.9
3	The Kingdom of the Maritime	56	76.7	68	93.1	56	76.7	67	91.7
4	The Kingdom of Funan	49	61.6	52	71.2	51	69.8	63	86.3
5	The early kingdom in Southeast Asia	45	67.1	53	86.3	47	64.3	62	84.9
6	The Kingdom of Old Kedah	39	61.6	43	68.4	49	67.1	64	87.6
7	The early kingdom in Southeast Asia	43	53.4	53	72.6	42	57.5	57	78.0
8	An important monument in Southeast Asia	49	58.9	56	76.7	45	61.6	56	76.7
9	Dependency of the agrarian and maritime governments	36	67.1	37	78.0	56	76.7	66	90.4
10	The discovery of artefacts	43	49.3	45	71.2	51	69.8	55	75.3
11	The Malay Kingdom along the Straits of Malacca	36	58.9	43	58.9	42	57.5	55	75.3
12	The concept of the royal deities in the early kingdom in Southeast Asia	49	67.1	50	79.4	57	78.0	59	80.8
13	The Arab society before the advent of Islam	47	64.3	52	75.3	43	58.9	57	78.0

14	The earliest stages of Propagation of Islam in Makkah	46	63.0	46	68.4	49	67.1	51	69.8
15	The Companions of Prophet Muhammad SAW	43	58.9	45	75.3	54	73.9	66	90.4
16	Propagation of Islam in Makkah	46	63.0	52	71.2	51	69.8	57	78.0
17	The War of Badar	20	27.3	25	34.2	19	26.0	54	73.9
18	The early history of the development of Islam in Makkah	51	69.8	52	78.0	56	76.7	59	80.8
19	Prophet Muhammad SAW's Migration	51	69.8	52	71.2	50	68.4	55	75.3
20	The Charter of Madinah	54	73.9	66	83.5	56	76.7	60	82.1
21	The Terms and Conditions of the Hudaibiyah Treaty	30	41.0	41	56.1	29	39.7	50	68.4
22	The Importance of the Hudaibiyah Treaty	28	38.5	33	45.2	32	43.8	55	75.3
23	The occasion of the reopening event of Makkah city	37	50.6	50	82.1	51	69.8	60	82.1
	Total Mean	40.8	55.9	46.6	68.5	45.3	60.8	58.0	79.5

Level of High Order Thinking in Learning History for the Aspect of Evaluation

Finally, the details for level of high order thinking in learning history for the aspect of evaluation are shown in Table 5.

Table 5: Content Knowledge for the Evaluation Thinking Level in History Subject

No.	Items	Control Groups				Treatment Groups			
		Pre		Post		Pre			Post
		f	%	f	%	f	%	f	%
1.	The Kingdom of Old Kedah	58	79.4	66	90.4	53	72.6	64	87.6
2.	The Community of the Ignorance	33	45.2	38	52.0	45	61.6	56	76.7
3.	Prophet Muhammad SAW's Migration	54	73.9	55	75.3	50	68.4	61	83.5
4.	The occasion of the reopening event of city of Makkah	37	50.6	38	52.0	47	64.3	55	75.3
5.	The Clan of Umaiyah	44	60.2	45	61.6	54	73.9	64	87.6
6.	The Art of the Ottoman Turkish Empire	38	52.0	40	54.7	46	63.0	60	82.1
7.	The Triumph of the Ottoman Turkish Empire	41	56.1	45	61.6	53	72.6	60	82.1
8.	The Contributions of the Ottoman Turkish Empire	15	20.5	25	34.2	25	34.2	39	53.4
9.	The Leadership of The Islamic Caliphate	42	57.5	45	61.6	51	69.8	61	83.5
	Total Mean	40.2	55.0	44.1	60.3	47.1	64.4	57.7	79.0

Based on Table 5, it can be seen that the students in the control groups (f = 40.2 and % = 55.0) had a lower mean score compared to the students in the treatment groups (f = 47.1 and % = 64.4) for the pre-test. For the post-test, they (f = 44.1 and % = 60.3) had a lower mean score compared to those in the treatment groups (f = 57.7 and % = 79.0). Items with the highest mean score related to the Kingdom of Old Kedah. Meanwhile, items with the lowest mean score related to the contributions of the Ottoman Turkish Empire. Analysis of the data also showed that the result of the post-test for the level of content knowledge for the history subject from the aspect of evaluation achieved by the treatment groups was 79.0%, while that of the control groups was 60.3%. The result showed that the percentage differences between treatment groups increased from the pre-test to the post-test by 14.6% compared to the control group, which was by 5.3%, with a difference of 9.3%. The findings of the data indicated that the level of content knowledge evaluation skills of the treatment groups was better than that of the control group, which was in line with the study carried out by Julkarim et al. (2017). In his study, Julkarim et al. (2017) found that students' ability to answer higher-order evaluation skills was good, and 55.6% of the students obtained a high score.

Discussion

This study showed overall that 21-CTHM is effective in improving higher order thinking skills among students learning history education. This situation clearly demonstrates that students who study History are more likely to adopt active learning and innovation approaches in line with the principles of learning underpinning the 21- CTHM. This module integrates soft skills, i-think, technology, and creativity. The findings from this study are parallel with previous studies by Meng & Idris (2015); Osman & Kamis (2019), which found that student-centred teaching will have a positive impact on student learning and motivate them in learning history.

In terms of applications, the results of the descriptive analysis clearly show that the 21-CTHM learning has significant differences between each item. It is measured through the pre-and post-tests analysis for both groups. It also shows that 21-CTHM is capable of enhancing knowledge and understanding of history through higher order thinking skills. For the aspects analysis and evaluation, 21-CTHM is shown as effective in enhancing the higher order thinking skills of students. This result contradicts the study by Felicia et al. (2017), Ang et al. (2016) that history students in Malaysia are less interested in history subjects. Thus, this study shows that 21-CTHM makes students understand and appreciate history.

Conclusion

It is clear in this study that the 21st Century Teaching History Module is very effective in improving the high order thinking skills among the secondary students in teaching and learning history. Thus, the module, can be implemented in other schools and in other subjects. Implementing this module may not only be beneficial academically, but may also help in enhancing soft skills and creativity in the learning process at school.

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