

Evaluating the Impact of Chatgpt on Academic Performance and Technology Acceptance: A Quasi-Experimental Study in Malaysian Chinese Independent School History Education

Cheong Ying De¹, Chong Pooi Yee²

^{1,2}Faculty of Social Sciences and Humanities, University of Technology Malaysia
Email: kame8787@gmail.com, shirleychong5146@hotmail.com

DOI Link: <http://dx.doi.org/10.6007/IJARBSS/v15-i8/26115>

Published Date: 15 August 2025

Abstract

This study investigates the technology acceptance of ChatGPT and its impact on academic performance in history studies among Malaysian Chinese Independent School students. Using the Technology Acceptance Model (TAM) as the theoretical framework, the research examines three objectives: (i) analyzing students' technology acceptance of ChatGPT, (ii) identifying the academic performance of students using ChatGPT compared to who do not use, and (iii) exploring the relationship between students' acceptance of ChatGPT and their academic performance. A quasi-experimental design was used in the mixed quantitative methodology, descriptive statistics, t-tests, and correlation analysis were used to analyze the findings. With a mean acceptance score much higher than 3, the results show that students showed a great degree of acceptability towards ChatGPT. Furthermore, students who utilized ChatGPT outperformed those who did not in subjective history questions, demonstrating the value of incorporating AI into the classroom. However, there was no statistically significant association found between students' academic achievement and their acceptance of ChatGPT, suggesting that desire, study habits, and prior knowledge may operate as mediating elements in this relationship. It emphasizes the necessity of more research to tackle these issues, investigate ChatGPT's long-term effects on education, and maximize its use to improve academic achievement.

Keywords: ChatGPT, Technology Acceptance Model, Academic Performance, Malaysia Independent School, History Teaching

Introduction

The introduction of AI among educationists changed the classroom setting and the classroom practices in the 21st century. Some researchers mentioned that AI's able to function as a digital assistant for both teachers and students in their individual teaching and learning processes, facilitating advanced deep learning and collaborative human-computer interaction

(Rouse, 2019). By integrating AI into teaching and learning, it can bring massive transformative changes to teaching and learning practices, breaking the barriers and limitations in traditional teaching and learning methods that ensure the time and location limitation wouldn't bother the educators and learners to enhance accessibility and personalization.

According to Dk (2023), AI is very useful for searching purposes; AI can understand and generate natural language; AI can give lexical analysis to the students which can structure an example of natural language into words, sentences, and paragraphs; AI could gather the data and help the students in seconds, to explain some concept; AI could offer pragmatic analysis, which can help to interpret the intended meaning of the words rather than only their literal meaning. From the above statements, it shows that AI might be able to substitute teachers in some way, AI helps students to explore more about one topic during the absence of a teacher anytime and anywhere.

On the other hand, History is the core and compulsory subject to pass the Malaysian Certificate of Education (SPM), in the secondary school curriculum of Malaysia; whereas students basically didn't see History as a commercially valuable subject (Azwan, et al., 2005). Instead, Malaysia History teaching and learning is often seen as focused on rote memorization and exam preparation. In Malaysia, textbooks still play an important role in History education. Using traditional teaching methods on history teaching, learning based on textbooks without emphasizing the ability to read, interpret, and draw meaning from historical sources (King et al., 2019), students cannot understand, analyze, and construct historical narratives (Carretero et al., 2022), they will not be able to practice the ability of HTS, they just memorize all for standardized national exams contents (Talin, 2016).

The challenge in 21st century History education requires students not only to focus on rote memorization, but to master history by emphasizing the integration of the components of knowledge, skills and values (Binti et al., 2019). History study is a cognitive process, students need to enhance analytical skills, and structured writing. The focus of history exams has shifted in recent years from rote memorization to assessing students' comprehension of Historical Thinking Skills (HTS); this shift makes it harder for teachers and students to perform well on subjective-format tests (Cengiz, 2015). Students cannot handle subjective questions effectively due to the time constraints in traditional classrooms. History subjective questions mainly demand students to have an ability on well-reasoned arguments, analysis of different perspectives, and coherent responses either. Subjective-format questions are more difficult than strict multiple-choice questions because they require the development of analytic skills in addition to the memorization of historical facts.

Additionally, History is the study of the past, it usually provides different interpretations of the past (Claus & Marriott, 2017). Many students find History is challenging to learn and explain because historical events have intricate structures (Gültekin et.al, 2011). When lengthy historical timelines are condensed into brief explanations in textbooks, making it harder for students to grasp the contents (Gültekin, et., 2011). In other words, learning history requires students to interpret and synthesize a variety of sources as a history student should be able to combine analysis of information sources, including documents, artefacts, images, and oral accounts (Claus & Marriott, 2017). While learning the history analytics skills might

need more teacher guidance and substantial feedback, students might not be able to do the deep learning during their self-learning time (Tirado-Olivares et al., 2024). These elements may make students less interested in studying history. Through semi-structured interviews with the students from Grade 8 and 9 students from a public secondary school, Chee-Huay Chong and Kee-Jiar Yeo discovered the three key factors of low academic performance of students in History subject: lack of attention during face-to-face lessons, poor study or analytical skills, and weak time management (Chee-Huay & Kee-Jiar, 2015).

Regardless of this, technology improvement, especially AI, might provide the solutions. First, AI can help students to do deep learning and personalized learning which teachers may be unable to do during their self-study time (Gbadegeshin et al., 2021; Rouse, 2019). Besides, as it personalizes a student's learning experience to fit his individualistic (Nicola & Dalessio, 2019; Xu & Babaian, 2021) and AI helps students to explain difficult historical timelines, helps the data integration and summarization anytime, anywhere. Through individualized practice and direction on subjective history questions, AI-powered feedback systems can support students' growth and increase their historical answering abilities, while some researchers said that AI improves students' historical knowledge and skills by generating the guideline for students to understand the subject knowledge and examination skill (Fischer et al., 2024).

Meanwhile, among various AI tools, ChatGPT suits to be integrated inside Malaysia's history teaching and learning process. As from earlier studies that demonstrate its capacity to enhance writing skills and topic knowledge (Slamet, 2024), ChatGPT can play a role by giving students opportunities to continuous practice, receive instant feedback, and refine their answers in a convenient way (Kindenberg, 2024). The latest GPT-4 enhances the effective knowledge transition of students, improving accuracy and adaptability over time (Nguyen et al., 2023). Kindenberg (2024) highlights the potential of ChatGPT in enhancing students' analytical abilities, understanding, and response structure in historical events and information synthesis. These abilities from ChatGPT ensure the potential to transform student's learning methods alongside a massive transformation in education that can overcome gaps in traditional education models. The above advantages emphasize ChatGPT's potential providing scalable assistance to students for their learning processes.

However, since AI-generated content directs students' comprehension and examination skills, integrating AI into history education has greatly enhanced students' academic results, reduced learning time, and ease the challenge of mastering subject knowledge (Pratama et al., 2022; Fischer et al., 2024); students are also facing new challenges in evaluating and utilizing AI-generated content. First, students need to do more critical analysis on whether it is suitable for them to use. Vast digital resources not only bring benefits and convenience but also bring challenges among students based on their level of digital readiness. As Malaysian students' reading abilities are decreasing especially after the pandemic ("PISA 2022 Results (Malaysia)," 2023), Malaysian students are doubtful prepared to properly use any digital database. They cannot handle the excessive amount of knowledge, data. When students experience overwhelms due to the extensive volume of data and the associated workload (U.S. Department of Education, 2023), they cannot perform well in enhancing their history analytic skills and results in their academic performance.

Meanwhile, Waring's research finds that if students can access DPS or enough volume of materials, they can perform well in carrying out a historical investigation, claiming a conclusion and being able to consider alternative perspectives (Waring, 2011). But Waring and Torrez (2010) observed that while the digitization of historical materials has facilitated access to resources, it has also created challenges in differentiating reliable sources from misinformation. Students may excessively depend on AI-generated content, neglecting to evaluate its accuracy or identify errors, this also affects their learning process. Based on previous study, it indicates that AI tools occasionally produce text derived from unreliable or fabricated sources, which may result in the spread of misinformation (C.W. et al., 2023).

Considering these dynamics, it is essential to evaluate the impact of these tools on students' overall academic achievement. Besides, educators should also consider students' attitudes and acceptance of AI tools in learning, as noted by Slamet (2024). Examining the correlation between students' perceptions of AI tools and their academic performance is essential for developing effective implementation strategies. In summary, although AI presents potential to transform history education, its implementation requires careful consideration to ensure their positive contribution to academic development. It could be useful to comprehend how its integration affects current traditional teaching methods and carefully consider how students engage with the technology to foster deeper learning and improve students' history answering level. It is necessary to examine students' use of ChatGPT to improve their comprehension and sharpen their historical response abilities at Chinese-Independence High School in Malaysia. The study has the following objectives, questions and Null hypotheses.

Objectives of the Study

- (a) To analyze students' technology acceptance towards learning using ChatGPT on History Studies.
- (b) To identify the academic performance of students using ChatGPT towards History Studies in a Chinese Independence High School in Kuala Lumpur.
- (c) To study the relationship between students' technology acceptance with their academic performance using ChatGPT.

Research Questions

- (a) What is the level of students' technology acceptance among Chinese Independence High School students towards ChatGPT?
- (b) What is the average accuracy level of history subjective questions among students who use ChatGPT?
- (c) Is there a statistically significant correlation between the level of acceptance of ChatGPT and their academic performance using ChatGPT?

Null hypotheses of the Study

- Ho1: The mean technology acceptance score is equal to or less than 3, indicating no significant positive acceptance level.
- Ho2: There is no significant difference in the average accuracy level in History subjective questions between students who use ChatGPT and those who do not.
- Ho3: There is no statistically significant correlation between the level of acceptance of Artificial Intelligence chatbot, and their academic performance using ChatGPT.

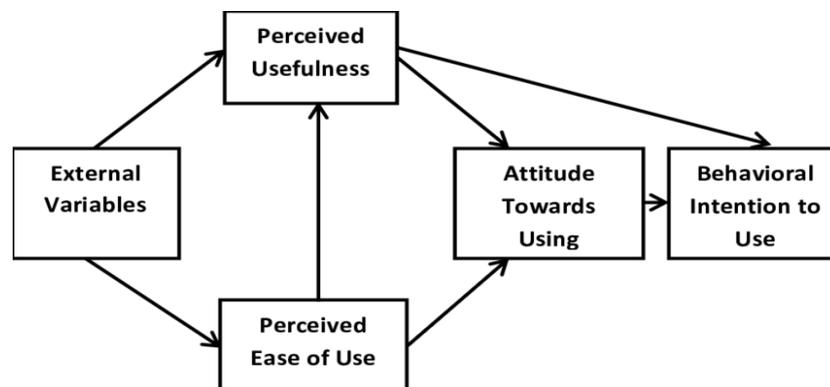
Importance of Study

With ramifications for numerous education stakeholders, this study investigates how Chinese Independence High School students use ChatGPT to help them understand subjective history topics. Gaining knowledge of how ChatGPT works in History subjects might be advantageous for educators. The results could help policymakers and educational planners decide how best to allocate resources and incorporate AI into education. Additionally, the study fills a research vacuum on AI chatbots, especially ChatGPT in Malaysian history teaching, specifically for students following the UEC syllabus, and advances knowledge of how digital tools are used in classrooms in the twenty-first century. Finally, by offering more comprehensive insights into AI's potential to improve humanities courses and raise student achievement, the study closes a gap in the body of knowledge about AI tools in history education.

Literature Review

Theoretical Framework

Technology Acceptance Model (TAM) has been used to examine how well students accept ChatGPT. TAM was first presented by Fred Davis in 1989, looking at how real usage, and perceptions of usefulness and advantages relate to user adoption of information systems. According to TAM, users' attitudes towards adopting a technology and its perceived usefulness both have a positive impact on the intention to utilize it (Alharbi and Drew, 2014). Behavioral intention will be impacted by perceived usefulness and perceived ease of use while perceived usefulness also influenced by perceived ease of use, with outside influences (Shao, 2020). In other words, students' intentions towards ChatGPT were affected by perceived usefulness and perceived ease of use, thus it impacted their technology acceptance level.



Figures 2.1 The detail of Technology Acceptance Model (TAM)

According to Limna, Kraiwanit, and Jangjarat (2023), "easy to use" refers to how simple the user believes the system to be to understand and how long it takes to use effectively (Sitthipon et al., 2022). A user's willingness to interact with a technology that requires little work from them is shown by perceived ease of use. This factor is very significant for both the initial acceptance of technology and its continued use. According to research, a technology's perceived ease of use increases the possibility that it will be actively used (Prastiawan, Aisjah, & Rofiaty, 2021). On the other hand, perceived usefulness refers to how much a user thinks technology may improve its efficiency and performance. It is an assessment of the advantages that technology offers in terms of making it easier to obtain desired services. A positive opinion of technology's perceived utility frequently serves as the foundation for a person's propensity to use it. People are more likely to use technology when they believe it will benefit

them. Productivity, effectiveness, requirements, and total benefits are all directly related to the benefits of using technology (Wardana et al., 2022).

Additionally, a study by Alisaiel, Cifuentes-Faura, and Al-Rahmi (2022) examined the factors influencing college students' behavior and intentions to utilize social media to enhance their academic performance. According to their research, people's perceptions of social media's usefulness, ease of use, and enjoyment are directly impacted when it is used to encourage student participation and collaborative learning. Because it is beneficial, students' attitudes and behavioral intentions about social media have a positive and direct effect on their academic achievement. Therefore, it is believed that the technique improves performance. As a result, this study will examine the relationship between academic achievement and perceived utility, usability, and intention.

Artificial Intelligence

Artificial intelligence, or AI, is the field of computer science that makes computers smart like humans (Emmert-Streib et al., 2020; Laskowski & Tucci, 2023). AI had the ability to perform as a typically required human cognitive function which are able to do problem-solving, decision-making, understanding natural language, and recognizing patterns. AI can process information by aiming for typical themes to build problem solving and solving diverse problems efficiently and effectively (Korteling et al., 2021).

ChatGPT

OpenAI came up with ChatGPT, a model for natural language processing (NLP) that is built on a Generative Pre-trained Transformer (GPT) design. Using artificial intelligence (AI) and deep learning, this AI tool can take textual inputs, like questions, and make answers that sound like they came from a real person. The appearance of ChatGPT would bring a distinct transformation to many domains, especially to the domain of education. The ability of ChatGPT or AI chatbots that can continuously learn from large databases and also adapt through user interactions brings potential to positively impact the process of teaching or learning.

Malaysian Independent-Chinese Secondary Schools

Malaysian Independent-Chinese Secondary Schools (MICSS) is a Chinese private school system established by the Malaysian Chinese community. Chinese would be medium instruction language, and they use the syllabus developed by the United Chinese School Committees' Association (UCSCA), also known as Dong Zong or the United Chinese School Teachers' Association (UCSTA), also known as Jiao Zong (Ministry of Education Malaysia, 2013). This syllabus's content is based on China, Taiwan, Hong Kong, and other education syllabus which are optimized based on Malaysia's occasions. Students shall sit for an examination which is the Unified Examination Certificate (UEC) after the 6-year syllabus.

Research Methodology

This quantitative study aims to understand the influence of ChatGPT on improving students' question answering skills. Secondly, also understanding their perceptions and acceptance towards the usage of ChatGPT in history subjects. To comprehend the participants' actual experiences relevant to the following research objective, quantitative research was conducted. This research used a non-random sampling approach, purposive sampling, with

53 Form 4 students chosen from Malaysian Independent Chinese Secondary Schools (MICSS) in Kuala Lumpur.

A quasi-experimental design with a pre-test and post-test approach to evaluate the impact of a treatment lesson on academic performance. The research was conducted over three weeks in a classroom setting, with 53 participants divided into two groups: the treatment group (27 students) and the control group (26 students). The students were taught about the modern world history of the UEC history syllabus, focusing on the Cold War theme.

Before the research, they were given basic lessons about the Cold War. After the lesson, they took a pre-test and a post-test. The treatment group will complete the subject exercise practice using ChatGPT, while the control group used teacher-prepared notes to complete their exercises. Their pre-test and post-test scores were compared to measuring individual progress and analyzing the treatment's effectiveness. Also, the 27 treatment students will answer a questionnaire with likert scales to test their technology acceptance level, through the Google Form. The study used descriptive and inferential statistical approaches. Descriptive statistics were used to assess students' perceived usefulness, perceived ease of use, and behaviour intentions, while paired sample t-tests were used to compare students' performance pre-test and post-test results. The Spearman Correlation Coefficient was used to determine the relationship between students' acceptance and academic performance.

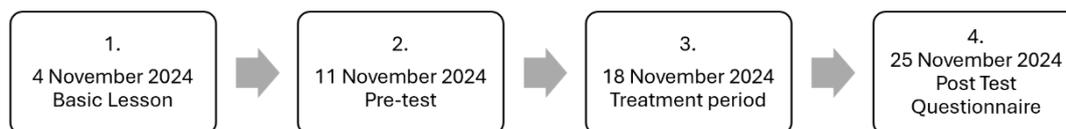


Figure 3.1 The details of Research Procedure

Table 3.1

The ChatGPT Usage Intentions among Higher Education Students' survey item from Shaengchart (2023)

Perceived Usefulness	1. I plan to use this AI tool when I want to learn a new thing. 2. I would use this AI tool to improve my learning skills. 3. I intend to continue using this AI tool
Perceived Ease of Use	1. Using this AI tool improves my skills. 2. Using this AI tool enhances my learning. 3. Using this AI tool is helpful in my study and daily life.
Intentions to Use this AI tool	1. Using this AI tool is easy for me. 2. This AI tool makes it easy for me to become skilful. 3. This AI tool is clear and understandable.

Data Analysis

Objective 1: To analyze students' acceptance towards ChatGPT.

The study of 27 students' acceptance of ChatGPT revealed a high degree of positive reception. The one-sample T-test confirmed that every item was statistically significant, with mean scores significantly higher than the neutral test value of 3; every item received a score higher

than 4.0, indicating that students generally consider ChatGPT to be a useful and efficient learning tool.

Meanwhile, the effect size analysis showed medium-large effect sizes, indicating strong agreement among students about ChatGPT's advantages. The majority of items' standard deviation values were less than 1.0, suggesting minimal response variability, which proved its accuracy.

Overall, UEC students view ChatGPT as a useful and useful learning tool, the study on students' technology acceptance of ChatGPT for studying history found that students had a high degree of acceptance, demonstrating its usability, clarity, and simplicity. The findings disprove the null hypothesis and suggest that students want to continue using ChatGPT for learning. The results are presented on the table below.

Table 4.1
Descriptive Statistics

Item	Mean	Std. Deviation	Std. Error Mean
I plan to use ChatGPT when I want to learn a new thing.	4.1852	0.92141	0.17733
I would use ChatGPT to improve my learning skills.	4.037	0.89792	0.17281
I intend to continue using ChatGPT.	4.8889	0.42366	0.08153
Using ChatGPT improves my skills.	4.0	0.96077	0.1849
Using ChatGPT enhances my learning.	4.0741	0.78082	0.15027
Using ChatGPT is helpful in my study and daily life.	4.7037	0.8689	0.16722
Using ChatGPT is easy for me.	4.7037	0.60858	0.11712
ChatGPT makes it easy for me to become skillful.	4.0	0.7338	0.14122
ChatGPT is clear and understandable.	4.7778	0.50637	0.09745

Table 4.2

One-Sample Test And Effect Sizes Table for Technology Acceptance

Item	t	df	p-value	Mean Difference	95% CI of Difference	Cohen's d	Hedges' Correction	95% CI of Effect Sizes
I plan to use ChatGPT when I want to learn a new thing.	23.602	26	<0.001	4.185	3.820 - 4.549	0.921	0.949	3.254 - 5.821
I would use ChatGPT to improve my learning skills.	23.362	26	<0.001	4.037	3.681 - 4.392	0.898	0.925	3.219 - 5.763
I intend to continue using ChatGPT.	59.962	26	<0.001	4.889	4.721 - 5.056	0.424	0.437	8.396 - 14.675
Using ChatGPT improves my skills.	21.633	26	<0.001	4.0	3.619 - 4.380	0.961	0.99	2.972 - 5.345
Using ChatGPT enhances my learning.	27.112	26	<0.001	4.074	3.765 - 4.383	0.781	0.804	3.754 - 6.672
Using ChatGPT is helpful in my study and daily life.	28.129	26	<0.001	4.703	4.360 - 5.047	0.869	0.895	3.899 - 6.919
Using ChatGPT is easy for me.	40.161	26	<0.001	4.703	4.463 - 4.944	0.609	0.627	5.604 - 9.846
ChatGPT makes it easy for me to become skillful.	28.325	26	<0.001	4.0	3.709 - 4.290	0.734	0.756	3.927 - 6.967
ChatGPT is clear and understandable.	49.028	26	<0.001	4.778	4.577 - 4.981	0.506	0.522	6.855 - 12.007

Objective 2: To identify the academic performance of students using ChatGPT towards History Studies.

By contrasting students who used ChatGPT with those who used normal lecture notes, the study examined how well students performed academically on subjective history questions. An independent T-test was conducted to generate the findings. First, the group using ChatGPT had a mean score of 6.22 (SD=1.28) on the pre-test, while the control group (conventional lesson) had a slightly higher mean score of 7.50 (SD=1.68), indicating that the group using ChatGPT did not perform as well at first. Also referring to the statistically significant difference

observed ($t(51) = 3.122$, $p = 0.003$), indicating the groups were not equal before the intervention.

At post-test, however, the group using ChatGPT significantly improved, obtaining a mean score of 12.85 ($SD=2.30$) as opposed to the control group 10.96 (2.41). This change suggests that the students' academic performance may have improved over time as a result of using ChatGPT, as it also showed a significant difference ($t(51) = -2.926$, $p = 0.005$).

Then, the statistical significance of the two groups' disparities in academic achievement was shown in Table 4.3 of the Independent Samples Test. The control group outperformed the treatment group in the pre-test, as indicated by the t-value of 3.106 and p-value of 0.003, which showed a statistically significant difference. In the post-test, the treatment group was favored, although the t-value was -2.926 and the p-value was 0.005, both of which were statistically significant. These findings imply that ChatGPT contributed to the treatment group's increased post-test performance.

On other hand, the size of the performance gap between the groups was displayed in the Independent Samples Effect Sizes Table 4.5, Cohen's d for the pre-test was 0.858, indicating a significant effect size and a definite advantage for the control group. Cohen's d in the post-test, on the other hand, was -0.804, favoring the treatment group despite having a huge effect size. This change emphasizes even more how significantly ChatGPT affects students' academic achievement.

In conclusion, the results showed a significant difference between the group using ChatGPT and the control group (conventional lesson), with the control group showing higher accuracy levels in the pre-test. However, after using ChatGPT, this group significantly increased their accuracy levels, outperforming the control group in the post-test. Therefore, the null hypothesis (H_02) was rejected, as the p-values for the pre-test and post-test are both less than 0.05. The findings suggest that ChatGPT can significantly improve academic achievement in history classes, despite the differences in accuracy levels between the two groups.

Table 4.3

Group Statistics for Academic Performance (Pre-Test and Post Test)

Test Type	Group	N	Mean	Std. Deviation	Std. Error Mean
Academic Performance Pre-test	1 = Control	26	7.5	1.679	0.329
Academic Performance Pre-test	2 = Treatment	27	6.22	1.281	0.247
Academic Performance Post-test	1 = Control	26	10.96	2.408	0.472
Academic Performance Post-test	2 = Treatment	27	12.85	2.295	0.442

Table 4.4

Independent Samples Test for Academic Performance (Pre-Test and Post-Test)

Test	Pre-test (Equal variances assumed)	Pre-test (Equal variances not assumed)	Post-test (Equal variances assumed)	Post-test (Equal variances not assumed)
Levene's Test for Equality of Variances - F	0.968	0.968	0.015	0.015
Levene's Test for Equality of Variances - Sig.	0.33	0.33	0.904	0.904
t-test for Equality of Means - t	3.122	3.106	-2.926	-2.924
t-test for Equality of Means - df	51.0	46.753	51.0	50.62
Significance (One-Sided p)	0.001	0.002	0.003	0.003
Significance (Two-Sided p)	0.003	0.003	0.005	0.005
Mean Difference	1.278	1.278	-1.89	-1.89
Std. Error Difference	0.409	0.411	0.646	0.647
95% Confidence Interval - Lower	0.456	0.45	-3.187	-3.189
95% Confidence Interval - Upper	2.099	2.105	-0.593	-0.592

Table 4.5

Independent Samples Effect Sizes

Academic Performance	Effect Size Measure	Standardizer	Point Estimate	95% CI Lower	95% CI Upper
Pre-test	Cohen's d	1.49	0.858	0.29	1.418
Pre-test	Hedges' correction	1.512	0.845	0.286	1.397
Pre-test	Glass's delta	1.281	0.997	0.387	1.592
Post-test	Cohen's d	2.351	-0.804	-1.361	-0.24
Post-test	Hedges' correction	2.386	-0.792	-1.341	-0.236
Post-test	Glass's delta	2.295	-0.824	-1.4	-0.234

Objective 3: To study the relationship between students' technology acceptance with their academic performance using ChatGPT.

The study investigated the correlation between acceptance of ChatGPT and academic performance using ChatGPT. Spearman's Correlation was used due to the non-normal distribution of data after the Shapiro-Wilk Test based on table 4.6. All survey items had p-values < 0.001, indicating non-normal distribution.

Table 4.6

Test of Normality

Category	Measurement Item	Kolmogorov–Smirnov Statistic	Kolmogorov–Smirnov Sig.	Shapiro–Wilk Statistic	Shapiro–Wilk Sig.
-	Academic performance Pre-test	0.198	0.008	0.911	0.024
-	Academic performance Post-test	0.115	0.2	0.947	0.178
Perceived Usefulness	I would use ChatGPT to improve my learning skills.	0.298	<0.001	0.784	<0.001
Perceived Usefulness	I plan to use ChatGPT when I want to learn a new thing.	0.272	<0.001	0.758	<0.001
Perceived Usefulness	I intend to continue using ChatGPT.	0.529	<0.001	0.293	<0.001
Perceived Ease of Use	Using ChatGPT improves my skills.	0.241	<0.001	0.822	<0.001
Perceived Ease of Use	Using ChatGPT enhances my learning.	0.277	<0.001	0.828	<0.001
Perceived Ease of Use	Using ChatGPT is helpful in my study and daily life.	0.485	<0.001	0.401	<0.001
Intentions to Use	Using ChatGPT is easy for me.	0.465	<0.001	0.544	<0.001
Intentions to Use	ChatGPT makes it easy for me to become skillful.	0.426	<0.001	0.563	<0.001
Intentions to Use	ChatGPT is clear and understandable.	0.484	<0.001	0.499	<0.001

Meanwhile, this study presents a Spearman's correlation study that uncovers significant relationships between students' perceptions of ChatGPT and their willingness to use the tool for learning. Only the correlation between the “I plan to use ChatGPT when I want to learn a new thing” and academic performance is notably high ($r = 0.077$, $p < 0.001$).

Usability also plays a crucial role in the acceptance of ChatGPT, with substantial correlations between ease of use and skill development ($r = 0.635$ to 0.626 , $p < 0.001$). However, some items, such as the perceived helpfulness of ChatGPT in daily life, showed weaker and insignificant correlations with the intention to use it ($r = 0.047$, $p = 0.815$), suggesting that while students recognize specific benefits, further investigation is needed to understand its

broader applicability in academic settings. Detailed results are provided in Table 4.9 of the study.

Table 4.7

Pearson Correlation between Students' Acceptance of ChatGPT and Their Academic Performance (Post-Test Scores)

Variable	Pearson Correlation (r)	Sig. (2-tailed)	N
I plan to use ChatGPT when I want to learn a new thing.	0.077	0.702	27
I would use ChatGPT to improve my learning skills.	0.227	0.255	27
I intend to continue using ChatGPT.	0.259	0.191	27
Using ChatGPT enhances my learning.	0.189	0.346	27
ChatGPT is clear and understandable.	0.351	0.072	27
ChatGPT makes it easy for me to become skillful.	0.194	0.332	27
Using ChatGPT is easy for me.	0.284	0.151	27
Using ChatGPT is helpful in my study and daily life.	0.295	0.135	27
Using ChatGPT improves my skills.	0.148	0.46	27

The study found no significant correlation between students' academic achievement and their acceptance of ChatGPT. There are some variables demonstrating weak positive correlation but all significant levels greater than 0.05. There could be a number of reasons why there isn't a statistically significant relationship between students' adoption of ChatGPT and their academic achievement. The impact of ChatGPT acceptance may be lessened by outside factors that affect academic success, including motivation, study habits, and past knowledge. Furthermore, the brief research period could not have given students enough time to create efficient usage habits or completely incorporate ChatGPT into their daily learning routines. The subjective nature of assessments, differences in how students used ChatGPT, and excessive dependence on technology may also be factors in the absence of quantifiable progress. Even though students might think ChatGPT is helpful, this does not always result in instant academic improvements, which emphasizes the necessity for longer-term study and more comprehensive performance metrics. On the other hand, the small size of the sample might also lead to changes going unnoticed.

Discussion of Findings

Based on the study, the null hypothesis 1 had been rejected, as there is significant positive acceptance level for the students who used ChatGPT. With a mean technological acceptability score higher than 3, the study's results demonstrate that Malaysian independent secondary school students had a favorable acceptance of ChatGPT. This suggests that employing ChatGPT to teach History subjects is widely accepted. Unlike traditional AI, ChatGPT uses a large-scale pre-trained language model to understand user questions and generate natural-

sounding responses. This advanced NLP technology has improved user satisfaction and increased efficiency in using it. It is also believed that students have high acceptance towards ChatGPT might because of the AI systems especially like ChatGPT could provide students the writing's structure suggestion and immediate feedback which has lead students to comfortably explore their ideas, hone their writing abilities at their own speed, which means, AI in some ways fills in the gaps left by teachers' absence (Tucker,2024).

Following this, ChatGPT seems to be proven as essential to history classes as ChatGPT can help with subjective questions writing, as in allows users to ask a range of questions, summarize materials, and engage with it similarly to peers in history educational contexts (Sok & Heng, 2023). The potential of ChatGPT to improve learning outcomes is further demonstrated by academic performance data, which shows a significant difference in average accuracy levels between students who utilize ChatGPT and those who do not in this study. As the null hypothesis 2 had been rejected as well, students who utilized ChatGPT showed improved accuracy in responding to subjective questions, indicating that the application successfully enhances conventional teaching techniques. As the above statements had supported the idea of Deng and Lin (2023), as ChatGPT's quick responses could provide students the personalized learning experience anytime, anywhere, this can then help students in the learning process, encouraging academic achievement.

With the least burdening teachers, it could be a great idea that now could enhance conventional textbook-centered teaching strategies to more self-personalize learning strategies. This is because now ChatGPT serves as intelligent personal assistants that can aid in the learning process, provides an ubiquitous learning environment, allowing students to engage in the teaching and learning process at any time and from any location. For any topics of history, where access to a variety of materials and viewpoints can enhance comprehension, this flexibility is especially advantageous. It is good to encourage educators and instructional designers, and even students themselves to alter ChatGPT to make it a more useful teaching and learning tool. ChatGPT offers a deeper, more varied learning experience for students in making finding and gathering materials, organizing information, and analysing data more efficient. It can solve the problem mentioned in the problem statement. As mentioned in the problem statement, students previously only mentioned in the History textbook and lack the ability to read and understand even the constructing meaning of history subjects, they now can use ChatGPT as a tool to overcome this problem.

Even while the findings suggest that ChatGPT may help students perform better academically, further research is required to fully understand the complex implications of integrating AI in the classroom, both positive and negative. This is especially crucial because there was no statistically significant relationship between students' academic achievement and their adoption of ChatGPT, according to this study. Based on this study, the null hypothesis 3 had been accepted. The elements that mediate the relationship between learning outcomes and technological acceptability are seriously called into question by this disparity. Based on the previous researchers, there is the positive impact of ChatGPT on students' engagement, critical thinking, and academic achievement. Recent studies by Kreps et al. (2020), they compared AI to a literary analyst, highlighting its ability to analyze intricate texts and find themes and motifs. They emphasized AI's potential to make academic discourse more

approachable while this might be similar to the History Students in this study as they think ChatGPT useful in responding to subjective history questions.

However, instead of helping students to become more critical thinkers, Darwin et al. (2023) indicated that the EFL students are actually boosting their self-esteem, this support makes them more self-reliant learners, which eventually improves their academic performance. Similar to Youssef et al. (2024) highlighting the potential of AI technology in improving learning experiences, but sometimes it doesn't mean that there is the direct relationship between its behavioral intention and academic performance. Likewise, the same goes to Zogheib, S.& Zogheib, B. (2024) statements, students are more inclined to use ChatGPT if they think it's practical and user-friendly; but there is no obvious difference in behavioral intention between intrinsic motivation. Social influence and outside motivation have a big impact on students' behavioral intentions; trust is also quite important in influencing students' behavioral intentions; as behavioral intention is the best indicator of actual use, meaning that students who plan to use ChatGPT are very likely to do so, but external factors also should be considered, and the technology acceptance is not the only thing that direct correlate to academic performance. Therefore, ChatGPT fosters student curiosity, engagement, and motivation, contributing to better academic results and a more effective educational approach, but the direct impact of ChatGPT acceptance on academic performance may be lessened by a number of external factors, including prior knowledge, study habits, and motivation.

To be deeply exploring the relationship between technology acceptance which includes perceived usefulness, perceived ease of use and students' intention to use the ChatGPT, the variations in students' actual usage patterns of ChatGPT should also be considered. As the usage of the ChatGPT can be used differently by students, leading to varying levels of benefit and performance, even with high acceptance levels, this study may produce inconsistent results. The differences in usage intensity, purpose of use, skill in using the tool, consistency in application, external factors like access to technology, learning goals and styles, reliance and over-dependence, and context-specific needs, might bring a different level of impact towards students.

Likewise, students may use ChatGPT for different purposes, such as clarifying doubts, generating ideas, or directly completing their assignments, then it brings different effects on students' academic performance. The effectiveness of the tool depends on how well students formulate prompts or questions while external factors like access to technology, time management, or personal motivation can also influence the frequency and effectiveness of use. This had been supported by the study of Al-Kfairy (2024), as unverified factors like accuracy, reliability, privacy and security, extrinsic motivation, trust, and technology readiness will also influence the acceptance level of students towards the ChatGPT, thus it affect the relationship in between. These contentious elements point to areas that require more investigation to fully understand their effects on educators' adoption and acceptance of ChatGPT (Al-Kfairy, 2024).

In other words, perceived ease of use can lead to the increase of behavioral intentions while increasing their technology acceptance level, but it is not affected by its perceived usefulness. Students felt it is easy to use the ChatGPT in completing their history assignment, but it does

not directly impact their academic performance. Their academic performance might increase due to their prior knowledge from the pretest. As Tanvir et al. (2023) also emphasize that, the ChatGPT actually leads to the good sides but also the bad sides, as there are significant correlations between academic success, motivation, innovation, and plagiarism. Their study shows that plagiarism made possible by ChatGPT can have a significant impact on students' creativity because the ease of using AI-generated content may cause them to rely too much on the tool to produce finished written works, which hinders the development of their originality and creative abilities (Tanvir et al., 2023). Since creativity improves academic performance, the ChatGPT hinders the students' creativity, so there is a non-significant correlation between academic performance and the technology acceptance level.

To conclude the non-significant relationship between academic performance and technology acceptance, it could be said that the increase of academic performance is not because of the technology acceptance level itself but it is because of external factors like prior knowledge of the test topic etc. In light of these factors, more research is necessary to examine ChatGPT's long-term effects on learning and to determine ways to optimize its possible advantages. Future studies should look at things like how deeply students interact with AI, how teachers can help students use AI as efficiently as possible, and how ChatGPT can be used in conjunction with other teaching strategies.

Moreover, narrowing down the elements of technology acceptance also would be important because the technology acceptance level might be increasing lead by the perceived ease of use but not perceived usefulness. It is crucial to determine the relationship between perceived usefulness, perceived ease of use with the behavioral intention for the usage of ChatGPT in learning history, this is because it might affect academic performance in the long term.

Significance of Study

This study examined the integration of AI into teaching and learning of history education in Malaysian Chinese Independent School's students. Based on the findings, there is a significant positive acceptance level for the students who used ChatGPT. ChatGPT has high satisfaction due to its immediate feedback while it can improve their subjective answering skills during teachers' absence. It is believed that the result could fill the gap in the literature of how AI assisted history education in the Malaysian Chinese Independent School (MICSS) system. It is important to explore the convenience of AI usage, how it supports students in order to develop their history answering skills or foster their higher-order cognitive abilities to improve academic performance and with absence of teachers.

Besides, this study provides evidence for teachers and curriculum designers that integration of AI tools could break the limitations of traditional, textbook-centred teaching. This research offered the positive insight into designing an AI-supported curriculum and classroom activities that more effectively increase student's motivation and improve History results among students.

Furthermore, facing the 21st century education revolution, this study provides evidence for academic researchers and educational strategists on how ChatGPT works among secondary school students. Although there were the improvement of students result and it showed that

high favorable of students towards the usage of ChatGPT, there was no correlation between both of it. This somehow does not align with the theory of TAM. Further education planning should explore insight to study the relationship between academic performance with their behavioral intentions on the usage of ChatGPT. Also, researchers can serve this study as a reference point of exploring knowledge on educational technology integration in humanities subjects.

A small conclusion, this study's result significantly demonstrates the potential of ChatGPT in the education system as a practical tool for pedagogical innovation and enhancing learning outcomes to train students prepared for the 21st century technology-driven future.

Suggestion for Further Studies

Based on the research findings and its limitations, researchers recommend some of the potential future studies to in-depth research into the integration of ChatGPT into 21st century education, especially secondary education.

First, this study was only conducted within a small group of students from a single Malaysian Chinese Independent School. This limits the researcher to generalize the impact of ChatGPT among secondary school students. Further research would require conducting across different MISCC from different locations, personal background, learning habits and academic abilities to observe trends in technology acceptance on AI tools and academic performance are tightly consistent. A large number of samples and also multiple backgrounds of students involved in further research would be a positive influence to establish the integration of ChatGPT into the education system.

Also, the research methodology based on a short-term quasi-experimental design, limited the study to explore long-term influence of ChatGPT on students' motivation engagement and also academic performance improvement. Further studies could adopt a longitudinal approach to investigate the long-term impact when educators and students continuously use the ChatGPT offers lasting educational benefits to assist development of History Thinking Skills, historical knowledge retention and also academic performance.

In summary, advancing research in these areas would expand and in-depth the research on integrating ChatGPT in history education, could assist educators, policymakers and technology developers access to accurately evidence-based research outcomes to maximize ChatGPT's role in the 21st Century classroom.

Summary

The study looks at how Malaysian Chinese Independent School students feel about ChatGPT and how it affects their history classes. It was discovered that students significantly embraced ChatGPT and performed better on subjective historical questions. Because students demonstrated better academic performance and a favorable level of technological adoption, the study shows the advantages of incorporating AI technologies like ChatGPT in the classroom. However, no statistically significant correlation was found between students' acceptance of ChatGPT and their academic achievement, indicating that the relationship is mediated by social effects, study habits, motivation, and prior knowledge. Potential issues were also noted by the study, including plagiarism, an excessive dependence on ChatGPT, and

uneven academic achievement outcomes. Future studies should look into ChatGPT's long-term effects on learning outcomes, examine how perceived utility, ease of use, and behavioral intents relate to one another, and address issues like plagiarism, over-reliance, and creativity loss.

References

- Alharbi, S., & Drew, S. (2014). Using the TAM in Understanding Academics' Behavioral Intention to Use Learning Management Systems.pdf. *International Journal of Advanced Computer Science and Applications*, 5(1), 143–155.
- Alismaiel, O. A., Cifuentes-Faura, J., & Al-Rahmi, W. M. (2022, April). Social Media Technologies Used for Education: An Empirical Study on TAM Model during the COVID-19 Pandemic. In *Frontiers in Education* (Vol. 7). Frontiers Media SA
- Al-Kfairy, M. (2024). Factors Impacting the adoption and acceptance of CHATGPT in educational settings: A narrative review of empirical studies. *Applied System Innovation*, 7(6), 110. <https://doi.org/10.3390/asi7060110>
- Alqahtani, T., Badreldin, H.I. et al. Albekairy, A. M. (2023). The emergent role of artificial intelligence, natural learning processing, and large language models in higher education and research, *Research in Social and Administrative Pharmacy* 19 (2023), pp.1236–1242, <https://doi.org/10.1016/j.sapharm.2023.05.016>
- Anggraini, M. P., Cahyono, B. Y., Anugerahwati, M., & Ivone, F. M. (2022, February). Correlation patterns among online reading, offline reading, metacognitive reading strategy awareness, and General English proficiency. 67th TEFLIN International Virtual Conference & the 9th ICOELT 2021 (TEFLIN ICOELT 2021) (pp. 170–175). Atlantis Press. <https://doi.org/10.2991/assehr.k.220201.030>
- Awang, M. M., Ahmad, A. R., Yakub, N. M., & Seman, A. A. (2016). Historical Thinking Skills among Pre-Service Teachers in Indonesia and Malaysia. *Creative Education*, 07(01), 62–76. <https://doi.org/10.4236/ce.2016.71007>
- Azwan, A., Abdul Ghani, A., Mohammad, Z., & Abd. Rahman Abd. Aziz. (2005). Kesan Efikasi Kendiri Guru Sejarah Terhadap Amalan Pengajaran Berbantuan Teknologi Maklumat dan Komunikasi (ICT). *Jurnal Penyelidikan Pendidikan*, 7, 15–24.
- Benjamin, R. et al. (2013). *The Case for Critical-Thinking Skills and Performance Assessment*. USA: Council for Aid to Education
- Binti, S., Awang, M. M., & Ahmad, A. (2019). Implementation of Historical Thinking Skill Among Malaysian Students using History Textbook: Concept, Issues and Challenges. <https://doi.org/10.32698/gcs.0197>
- Black, E. R. (2017, December 1). Learning then and there: An exploration of virtual reality in K-12 history education. <http://hdl.handle.net/2152/63616>
- Brooks, S. (2013). Teaching for Historical Understanding in the Advanced Placement Program: A Case Study. *The History Teacher*, 47, 61-77.
- Buhl, H. U., & Winter, R. (2008). Full Virtualization – BISE's Contribution to a Vision. *Business & Information Systems Engineering*, 1(2), 133–136. <https://doi.org/10.1007/s12599-008-0023-2>
- Fayrah. (2023, November 14). To Educate Students about AI, Make Them Use It. *Scientificamerican*. Retrieved January 16, 2024, from <https://www.scientificamerican.com/article/to-educate-students-about-ai-make-them-use-it/>

- Carretero, M., Cantabrana, M., & Parellada, C. (2022). History Education in the Digital Age. In Springer eBooks. <https://doi.org/10.1007/978-3-031-10743-6>
- Cengiz, O. (2015). Social studies teacher candidates views on historical thinking skills. *Educational Research and Reviews*, 10(14), 2031–2042. <https://doi.org/10.5897/err2015.2294>
- Challenor, J., & Ma, M. (2019). A Review of Augmented Reality Applications for History Education and Heritage Visualisation. *Multimodal Technologies and Interaction*, 3(2), 39. <https://doi.org/10.3390/mti3020039>
- Chee-Huay, C., & Kee-Jiar, Y. (2015). Why Students Fail in History: A Minor Case Study in Malaysia and Solutions from Cognitive Psychology Perspective. *Mediterranean Journal of Social Sciences*. <https://doi.org/10.5901/mjss.2016.v7n1p517>
- Claus, P., & Marriott, J. (2017). History: An Introduction to Theory, Method and Practice. <http://ci.nii.ac.jp/ncid/BB19317477>
- Darwin, Rusdin, D., Mukminatien, N., Suryati, N., Laksmi, E. D., & Marzuki. (2023). Critical thinking in the AI era: An exploration of EFL students' perceptions, benefits, and limitations. *Cogent Education*, 11(1). <https://doi.org/10.1080/2331186X.2023.2290342>
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8), 982–1003. <https://doi.org/10.1287/mnsc.35.8.982>
- Deng, J., & Lin, Y. (2023). The Benefits and Challenges of ChatGPT: An Overview. *Frontiers in Computing and Intelligent Systems*, 2(2), 81–83. <https://doi.org/10.54097/fcis.v2i2.4465>
- Dk. (2023). Simply artificial intelligence. Dorling Kindersley Ltd.
- Duman, M. Ç., & Akdemir, B. (2021). A study to determine the effects of industry 4.0 technology components on organizational performance. *Technological Forecasting and Social Change*, 167(6), 1–14. <https://doi.org/10.1016/j.techfore.2021.120615>
- Emmert-Streib, F., Yli-Harja, O., & Dehmer, M. (2020). Artificial Intelligence: A Clarification of Misconceptions, Myths and Desired Status. *Frontiers in Artificial Intelligence*, 3. <https://doi.org/10.3389/frai.2020.524339>
- Fischer, I., Sweeney, S., Lucas, M., & Gupta, N. (2024). Making sense of generative AI for assessments: Contrasting student claims and assessor evaluations. *The International Journal of Management Education*, 22(3), 101081. <https://doi.org/10.1016/j.ijme.2024.101081>
- Garcia, A., Seglem, R., & Share, J. (2013). Transforming Teaching and Learning Through Critical Media Literacy Pedagogy. *LEARNing Landscapes*, 6(2), 109–124. <https://doi.org/10.36510/learnland.v6i2.608>
- Gbadegeshin, S. A., Natsheh, A. A., Ghafel, K., Tikkanen, J., Gray, A., Rimpiläinen, A., Kuoppala, A., Kalermo-Poranen, J., & Hirvonen, N. (2021). WHAT IS AN ARTIFICIAL INTELLIGENCE (AI): A SIMPLE BUZZWORD OR A WORTHWHILE INEVITABILITY? *ICERI Proceedings*, 1, 468–479. <https://doi.org/10.21125/iceri.2021.0171>
- Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285. <https://doi.org/10.1016/j.susoc.2022.05.004>
- Hamilton, D., McKechnie, J., Edgerton, E., & Wilson, C. (2020). Immersive virtual reality as a pedagogical tool in education: a systematic literature review of quantitative learning outcomes and experimental design. *Journal of Computers in Education*, 8(1), 1–32. <https://doi.org/10.1007/s40692-020-00169-2>

- House, W. (2024, October 24). Memorandum on advancing the United States' leadership in Artificial intelligence; harnessing artificial intelligence to fulfill national security objectives; and fostering the safety, security, and trustworthiness of artificial intelligence. The White House. <https://www.whitehouse.gov/briefing-room/presidential-actions/2024/10/24/memorandum-on-advancing-the-united-states-leadership-in-artificial-intelligence-harnessing-artificial-intelligence-to-fulfill-national-security-objectives-and-fostering-the-safety-security/>
- Kementerian Pendidikan Malaysia. (2022). Laporan Analisis Keputusan Peperiksaan SPM Tahun 2022.
- Kindenberg, B. (2024). ChatGPT-Generated and Student-Written Historical Narratives: A Comparative Analysis. *Education Sciences*, 14(5), 530. <https://doi.org/10.3390/educsci14050530>
- King, W. L., Awang, M. M., Ahmad, A. R., & Dahalan, S. C. (2019b). The Potentials of Using Digital Primary Sources in History Classroom. *Sustainable Development and Societal Wellbeing in the Current Technological Era*, 47–52. <https://doi.org/10.32698/gcs.0169>
- Korteling, J. E., Van De Boer-Visschedijk, G. C., Blankendaal, R. a. M., Boonekamp, R. C., & Eikelboom, A. R. (2021). Human- versus Artificial Intelligence. *Frontiers in Artificial Intelligence*, 4. <https://doi.org/10.3389/frai.2021.622364>
- Kreps, S., McCain, R., & Brundage, M. (2020). All the news that's fit to fabricate: AI-Generated text as a tool of media misinformation. *Journal of Experimental Political Science*, 9(1), 104–117. <https://doi.org/10.1017/XPS.2020.37>
- Laskowski, N., & Tucci, L. (2023, November 13). artificial intelligence (AI). *Enterprise AI*. <https://www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence>
- Lercari, N. (2015). Simulating History in Virtual Worlds. In *Progress in IS* (pp. 337–352). https://doi.org/10.1007/978-3-319-22041-3_13
- Limna, P., Kraiwanit, T., & Jangjarat, K. (2023). Adopting the Technology Acceptance Model (TAM) to Explore Online Purchase Intention via Facebook Live Streaming: Empirical Evidence from Bangkok, Thailand. *ASEAN Journal of Management & Innovation*, 10(1), 1-13. <https://ajmi.stamford.edu/index.php/ajmi/article/view/385>.
- Ling Weay, A., Masood, M. & Abdullah, S. (2016). 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. *International Journal of Assessment and Evaluation in Education*, 6. 65-73.
- Ma, G. (2023). Chance or Challenge: The Role of ChatGPT in History Teaching and Historical Research in Higher Education. In *Atlantis Highlights in Computer Sciences/Atlantis highlights in computer sciences* (pp. 869–874). https://doi.org/10.2991/978-94-6463-264-4_101
- Malaysia Education Blueprint 2013-2025 (Preschool to Post-Secondary Education). Kementerian Pendidikan Malaysia. Retrieved from <http://jpwpl.moe.gov.my/download/phocadownload/sector/spm/upm/malaysiaeducat ionblueprint.pdf>
- Meyer, A. (2019). Artificial intelligence technology enhances educational experience. *The Campanile*. <https://thecampanile.org/19297/science-tech/artificial-intelligence-technology-enhances-educational-experience/>
- Ministry of Education. (2013). Malaysia Education Blueprint 2013 - 2025. In *Executive Summary*.

- Nguyen, X. H., Nguyen, H. A., Cao, L., & hana, T. (2023, August 3). ChatGPT's Understanding of History A Comparison to Vietnamese Students and its Potential in History Education. <https://doi.org/10.35542/osf.io/8z9tj>
- Nicola, C. B., & Dalessio, D.(2019).Artificial Intelligence and the Impact on Business Curricula. *Academy of Business Research Journal*; Gulfport Vol.3,(2019):30-53.
- Obeidat, H. H., Abdelrahman, M. S. B., Ateyat, K., & Al-Arood, M. (2011). The effect of students' reluctance of studying history on their level of historical culture. *Asian Social Science*, 7(2). <https://doi.org/10.5539/ass.v7n2p119>
- Ofianto, Aman, Ningsih, T. Z., & Abidin, N. F. (2022). The development of historical thinking assessment to examine students' skills in analyzing the causality of historical events. *European Journal of Educational Research*, 11(2), 609-619. <https://doi.org/10.12973/eu-jer.11.2.609>
- Ofianto, T. Z. N. (2021). Development of Students' Historical Thinking Skills Through the Project-Based Learning Model. *International Journal of Academic Research in Progressive Education and Development*, 10(2), 615–624.
- PISA 2022 Results (Malaysia). (2023, December 5). In OECD. OECD. Retrieved January 16, 2024, from <https://www.oecd.org/publication/pisa-2022-results/webbooks/dynamic/pisa-country-notes/1dbe2061/pdf/malaysia.pdf>
- Prastiawan, D. I., Aisjah, S., & Rofiaty, R. (2021). The Effect of Perceived Usefulness, Perceived Ease of Use, and Social Influence on the Use of Mobile Banking Through the Mediation of Attitude Toward Use. *Asia Pacific Management and Business Application*,9(3), 243-260. <https://apmba.ub.ac.id/index.php/apmba/article/view/420>.
- Pratama, R. A., Pratiwi, I. M., Saputra, M. A., & Sumargono, S. (2022, March 1). Integration of STEM education in history learning. *International Journal of Evaluation and Research in Education (IJERE)*, 11(1), 313. <https://doi.org/10.11591/ijere.v11i1.22064>
- Raghaw, M., Paulose, J., & Goswami, B. (2018b). Augmented reality for history education. *International Journal of Engineering & Technology*, 7(2.6), 121. <https://doi.org/10.14419/ijet.v7i2.6.10136>
- Raharjana, I. K., Siahaan, D., & Fatichah, C. (2021). User stories and natural language processing: A systematic literature review. *Institute of Electrical and Electronics Engineers Access*, 9(1), 53811–53826. <https://doi.org/10.1109/access.2021.3070606>
- Rashidi, Q. N. M. (2024, April 04). "AI education in schools needs a cautious approach." *thesun.my*. <https://thesun.my/malaysia-news/ai-education-in-schools-needs-cautious-approach-LI12297639>
- Research Guides: Using the Library of Congress Online: A Guide for Middle and High School Students: Types of Sources. (n.d.). <https://guides.loc.gov/student-resources/types>
- Rohlf, G. (2015). How to Make Field Trips Fun, Educational, and Memorable: Balancing Self-Directed Inquiry with Structured Learning. *The History Teacher*, 48, 517-528.
- Rouse, M. (2019). What is AI (artificial intelligence)? - Definition from WhatIs.com. [online] Search Enterprise AI. Available at: [https:// searc hente rpris eai. techt arget. com/ defin ition/ AI- Artificial- Intelligence](https://searchopt.com/definition/AI-Artificial-Intelligence).
- Shaengchart, Y. (2023) A Conceptual Review of TAM and ChatGPT Usage Intentions Among Higher Education Students (September 2023). *Advance Knowledge for Executives*, 2(3), <https://ssrn.com/abstract=4581231>
- Shao, C. (2020). An Empirical Study on the Identification of Driving Factors of Satisfaction with Online Learning based on TAM. In *5th International Conference on Economics, Management, Law and Education (EMLE 2019)* (pp. 1067-1073). Atlantis Press.

- Sitthipon, T., Siripipatthanakul, S., Phayaphrom, B., Siripipattanakul, S., & Limna, P. (2022). Determinants of Customers' Intention to Use Healthcare Chatbots and Apps in Bangkok, Thailand. *International Journal of Behavioral Analytics*, 2(2), 1-15.
- Slamet, J. (2024). Potential of ChatGPT as a digital language learning assistant: EFL teachers' and students' perceptions. *Discover Artificial Intelligence*, 4(1). <https://doi.org/10.1007/s44163-024-00143-2>
- Sok, S., & Heng, K. (2023). ChatGPT for Education and Research: A Review of Benefits and Risks. *SSRN Electronic Journal*. DOI:10.2139/ssrn.4378735.
- Talin, R. (2016). Why Historical Thinking Skills was not there. *International Journal of Learning Teaching and Educational Research*, 15(3). <http://eprints.ums.edu.my/15178/>
- Tanvir, K., Islam, M. S., Sezan, S. B. K., Sanad, Z. A., & Aatur, A. I. (2023). Impact of ChatGPT on Academic Performance among Bangladeshi Undergraduate Students. *Deleted Journal*, 35, 18–28. <https://doi.org/10.55529/ijrise.35.18.28>
- Tirado-Olivares, S., López-Fernández, C., González-Calero, J. A., & Cózar-Gutiérrez, R. (2024). Enhancing historical thinking through learning analytics in Primary Education: A bridge to formative assessment. *Education and Information Technologies*. <https://doi.org/10.1007/s10639-023-12425-w>
- TUCKER, L. G. (2024). APPLICATIONS OF AI IN PRIMARY AND SECONDARY EDUCATION (By C. ANGULO BAHON, A. HERNANDEZ FERNANDEZ, & Sarah Bettis) [Thesis]. <https://upcommons.upc.edu/bitstream/handle/2117/413223/183431.pdf?sequence=2>
- Department of Education. (2023). Office of Educational Technology, Artificial Intelligence and Future of Teaching and Learning: Insights and Recommendations, Washington, DC.
- Wardana, A. A., Saputro, E. P., Wahyuddin, M., & Abas, N. I. (2022). The Effect of Convenience, Perceived Ease of Use, and Perceived Usefulness on Intention to Use E-Wallet. In *International Conference on Economics and Business Studies (ICOEBS2022)* (pp. 386-395). Atlantis Press. <https://doi.org/10.2991/aebmr.k.220602.051>.
- Waring, S. M. (2011). Preserving History: The Construction of History in the K-16 Classroom. <https://eric.ed.gov/?id=ED529591>
- Waring, S. M., & Torrez, C. a. F. (2010). Using Digital Primary Sources to Teach Historical Perspective to Preservice Teachers. *Contemporary Issues in Technology and Teacher Education*, 10(3), 294–308. https://www.learntechlib.org/p/29480/article_29480.pdf
- What is AI (artificial intelligence)? (2024, April 3). McKinsey & Company. <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-ai>
- Xu, J. J., & Babaian, T. (2021). Artificial intelligence in business curriculum: The pedagogy and learning outcomes. *The International Journal of Management Education*, 19(3), 100550. <https://doi.org/10.1016/j.ijme.2021.100550>
- Youssef, E., Medhat, M., Abdellatif, S., & Malek, M. A. (2024). Examining the effect of ChatGPT usage on students' academic learning and achievement: a survey-based study in Ajman, UAE. *Computers and Education Artificial Intelligence*, 7, 100316. <https://doi.org/10.1016/j.caeai.2024.100316>
- Zogheib, S., & Zogheib, B. (2024). Understanding University Students' Adoption of ChatGPT: Insights from TAM, SDT, and Beyond. *Journal of Information Technology Education Research*, 23, 025. <https://doi.org/10.28945/5377>