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Online Learning with Metaverse for History Education At Primary School Education Level

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Abstract

Virtual self-presentation, crucial for online self-identity formation, differs from real-space presentation due to the potential distortion caused by the absence of direct observation of verbal and non-verbal cues in virtual environments, particularly evident in the popularity of avatar-based social media platforms like ZEPETO. This research aims to find out how ZEPETO users present themselves in the virtual world by using 3D avatars as the characters they play. This study should help us learn more about how metaverse technology can be used to teach history and help teachers improve their students' learning experiences. The study looked at how well ZEPETO worked as a new way to teach Historical Thinking Skills (HST). The study was based on a field study that was done at a local school. The data showed that online students knew a lot about history and understood it well. The second goal of the study was to find out how much fifth-grade students in local school knew about History when they learned about it online using the ZEPETO. The data showed that using metaverse through applications helps students do better in their History Education classes. Therefore, this research shows that users present themselves based on circumstances or message content that shows similar interests when using ZEPETO, they do this by creating new self-presentations consistently, creating self-presentations in accordance with one's physical self, and creating self-presentations based on the construction of perceptions from other people. Lastly, this study showed the potential of the use of metaverse in research on elementary school history education.

Keywords: Online Learning, Metaverse-based Learning, ZEPETO, Historical Thinking Skills (HST), History Education, Academic Performance, Elementary School Students

Introduction

The significance of education in fostering national development is widely acknowledged. However, in the contemporary era characterized by globalization and technological advancements, the field of education encounters the formidable task of equipping the younger generation with the necessary competencies in knowledge acquisition and critical thinking abilities. For instance, the field of History places a significant emphasis on the cultivation and application of Higher-Level Thinking Skills (HTHS) in order to comprehensively comprehend and appreciate the intricacies and significance of historical events and phenomena. The utilisation of a pedagogical framework that is suitable for the modern era in

the teaching of History at the primary school level has the potential to mitigate the difficulties associated with curriculum implementation. The objective of this curriculum is to cultivate students who possess proficiency in Higher Level Thinking Skills (KBAT). In order to attain this objective, it is imperative for educators to impart the skills of Historical Thinking (HST) to students, placing particular emphasis on fostering active engagement among them (Merkt et al., 2017; Abbas & Rajiani, 2019).

Recent advancements in virtual reality (VR) and augmented reality (AR) have revolutionized educational technology, offering immersive and interactive environments that transport students to various historical periods and events. Through VR headsets and AR applications, students can explore ancient civilizations, witness pivotal historical moments, and interact with virtual artifacts and characters. These technological breakthroughs provide educators with powerful tools to create engaging and dynamic learning experiences tailored to diverse learning styles and interests. As technology evolves, the potential for integrating VR and AR into history education is boundless, promising to reshape how students engage with and comprehend the past. By immersing students in virtual environments, educators can encourage active engagement and facilitate deep exploration of historical topics (Ruzian et al., 2019). The interactive nature of the metaverse enables students to actively participate in their learning journey, fostering critical thinking skills, empathy for historical figures, and a deeper understanding of complex historical events. Collaborative activities within the metaverse promote teamwork and communication, preparing students for the collaborative nature of the modern workforce. Additionally, the dynamic and interactive nature of virtual environments caters to diverse learning styles, ensuring that all students have the opportunity to thrive. Leveraging the pedagogical benefits of the metaverse in history education has the potential to revolutionize teaching and learning, offering more engaging and effective educational experiences for students.

ZEPETO, launched in 2018 by Snow Corporation, is a popular platform for avatar customization and virtual world creation, with 20,000 global users by March 2021 (Han et al., 2021). It supports human-like avatars, virtual currency for customization, and various communication features. Integrating ZEPETO into the history curriculum provides an engaging learning experience where students interact with historical settings and characters, fostering curiosity, critical thinking, and empathy. This approach allows for personalized learning, promoting inclusivity and accessibility. The study aims to explore the effectiveness of using ZEPETO for history education, with the potential to enhance teaching practices and student engagement, ultimately transforming primary school history education (Han et al., 2021).

Online learning, also known as e-learning, has become increasingly vital, especially amid the COVID-19 pandemic. Halim (2020) highlights the importance of technology in education, citing platforms like EduwebTV KPM and blogs that enhance accessibility to resources and engagement with academic disciplines (Halim, 2020). Websites provide a convenient and cost-effective means of obtaining education, with educators adapting instructional approaches to suit online learning demands. Additionally, the utilization of educational media has been shown to enhance student engagement and comprehension. Metaverse technology shows promise in online education by creating virtual learning environments, with ZEPETO, an avatar-based social media platform, being a notable example with over one hundred million downloads.

By employing a suitable methodology and harnessing online educational technology, it's conceivable to enrich the engagement and effectiveness of History lessons in primary school. Teachers serve as the pivotal force behind all Pedagogy and Curriculum (PdPc), whether within or outside the classroom. The educational experience becomes more enjoyable when the teaching approach is imbued with creativity. According to Razali and Khalid (2021), aligning teaching strategies with students' needs can be facilitated by educational technology, offering students the autonomy to select their learning methods while the teacher assumes the role of a facilitator rather than a director. The integration of educational technology applications proves advantageous by fostering greater user involvement in content creation and management, thereby transforming the nature and significance of information. Consequently, the utilization of technology has become paramount, leading to the emergence of the Metaverse as a captivating alternative.

According to Endarto (2022), the ZEPETO application, situated within the Metaverse, offers users a platform for engaging in interactive and lifelike educational experiences. These experiences encompass the ability to interact with historical figures and events. Notwithstanding the potential benefits, there remains a dearth of scholarly investigations pertaining to the utilisation of ZEPETO in the context of primary school History education. Therefore, the objective of this study is to assess the efficacy of ZEPETO as a tool for instructing Historical Thinking Skills (KPS) in a novel manner. Endarto (2022) asserts that the ZEPETO application, within the Metaverse, provides users with interactive educational experiences, including interactions with historical figures and events (Endarto, 2022). Despite its potential benefits, there is a lack of scholarly research on ZEPETO's use in primary school History education. Hence, the study aims to evaluate ZEPETO's effectiveness in teaching Historical Thinking Skills (KPS) in a unique manner.

The study by Ridhuan & Norman (2023) aims to provide innovative perspectives on the potential of Metaverse technology in history education, offering valuable recommendations for educators to enhance students' learning experiences (Ridhuan & Norman, 2023). Incorporating the ZEPETO application into the Metaverse is seen as a strategy to augment the appeal and relevance of historical learning experiences (Zhang, 2023). However, the existing research on ZEPETO's integration in history education remains limited, prompting this study to investigate its utilization in elementary school history teaching. This research endeavor holds significance in comprehending the potential implications of the Metaverse for enhancing historical learning experiences, especially amidst pedagogical transformations due to the pandemic and technological advancements.

Specifically, the research aims to assess fifth-grade students' (11 years old) comprehension of history through the use of ZEPETO in online educational settings. The hypothesis posits a significant enhancement in comprehension following engagement with the ZEPETO application. The study's focus on students enrolled at a local school limits the generalizability of the findings to this specific educational institution. The reliability of data depends on the veracity and dependability of respondents during the questionnaire completion process.

Objectives of The Study

The objectives of this research focus on exploring online learning with the Metaverse, specifically through the ZEPETO application, for the history curriculum in primary schools. These objectives include:

I. Assessing the comprehension level of fifth-grade students at a local primary school in history when learning online via metaverse.
II. Evaluating the comprehension level of fifth-grade students at a local primary school in history when using the metaverse as a learning tool.

Research Questions

The research inquiries concerning online learning with the Metaverse for history education in primary schools utilizing the ZEPETO application are as follows:

I. What is the extent of comprehension among fifth-grade students at a local primary school regarding the subject of history when learning online via metaverse?
II. Does the utilization of the metaverse using ZEPETO application lead to an improvement in the level of comprehension among fifth-grade students at a local primary school regarding the subject of history?

Independent Variable (IV): The use of the metaverse using ZEPETO application for online learning in history education.

Dependent Variable (DV): The level of understanding or comprehension of history among primary school students.

Literature Review

History Education in Primary School

This literature review offers a comprehensive examination of previous works, theories, and studies pertaining to the integration of the History subject in primary schools, the utilization of online platforms for history subject learning, the comprehension and definition of Metaverse and ZEPETO, the identification of influences and challenges associated with implementing online learning for primary school students, and the requisite measures or initiatives to fulfil the research objectives.

Gaining a comprehensive understanding of the evolution and progression of pedagogy in the field of History will establish a solid groundwork for formulating a suitable strategy for integrating Metaverse technology. There is an increasing inclination to utilize technology in the educational process, and a comprehensive comprehension of its implementation within the framework of Malaysian education would yield a more lucid awareness of the obstacles and prospects.

The government introduced a proposal on October 14, 2008, advocating for the incorporation of the History topic into the curriculum of elementary schools across the entire nation. The primary aim of this initiative was to offer pupils an early opportunity to familiarize themselves with the historical narrative of their country's growth. According to Ahmad (2016), the curriculum would incorporate the instruction and acquisition of knowledge in the field of History, commencing from Year One, so as to supplant the Local Studies topic. The incorporation of the History discipline into primary education, employing pedagogical methodologies that are in line with the requirements of the contemporary era, is anticipated to tackle prevalent obstacles encountered in the execution of the History syllabus. Educators are faced with the task of incorporating the fundamental principles of Historical Thinking Skills into their pedagogical methods, with a particular emphasis on promoting active student

involvement in the teaching and learning process. The framework of Historical Thinking Skills (KPS) can be characterized as a cognitive process encompassing analytical, critical, and creative thinking. The fundamental aim of this study is to get a comprehensive understanding of historical events, develop meaningful links with the present, and promote effective preparation for the future (Nazir, 2019).

The Importance of Historical Thinking

The cultivation of a profound comprehension of the historical backdrop, progression, and the capacity to derive significant insights from the history of one's nation is of utmost importance for the younger cohort. It is imperative for them to exhibit real appreciation for their nation's historical context. Nevertheless, in order to cultivate a fascination with history, it is imperative to initiate early exposure. According to Ahmad (2016), a firm foundation and setup can foster comprehension of the importance of history and its pertinence in present-day society. The subject of History holds great importance in the realm of education, as it plays a crucial role in fostering the development of character and promoting a sense of unity among the populace of a nation. Furthermore, it functions as the exclusive conduit via which a country's heritage and cultural inheritance can be transmitted to the contemporary cohort (Suhaibo, 2007).

History Subject Curriculum Development

The incorporation of the History curriculum has a substantial influence on cultivating a sense of patriotism among individuals and society. The National Curriculum Transformation has been implemented with the objective of improving the national education system, particularly at the primary school level. Its purpose is to ensure that the school curriculum is in line with the current and future demands and complications (Ahamad Rahim, 2011). According to Ismail (2013), the history curriculum under the KSSR framework places emphasis on the incorporation of cognitive, affective, and psychomotor domains, as well as the utilization of contemporary values such as critical thinking, proficiency in information and communication technology, multiple intelligences, future-oriented studies, and lifelong learning.

Online Teaching and Learning

During the ongoing pandemic, the domain of education has witnessed a notable transition towards the adoption of online pedagogical approaches, employing diverse pre-existing digital platforms. Online teaching, learning, and facilitation encompass educational endeavours that are carried out using digital technology and the internet. The adoption of this strategy has become more widespread in Malaysia, as it incorporates the implementation of teaching and learning activities within the home environment, commonly referred to as PdPR (Pembelajaran dan Pendidikan di Rumah). Educators have been compelled to adjust to the prevailing circumstances, sometimes referred to as the 'new normal.' This necessitates the adoption of novel pedagogical and instructional methods, particularly in the realm of online home-based learning, as mandated by the Ministry of Education Malaysia's standards. The user's text lacks academic tone and structure. It should be rewritten to adhere to academic standards. Educational professionals have been compelled to adjust to the prevailing circumstances, characterized by novel pedagogical and instructional methodologies, particularly the use of online domiciliary learning, known as PdPR, in accordance with the directives outlined by the Ministry of Education Malaysia. Furthermore,

the implementation of distant online learning presents educators with a multitude of problems, as emphasized by (Goliong et al., 2016).

Online education, with a focus on addressing the needs and goals of students, spans multiple dimensions including curriculum content, assessment techniques, and learning ways that diverge from conventional methods. These dimensions are specifically planned and aligned to be compatible with the existing curriculum. According to Syaheerah (2021), the government's growth strategy signifies its preparedness to adopt and incorporate technical innovations. The phenomenon of e-learning, sometimes known as online learning, has exerted a substantial influence on the conversion of conventional education into digital platforms, embracing both material and instructional approaches (Fairuz, 2020). Zhu et al (2020) did a study which suggests that online learning has the capacity to cultivate favourable behaviours among students.

The integration of technology within the teaching and learning process, particularly through the implementation of interactive instructional methods, has garnered considerable recognition among students. The primary reason for the effectiveness of interactive learning is its creative, inventive, and engaging characteristics, which also provide the benefit of being accessible from any location (Hashim, 2016). Nevertheless, there exist certain obstacles that impede the provision of sufficient support for the online teaching and learning experience, such as insufficient equipment and restricted internet network connectivity (Doman, 2017).

Panteli and Panaoura (2020) have observed that students have demonstrated a constrained ability to adjust to prevailing conditions. Frequently, there is a tendency to give precedence to individualized instruction while encountering difficulties in directing attention towards virtual educational initiatives. According to the study conducted by Siti Balqis and Muniroh (2020), it was discovered that the utilization of passive and unengaging educational approaches can result in unfavourable perceptions of online learning among students.

Metaverse and Implications of Metaverse in The World of Education

The Metaverse functions as a virtual realm that enables individuals to engage in social, economic, and cultural endeavours by means of avatar embodiment (Hendaoui, 2008). According to Davis (2009), the utilization of avatars facilitates interpersonal involvement. The incorporation of the Metaverse into the realm of education presents a wide array of benefits and prospects for both learners and instructors. Firstly, the use of digital virtual information enables students to gain a profound grasp of visually hidden and three-dimensional aspects. This allows them to efficiently handle complicated problems by immersing themselves in virtual worlds that closely resemble real-world events. The utilization of experiential learning methods enhances individuals' understanding of complex subject matter that may be difficult to comprehend just through conventional text-based approaches, enabling people to actively develop knowledge by engaging in practical, hands-on experiences.

Furthermore, the Metaverse provides a platform for interactive experiences that encompass many activities such as reading, writing, and speaking, all within the context of the learning environment. Students have the ability to actively interact with the subject matter, actively contribute to conversations, and engage in collaborative activities with their peers, thus enriching their overall comprehension. Moreover, the Metaverse promotes introspection into individuals' daily existence, cultivating the capacity to effectively embody and use knowledge. The provision of feedback by peers inside the virtual social network serves as a means of reinforcement and rewards, enhancing the motivation of learners.

Moreover, students have the opportunity to engage in critical examination of diverse information available on lifelogging platforms, and afterwards employ collective intelligence to creatively reconstruct this knowledge. This process facilitates the development of their analytical and creative thinking abilities. The Metaverse effectively addresses spatial and physical constraints commonly connected with the process of teaching and learning, hence enabling education to surpass geographical bounds and take place within immersive virtual worlds. In addition, virtual simulations offer a means of conducting practical training that circumvents the limitations posed by the substantial expenses and potential hazards inherent in real-world situations (Nurul, 2023).

Educators possess the capability to generate personalized avatars that reflect their individual tastes and unique physical attributes. These avatars are afterwards employed as virtual characters for the purpose of imparting knowledge and instructing students in the domain of History. The use of diverse avatars and gaming-like settings enhances the level of engagement experienced during the teaching and learning process. ZEPETO provides students with the opportunity to engage in interactions with their peers and educators within a virtual environment populated by avatars. Numerous opportunities exist for engaging with individuals from diverse geographical locations and exchanging information. Students have the opportunity to establish social connections with those who possess comparable interests, thereby fostering friendships, all while abstaining from divulging any personal details, including actual names or profile images. Educators and learners possess the potential to proficiently utilize the ZEPETO application as a pedagogical tool for the purpose of instructing and comprehending the subject of History in a creative manner. According to Salsabil (2022), the utilization of in-game design in educational settings allows students to engage in virtual experiences that pertain to historical scenarios or contexts. This immersive approach has the potential to elevate students' cognitive abilities and promote a deeper comprehension of the subject matter being taught.

Methods

The present study utilizes a quantitative descriptive analysis methodology, which entails the collection of data through the administration of Likert scale questionnaires. The data is obtained from a sample of fifth-grade kids who were randomly picked from a local primary school in Bangi district, located in the state of Selangor. The research was carried out in a sequential manner, including several phases such as a comprehensive examination of pertinent scholarly works, data gathering through the implementation of a questionnaire, meticulous analysis of the amassed data, further deliberation, and ultimately, the formulation of conclusive findings. Extensive literature searches have been done to create a complete collection of data from books, journals, and websites pertaining to the use of the Metaverse for online learning in the domain of History at the primary school level, with a specific focus on the ZEPETO application. Consequently, the aforementioned data is employed to tackle the three research objectives. Questionnaires are utilized as a means of collecting data and information pertaining to the investigation of this study problem from diverse viewpoints. The present chapter encompasses a comprehensive assessment of the relevant literature, followed by a quantitative analysis conducted on the responses obtained from a sample of 5th-grade students enrolled at a local primary school, who were actively involved in the research investigation.

Data Collection Procedures

The present study involved a cohort of pupils from primary schools located in the Bangi area, Selangor. The sample was expanded to include a total of three primary schools. The study involved 45 fifth-grade students from local primary schools aged 11 years old. Additionally, the study incorporated an innovative approach to deliver history lessons using the ZEPETO application within the metaverse.

The lesson delivery involved creating virtual environments that replicated historical settings, allowing students to immerse themselves in interactive learning experiences. Within these virtual environments, historical scenes and scenarios were recreated, enabling students to engage with historical figures and events in a dynamic and immersive manner. Educators guided students through these virtual experiences, providing context, explanations, and facilitating discussions to enhance understanding and critical thinking.

This unique approach to lesson delivery leveraged the immersive capabilities of the metaverse to create memorable and impactful learning experiences for students. By integrating technology and virtual reality into history education, educators were able to capture students' interest and foster a deeper appreciation for historical concepts and events. This innovative teaching method not only engaged students but also provided them with valuable opportunities to apply historical thinking skills in a hands-on, interactive environment. This is illustrated in Figure 1.

Figure 1: Example of students in the metaverse during a history lesson

The research utilizes a quantitative descriptive analysis methodology, which entails the collection of data through the administration of questionnaires. This methodology encompasses the utilization of statistical functions to characterize and elucidate the data and phenomena gathered during the research and inquiry endeavour. Descriptive statistics are commonly displayed through various formats such as tables, graphs, charts, models, and other visual representations (Berawi, 2017).

The research instrument employed in this study is a questionnaire, designed as a survey, which consists of a series of inquiries and guidelines for gathering data from the selected sample of the study. Section A has five survey items designed to gather demographic information from the participants. Section B of the survey has ten survey items designed to evaluate the students' proficiency in online learning specifically for the topic of History. These items have been adapted from the research conducted by Sumarni and Zamri in 2018. Section C comprises a set of 10 survey items designed to evaluate the students' proficiency in History subjects utilizing the Metaverse platform via the ZEPETO application. These survey items have been adapted from a previous study conducted by Han, Heo, and You in 2021.

Table 3.1
Survey Questionnaire Content

Part	No. of Item	Description	Source
A	5	Respondent's Background and Demography	
B	10	Level of knowledge (History subject)	Sumarni and Zamri (2018)
C	10	Level of knowledge (History subject) through ZEPETO application	Han et al. (2021)

The survey questionnaire comprises items that have been adapted from the works of Sumarni and Zamri (2018) as well as (Han et al., 2021). These items have demonstrated reliability in prior research endeavours. The reliability test outcomes for both sets of questions surpassed a threshold of 0.700. Research tools that possess reliability and validity indices over 0.7 are regarded as appropriate survey surveys. The formal survey is administered once the pilot test findings meet the criteria for reliability and validity.

A preliminary investigation is undertaken to assess the accuracy and consistency of the survey questionnaire that has been developed. The survey questionnaire is subjected to a thorough

assessment by the researcher, who collaborates with the supervisor to identify areas for improvement. Following this, pilot research was carried out on a sample of 30 children who were not included in the project's participant pool. These students were selected from two national primary schools located in Bangi, Selangor, and were in the 5th grade.

The internal reliability index of each construct in the survey questionnaire is derived using the Cronbach Alpha value, which serves as a baseline for evaluating the internal consistency of constructs (Cronbach, 1946). The appendix includes tables that present the results of the analysis undertaken to assess the survey questionnaire's validity and reliability. The assessment of instrument reliability includes the examination of both stability and internal consistency of the survey questionnaire. The data collection for this pilot project and the assessment of its reliability were conducted using the Statistical Package for Social Science (SPSS) version 20.0 software.

The study will employ a questionnaire technique to gather information. A questionnaire is utilized as a means of gathering information from participating pupils through the process of posing questions and eliciting their responses. The survey, modified from previous scholarly investigations, will be constructed utilizing Google Forms to enhance accurate and streamlined data gathering. Following this, WhatsApp will be utilized by educators to disseminate the survey to the participating students as respondents, granting them a period of one week to complete the questionnaire for the study.

The selection of a questionnaire as the method for data collection was motivated by its ability to expedite the process, gather data from a substantial pool of respondents, facilitate the inclusion of numerous inquiries on a given topic, and provide flexibility in data analysis. Questionnaires provide researchers with the opportunity to obtain valuable insights into several aspects of research participants' cognition, affect, attitudes, beliefs, values, perceptions, personalities, and intentions pertaining to their behaviour (Duli, 2019). Throughout the process of data collecting, students will receive comprehensive information regarding the research's objectives, the instrument employed for data collection, as well as the strict adherence to confidentiality protocols pertaining to the gathered information. Following this, participants will be provided with the assurance that their involvement in the research is voluntary. Subsequently, students will be requested to respond to inquiries utilizing the provided scale.

The research instruments utilized for sections B and C consist of Likert scale questionnaires. These questionnaires prompt respondents to indicate their degree of agreement with statements by picking one of five available options, each representing a different level of agreement. The options are as follows: 4 = Strongly Agree, 3 = Agree, 2 = Disagree, and 1 = Strongly Disagree. A visual representation of these options may be found in Table 3.2.

Table 3.2
Likert Scale

Item	Scale
Strongly Disagree (SD)	1
Not Agree (NA)	2
Neutral (N)	3
Agree (A)	4
Strongly Agree (SA)	5

Data Analysis

The data will be subjected to analysis utilizing descriptive and inferential approaches, such as frequency analysis, percentages, and mean scores. A descriptive analysis will be performed to assess and understand the minimal scores established by (Chua, 2011). The objective of this analysis is to assess the extent of historical knowledge among 5th-grade students at Sekolah Kebangsaan Bangi, specifically in relation to online learning and the use of Metaverse applications, as depicted in Table 3.3.

Table 3.3
Interpretation of Minimum Scores

Minimum Scores Range	Interpretation
1.00 – 2.33	Low
2.34 – 3.67	Medium
3.68 – 5.00	High

Descriptive data analysis can be conducted either through manual calculations or by utilizing software applications or programs. The Statistical Package for the Social Sciences (SPSS) is a comprehensive software tool that will be utilized for the analysis conducted in this study. SPSS is widely recognized and extensively used software for statistical data processing on a global scale. The selected methodological technique for this particular investigation is quantitative in nature. The statistical software package SPSS has the ability to analyse and interpret both qualitative and quantitative data. The data is subsequently subjected to additional processing using the SPSS application, which produces various output values such as standard deviations, variances, standard errors, one-sample t-tests, paired-sample t-tests, and other statistical measures (Zein, 2019).

Results

Gender of Students

Among the cohort of 45 fifth-grade students at Sekolah Kebangsaan Bangi, Selangor, a gender distribution was observed. Specifically, 20 students were identified as male, while the other 25 students were classified as female. This information is presented in Table 4.1. There is a lack of statistically significant evidence to support a correlation between gender and students' degree of knowledge in the topic of History while utilizing online learning platforms such as ZEPETO. The data presented above serves the objective of providing informative insights into the characteristics of the respondents who participated in the study.

Table 4.1
Gender of Students

Gender	Frequency	Percentage (%)	Cumulative Percentage (%)
Female	25	60	60
Male	20	40	100
Total	**45**	**100**	

Ethnicity of Students

The predominant ethnic group among the participating students is Malay, comprising 42 students, which accounts for 85% of the total. This is followed by 2 students of Indian ancestry, representing 10% of the sample. Based on the data provided in Table 4.2, it can be

observed that among the respondents, just a single individual identifies as being of Chinese origin.

Table 4.2
Ethnicity of Students

Race	Frequency	Percentage (%)	Cumulative Percentage (%)
Malay	42	85	85
Chinese	1	5	90
Indian	2	10	100
Total	45	100	

Types of Electronic Devices

Table 4.3 displays the various electronic gadgets possessed by the fifth-grade pupils who took part in the study. A significant proportion of the participants, including 37 students, or 60% of the sample, possess personal mobile devices. In contrast, it is seen that a total of six pupils, constituting 30% of the sample, had mobile phones that were provided by their parents. There are just two students who use laptops as a means of learning.

Table 4.3
Types of Electronic Devices

Electronic Devices	Frequency	Percentage (%)	Cumulative Percentage (%)
Smartphone (Parents)	6	30	30
Smartphone (Self)	37	60	90
Laptop	2	10	100
Total	45	100	

Duration of Internet Access

According to the data presented in Table 4.4, it can be observed that a group of 23 students who were part of the study reported spending a range of 3 to 4 hours per day engaging with internet activities. Subsequently, a group of 16 pupils is seen to engage in internet browsing activities for a duration exceeding four hours on a daily basis. A limited number of pupils, specifically seven individuals, engage with the internet on a daily basis for a duration of one to two hours, therefore indicating a relatively tiny proportion.

Table 4.4
Duration of Internet Access

Electronic Devices	Frequency	Percentage (%)	Cumulative Percentage (%)
1 to 2 hours	7	15	15
3 to 4 hours	22	50	65
4 hours and above	16	35	100
Total	45	100	

Data Analysis

According to the data presented in Table 4.5, it can be observed that the minimum scores achieved for each question are above the threshold of 3.30. The item with the highest minimum score, which is 4.40, is item 1. This item is titled 'I prefer learning History online compared to utilizing textbooks,' and it has a standard deviation of 0.681. Out of the sample

population of 45 students, 43 individuals, constituting 90% of the respondents, expressed agreement with the given question, while a mere 2 students opted for a 'Neutral' stance. The question regarding the suitability of online learning for the History subject received a second-highest minimum score of 4.35, with 85% of students expressing agreement. The minimal score of 3.40 was observed for item 10, which pertains to the level of comfort in utilizing online apps for posing inquiries to the teacher. This particular issue garnered agreement from a mere 10 pupils.

Out of all the questions, only three earned votes on the 'Disagree' scale. However, it is important to note that the number of votes was rather low, with none of the questions receiving more than five votes. The following statements correspond to the second, fourth, and tenth items of the questionnaire: "Online learning has the potential to enhance my comprehension of historical subjects," "I experience a sense of enthusiasm when utilizing the internet for studying history," and "I possess a level of comfort in utilizing online platforms to seek clarification from instructors." The items that received the highest number of votes on the 'Neutral' scale were item 4, which states, 'I have a sense of excitement when utilizing the internet for studying History,' and item 7, which states, 'My enthusiasm for studying History is heightened while utilizing online applications.'

According to the survey results, the item pertaining to the delivery of the History subject utilizing ZEPETO in an engaging and concise manner obtained the highest minimum score of 4.45, with a standard deviation of 0.510. The 'Strongly Agree' and 'Agree' scales were the preferred choices among the majority of students, with 15 votes (45%) and 30 votes (55%) respectively. The minimum score of 4.35 is the second highest among all scores. Two questions, specifically item 7 and item 9, obtained the same minimum score. The results indicate that a significant proportion of respondents, 45%, expressed agreement with the statement that utilizing ZEPETO as a learning tool has facilitated their mastery of the topic of History. This finding is consistent across both the 'Strongly Agree' and 'Agree' response categories. Ten percent of the participants selected the 'Neutral' option as their chosen response. In relation to Item 9, the application ZEPETO has been found to facilitate comprehension of historical content and effectively alleviate feelings of monotony. This conclusion is supported by the substantial proportions of respondents who expressed strong agreement (40%) and agreement (55%) with this statement. A minority of 5% of participants selected the 'Neutral' option as their chosen response.

The minimum score obtained for this analysis is 3.85, which represents the lowest value recorded. The minimum score is achieved through two specific questions, specifically item 3, which pertains to the ability to think critically when learning history subjects based on the Metaverse, with a standard deviation of 0.933. Additionally, item 4 focuses on the potential for collaborative learning with peers when studying history through the Metaverse, with a standard deviation of 0.671. In the present poll, a mere two participants selected the 'Strongly Disagree' option on the scale for question 3, accounting for 10% of the whole sample. The survey results indicate that item 1, which pertains to the increased interest in learning History after utilizing Metaverse-based learning materials, had the biggest number of votes on the 'Neutral' scale. Specifically, this item garnered 8 votes, which accounts for 40% of the total votes.

Table 4.5
Student's Knowledge of Online Learning for The Subject of History

Questions	SA	A	N	NA	SD	MEAN	S.D
1. **I am more interested in learning History after using learning materials based on Metaverse.**	15 30%	10 30%	20 40%	0	0	3.90	0.852
2. **I became more information literate and my historical knowledge increased after using learning materials based on Metaverse.**	10 35%	25 40%	10 25%	0	0	4.10	0.788
3. **Learning history subjects based on Metaverse can help me think critically.**	8 25%	30 45%	7 20%	0	0	3.85	0.933
4. **Metaverse-based history learning can help me to collaborate with friends.**	3 15%	36 55%	6 30%	0	0	3.85	0.671
5. **Learning history based on Metaverse can help me to communicate with friends.**	5 25%	37 60%	3 15%	0	0	4.10	0.641
6. **Metaverse-based learning can help me to focus more in the learning process of the History subject.**	7 35%	36 55%	2 10%	0	0	4.25	0.639
7. **Learning to use ZEPETO helped my mastery in the subject of History.**	23 45%	21 45%	1 10%	0	0	4.35	0.671
8. **Presentation of the History subject using ZEPETO is interesting and simple.**	27 25%	18 55%	0	0	0	4.45	0.510
9. **ZEPETO makes it easy for me to understand history subjects and get rid of boredom.**	14 40%	30 55%	1 5%	0	0	4.35	0.587
10. **I prefer to study History through the ZEPETO app rather than online classes.**	5 25%	35 50%	5 25%	0	0	4.00	0.725

Table 4.6
Student's Knowledge on History Subject with Metaverse Application

Questions	SA	A	N	NA	SD	MEAN	S.D
1. **Like learning History online instead of using textbooks.**	28 50%	15 40%	2 10%	0	0	4.40	0.681
2. **Online learning can improve my understanding of a topic in the subject of History.**	35 40%	6 30%	4 20%	0	0	4.00	1.026
3. **Online learning is suitable for the subject of History**	35 50%	7 35%	3 15%	0	0	4.35	0.745
4. **Feel enthusiastic when accessing the Internet to learn the subject of History.**	15 30%	10 25%	20 35%	0	0	3.75	1.080
5. **Learning History online makes it easier for me to communicate with friends.**	6 30%	33 40%	6 30%	0	0	4.00	0.795
6. **Use of online learning methods increased my interest in the subject of History.**	6 30%	35 50%	4 20%	0	0	4.10	0.718
7. **Feel more motivated to learn the subject of History when using the online application.**	3 15%	35 50%	7 35%	0	0	3.80	0.696
8. **Hope the use of online applications continues for learning History in the future.**	5 25%	37 60%	3 15%	0	0	4.10	0.641
9. **Like to compete with my friends while using online learning applications.**	7 35%	34 45%	4 20%	0	0	4.15	0.745
10. **Comfortable using the online application to ask questions to the teacher.**	2 10%	33 40%	6 30%	4 20%	0	3.40	0.940

The demographic features of the respondents have been comprehensively analysed in relation to all the survey questions presented in Section A. In general, the results obtained from both Section B and Section C of the survey, which pertain to the understanding of online learning and the ZEPETO application for the History topic among 5th-grade students at primary schools located in the Bangi district in Selangor, demonstrate a predominantly favourable outcome.

The findings of the analysis indicate that a significant proportion of students have demonstrated a keen interest in adopting the online learning modality for the study of History. Although there were initial concerns over its effects on student comprehension and interest, prevailing optimistic perspectives underscore the potential of this technique in shaping the learning process. Likewise, the utilization of the ZEPETO application has elicited favourable responses from pupils, with a range of advantages noted, such as enhanced proficiency in academic subjects and the development of critical thinking skills.

The present study brings attention to a significant transformation in the field of education during the digital and technological age. The widespread enthusiasm and adoption of online learning, as well as the use of the ZEPETO application, demonstrate students' preparedness to embrace educational transformations and advancements. Nevertheless, there is still a need to address elements pertaining to their influence on students' comprehension and engagement. Hence, this research offers a comprehensive outlook on the advantageous possibilities of technology in the realm of education, as well as the imperative for continuous improvement and use to augment the overall student learning process.

Discussion

Summary of Findings

The ZEPETO application, which has been the primary subject of investigation in this study, has demonstrated favourable outcomes in facilitating the educational process and augmenting students' comprehension of the History discipline. According to the results gathered, this particular application has the potential to enhance students' engagement with a subject that is commonly perceived as lacking in excitement and intrigue. In general, the use of the Metaverse generated by the ZEPETO application offers distinctiveness and interaction that exploit cutting-edge technology to impart content in a captivating and efficient manner to students. Nowak & Fox (2018), revealed that avatars can be considered as messages that can influence a person's perspective and perception in a digital environment. In this research, avatars act as messages in computer-mediated communication (CMC). Users can use avatars as a tool to convey the process of self-presentation online. In several points explained in the research results, it can be seen that when someone carries out the process of self-presentation, they tend to show their identity positively to other users. Additionally, the presentation process is carried out online via computer-mediated communication (CMC). This proves that the results of research in freelance studies show that the use of technology today in learning systems has helped students become more interested in studying history subjects in the form of animation and teachers can also develop skills in technology.

Moreover, the findings additionally validate that the participants in this research collectively concur that the utilization of Metaverse via the ZEPETO application effectively stimulated their curiosity in the acquisition of historical knowledge. This observation suggests that this application has the potential to serve as an efficacious instrument in fostering students' engagement and enjoyment in interactive learning experiences. The ZEPETO application's ability to generate personalized avatars and dynamic visual experiences contributes to enhancing the engagement and appeal of the learning process. Based on research results, ZEPETO users create new or different identities through avatars by realizing what they cannot realize in real life. As stated by Kafai et al (2010), that users can freely choose and use certain attributes on their avatars that they may not be able to display in real life.

Previous research conducted by Jande & Ibrahim (2020), also revealed that users use virtual worlds to create their own new identities by duplicating parts of themselves through the use

of avatars by adding something they would like to have in real life and may find it difficult to acquired (creating the best version of themselves). This happens because in the virtual world, avatars are used as a user's self-representation, whereas ZEPETO is an avatar-based anonymous social media that allows users to rebuild their identity online just by customizing their avatar (Hanika, 2016). ZEPETO users will maintain the identity they have created from the start by developing the positive perceptions that other people have formed towards them. Other people's perceptions will be formed based on what they see of someone until the assumption is created that what they see is a reflection of someone's personality (Walther, 1996). Based on research results, ZEPETO users can freely express themselves through avatars. This happens because avatars are anonymous, where users do not know their true form, so they can freely manipulate their appearance to gain positive perceptions from other people through the avatar's appearance, which they then develop to embody other people's perceptions of them (Vasalou et al, 2008). Previous research conducted by Hanika (2016), also revealed that individuals can present themselves verbally and non-verbally to other people who interact with them and can actively adjust one's perception when faced with other players (coplayers).

In this research, ZEPETO users utilized existing customization features to create their own characteristics on their avatars according to their individual tastes, with the aim of being a form of self-presentation as well as differentiating one avatar from another. Previous research conducted by Febriani (2017) also stated that the avatar creation feature gives users the freedom to create avatar characters according to their individual preferences. This is different from previous research where customization options have been provided by the application so Users can only choose through the menu provided, whereas in ZEPETO users can freely recreate the model and face shape of their avatar starting from the shape of the face, eyes, eyebrows, nose and lips so that users can create more freedom to create their avatar according to their references. want.

In this research, the feedback received by users also greatly influences the user's self-presentation. Feedback received by ZEPETO users is not only in the form of likes, but also in the form of comments from responsive friends. Burrow & Rainone (2017), found that positive feedback on social media (calculated from the number of likes received) can increase an individual's assessment that he or she has received good reception from others. This is the same as the results of this research, where when users receive comments in the form of praise, they feel happy because they have been received according to their expectations or hopes. However, when users receive negative comments, they will respond negatively again. ZEPETO users will behave according to how other users treat them. This is in line with the ideas of Walther (1996), who says that feedback can make a user feel accepted or belonging, but feedback can also have negative consequences if it is negative.

Nevertheless, it is imperative to acknowledge certain constraints within the scope of this study. The investigation was conducted in an urban school setting. The potential consequences of this phenomenon could have an impact on the accessibility and adoption of technology inside educational settings. The outcomes of the study could potentially alter if a comparable investigation were to be carried out in educational institutions situated in rural regions, where the extent of technology utilization may exhibit differences.

Furthermore, it is important to take into account the sample size of the study. This study had a limited sample of 45 fifth-grade children, perhaps limiting the representation of diverse individual characteristics and a comprehensive range of subjects. By increasing the sample size, the research findings can be examined with enhanced depth and precision. The present

study is additionally limited by temporal constraints, potentially impacting the ability to effectively compare the ZEPETO application with traditional educational methodologies. A thorough understanding of the effects of utilizing this application over an extended duration can be obtained through a longitudinal evaluation.

The concluding discourse of this investigation ought to be guided by the objectives and aims of the research, including a comprehensive examination of all the research inquiries delineated in the introductory chapter at the inception of the study. The final discussion presented in this study is in accordance with the specified objectives of the research, aiming to address all the research questions provided in the initial chapter. This discussion aims to conduct a detailed evaluation of the research findings and determine the degree to which they have successfully accomplished the study objectives and addressed each of the established objectives. The study will establish a connection between these findings and the hypotheses examined in the existing literature, while also making reference to pertinent previous research outcomes.

Additionally, this discourse will also examine the pragmatic ramifications of the research outcomes within the domain of History education at the primary level, employing the Metaverse platform and the ZEPETO application. The consequences of this study have the potential to provide valuable guidance for educators and researchers in the development of more impactful and inventive pedagogical approaches. In this discourse, the amalgamation of research findings and previously set research objectives will be undertaken, hence offering a more comprehensive outlook on the extent to which the study has effectively attained its objectives and addressed the research inquiries.

The concluding discussion of this study should be directed by the research's objectives and aims, encompassing a comprehensive analysis of the research questions specified in the introductory chapter at the outset of the investigation. The final discussion presented in this study is in accordance with the specified objectives of the research, aiming to address all the research questions provided in the initial chapter. This discourse aims to conduct a detailed evaluation of the research findings and determine the degree to which they have successfully fulfilled the study objectives and addressed each of the established objectives. The study will establish a connection between these findings and the hypotheses examined in the existing literature, while also making reference to pertinent previous research outcomes.

In addition, this discourse will also examine the pragmatic ramifications of the research outcomes within the domain of History education at the primary level, employing the Metaverse platform and the ZEPETO application. The consequences of this study have the potential to provide valuable guidance for educators and researchers in the development of teaching approaches that are both more successful and innovative. In this discourse, the amalgamation of research findings with the previously defined research objectives will be undertaken, hence offering a more comprehensive outlook on the extent to which the study has effectively attained its objectives and addressed the research inquiries.

Based on the primary objective of the study, which sought to ascertain the extent of comprehension among 5th-grade students at Sekolah Kebangsaan Bangi, Selangor, with regards to the History subject through online learning, the analysis of the results suggests that the students exhibit a high level of knowledge and understanding in History acquired through online platforms. The minimum scores achieved for each question, when considered collectively, exceeded 3.40.

The results align with a study conducted by Farhanah (2020), indicating that students possess a substantial level of knowledge and exhibit a favourable disposition towards online learning,

as demonstrated by minimum scores of 3.92 and 3.82, respectively. The aforementioned statistics illustrate a notable inclination among students to participate in online History instruction.

The primary aim of this research was to ascertain the extent of historical knowledge among fifth-grade students at Bangi National School in Selangor, utilizing the ZEPETO program. According to the findings presented in Table 3.5, a significant proportion of the participating students opted for the "Agree" and "Strongly Agree" rating options while providing their comments. This statement indicates that fifth-grade students at Bangi National School in Selangor recognize the significant educational benefits of utilizing the ZEPETO application, which enhances their learning experience and offers a novel approach to studying History. The Metaverse, an emerging technology, demonstrates significant potential in diverse disciplines despite its relative novelty. The utilization of this technology holds considerable promise in augmenting the quality and efficacy of pedagogical and educational methodologies in forthcoming times. The Metaverse technology, classified as an audio-visual-based instructional media, not only facilitates the learning process but also presents educators in Malaysia with potential to enact significant changes in the education sector (Al Yakin, 2023).

In summary, the utilization of the ZEPETO program as an embodiment of the Metaverse in the context of studying the History discipline is a compelling option that has promise for delivering a heightened level of interactivity and engagement in the learning process. Despite the presence of certain limitations within this study, the results offer a favourable perspective on the potential of the ZEPETO application in resolving obstacles associated with traditional learning methods and fostering students' engagement with the subject of History. However, additional measures and more extensive research are required to uphold the efficacy and pertinence of employing this technology in the realm of education in the forthcoming years.

Research Implications

The aforementioned points elucidate the ramifications associated with the utilization of online learning, encompassing a diverse range of aspects that possess the potential to exert a substantial impact on the realm of education and the process of acquiring knowledge. Primarily, online learning provides an unparalleled degree of accessibility and adaptability. The utilization of technology in education facilitates the overcoming of geographical and temporal limitations, thereby enabling students to access and derive educational advantages from historical lectures, irrespective of their location or time constraints.

One of the primary benefits of online education is in its ability to seamlessly include multimedia elements. By integrating diverse multimedia components such as films, animations, graphics, and interactive materials, a dynamic and captivating educational setting is established. The incorporation of visual and auditory elements in educational settings contributes to the deepening of students' understanding of historical themes. Active engagement is a crucial element that emphasizes the significance of students' active participation and involvement in their educational endeavours. Online learning systems enable this by providing interactive activities, such as quizzes, games, and projects. Engagement of this nature serves to maintain students' interest in the subject matter.

The efficiency of monitoring and assessment in online education is considerable. Educators have the ability to methodically monitor the progress of children and offer prompt feedback and assistance. The use of ongoing assessment guarantees the achievement of educational goals. Moreover, online learning provides students with crucial technological competencies,

thereby aligning them with the requirements of the modern era. Nevertheless, it is imperative to acknowledge and tackle the technical obstacles while also guaranteeing fair and equal access to technology.

The cultivation of discipline and self-reliance is necessary for students to achieve success in the realm of online education. Efficient time management and assuming responsibility for one's own learning process are essential components of online education. Conversely, online learning has the potential to diminish the extent of social engagement that is commonly encountered inside a conventional classroom setting. One potential drawback is that students could experience a lack of in-person engagement with both their peers and professors. The need for source credibility is of utmost significance in the era of digital technology. It is imperative for students to possess the necessary skills to evaluate the credibility of internet sources in order to differentiate between true information and falsehoods.

Educators assume a crucial and influential position in the realm of online learning. Sufficient training is vital in order to equip individuals with the necessary abilities to proficiently present instructional content, offer constructive feedback in online settings, and properly oversee virtual learning environments. Ensuring the privacy and security of students throughout their interaction with educational platforms is of paramount importance, making online safety a primary concern.

The advent of online learning has resulted in a paradigm shift in education, leading to a transformation of conventional teaching methodologies and a greater emphasis on technology-driven techniques. In summary, the ramifications of online learning are many. In the field of education, they provide both prospects and obstacles. Educators and governments may optimize the educational experience for students by comprehending and effectively addressing various consequences associated with online learning.

Recommendations

The provision of recommendations for additional research holds significant importance in broadening the scope of comprehension and fostering advancements within the realm of historical education, particularly in relation to the utilization of the Metaverse and the ZEPETO application. In a study conducted by Kuppusamy and Norman (2021), it was found that incorporating interactive workshops and utilizing up-to-date digital resources can serve as a viable approach to enhance the efficacy of the Professional Development Programme within the education domain. This approach not only aids in aligning educational performance with global benchmarks but also contributes to maintaining a balance in this regard.

The significance of incorporating Information and Communication Technology (ICT) and the notion of Metaverse into education has become progressively crucial in the era of virtual learning. The expansion of Metaverse applications within the educational community, encompassing educators, instructors, and researchers in the field of education, represents a promising advancement. Educators who lack the motivation to embrace information and communication technology (ICT) and the Metaverse platform may find it challenging to align themselves with progressive pedagogical techniques.

Conclusion

This study has discovered some positive outcomes experienced by educators and students. One notable benefit is that the incorporation of technology in history education fosters increased student engagement, boosting their attention and focus. The heightened level of motivation observed in individuals plays a significant role in fostering the ongoing

development of competencies throughout their lives. The utilization of Metaverse platforms, alongside the ZEPETO application, affords students the chance to engage with a wide range of contemporary educational resources in a manner that is unconstrained and varied. The effective utilization of the ZEPETO application can potentially result in time and energy conservation during lesson preparation.

In addition, the comprehension of the discipline of History can be facilitated by the integration of visually engaging representations. The efficacy of enhancing online learning through the utilization of the Metaverse platform is contingent upon the establishment of a proficient technological framework. Providing instructors and students with suitable early exposure and training during the initial phases of schooling is crucial. The utilization of Metaverse technology in online education is anticipated to generate favourable outcomes in alignment with the government's goals to promote digitalization in the education domain.

This study effectively demonstrates the notable positive influence of employing Metaverse technology, namely through the utilization of the ZEPETO application, in the educational context of History for primary school children. The primary factor of significance lies in its capacity to generate interest and foster active involvement in the educational experience, hence affecting students' motivation to engage more profoundly in the process of learning.

The utilization of the Metaverse platform facilitates the provision of an interactive and captivating learning environment to pupils, as exemplified by the ZEPETO application. The application's capacity to integrate visual elements with the curriculum content has enhanced comprehension and knowledge assimilation, hence enhancing the enjoyment and significance of the learning process. In addition, the use of the ZEPETO application has resulted in an enhancement of student concentration, thereby bolstering the educational experience.

The efficacy of incorporating Metaverse technology into online education is contingent upon the presence of a resilient technological framework and the educators' adeptness in efficiently organizing and administering instructional resources. The importance of awareness and early training for educators and students cannot be overstated in ensuring the successful execution of a program or initiative. This research demonstrates the potential of Metaverse technology, namely the ZEPETO application, to enhance the quality of education. The desire for a more comprehensive educational objective necessitates the increased implementation of this technology within the realm of education.

In summary, this research has yielded findings about the impact of utilizing the Metaverse via the ZEPETO application on the educational experience of primary school pupils in the subject of History. The robust endorsement of technology in education is primarily driven by its significant beneficial effects on motivation, interest, and comprehension among students. In light of the discoveries made in this study, educators and instructors are encouraged to use proactive measures in order to enhance their pedagogical methods and promote the overall quality of education.

References

Abbas, E. W., & Rajiani, I. (2019). Managing e-learning in public universities by investigating the role of culture. Polish Journal of Management Studies, 20.

Rahim, A. (2011). Kurikulum sejarah ke arah pembentukan bangsa di Malaysia. In Proceedings International Seminar on Educational Comparative for Active Learning Between Indonesia and Malaysia. Universiti Malaya, Universiti Kebangsaan Malaysia dan Universiti Pendidikan Indonesia.

Ahmad, A. R., & Awang, M. M. (2016). Kurikulum Standard Sekolah Rendah (KSSR) Mata Pelajaran Sejarah: Pelaksanaan Dan Cabaran. In Proceedings 7th International Seminar on Regional Education (Vol. 1, pp. 435-445).

Al Yakin, A., & Seraj, P. M. I. (2023). Impact of Metaverse Technology on Student Engagement and Academic Performance: The Mediating Role of Learning Motivation. International Journal of Computations, Information and Manufacturing (IJCIM), 3(1), 10-18.

Berawi, F. M. (2017). Metodologi Penyelidikan: Panduan Menulis Tesis. UUM Press.

Burrow, A. L., & Rainone, N. (2017). How many likes did I get? Purpose moderate's links between positive social media feedback and self-esteem. Journal of Experimental Social Psychology, 69, 232–236. https://doi.org/10.1016/j.jesp.2016.09.005

Chua, Y. P. (2011). Kaedah Penyelidikan. Selangor: McGraw Hill (Malaysia) Sdn. Bhd.

Davis, A., Murphy, J., Owens, D., Khazanchi, D., & Zigurs, I. (2009). Avatars, people, and virtual worlds: Foundations for research in Metaverses. Journal of the Association for Information Systems, 10(2), 1. https://doi.org/10.17705/1jais.00183

Doman, N. (2017). Implikasi Google Apps dalam Pengajaran dan Pembelajaran Pelajar Pesisir UTHM (Doctoral dissertation, Universiti Tun Hussein Onn Malaysia).

Duli, N. (2019). Metodologi Penelitian Kuantitatif: Beberapa konsep dasar untuk penulisan skripsi & analisis data dengan SPSS. Deepublish.

Endarto, I., & Martadi, M. (2022). Analisis Potensi Implementasi Metaverse Pada Media Edukasi Interaktif. Barik - Jurnal S1 Desain Komunikasi Visual, 4(1), 37-51. https://ejournal.unesa.ac.id/index.php/JDKV/article/view/48250

Farhanah. (2020). Development and validation of an instrument to measure STEM teachers' instructional preparedness. Asian Journal of University Education/Asian Journal of University Education, 16(3), 193. https://doi.org/10.24191/ajue.v16i3.11084

Febriani, R. (2017). Menjajaki "Kehidupan Kedua" Tak Semudah Kusangka: Cipta Reka Virtual Life Melalui Aplikasi Avakin Life. January. https://doi.org/10.13140/RG.2.2.12005.32481

Halim, N. F., Ahmad, A. R., & Awang, M. M. (2020). Tahap Pengetahuan Dan Sikap Murid Tahun 4 Terhadap Pembelajaran Atas Talian Dalam Subjek Sejarah. Implication Of Covid-19 Pandemic Towards Education, Social Life & Global Economics, 72.

Han, J., Heo, J., & You, E. (2021). Analysis of Metaverse Platform as A New Play Culture: Focusing on Roblox and ZEPETO. In 2nd International Conference on Human-Centered Artificial Intelligence (pp. 27-36).

Hanika, I. M. (2016). Self-Presentation dalam Kehidupan Virtual. Jurnal ILMU KOMUNIKASI, 13(1), 93–108. https://doi.org/10.24002/jik.v13i1.601

Hashim, H., Nasri, S. M. M., & Mustafa, Z. (2016). Cabaran Yang Dihadapi Oleh Guru Dalam Pelaksanaan Persekitaran Pembelajaran Maya Frog Di Bilik Darjah [Teachers' Challenges in the Implementation of Frog Virtual Learning Environment in Classrooms]. Asia Pacific Journal of Educators and Education, 31(31), 115-129.

Hendaoui, A., Limayem, M., & Thompson, C. W. (2008). 3D social virtual worlds: Research issues and challenges. IEEE Internet Computing, 12(1), 88-92.

Jande, L. V., & Ibrahim, N. A. (2020). The Presentation of Self and Identity Construction in Virtual World: A Case Study of Avakin Life. LSP International Journal, 7(2), 107–118. https://doi.org/10.11113/lspi.v7.15271

Nazir, J. (2019). Panduan Pengurusan Mata Pelajaran Sejarah: Sekolah Rendah dan Sekolah Menengah. Retrieved from https://www.moe.gov.my/pekeliling/4414-buku-panduan-mp-sejarah/file

Kafai, Y. B., Fields, D. A., & Cook, M. S. (2010). Your second selves: Player-designed avatars. Games and Culture, 5(1), 23–42. https://doi.org/10.1177/1555412009351260

Kuppusamy, Y., & Norman, H. (2021). Kemahiran teknologi dan kesediaan melaksanakan pembelajaran dan pemudahcaraan dalam talian semasa era pandemik dalam kalangan guru di sekolah rendah Tamil. Jurnal Dunia Pendidikan, 3(1), 428-441.

Goliong, L. M. K., Abdullah, & Talin, R. (2016). Kompetensi Peribadi, Pedagogi, Profesionalisme Guru Sekolah Berprestasi Rendah Bahagian Barat Dan Utara Sabah. Jurnal Pendidikan Nusantara.

Merkt, M., Werner, M., & Wagner, W. (2017). Historical thinking skills and mastery of multiple document tasks. Learning and Individual Differences, 54, 135-148.

Jafar, M. F. (2020). Kesediaan pembelajaran dalam talian semasa pandemik Covid-19. Prosiding Seminar Darulaman 2020 Peringkat Kebangsaan, 404-410.

Hamdan, N. S., & Muhamad, T. A. (2021). Motivasi Pelajar Sekolah Menengah Kebangsaan Di Kuala Lumpur Dan Keterlibatan Pelajar Dalam Pengajaran Dan Pembelajaran Dalam Talian Sepanjang Tempoh Pandemik Covid-19. 2nd International Conference on Education, Social Sciences and Engineering (ICESE 2021).

Nowak, K. L., & Fox, J. (2018). Avatars and computer-mediated communication: A review of the definitions, uses, and effects of digital representations. Review of Communication Research, 6, 30–53. https://doi.org/10.12840/issn.2255- 4165.2018.06.01.015

Nurul, A., & Norman, H. (2023) Kajian Tinjauan Keberkesanan Penggunaan Metaverse dalam Membantu Pembelajaran dengan Memanfaatkan ZEPETO sebagai Platform. Jurnal Dunia Pendidikan. https://doi.org/10.55057/jdpd.2022.4.4.19

Panteli, P., & Panaoura, A. (2020). The effectiveness of using mobile learning methods in geometry for students with different initial mathematical performance. Social Education Research, 1-10.

Rahman, K. R., Shitol, S. K., Islam, M. S., Iftekhar, K. T., & Pranto, S. A. H. A. (2023). Use of Metaverse Technology in Education Domain. Journal of Metaverse, 3(1), 79-86.

Razali, N., & Khalid, F. (2021). Penggunaan Aplikasi Pembelajaran Mudah Alih dalam Pembelajaran Matematik bagi Pelajar Sekolah Menengah. Malaysian Journal of Social Sciences and Humanities (MJSSH), 6(6), 73 - 85.https://doi.org/10.47405/mjssh.v6i6.812

Ridhuan, N. A. M., & Norman, H. (2023). Kajian Tinjauan Keberkesanan Penggunaan Metaverse dalam Membantu Pembelajaran dengan Memanfaatkan ZEPETO sebagai Platform. Jurnal Dunia Pendidikan, 4(4), 225-233.

Ruzian, M. (2019). Literasi Perundangan Media Baharu dalam Kalangan Belia (Legal Literacy of New Media Legislations Among Youths). Jurnal Komunikasi, Malaysian Journal of Communication, 35(3), 372–389. https://doi.org/10.17576/jkmjc-2019-3503-22

Salsabil, S. A., Amanda, D., Adilah, R. R., & Aeni, A. N. (2022). Pemanfaatan Aplikasi ZEPETO Sebagai Media Pembelajaran Budaya Islam Untuk Siswa Kelas 4 SD/MI. Al Qalam: Jurnal Ilmiah Keagamaan dan Kemasyarakatan, 16(5), 1711-1720.

Mahlan, S. B., & Hamat, M. (2020). Pengajaran Dan Pembelajaran Dalam Talian Semasa Perintah Kawalan Pergerakan. Creative and Innovative Teaching Practices during COVID-19 Movement Control Order (MCO) Volume 1, September 2020, 14-23.

Suhaibo, H. H. (2007). Pemupukan patriotisme dalam pendidikan sejarah tingkatan satu (Doctoral dissertation, Fakulti Pendidikan, Universiti Malaya).

Sumarni, L., & Zamri, M. (2018). Tahap Pengetahuan, Sikap Dan Kesediaan Pelajar Tingkatan 4 Terhadap Penggunaan Pembelajaran Persekitaran Maya Vle Frog Dalam Pembelajaran

Bahasa Melayu [The Level of Knowledge, Attitudes, and Readiness Form 4 Students to the Using of Virtual Learning Environment VLE Frog in Malay Language Learning]. Jurnal Pendidikan Bahasa Melayu, 8(2), 53–62. Retrieved from http://spaj.ukm.my/jpbm/index.php/jpbm/article/download/166/144

Vasalou, A., Joinson, A., Bänziger, T., Goldie, P., & Pitt, J. (2008). Avatars in social media: Balancing accuracy, playfulness and embodied messages. International Journal of Human-computer Studies, 66(11), 801–811. https://doi.org/10.1016/j.ijhcs.2008.08.002

Walter, T. (1996). A new model of grief: Bereavement and biography. Mortality, 1(1), 7–25. https://doi.org/10.1080/713685822

Zein, S. Z., Yasyifa, L. Y., Ghozi, R. G., Harahap, E., Badruzzaman, F. H., & Darmawan, D. (2019). Pengolahan dan Analisis Data Kuantitatif Menggunakan Aplikasi SPSS. Teknologi Pembelajaran, 4(2).

Zhang, X. (2023). Switching to metaverse? Perspectives from push–pull–mooring model. Journal of Computers in Education. https://doi.org/10.1007/s40692-023-00301-y

Zhu, Y., Zhang, J. H., Au, W., & Yates, G. (2020). University students' online learning attitudes and continuous intention to undertake online courses: a self-regulated learning perspective. Educational Technology Research and Development, 68(3).