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COGNITIVE ASSESSMENT: INTEGRATED GEOGRAPHY AND SIRAH ELEMENTS THROUGH GEOSIRAH LEARNING TOOL

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Abstract:

Sirah provides a significant history and chronology of a specific narrative, which requires accurate comprehension and retention through the study of details such as dates, locations, and events. However, most students expressed an apathetic disposition and were prone to boredom when required to comprehend Sirah history through extended reading. The purpose of this study is to determine the understanding level of secondary school students in the Sirah subject, which incorporates geography elements through a GeoSirah learning tool version 2. By employing a quantitative method, a questionnaire form was distributed among 31 respondents from Sekolah Menengah Agama Nurul Islam, Kedah, and the cognitive improvement (knowledge (C1) and comprehension (C2) was assessed through the implementation of the pre-test and post-test methods. The data was analysed using descriptive analysis and a paired-sample t-test approach using SPSS software. The pre-test and post-test

International Journal of Modern Education
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results demonstrated a positive impact, with a significant increase in the mean rate of 23.44%. This study concludes that the integration of geographical elements into Sirah learning through GeoSirah aid improves students' cognitive knowledge and comprehension of Sirah subjects, thereby enhancing their interest and enjoyment in the subject matter.

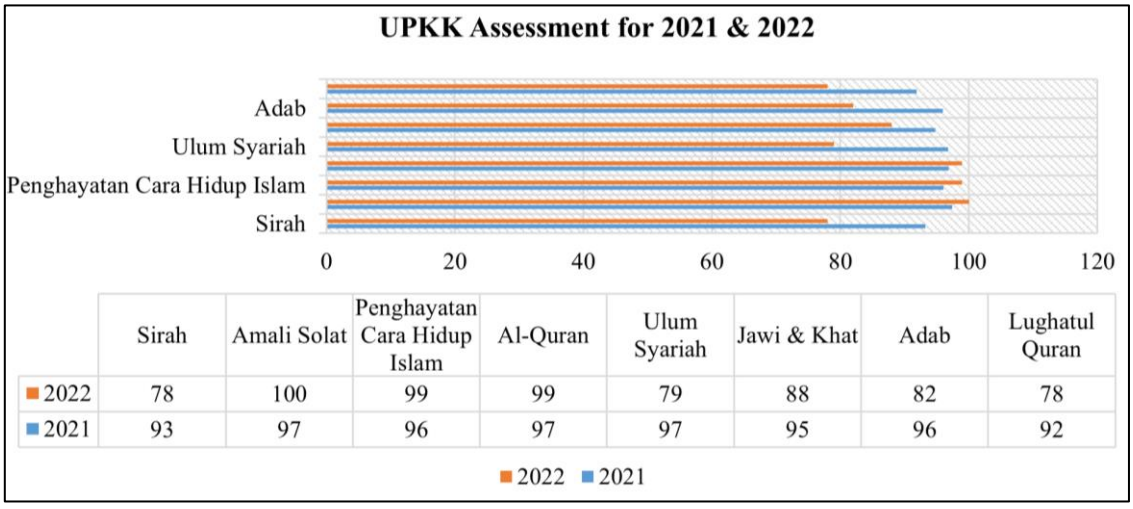
Keywords:

Blooms Taxonomy, Geography, Learning Tool, Secondary School, Sirah

Introduction

Islamic education, especially in Sirah subjects, is tedious and lacking in interest, as well as motivation for students to engage with subject matter that requires extensive reading (Kamarazaman et al., 2021). Furthermore, teaching methods prioritise teacher-centred approaches, focusing only on the development of memorization abilities and the ability to answer exam question (Che Ibrahim et al., 2021; Mohd Nawi, 2020; Norzaharah Yahaya, 2011). Furthermore, students also encounter challenges in remembering significant dates, names, and events from historical occurrences (Kamarazaman et al., 2021; Mohd Sharif et al., 2017). Therefore, the multimedia approach is applied to facilitate the learning process and maintain a significant degree of expertise in the domains of knowledge, culture, and global communication (Mohd Nawi, 2020). Furthermore, it is crucial to integrate multimedia elements with geography elements, which include shapes, locations, pathways, and relationships, to enhance students' comprehension of spatial information (Newcombe & Shipley, 2015). By embedding the geography elements, students can explore and comprehend the world's physical and cultural dimensions, which leads to an improvement in their cognitive thinking abilities.

Figure 1 shows an assessment of Ujian Penilaian Kelas Kafa (UPKK) for 2021 and 2022, and it found that the Sirah subject has decreased drastically from 93.21% to 78%. It is due to the weak understanding of Sirah subjects among students as compared to other subjects (Berita Harian Online, 2023; Harian Metro, 2021). Therefore, digital learning in Islamic subjects should be taken into serious consideration to encourage students' spatial thinking abilities and increase their interest in learning geography and Sirah subjects together.



	Sirah	Amali Solat	Penghayatan Cara Hidup Islam	Al-Quran	Ulum Syariah	Jawi & Khat	Adab	Lughatul Quran
2022	78	100	99	99	79	88	82	78
2021	93	97	96	97	97	95	96	92

Figure 1: UPKK Assessment for 2021 and 2022

Source: (Berita Harian Online, 2023; Harian Metro, 2021)

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Several studies focused on geography subjects, incorporating a Geographical Information System (GIS) with a multimedia approach to assess and evaluate cognitive skills for knowledge improvement (Mokhtar et al., 2021; Ridha et al., 2019). The adaptation of spatial elements in school subjects and digital skills during learning activities has been explored in previous studies (Abdullah & Razak, 2021; Kamarazaman et al., 2021; Landicho, 2020). To increase interest in the classroom, a multimedia approach and a mobile android version are applied to enhance the delivery of Sirah subject matter via an innovative learning approach (Mohd Rum et al., 2022). Therefore, the incorporation of several disciplines and creative instructional approaches is crucial in fostering students with a comprehensive skill set in the always changing field of education (Naz & Murad, 2017).

However, only a few studies have explored the learning approach of incorporating spatial elements using GIS and multimedia platforms into Sirah subjects for cognitive skill improvement. This study aims to determine secondary school students' comprehension level of the Sirah subject, which incorporates geography elements through a GeoSirah learning tool. The GeoSirah learning tool's contribution is that it can assist students in their learning process. The presence of GIS and multimedia platforms in Sirah can enhance students' comprehension and enjoyment, while also fostering their imagination and cultural understanding.

Literature Review

Learning Approaches for Islamic Education, Sirah Subject

Table 1 shows numerous studies have embedded the digital skill to encourage students' interest in the learning process, especially in the classroom environment (Abdullah & Razak, 2021; Kamarazaman et al., 2021). Kamarazaman et al. (2021) investigated students' attitudes towards incorporating game-based learning into the Sirah subject, and the findings demonstrated that using the game method facilitated better retention of information, enhanced comprehension of the subject matter, enhanced student concentration, increased motivation, and sparked greater interest among students. Furthermore, the level of enthusiasm and satisfaction among primary school students for the adaptation of the gamification approach to Islamic history learning is improving and attracting student interest (Abdullah & Razak, 2021). Research has proven that mobile learning provides a unique approach to learning the Sirah subject and related disciplines, which most students find uninteresting and tedious (Kamarazaman et al., 2021). The results showed that students have a strong preference for using games as a means of learning and can acquire knowledge in the subject of Sirah more effectively.

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Table 1: Summary of Recent Implementation for Improving Sirah Learning

Author	Paper Title	Method	Finding
Mohd Sharif et al. (2017)	The Teaching and Learning of Sirah Using the Game Method Among Gifted Students	This study used a survey method with questionnaires among 79 gifted students at Kolej PERMATA pintar, Universiti Kebangsaan Malaysia covers student demographics, perceptions, and acceptance of the Sirah game method.	Employing the game technique for teaching and learning Sirah facilitated students' retention of factual information, enhanced comprehension of the studied Sirah topics, heightened students' concentration, boosted their motivation, and piqued their curiosity.
Mohd Rum et al. (2022)	Sirah Learning Mobile Application for Kafa Primary School Students: A Preliminary Study	An android-based mobile application was created using the ADDIE concept. The systems performance was evaluated using two types of testing: functionality and usability.	The study met its objectives as, evidenced by the functional testing results. Additionally, the usability testing demonstrated a satisfactory score of 77.81% through the use of SUS calculation.
Kamarazaman et al. (2021)	Mobile Educational Games for Learning Sirah Nabi: Development and Usability Evaluation	The ADDIE approach was used to assist in instructional design and development for the Sirah mobile applications, along with the evaluation process including game usability, mobility, learning content, playability, satisfaction, and efficiency.	The study indicated that students are enthusiastic about using games to improve their understanding of Sirah and find it an engaging way to learn.
Amirah Syafiqah & Khadijah (2022)	Penggunaan "Augmented Reality" di Dalam Pengajaran Sirah	Pre- and post-tests were distributed to 29 Year Two students as a control group and 30 students as a treatment group to determine achievement differences between the two groups.	The use of aaugmented reality can have a positive effect and increase students' cognitive interest. Students agree that employing augmented reality can help them remember the history of Prophet Muhammad SAW more accurate.

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Adaptation of Geography Elements to Sirah Learning

Interdisciplinary learning is recognised as a powerful educational approach that extends beyond traditional subject areas, fostering students to connect diverse fields of knowledge (Harvie, 2022). The inclusion of geography components in the learning process can improve comprehension, knowledge, and abilities by leveraging visual aids and imaginative thinking (Mahat et al., 2020). According to Landicho (2020), the Google Maps platform is capable of serving as an educational tool that can enhance students' engagement, deepen their comprehension of academic subjects, and enhance their critical-thinking abilities. Utilising animated maps for data visualisation can boost comprehension of the spatial element, enabling learners to effectively employ spatial thinking in problem-solving scenarios (Kinoti & Muchai, 2016; Xiang & Liu, 2017). Hence, employing a multimedia-based teaching and learning approach in the Sirah subject, which incorporates geographical elements to visually depict historical events' locations through storytelling on a map, can be linked to the learning outcomes of advanced classroom practices (Mokhtar et al., 2023).

Assessment of Cognitive Level through GIS and Multimedia Approach

A study related to the integration of multiple subjects has been conducted by combining geography, science, and mathematics curriculums in the learning process to evaluate the cognitive outcomes using descriptive analysis, paired-samples t-tests, and pre- and post-tests methods (Oldakowski & Johnson, 2018). In evaluating the cognitive level, Kasilingam et al. (2014) and Berendsen et al. (2023) carried out the study to investigate the improvement of students' cognitive skills and self-discipline towards academic achievement using bloom's taxonomy. In addition, revised Bloom's taxonomy, Krathwohl (2002) has been introduced, which consists of six (6) cognitive levels based on observed behaviour, including knowledge, understanding, application, analysis, synthesis, and assessment. It is widely acknowledged as an assessment framework and is commonly utilised for creating learning objectives, evaluating curricula, analysing instruction, and constructing tests.

Data and Methodology

Data Preparation

The GeoSirah instructional tool was created using the ArcGIS storymap feature. In order to foster a visualisation skill of the events that occurred during the Israk Mikraj and Hudaibiah Agreement, which occurred during the life of the prophet Muhammad S.W.T., two videos were presented that utilised spatial elements usually encountered in geography. ArcGIS Pro software produced an attractive map of Arab Saudi Arabia, depicting the entire country in a three-dimensional (3D) format. The insertion of the polygon geometry type into the application was accomplished by adapting the Google Earth features. The video provided an illustration of the prophet's movement during the two events through the distance between points. Subsequently, by utilising a quantitative method, a collection of eleven (11) questions was adopted, comprising three sections: Sirah, Geography, and Sirah with Geography. Bloom's taxonomy was utilised to categorise the question into two levels: knowledge (C1) and comprehension (C2) at the cognitive level, as depicted in Table 2.

International Journal of Modern Education
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Table 2: Cognitive Level Questions

Section	Cognitive level	Number of Question
Sirah	C1	3
	C2	1
Geography	C1	3
	C2	1
GeoSirah	C1	2
	C2	1

Methodology

Figure 2 shows the flowchart of methodology for achieving the goals of this study. About 31 respondents among secondary school students at Sekolah Menengah Agama Nurul Islam, Ayer Hitam, Kedah were involved in this research work. The group's composition consists of 17 students from lower secondary schools and 14 students from upper secondary schools, with 20 females and 11 males. The adopted questionnaire was distributed to the secondary school students to execute the pre-test and post-test to assess students' achievement for evaluating their cognitive ability to comprehend the Sirah subject via the GeoSirah learning tool. In addition to the paired-sample t-test, descriptive analysis methods (frequency, percentage, mean, and standard deviation (sd)) (Alabsi, 2020) were employed to examine the results of the pre- and post-tests (Oldakowski & Johnson, 2018).

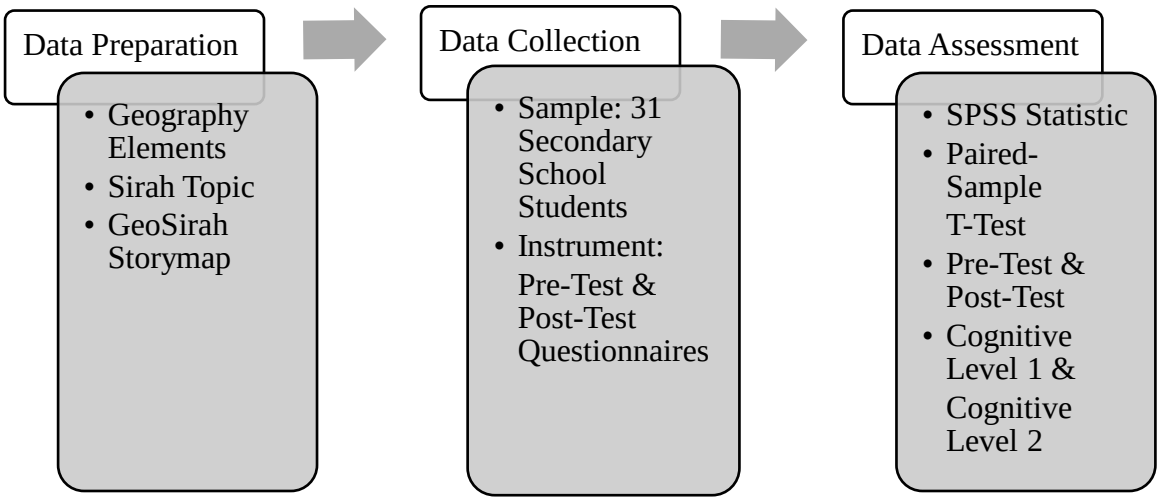

Figure 2: Flowchart of Methodology

To evaluate the effectiveness of the GeoSirah learning tool, the interface of the GeoSirah storymap (Figure 3) was used. The application provides multiple tabs, including home, biography of Prophet Muhammad SAW, storytelling video, games, state of Saudi Arabia, how to use, and story credit. The introduction tab provides a comprehensive overview of the GeoSirah storymap. Several elements such as multimedia components and geographical aspects has been employed in the storyboard animation design and application development. When creating the story map, geography, multimedia, and other elements were used to create the narrative of each Sirah topic.

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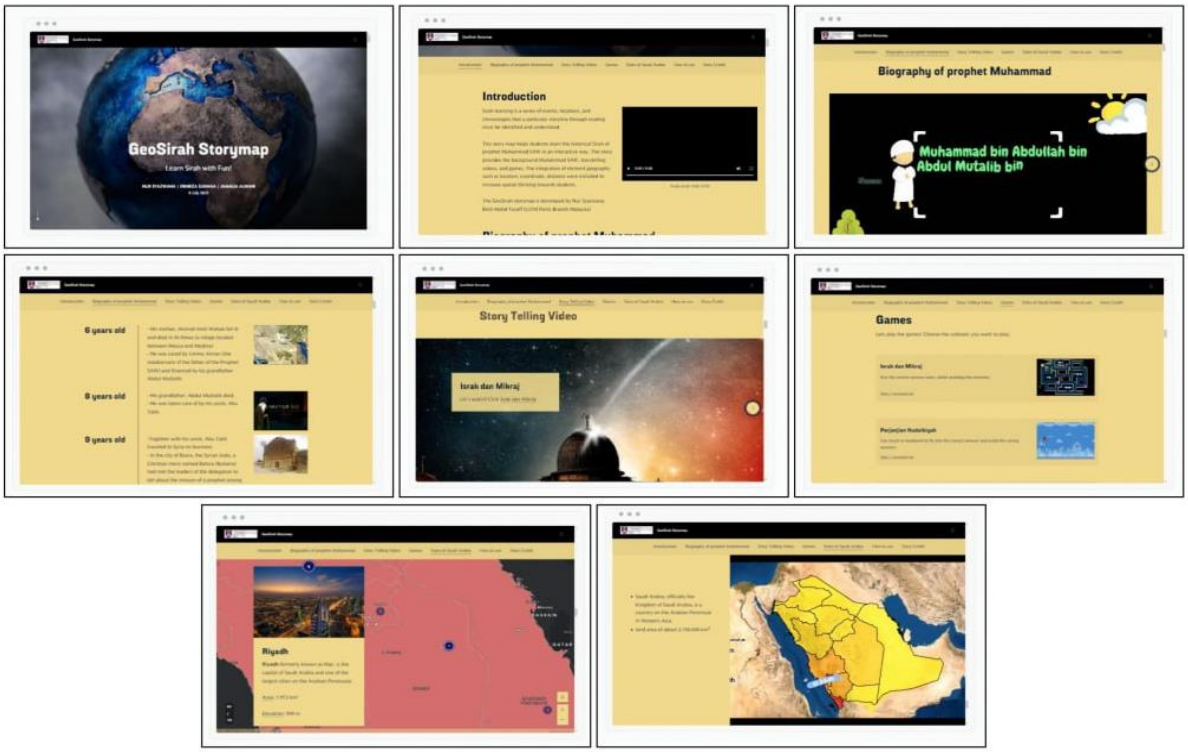

Figure 3: GeoSirah Interface

The questionnaire has been distributed to the students before introducing of the prototype. The students have been given the instruction about time duration and how the session is implemented. Each of the respondent took about 5-8 minutes to answer all the questions. From the result, the analysis was calculated using descriptive analysis and paired-sample t-test approach through the Statistical Package for the Social Sciences (SPSS) software.

In order to manage the data collection, there were several challenges that have been faced. The participants were typically causing the challenges where the opinions of participants were not adequate, their motivation were low, and they were unwilling to participate in the research. Moreover, the research's subject matter may not be in accordance with the interests of the respondents. Respondents may be reluctant to share their opinions or engage in discussions regarding subjects that do not pique their interest.

Result and Discussion

Tables 3 and 4 present the statistical data for paired samples, including correlation and findings of the paired sample test for Pre-Test (PreT), Post-test (PosT), respectively. The data indicates that the pre-test yielded a correct response rate of 34.62%, however the post-test showed a higher rate of 58.06%. The overall response rate for the right answer on the pre-test and post-test shown a 23.44% rise. The pre-test showed that the mean score was 5.19 (sd = 2.69). The mean score of the post-test question was 8.71 (sd = 2.30). The mean score for the difference between post-test and pre-test (PosT - PreT) was 3.52.

The study revealed a 95% confidence interval of 3.52, indicating that the student's score (PosT - PreT) falls within the significant range of 2.51 to 4.53. This range is considered acceptable according to Alabsi (2020). Furthermore, this study discovered that the p-value is below 0.05

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($p = 0.001 < 0.05$), indicating that the utilisation of the GeoSirah storymap in the Sirah subject as an educational tool among secondary school students significantly improves the cognitive level of students' spatial thinking. Maneejuk & Yamaka (2021) stated that a p-value less than 0.05 ($p < 0.05$) indicates a significant finding, leading to the rejection of the null hypothesis.

The correlation coefficient between the post-test and pre-test was found as 0.40, which indicates a low positive correlation (Mukaka, 2012). The same value found in study by Balan et al. (2019), which the significant correlation coefficient in between 0.24 - 0.40 with p-value < 0.05. Thus, although the correlation of this study is only 40%, the p-value associated with this correlation was statistically significant. The pre-test and post-test results for this study increased the number of students who answered the questions correctly about the geography and Sirah subject. It also demonstrated how the course had positively improved the way in which students were learning.

Table 3: Paired Sample Statistics and Correlation

	Mean	N	Std. Deviation	Std. Error Mean	Correlation (R)
Post-Test	8.7097	31	2.29773	0.41268	0.398
Pre-Test	5.1935	31	2.68849	0.48287	

Note: Pre- Test (PreT), Post-test (PosT)

Table 4: Paired Sample Test of Pre-Test and Post-Test

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
PosT - PreT	3.51613	2.75525	0.49486	2.50550	4.52676	7.105	30	<0.001

Note: Pre- Test (PreT), Post-test (PosT)

Table 5 shows the paired-sample t-test for cognitive level result. For the C1 assessment, it is found that the mean score (PosT - PreT) was 2.03 (sd = 2.23). Furthermore, for cognitive level: C2, the mean score (PosT - PreT) was 1.10 (sd = 2.01). The 95% confidence interval for mean score (PosT - PreT) for the C1 assessment is in range 1.21 - 2.85 while for C2 was 0.36-1.83. The mean score (PosT - PreT) for C1 assessment was 2.03 while test (post – pre) for C2 was 1.10. These results indicate significant impact variations of the student's score between pre- and post-tests, where the scores are level passed since the values lied within lower and upper bound (Alabsi, 2020). For the mean score (PosT - PreT), a probability value (p-value) for C1 and C2 was acceptable level 0.05 (0.001 < 0.05) and 0.05 (0.005 < 0.05), respectively. The results show the significant impacts with the use of GeoSirah storymap as a learning tool in Sirah subject among secondary school students. Moreover, correlation coefficient between C1 post-test and pre-test was 0.13, which indicates a low correlation, but the p-value statistically significant (Balan et al., 2019; Mukaka, 2012). Meanwhile, correlation coefficient between C2 post-test and pre-test was 0.57, where it indicates a moderate correlation since the value is within 0.5- 0.7 (Mukaka, 2012). In conclusion, the findings of the C1 and C2 tests indicated that students' knowledge about the Sirah by adapting the spatial elements of the geography increases. It also demonstrated how the course had positively improved the way in which students were learning.

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IJMOE
Volume 6 Issue 21 (June 2024) PP. 577-587
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Table 5: Paired Sample Test of Cognitive Level Result

	Mean	Std. Deviation	Std. Error Mean	Correlation	95% Confidence Interval		t	Sig. (2-tailed)
					Lower	Upper		
PosT - PreT (C1)	2.03	2.23	0.40	0.13	1.21	2.85	5.08	<0.001
PosT - PreT (C2)	1.10	2.01	0.36	0.57	0.36	1.83	3.04	0.005

Note: Pre- Test (PreT), Post-test (PosT)

Conclusion

This study was focused on cognitive level assessment in Sirah subject through the integration of geography and multimedia elements using GeoSirah learning tool. The first finding indicates that the mean score between pre-test and post-test was significantly increases at 3.52. The correlation coefficient between the post-test and pre-test for the all questions indicates a low positive correlation 40% with p-value ($0.001 < 0.05$). The second finding reveal that the mean score for C1 and C2 (between post-test and pre-test) was significantly rises at 2.03 and 1.10, respectively. The correlation coefficient for C1 and C2 (between post-test and pre-test) indicates a low correlation at 13% and moderate correlation at 57% with p-value ($0.001<0.05$) and ($0.005<0.05$), respectively. In this paper, the primary objective of determining the understanding level of secondary school students in Sirah subject was completely achieved, which incorporates geography elements through a GeoSirah learning tool. The inclusion of technology and multimedia in GeoSirah learning tool is expected to provide a significant contribution in assisting students during learning activities in Sirah subject to improve students' comprehension and interest in Sirah lessons. In conclusion, GeoSirah learning tool enables students to comprehend the key events in the Sirah subject through the integration of geography elements as well as improving their cognitive level in order to provide a novel efficient learning approach.

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