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Geosirah Storymap: Fusing Geographic Spatial Elements with Sirah for An Innovative Digital Learning Experience in Primary Schools

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ABSTRACT

The study of Sirah (Islamic history) needs the precise memorisation of the orders of events, dates and places. However, traditional reading-based learning generally leads to low student interest and retention. Therefore, the GeoSirah Storymap was created by integrating geographical factors into video- and game-based learning environments with the ADDIE (Analysis, Design, Development, Implementation, Evaluation) paradigm. Based on the Technology Acceptability Model (TAM), a User Acceptability Test (UAT) was conducted to measure the student acceptability and impact. The results showed high acceptability levels with the highest mean scores for Attitude (mean=4.69) and Intention to Use (mean=4.67) and strong scores for Perceived Ease of Use (mean=4.52) and Perceived Usefulness (mean=4.34). These results demonstrate that the incorporation of multimedia elements, such as interactive spatial maps, visuals and narrative animations, greatly boosts student.

1. Introduction

The Malaysia Education Blueprint 2013–2025 highlights system-wide structural improvement to enhance the quality of the education system [4]. In addition, it is also aligned with the Sustainable Development Goal (SDG 4) to ensure all children have access to high-quality education and promote opportunities for lifelong learning for all. Thus, digital transformation provides a significant avenue to foster inclusive classrooms and improve involvement in Islamic education. However, traditional pedagogical methods toward teaching the Sirah are largely lecture-based, makes students passively memorise important dates, names, locations, and events from the past. Additionally, teachers consider it challenging to address the various requirements of all students in the classroom [14]. This absence of context makes it difficult for students to engage in critical thinking and decreases their interest [3,11,16]. Hence, Islamic education necessarily incorporates the new multimedia methods, which become an imperative to revamp the Islamic pedagogical practices at all education levels [1].

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The spatial elements in geography, such as locations, regions, environment and society, act as a structured framework for understanding data and the historical contextualisation [6]. The spatial components can be visualised to improve data analysis skills. The use of visual learning aids by the teachers instead of text-based information alone, combined with multimedia and Sirah subject matter, would be an advantage to enhance student understanding. This is because the narrative-based learning requires time for students to assimilate the main points of the story that they are reading [5]. Therefore, the integration of visual aids such as graphics, audio recordings, pictures, models, charts, maps, videos, presentations, and real images can significantly improve their understanding and clarify historical narratives [12,20]. Furthermore, the mapping tools in lessons on Sirah help students understand and clearly visualise the locations and events in Islamic history. Therefore, multimedia fosters a technology-based constructivist learning environment that encourages self-exploration, collaboration, and active engagement in problem-solving [15]. In addition, the adoption of educational games in teaching and learning as a supplement to traditional methods enhances learners' experiences while improving skills such as rule-following, problem-solving, interaction, critical thinking, creativity, teamwork, and team spirit [9,18].

The integration of data visualisation skills in the Sirah curriculum is vital for improving students' understanding of the life, teachings, and historical context of Prophet Muhammad and early Islam. Mapping historical events and employing spatial features will assist students in fostering visual narratives through infographics or storyboards to illustrate occurrences in the Sirah. Consequently, the problem of student disinterest in Islamic subject matter can be reduced by implementing a digital approach via visualisation techniques. This study highlights the application of modern technology, rendering the GeoSirah Storymap a learning tool used in the Sirah subject. The integration of geography to enhance comprehension of Islamic topics is intended to encourage a generation that thoroughly values Islamic history. This strategy is likely to engage and excite primary school students, enhancing their enthusiasm for studying the Sirah subject.

2. Methodology

The ADDIE instructional design model was employed to develop a multimedia prototype to support the teaching and learning of Sirah in Islamic education. The project methodology was divided into five main phases: i) analysis, ii) design, iii) development, iv) implementation, and v) evaluation, which systematically guided the development of the GeoSirah Storymap. A non-probability voluntary-response sampling approach was employed to recruit participants for the evaluation of the GeoSirah Storymap prototype. The questionnaire was distributed online through Google Forms to reach potential respondents, including students, parents, and teachers. A total of 48 respondents participated in the application evaluation, including seventeen (17) students (35.4%), eighteen (18) parents (37.5%), and thirteen (13) teachers (27.08%).

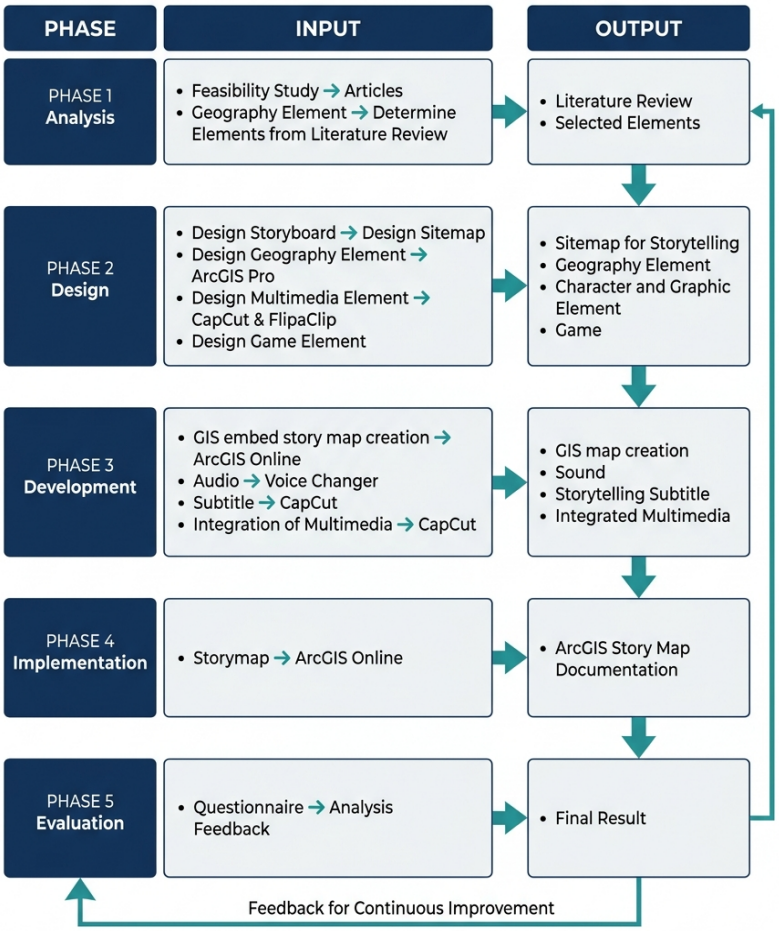


Fig. 1. Detailed methodology

2.1 Phase 1: Analysis

The first phase involves a feasibility study of the research. The topic of Sirah content in the provided textbook was determined to identify the appropriate content for developing the storyboard. In addition, this phase involved the determination of geographical elements from the literature review. All the parameters, such as distance, direction, coordinates, location, and others, were chosen based on review articles, and the software used was Google Earth and ArcGIS Pro. All these elements are embedded in the GeoSirah Storymap learning tool.

2.2 Phase 2: Design

The design phase develops the interfaces for the sitemap, storyboard, geographic elements, multimedia elements, and game learning. ArcGIS Pro, ArcGIS Online, FlipaClip, Eclipse Crossword, and CapCut were used during this phase. All selected geographic elements (distance, coordinates, routes, and directions of the locations) were integrated into the GeoSirah Storymap, which was converted into graphics, text, and videos for content development. The spatial elements are highlighted in each piece of content. Figure 2 illustrates the storymap interface, highlighting the prioritised, linked, and labelled pages in the sitemap. The interface includes the primary navigation and a subpage that links to each section. The GeoSirah Storymap development consists of several parts: home, biography of Prophet Muhammad, storytelling video, games, and state of Saudi Arabia.

2.3 Phase 3: Development

The main section is the storytelling video, which includes the Sirah narrative along with elements such as geography, multimedia, and storytelling techniques. To optimise the storymap content, a storyboard is essential to ensure that all necessary values are integrated between the Sirah and geography components of the prototype application. The storyboard was developed using various aspects, including Sirah, geography, multimedia, and storytelling, to present the Sirah in a visually appealing and easy-to-understand manner. Additionally, sounds, images, characters, and animations are used to create the scenes, enhancing comprehension and imagination through clear visual representation. Sirah storytelling was also provided with captions in each of the videos to increase student engagement with video content and their understanding of the language [21].

2.4 Phase 4: Implementation

In this phase, the map of Saudi Arabia was created using ArcGIS Online and adjusted by zooming in and out. The geometry type of the Saudi Arabia map is in polygon format, using the global datum of the World Geodetic System 1984 (WGS84), and it was retrieved from the website https://public.opendatasoft.com/ at no cost. The classification tool is used to classify the Arab Saudi map into several provinces for more intriguing information in digital form, which includes pictorial elements and location information, such as area and elevation. The web map utilises the dark human geography as its background to accentuate the state of Saudi Arabia, providing a comprehensive vector basemap in a dark monochromatic style.

2.5 Phase 5: Evaluation

Users evaluate the storymap during the evaluation step of the ADDIE technique [7]. The Technology Acceptance Model (TAM) was applied to determine the acceptance rate of the GeoSirah Storymap application via distributed questionnaires through Google Forms to ensure its functionality for users. The use of established TAM constructs provided the theoretical basis for the questionnaire. Internal consistency was subsequently assessed using Cronbach's alpha in SPSS. We computed statistical values such as standard deviation, minimum and maximum values, and mean value to assess the application's performance. Using a five-point Likert scale [13], the questionnaire had four (4) different parts: perceived ease of use (PEU), perceived usefulness (PU), attitude towards use (ATT), and intention to use (BI) [2]. This survey employed a closed-ended question, allowing the respondent to choose only one possible answer. One (1) indicates strong disagreement, two (2) indicates disagreement, three (3) indicates neutrality, four (4) indicates agreement, and five (5) indicates strong agreement. This phase plays a crucial role in assessing each stage, ensuring that the ADDIE instructional design achieves and fulfils its objectives.

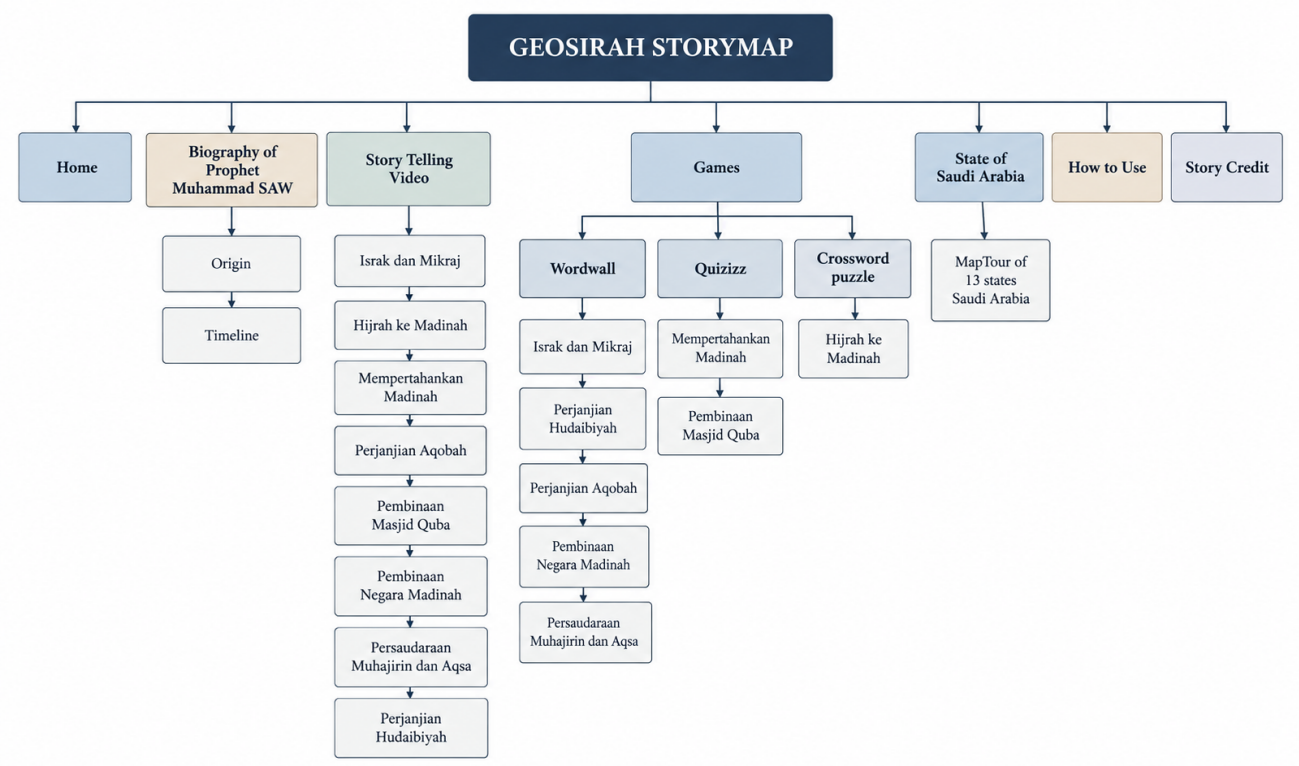


Fig. 2. Sitemap of the GeoSirah application

The internal consistency of the questionnaire was assessed using Cronbach's alpha in SPSS. Based on Table 1, the reliability coefficients were 0.839 for Perceived Usefulness (PU), 0.624 for Perceived Ease of Use (PEU), 0.820 for Attitude Towards Use (ATT), and 0.851 for Behavioural Intention to Use (BI). Based on the guidelines proposed by George and Mallery [23], PU, ATT, and BI demonstrated satisfactory internal consistency, whereas PEU showed comparatively lower internal consistency and fell within the questionable range ($\alpha = 0.624$). Therefore, findings related to the PEU construct should be interpreted with appropriate caution.

Table 1
Reliability analysis of the TAM constructs

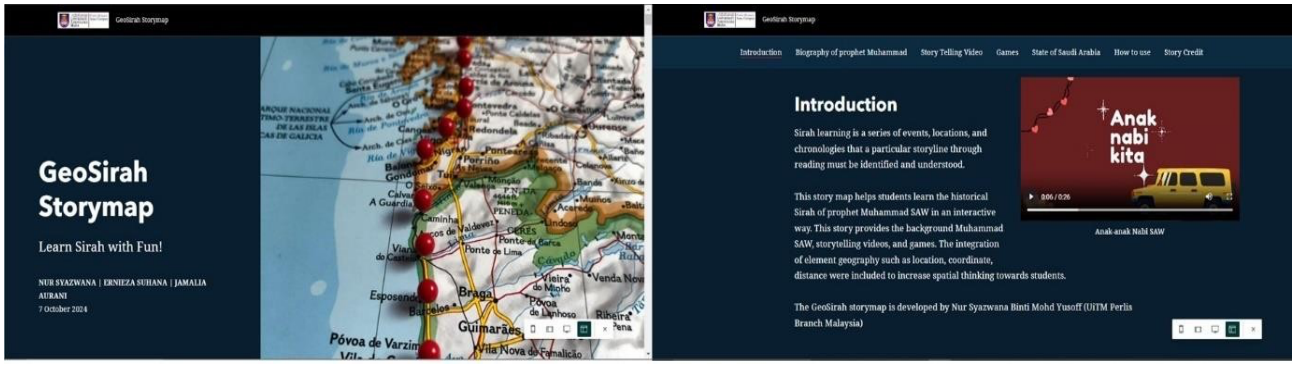
TAM Construct	Cronbach's Alpha (α)	Interpretation
Perceived Usefulness (PU)	0.839	Good
Perceived Ease of Use (PEU)	0.624	Questionable
Attitude Towards Use (ATT)	0.820	Good
Behavioural Intention to Use (BI)	0.851	Good

3. Results and Analysis

3.1 GeoSirah Storymap Animation

Figure 3 shows the interface for the GeoSirah Storymap. The Introduction tab provides an overview of the GeoSirah Storymap. The initial data analysis identified several features, including multimedia elements and geographic components, as necessary for constructing the storyboard animation video. The storymap integrates multimedia and geography elements to tell each Sirah topic's storyline, which consists of several tabs, including home, the biography of Prophet Muhammad (SAW), a storytelling video, games, provinces, and the state of Saudi Arabia. About five (5) spatial elements, such as distance, area, coordinates, location, and direction [8,17], were embedded in the GeoSirah Storymap through the provided video storytelling. The distance between

the points can be measured on the map by selecting any two points. For instance, the storyline video measured the distance from Mekah to Masjid Al-Aqsa to illustrate the journey of the Israk. Additionally, you can access the region of Saudi Arabia in this story map by clicking on the desired region, while the story map video displays the coordinates of Saudi Arabia.



(a) (b)

Fig. 3. Interface of GeoSirah Storymap (a) Front page of GeoSirah (b) Application tab for GeoSirah

Figure 4 illustrates several moments from Israk Mikraj, seamlessly combining the important features. About five (5) spatial elements, such as distance, area, coordinates, location, and direction [8, 17], were embedded in the GeoSirah Storymap through the provided video about the Israk Mikraj story. The distance between the points can be measured on the map by selecting any two points. The distance in the Sirah narrative helps to set the story in a physical context, allowing students and viewers to better understand the enormity and scope of the Sirah journey. In the instance of Israk Mikraj, the distance from Mekah to Masjid Al-Aqsa can be plotted on a map, emphasising the miraculous aspect of the journey, which was completed in a relatively short time. It provides the students with a spatial frame, enabling them to visualise and determine the real-world repercussions of the narrative. Additionally, students can access the specific area of Saudi Arabia in this storymap by clicking on their desired region. Besides, the storymap video displays the coordinates of Saudi Arabia. Supplying precise physical coordinates for notable locations improves the reliability and tangible connection to historical events. Students can observe the precise positions of Mecca, Masjid Al-Aqsa, and other significant regions. Coordinates associate the narrative with distinct, identifiable locations in the current world, providing historical accounts such as Israk Mikraj with a concrete link to modern geography. Moreover, the storytelling video illustrates the location and direction of a significant event using an image and a geographic element that includes the coordinates of the place. Location-based storytelling enhances narrative content by depicting the exact locations of the Sirah events. In the context of Israk Mikraj, students can identify significant places such as Mecca and Al-Aqsa Mosque. Incorporating visual locations enables students to more clearly follow the flow of events, enhancing their comprehension of the story's spatial movement. Moreover, the video illustrates Israk Mikraj's journey from the beginning, showing various directions (Figure 4). Thus, the aim is to enhance students' comprehension of the narrative progression in the Sirah subject through data visualisation of the location of each event.



Fig. 4. Integration of spatial elements and Israk Mikraj storytelling

3.2 User Acceptance of GeoSirah Prototype Implementation

The sample comprised seventeen (17) respondents who were students (35.42%), eighteen (18) who were parents (37.5%), and thirteen (13) who were teachers (27.08%). Table 2 indicates that 41.2% of the students chose a website as their preferred learning platform, followed by an Android application (35.3%) and a textbook (17.6%), while only one (1) (5.9%) respondent chose a computer as the learning medium. The low preference for traditional textbooks among students suggests a waning interest in printed materials, potentially due to the rise of digital alternatives that provide more interactive and updated content. A noteworthy 41.2% of students use websites as their main source of educational material. This preference demonstrates how much students respect online resources because they offer a plethora of information, interactive tools, and easy access to a wide range of materials. In addition, most of the students, about 82.35%, frequently use a website platform as a multimedia tool for learning. This outcome serves as a positive indicator for the application's continued operation in the future.

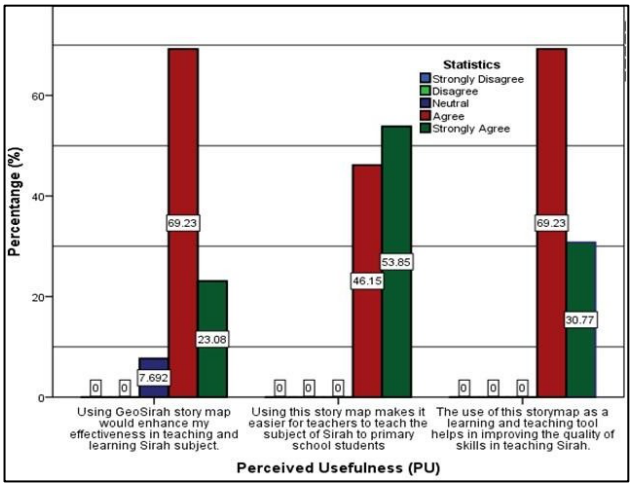
Table 2
Preferred choice of learning platform for students

Description	Frequency	Valid Percentage	Cumulative Percent
Textbook	3	17.6	17.6
Computer	1	5.9	23.5
Android application smartphone	6	35.3	58.8
Website	7	41.2	100.0
Total	17	100.0	

According to Figure 5a, the respondents strongly agree (23.08%), agree (69.23%), and are neutral (7.692%) that the GeoSirah Storymap application can enhance the learning of the Sirah subject. Furthermore, by implementing the GeoSirah Storymap, the respondents strongly agree (53.85%) and agree (46.15%) that this storymap makes it easier for teachers to teach the subject of Sirah, especially to primary school students. Moreover, the respondents strongly agree (30.77%) and agree (69.23%) that using this storymap as a learning and teaching tool helps improve the quality of skills in teaching Sirah. Based on all questions, none of the respondents indicated that they disagreed or strongly disagreed with any of them. This section focused only on the views of teachers, with a total of 13 respondents. The analysis yielded a mean statistic of 4.15 and a standard deviation of 0.555 for this

question based on the responses received. Thus, the GeoSirah Storymap received positive feedback from the teachers to enhance students' learning in the Sirah subject.

Figure 5b displays the percentage of perceived ease of use (PEU) with strongly agree (60.42%), agree (31.25%), and neutral (8.33%), indicating that the integration of geographical elements in the Sirah subject has a positive impact on students' understanding. Furthermore, respondents indicated that 62.50% strongly agree, 27.08% agree, and 10.42% are neutral regarding the user-friendliness of the GeoSirah Storymap. Based on both questions, none of the respondents indicated that they disagreed or strongly disagreed with the question. Therefore, this part is suitable for assessing how easy it was for the respondents to use this application based on their perceptions. This section focuses on all respondents, with a total of 48. Figure 5c shows the percentage of users' attitudes toward using the GeoSirah narrative map. About 33 respondents (68.75%) strongly agreed with this statement, followed by 15 respondents (31.25%) who also agreed. All respondents indicated agreement with the question. Consequently, the mean and standard deviation for this question were 4.69 and 0.468, respectively.



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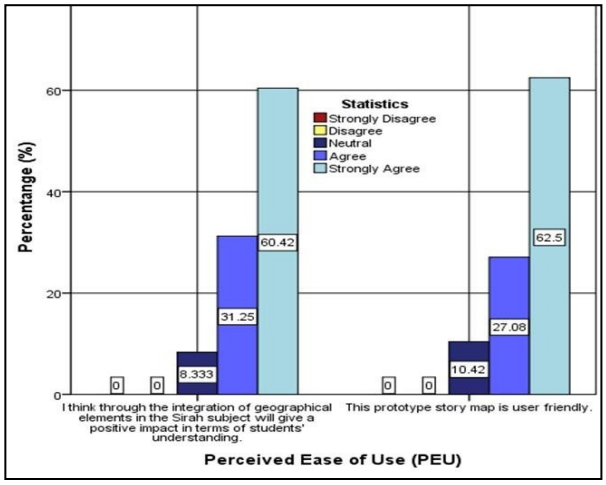

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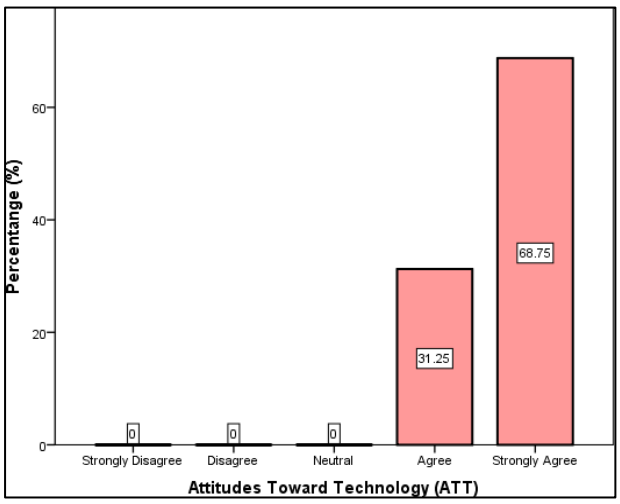
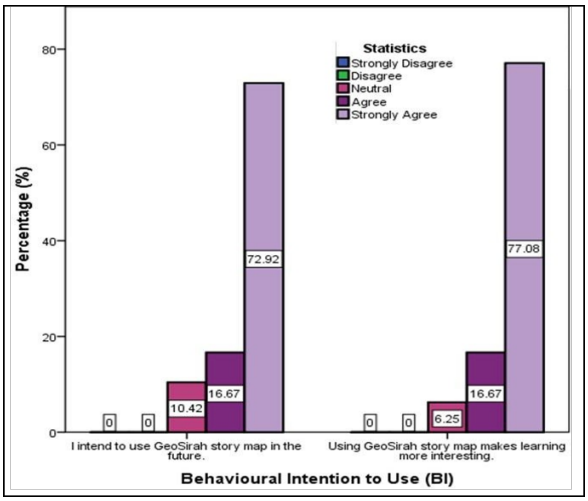


(c)



(d)

Fig. 5. Percentages of (a) Perceived Usefulness (PU), (b) Perceived Ease of Use (PEU), (c) Attitude Towards Use (ATT), and (d) Behavioural Intention to Use (BI)

Figure 5d provides an overview of Behavioural Intention to Use (BI) towards GeoSirah Storymap for Islamic education of primary school students. Perceived Ease of Use (PEU) indirectly influences BI as well [22]. The results show that 72.92%, 16.67%, and 10.42% of the respondents strongly agree, agree, and are neutral, respectively, that the GeoSirah Storymap will be beneficial for them in the future. Moreover, using a GeoSirah Storymap, the respondents strongly agree (77.08%), agree (16.67%), and are neutral (6.25%) that learning the Sirah subject is more interesting. Based on both questions, none of the respondents indicated that they disagreed or strongly disagreed with the question. The findings indicate that the GeoSirah Storymap can serve as a technology-enhanced learning tool for Sirah education. Overall, about 41 respondents (85.4%) strongly agreed, and five (5) respondents (10.4%) agreed that the story map was enjoyable. The storymap was also evaluated for user-friendliness. This demonstrates that modern technology can be effectively used as an educational tool.

Table 3 indicates favourable perceptions of the GeoSirah Storymap among the surveyed respondents. Attitude towards using the platform recorded a mean score of 4.69, followed by behavioral intention to use (4.67) and perceived ease of use (4.52). Perceived usefulness recorded a mean score of 4.34 among the 13 teachers who responded to the relevant items. These findings are comparable with the study by Kamarazaman *et al*., [11], which investigated the development and usability of mobile educational games for Sirah learning. Their study demonstrated the potential of digital game-based approaches to support Sirah learning. Similarly, the present study indicates favourable user perceptions towards the integration of digital technology into Sirah learning. However, GeoSirah differs by incorporating geographical visualisation and spatial elements into interactive story maps, multimedia content, and game-based learning activities.

The findings are also consistent with the broader literature on technology acceptance in digital learning environments. Al-Adwan *et al*., [2] employed an extended Technology Acceptance Model to investigate students' behavioral intentions towards metaverse-based learning platforms. Although the technology and target population differed from those of the present study, both studies highlight the relevance of users' perceptions and behavioral intentions in understanding the acceptance of technology-enhanced learning environments. The relatively high behavioral intention score obtained in the present study (mean = 4.67) suggests that respondents generally expressed a positive intention towards using GeoSirah as a digital learning resource.

Nevertheless, the findings should be interpreted cautiously. The study employed a non-probability voluntary-response sampling approach and involved a relatively small sample of students, parents, and teachers. Furthermore, the perceived usefulness results were obtained from teachers only. In terms of instrument reliability, PU (α = 0.839), ATT (α = 0.820), and BI (α = 0.851) demonstrated good internal consistency according to the guidelines proposed by George and Mallery [23]. However, PEU recorded a comparatively lower Cronbach's alpha (α = 0.624), which falls within the questionable range and should therefore be interpreted with caution [23]. Consequently, the findings provide preliminary evidence of user acceptance of the GeoSirah Storymap rather than conclusive evidence of its effectiveness in improving students' learning outcomes. Future studies should involve larger and more representative samples, further refine and validate the PEU items, and incorporate direct assessments of students' learning performance.

Table 3
TAM evaluation mean score for GeoSirah Storymap

TAM Construct	Mean Score	Interpretation
Attitude Towards Use (ATT)	4.69	Highly Positive
Behavioral Intention to Use (BI)	4.67	Highly Positive
Perceived Ease of Use (PEU)	4.52	Positive
Perceived Usefulness (PU)	4.34	Positive

4. Conclusions

In summary, the study's goal is to improve the learning platform of the GeoSirah Storymap and evaluate the acceptance received by students, parents, and teachers. Learning Sirah using multimedia technology integrated with geographical elements is necessary to improve a more captivating learning environment in Islamic education. The ADDIE model approach, which entails analysis, design, development of a prototype, implementation, and evaluation of the prototype, was used to complete the storymap's development. A descriptive survey was conducted to analyse the prototype, and the suggestions that were gathered helped to enhance it. The storymap was created by integrating a game, a map, and a storytelling video that includes geographical elements such as distance, location, direction, and area related to Saudi Arabia.

A user acceptance test was conducted to evaluate the GeoSirah Storymap for primary school students. The user acceptance test for the application was analysed using the technology acceptance model (TAM) as a theoretical framework. Perceived ease of use (PEU), perceived usefulness (PU), attitude towards use (ATT), and intention to use (BI) were the characteristics that were examined. Based on the findings, the total average mean for PEU, PU, ATT, and BI was 4.52, 4.34, 4.69, and 4.67, respectively. Consequently, the participants welcomed the GeoSirah Storymap, which included integrating geography components into the learning resources for the Sirah subject. Thus, by fostering an environment in which students may practise more easily and deepen their comprehension, the adoption of this approach may provide a potentially useful digital approach to support the teaching and learning of Sirah. When the plot is combined with geography-related aspects and the application is easily accessible, it might also be useful and effective in the development of new ways and strategies for learning Sirah. The geographical approach to Islamic education should therefore be introduced to pupils at a young age so that they can investigate, analyse, understand, and think creatively.

In conclusion, most respondents agreed with the prototype of the GeoSirah Storymap used as a learning tool for primary school students. With the presence of geography elements, Sirah subjects will be more engaging for students.

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