Journal of Engineering Research and Education
Volume 18, (Special Issue) 2026 [197-206]

Artificial Intelligence Tools in Arabic Learning Content Creation: Evaluating the Benefits and Overcoming the Challenges

Zainab S. Attarbashi[1,*], Oula Sakka[2], and Elin Eliana Abdul Rahim[2]

[1]Department of Computer Science, Kulliyyah of Information and Communication Technology, International Islamic University Malaysia, 51300 Gombak, Malaysia
[2] Department of Information Systems, Kulliyyah of Information and Communication Technology, International Islamic University Malaysia, 51300 Gombak, Malaysia

ABSTRACT

The integration of artificial intelligence (AI) into content creation offers transformative potential for education, particularly in streamlining the production of animated learning materials. While educational animation is highly effective for simplifying complex subjects, its traditional production is often resource intensive. This paper explores the application of AI tools in creating an animated video to explain Hadith terminology to school students. It documents the end-to-end production process, from AI-assisted script generation to voice synthesis, to evaluate the practical benefits and challenges. The findings reveal that while AI significantly accelerates production, its use for Arabic-language Islamic content presents significant hurdles. These include cultural and stereotypical biases in datasets, inaccurate Arabic linguistic processing, inappropriate visual representations, and flawed text-to-speech pronunciation. The study concludes that while AI is a powerful tool for efficiency, its effective use in this context requires careful oversight and underscores the urgent need for developing culturally and linguistically nuanced AI models designed to Arabic Islamic education.

Keywords: Educational animation, AI tools, Arabic text-to-speech, Arabic educational content.

1. INTRODUCTION

Education has evolved significantly with the integration of technology, offering new ways to make learning more engaging and effective. Traditional teaching methods, such as textbooks and lectures, are increasingly being supplemented with digital tools like videos, interactive apps, and animations[1]. Among these, educational animations have proven particularly useful for explaining complex topics in a simple and visually appealing way [2].

Several studies highlight the potential of animation as an effective educational tool. According to Mayer's Cognitive Theory of Multimedia Learning [2], animation can improve learning outcomes by presenting auditory and visual information simultaneously, aiding in knowledge retention and comprehension as shown in Figure 1. Animation's ability to simplify complex concepts and create dynamic visual narratives which may assists learners understanding.

In recent years, Artificial Intelligence (AI) tools have begun to play a major role in content creation [3]. AI can assist in writing scripts, generating voiceovers, and even creating animations, reducing the time and cost required for video production. This is especially valuable for Arabic educational content, where resources may be limited, and the demand for high-quality learning materials is growing.

*zainab_senan@iium.edu.my

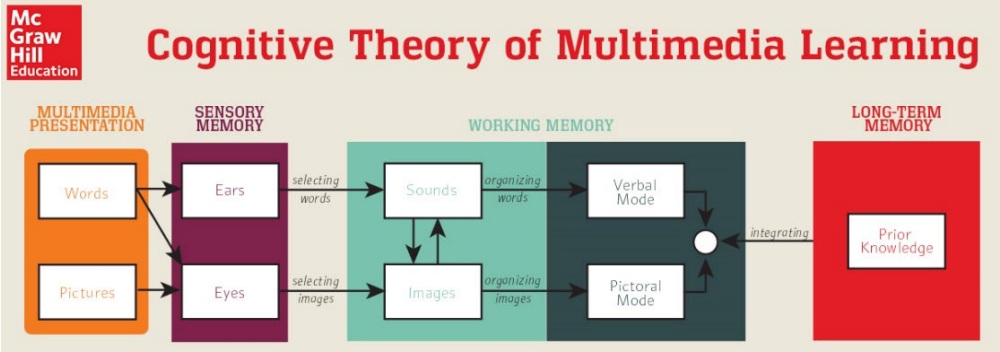


Figure 1. Mayer's Cognitive Theory of Multimedia Learning [2].

However, using AI for Arabic content specifically in specialized fields like Islamic education, comes with challenges. Many AI tools face challenges such as limited high-quality Arabic training data (leading to errors in classical Arabic or Islamic terminology), poor right-to-left script support in design software, and contextual misunderstandings of religious content (e.g., inappropriate visuals or misinterpreted Hadith). Other issues include robotic voice synthesis, lack of Arabic-friendly interfaces, and ethical concerns around data privacy and algorithmic transparency. These barriers highlight the need for culturally adapted AI solutions and human oversight to ensure accurate, engaging, and respectful educational content.

This paper explores the benefits and challenges of using AI tools to create Arabic educational animations, with a focus on a case study involving the production of a video on Hadith terminology. The study aims to answer the following questions:

1) How can AI tools improve the efficiency and accessibility of Arabic educational animation?

2) What are the main challenges when using AI for Arabic and Islamic educational content?

3) How can these challenges be addressed to produce accurate and culturally appropriate materials?

By examining these questions, this research contributes to the broader discussion on how AI can support education in the Arabic-speaking world while respecting its linguistic and cultural nuances.

2. LITERATURE REVIEW

Traditional educational approaches have historically emphasized direct instruction, textbook-based learning, and teacher-centered classrooms. These methods, while effective for knowledge transmission, often struggle to accommodate diverse learning styles and maintain student engagement [4]. The passive nature of traditional learning can be particularly challenging when teaching complex subjects that could benefit from visualization and interaction.

Whereas technology-enhanced learning methods use digital tools to create more dynamic and personalized educational experiences. Research in cognitive theory suggests that multimedia learning, when properly designed, can significantly improve knowledge retention and transfer [2]. Educational animations, as a subset of technology-enhanced learning, offer unique advantages by combining visual and auditory information channels to explain abstract concepts through storytelling and dynamic visualization[5]. One principle of the Theory of Multimedia Learning is the Modality Principle, which states that people learn better when they hear spoken

words instead of reading text on the screen. This approach is used in this project because people are more familiar with watching narrated animation rather than reading text-based animation.

The shift towards digital learning accelerated during the COVID-19 pandemic, demonstrating both the potential and limitations of various educational technologies [1]. While technology offers scalability and accessibility benefits, its effectiveness depends on careful pedagogical design and alignment with learning objectives. This difference between traditional and technology-enhanced methods forms an important context for examining AI's role in educational content creation.

The application of artificial intelligence in education has evolved rapidly in recent years, moving from theoretical potential to practical implementation. AI-powered tools now assist with content generation, adaptive learning systems, and automated assessment [6]. In content creation specifically, AI applications can be categorized into three main areas:

First, natural language processing (NLP) tools enable automated generation and refinement of educational texts. Systems like GPT-3 have demonstrated remarkable capabilities in producing coherent explanations and learning materials [7]. Second, computer vision and generative adversarial networks (GANs) facilitate the creation of visual content, from simple illustrations to complex animations [8]. Third, speech synthesis technologies have reached levels of naturalness that make them viable for educational narration [9].

Global adoption patterns reveal interesting trends. Western education systems have been early adopters, particularly in STEM fields where AI-generated visualizations can simplify complex phenomena. Asian markets have focused on AI's role in language learning and automated tutoring systems [10]. However, these applications frequently assume English-language contexts or roman-alphabet based languages, creating significant barriers for adoption in Arabic educational settings.

The application of AI to Arabic and Islamic education faces multiple layers of challenges that require careful examination. Linguistically, Arabic presents unique difficulties for NLP systems due to its diglossic nature [11], complex morphology [12], and right-to-left script orientation. While Modern Standard Arabic is used in formal education, the gap between it and regional dialects creates comprehension challenges that most AI systems cannot adequately address [13].

Cultural and religious considerations introduce additional complexity. Islamic educational content requires careful handling of sacred texts, proper representation of historical figures, and adherence to theological accuracy. Current AI systems often lack the contextual understanding needed to appropriately handle such sensitive material, sometimes producing outputs that are culturally inappropriate or theologically problematic.

Technical limitations compound these challenges. The relative scarcity of high-quality Arabic training datasets compared to English [14], combined with the underrepresentation of Arabic in major NLP models [15], creates a significant performance gap. Specific technical issues include:

- Morphological complexity leading to higher error rates in text generation and analysis.
- Poor handling of diacritics (*Tashkeel*) essential for proper pronunciation and meaning.
- Limited support for right-to-left text in design and animation tools.
- Inadequate cultural context in training data leading to inappropriate outputs

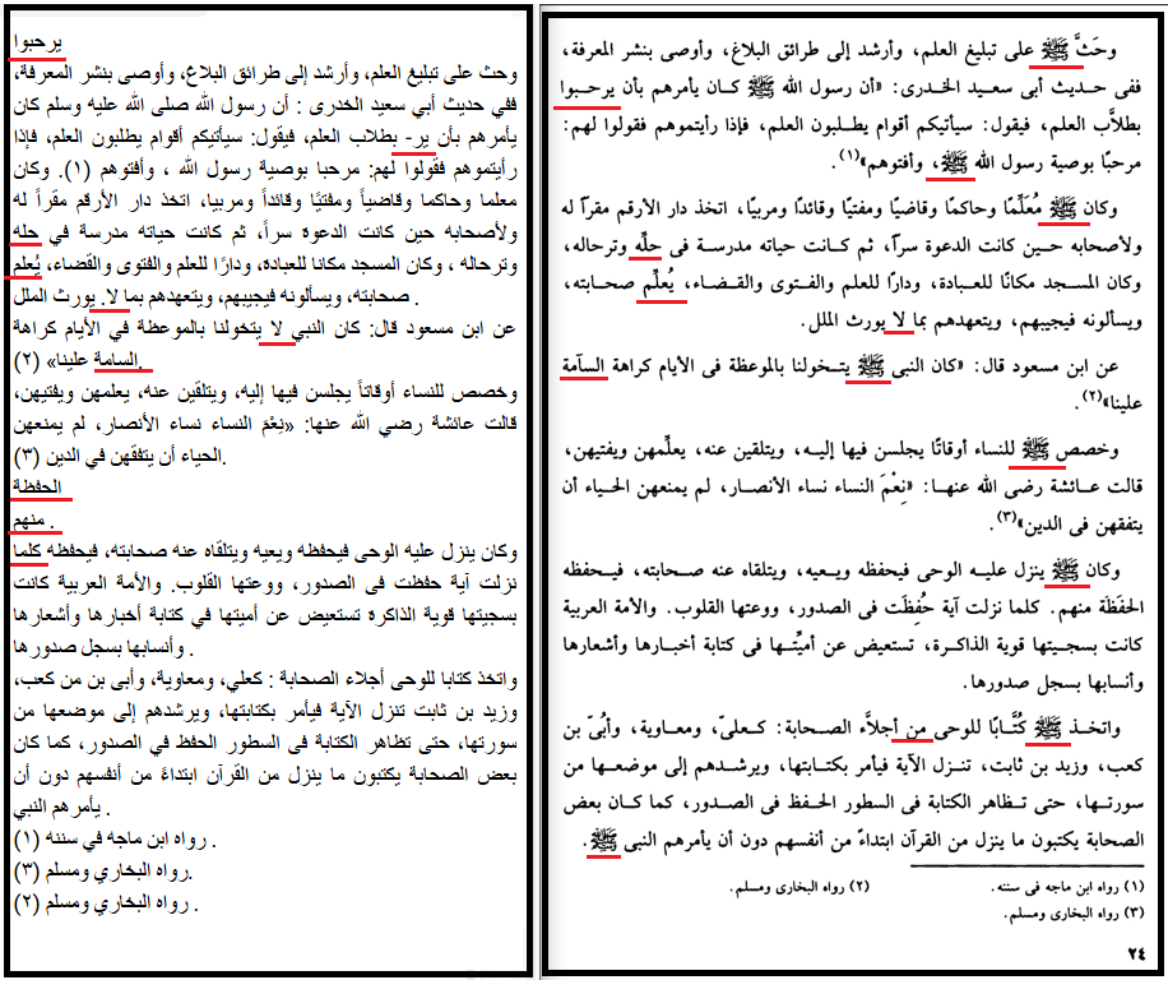
These gaps are particularly evident in specialized domains like Hadith studies, where precise terminology and contextual understanding are paramount [16]. The combination of linguistic, cultural, and technical barriers suggests that direct application of existing AI tools to Arabic Islamic education requires significant adaptation and oversight.

3. CASE STUDY: CREATING AN ANIMATED VIDEO ON HADITH TERMINOLOGY

This chapter documents the complete process of developing an Arabic-language animated educational video about Hadith terminology (Mustalah Al-Hadith), highlighting both the potential and limitations of using AI tools in Islamic educational content creation. The project aimed to simplify complex Hadith science concepts for diverse audiences, including non-Arabic speakers and younger students, while maintaining rigorous academic and religious standards.

3.1 Content Preparation and Text Extraction

The project began with a standard 192-page textbook used in Islamic schools[17], which presented immediate technical challenges. The PDF version contained non-selectable image-based text, requiring conversion through optical character recognition (OCR) software. Initial attempts at bulk conversion failed due to format compatibility issues and the complex layout of Arabic texts. When processed page-by-page, commercial OCR tools achieved approximately 75% accuracy for Arabic content (see figure 2), while AI-powered solutions like ChatGPT's image-to-text feature introduced unwanted summarization and occasional misinterpretations of religious terminology (see figure 3).



برحبوا
وحث على تبليغ العلم، وأرشد إلى طرائق البلاغ، وأوصى بنشر المعرفة، ففي حديث أبي سعيد الخدرى : أن رسول الله صلى الله عليه وسلم كان يأمرهم بأن ير- بطلاب العلم، فيقول: سيأتيكم أقوام يطلبون العلم، فإذا رأيتموهم فقولوا لهم: مرحبا بوصية رسول الله ، وأفتوهم (١). وكان معلما وحاكما وقاضياً ومفتيًا وقائداً ومربيا، اتخذ دار الأرقم مقراً له ولأصحابه حين كانت الدعوه سراً، ثم كانت حياته مدرسة في حله وترحاله ، وكان المسجد مكانا للعباده، ودارًا للعلم والفتوى والقضاء، يُعلم صحابته، ويسألونه فيجيبهم، ويتعهدهم بما لا. يورث الملل.
عن ابن مسعود قال: كان النبي لا يتخولنا بالموعظة في الأيام كراهة السامة علينا» (٢)
وخصص للنساء أوقاتاً يجلسن فيها إليه، ويتلقين عنه، يعلمهن ويفتيهن، قالت عائشة رضي الله عنها: «نِعْمَ النساء نساء الأنصار، لم يمنعهن الحياء أن يتفقهن في الدين (٣)
الحفظة
منهم.
وكان ينزل عليه الوحى فيحفظه ويعيه ويتلقاه عنه صحابته، فيحفظه كلما نزلت آية حفظت فى الصدور، ووعتها القلوب. والأمة العربية كانت بسجيتها قوية الذاكره تستعيض عن أميتها في كتابة أخبارها وأشعارها وأنسابها بسجل صدورها.
واتخذ كتابا للوحى أجلاء الصحابة : كعلي، ومعاوية، وأبى بن من كعب، وزيد بن ثابت تنزل الآية فيأمر بكتابتها، ويرشدهم إلى موضعها من سورتها، حتى تظاهر الكتابة فى السطور الحفظ في الصدور، كما كان بعض الصحابة يكتبون ما ينزل من القرآن ابتداءً من أنفسهم دون أن يأمرهم النبي.
رواه ابن ماجه في سننه (١)
رواه البخاري ومسلم (٢)
رواه البخاري ومسلم (٣)

وحَثَّ ﷺ على تبليغ العلم، وأرشد إلى طرائق البلاغ، وأوصى بنشر المعرفة، ففى حديث أبى سعيد الخدرى: «أن رسول الله ﷺ كان يأمرهم بأن يرحبوا بطلاَّب العلم، فيقول: سيأتيكم أقوام يطلبون العلم، فإذا رأيتموهم فقولوا لهم: مرحبًا بوصية رسول الله ﷺ، وأفتوهم»(١).

وكان ﷺ مُعَلِّمًا وحاكمًا وقاضيًا ومفتيًا وقائدًا ومربيًا، اتخذ دار الأرقم مقرًا له ولأصحابه حين كانت الدعوة سرًا، ثم كانت حياته مدرسة فى حِلِّه وترحاله، وكان المسجد مكانًا للعبادة، ودارًا للعلم والفتوى والقضاء، يُعلِّم صحابته، ويسألونه فيجيبهم، ويتعهدهم بما لا يورث الملل.

عن ابن مسعود قال: «كان النبى ﷺ يتخولنا بالموعظة فى الأيام كراهة السآمة علينا»(٢).

وخصص ﷺ للنساء أوقاتًا يجلسن فيها إليه، ويتلقين عنه، يعلِّمهن ويفتيهن، قالت عائشة رضى الله عنها: «نِعْمَ النساء نساء الأنصار، لم يمنعهن الحياء أن يتفقهن فى الدين»(٣).

وكان ﷺ ينزل عليه الوحى فيحفظه ويعيه، ويتلقاه عنه صحابته، فيحفظه الحفَظَة منهم. كلما نزلت آية حُفِظَت فى الصدور، ووعتها القلوب. والأمة العربية كانت بسجيتها قوية الذاكرة، تستعيض عن أميِّتها فى كتابة أخبارها وأشعارها وأنسابها بسجل صدورها.

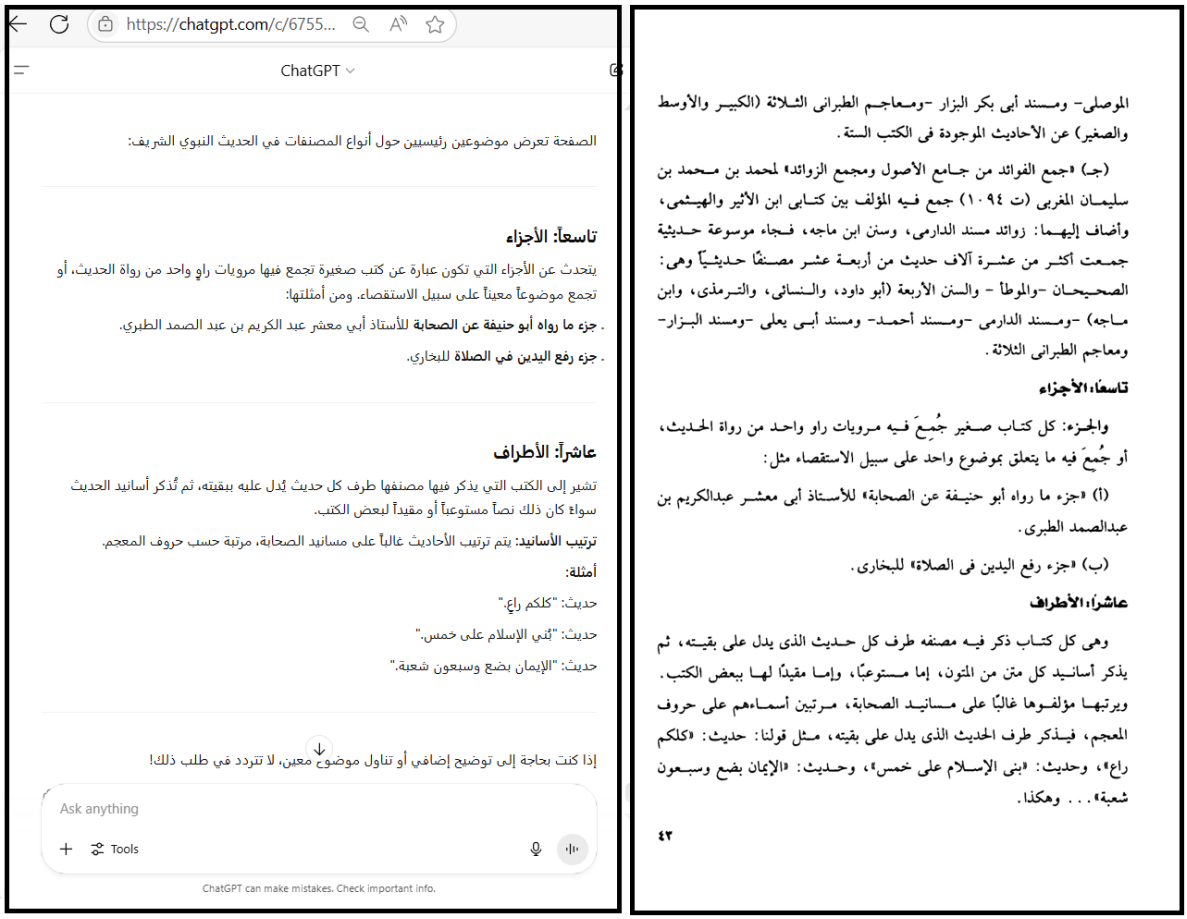
واتخذ ﷺ كُتَّابًا للوحى من أجلاَّء الصحابة: كعلىّ، ومعاوية، وأُبَىّ بن كعب، وزيد بن ثابت، تنزل الآية فيأمر بكتابتها، ويرشدهم إلى موضعها من سورتها، حتى تظاهر الكتابة فى السطور الحفظ فى الصدور، كما كان بعض الصحابة يكتبون ما ينزل من القرآن ابتداءً من أنفسهم دون أن يأمرهم النبى ﷺ.

(١) رواه ابن ماجه فى سننه. (٢) رواه البخارى ومسلم.
(٣) رواه البخارى ومسلم.

٢٤

(a) (b)

Figure 2. (a) The result of Arabic image-to-text using OCR software. (b) original text.



(a) (b)

Figure 3. (a) The result of Arabic image-to-text using ChatGPT Plus. (b) original text.

These experiences demonstrated that while AI tools can accelerate text extraction, they require multiple verification passes and continuous human oversight when handling sensitive religious content. The optimal workflow combined manual verification with AI-assisted processing to balance efficiency and accuracy.

3.2 Script Development and AI Limitations

Developing the video script revealed both the capabilities and shortcomings of generative AI. While ChatGPT could produce draft content in Arabic, it struggled to identify and prioritize key Hadith concepts without explicit human guidance. The AI frequently omitted critical nuances in terminology or provided oversimplified explanations unsuitable for academic purposes. However, once subject matter experts identified core concepts, AI proved valuable for structuring content and generating English translations for subtitles. This hybrid approach produced the best results. The experience showed that in specialized religious education, AI serves best as an assistant rather than a content authority.

3.2 Character Design Challenges

Creating appropriate visual representations of Islamic scholars exposed significant cultural gaps in AI image generation tools. The AI tools generated noticeably different visual outputs depending on the language used for prompts. When requests were submitted in Arabic, the resulting images of Islamic scholars often appeared visually unappealing, with dull color palettes dominated by monotonous browns and grays that failed to capture viewers' attention. The characters were rendered with flat, uninspired designs that lacked visual energy, making them unsuitable for

engaging educational animation. On the other hand, English-language prompts produced more lively and visually compelling results, with richer color schemes and more thoughtful compositions. As shown in Figure 4, the Arabic-prompted images frequently feature poorly balanced visuals while maintaining the problematic stereotypical representations. The findings reveal how language choice in AI prompts can affect not just cultural accuracy but also basic production quality in animation projects.

(a) (b)

Figure 4. The differences of results when requesting ChatGPT to draw a cartoon character (a) asking in Arabic (b) asking in English.

Requests in English generated somewhat better results but still failed to maintain character consistency across different expressions needed for animation. The project team developed a workaround by generating all required facial expressions in single batches, though this required extensive manual filtering. More concerning were occasional inappropriate elements in generated images, such as incorrect scholarly attire or facial features inconsistent with cultural norms as the example shown in figure 5. These issues necessitated close artistic supervision and frequent manual corrections to ensure culturally respectful representations.

Figure 5. Inappropriate elements in generated images by ChatGPT Plus.

3.3 Background Design and Cultural Considerations

AI tools showed similar limitations in creating suitable backgrounds for the animation. While capable of producing technically proficient Islamic architectural elements, the generators frequently inserted culturally incongruous details. Some outputs included:

- Inappropriate gender mixing in study circles, and a man wearing glasses in early years of Islam centuries before the invention of glasses, as in figure 6.a
- Jewish religious symbols in Islamic educational settings, as in figure 6.b
- Stereotypical "Orientalist" depictions of Arab culture as appeared in the ArabPeninsular map shown in figure 6.c
- Fundamental errors in religious practices (e.g., Muslims praying in different directions instead of uniformly toward the Qibla, and wearing Ihram cloth as in figure 6.d)

(a)

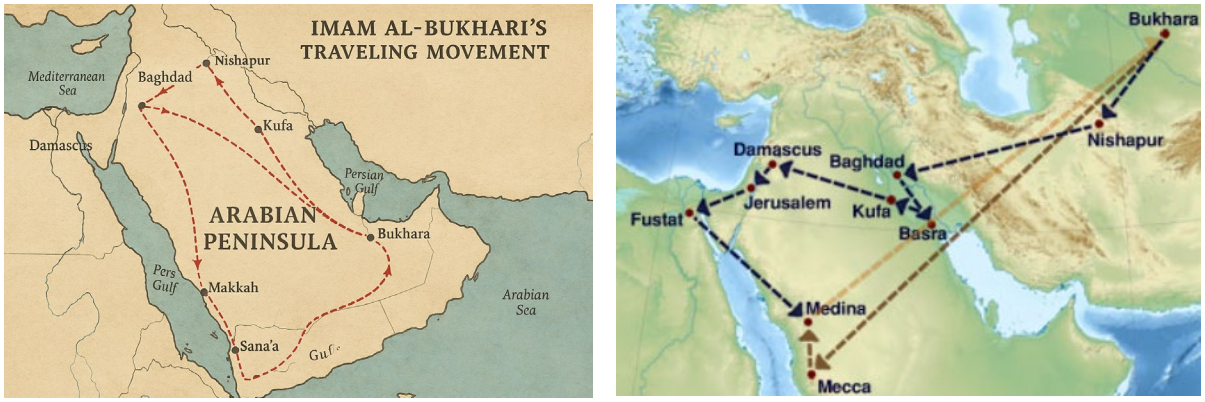
(b)

(c)

(d)

Figure 6. Examples of limitations in creating backgrounds by AI tools.

Figure 7 shows another instance of AI-generated historical and geographical inaccuracy. A comparison between the AI-generated map (5a) and the correct version (5b) reveals that while the travel route is accurate, the misplacement of cities constitutes a serious flaw. This misrepresentation compromises the historical integrity and central message of the educational material.



(a) (b)

Figure 7. Examples of limitations in creating backgrounds by AI tools.

The team implemented a careful review process, examining each generated background for historical, religious, and cultural appropriateness. This required multiple regeneration attempts or manual editing to remove problematic elements. The experience highlighted the importance of cultural competence in AI training datasets, particularly for religious educational materials.

3.3 Voice Synthesis and Audio Production

The audio production phase exposed significant limitations in existing Arabic text-to-speech (TTS) technology. Most commercial systems failed to accurately pronounce essential Classical Arabic terms, necessitating a multi-faceted mitigation strategy. After extensive testing, the team selected a platform that achieved acceptable accuracy only when the script was fully diacriticalized (*Tashkeel*). Even then, every audio segment required verification by native Arabic speakers to correct subtle pronunciation errors that risked altering the meaning of sensitive religious terms. The constraints of the technology directly impacted on the script's content; on numerous occasions, the team was forced to spend considerable time replacing some vocabulary with synonyms that were easier for the TTS system to articulate. In a more critical instance, the inability of every TTS tool to correctly pronounce the word "يُفَقِّهْهُ" necessitated the complete replacement of one Prophetic Hadith ("مَن يُرِدِ اللهُ به خيرًا يُفَقِّهْهُ في الدين") with another. Consequently, the final workflow combined AI-generated audio for simpler sections with professional voice artist recordings for critical or theologically sensitive content.

4. CONCLUSION

This study examined the use of AI tools in creating educational Arabic animations, using Hadith terminology as a case study. While AI showed potential for streamlining production processes like text extraction, script drafting, and visual generation, significant limitations appeared when handling culturally and religiously sensitive Islamic content. The research revealed critical challenges including language disparities in AI outputs, cultural inaccuracies in generated visuals, and technical shortcomings in Arabic language processing. These challenges may arise because AI systems often do not receive enough training to effectively manage the diversity and complexity of cultural and religious topics. As a result, the AI may fail to grasp the important context and meanings behind the information, which can lead to errors. Furthermore, the complexity of the Arabic language, including its various dialects and writing styles, presents additional difficulties that hinder the AI's ability to generate accurate outputs.

The project's success ultimately depended on a carefully balanced hybrid approach. AI tools were employed for their efficiency in automating repetitive tasks, while human experts provided essential oversight to ensure accuracy and cultural appropriateness. This combination allowed the use of AI's speed while maintaining the integrity of religious content.

Looking forward, meaningful improvements will require collaborative efforts between AI developers and subject matter experts. Key priorities should include developing more robust Arabic language models, creating culturally representative training datasets, and implementing better customization options for religious and educational contexts. Technical solutions must be paired with ethical guidelines to ensure AI tools respect cultural and religious sensitivities. While these tools can enhance content creation, they cannot replace human judgment.

ACKNOWLEDGEMENTS

This work was supported by Jamalullail Responsible Research Grant Scheme (JRRGS), under Project No. JRRGS24-006-0006. The author would like to express heartfelt gratitude to the late Dr. Eeman Abbas, whose early encouragement of this research idea is deeply appreciated and fondly remembered. May Allah have mercy on her.

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