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Factors Influencing the Acceptance of Metaverse Technology in Teaching Islamic Sciences (Hadith and Prophetic Biography as a Model) in Light of the UTAUT2 Model

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Abstract

This study enhances the developing dialogue on immersive technology in Islamic higher education by investigating the factors influencing metaverse acceptability in the instruction of Hadith and the Prophetic Biography, utilizing the Unified Theory of acceptability and Use of Technology (UTAUT2). This study examines the impact of performance expectancies, perceived ease of use, institutional support, motivation, hedonic enjoyment, and demographic variables on Sharia-informed digital pedagogy, while offering ethically based implementation instructions to address a significant vacuum in the field. The study used a quantitative descriptive-analytical design. An online survey was used to gather information from (201) Al Qasimia University staff and students (out of a total population of 300) during the second semester of the 2025–2026 school year. Partial Least Squares Structural Equation Modelling (PLS-SEM) was used in the UTAUT2 framework to examine structural relationships. The findings show that while enabling environments improve implementation, behavioural intention is highly predicted by motivation, perceived ease of use, and performance expectancy. Differences by gender and age were

statistically significant. The findings contribute theoretically by contextualizing UTAUT2 within Islamic pedagogical environments and practically by outlining culturally and religiously responsive design principles. The paper offers an empirically supported paradigm for the ethical and Sharia-compliant incorporation of metaverse technology into Islamic sciences curricula at the university level.

Keywords: *Hadith Education; Islamic Sciences; Metaverse Technology; Prophetic Biography; Technology Acceptance; UTAUT2 Model; Virtual Learning Environment*

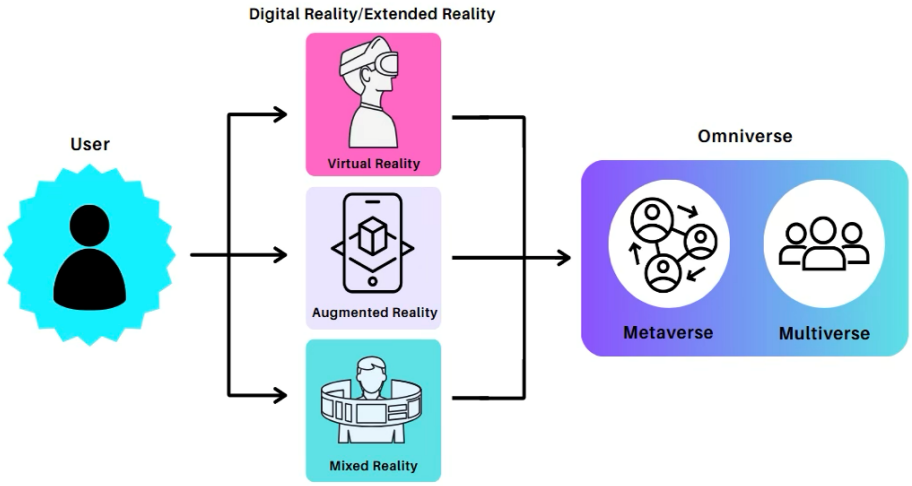
INTRODUCTION

By switching from traditional instructional approaches to digital models across a wide range of disciplines, the education industry has experienced a qualitative leap and is now more in line with other facets of life. This change relies on emerging digital technologies such as the Metaverse, which functions as a persistent virtual environment that supports interoperability and accessibility among multiple interconnected virtual worlds (Kumar et al., 2025; Sadeghi-Niaraki et al., 2025; Serras et al., 2024). Supporters see the Metaverse as the internet's logical progression, imagining a vast network of linked virtual worlds for a variety of purposes like gaming, live entertainment, and design collaboration (Dwivedi et al., 2022; Herath et al., 2024; Iqbal & Campbell, 2023; Onu et al., 2024).

Additionally, it has been defined as a merger of AR + MR + VR + XR by Duzcu (2025). Buragohain et al. (2023) , Popova (2023) and Alfaisal et al. (2024) classified it as a "digital system or structure." Based on these definitions, the working definition used in this study is as follows: the Metaverse is a digital learning environment that unifies three disparate ecosystems (Figure 1) in an open-ended area. Through the use of specific electronic processes created—by artificial intelligence—it enables people to engage with and replicate a virtual world. Additionally, it allows users to create instructional materials based on their academic areas of expertise.

Figure 1

D3 Components: Metaverse = AR + MR + VR and the Supporting Logistical Equipment



Source: Authors' analysis.

Because of this, this virtual world has developed into a thriving area for growth in a number of areas, most notably education. This was illustrated by Virani & Rautela (2024) in a bibliometric analysis that used pertinent Scopus-indexed studies obtained from 2010 through February 2024 to examine the relationship between the Metaverse and education.

Because of its potential to increase student and instructor motivation, improve learning outcomes, and increase participation—particularly in higher education—this technology has garnered increasing interest in recent research. The Metaverse in education is expected to increase at a compound annual growth rate of 46.14% from USD 2.5 billion in 2024 to USD 24.7 billion by 2030, according to worldwide market predictions (H. Singh, 2024; Statista, 2024). Despite this, adoption is still slow. This is due to the fact that implementation is influenced by users' acceptance, their preparedness to utilize it, and

the factors that influence that acceptance in addition to technical availability.

However, a number of universities have experimented with virtual worlds in institutional events, including the Hong Kong University of Science and Technology's "Twin Campus" Metaverse project, the University of California's "Blockley" virtual graduation ceremony, and the University of Hong Kong's "Alumniland" platform (Lin et al., 2025). Long-running virtual worlds such as Second Life showed that metaverse-like environments could support courses, seminars, teamwork, simulation, and even virtual OSCEs in medical education (Al-Adwan & Al-Debei, 2024; AlDhanhani et al., 2023; Almarzouqi et al., 2022a; Huang et al., 2024; Li et al., 2025). These platforms also offered persistent access, copresence, and real-time interaction, which helped sustain student engagement (Lewis et al., 2024; Popov et al., 2024; Salloum et al., 2023; Sendra-Portero et al., 2024).

More recently, several international colleges as well as several Arab universities, such as those in the United Arab Emirates, have included this technology into their curricula and teaching methods (Abukhalaf et al., 2024). Ras Al Khaimah Medical and Health Sciences University has been offering students a facility since 2023 that allows them to take part in interesting and cutting-edge learning opportunities by immersing them in interactive medical scenarios (Elbeshbeishy et al., 2025). Strong academic achievement and the emergence of a new, contemporary generation of practicing physicians are supported by this. In the same year, Hamdan Bin Mohammed Smart University also pledged to use cutting-edge technologies, most notably the Metaverse, which it views as a qualitative change in education because of its ability to offer a wide range of student populations access to excellent instruction and training (Bhat, 2023).

The evidence splits into three linked questions: Arab-university coverage, consistency of UTAUT/UTAUT2 relationships, and demographic moderators (Al-Adwan et al., 2023; Al-Adwan & Al-Debei, 2024; Al-kfairy et al., 2024; Alkhwaldi, 2023; Almarzouqi et al., 2022b). Overall, the gap is real: metaverse acceptance research in higher education is growing, but Arab-region studies remain relatively few, theory use is fragmented across UTAUT, UTAUT2, and TAM variants, and demographic effects are still thinly tested (Abdulmuhsin et al., 2025; Castro-Lopez et al., 2025; Daradkeh et al., 2024; Shwedeh, 2024; Usman et al., 2025; Yang et al., 2022). Numerous recent studies have examined this technology's application in higher education and have generally indicated that it has the ability to improve motivation and interaction. Nevertheless, the majority of these investigations were carried out in non-Arab environments, and the results have been inconsistent. A lot of them were based on the Unified Theory of Acceptance and Use of Technology and its Extension (UTAUT2), which explains a number of variables like effort expectancy, performance expectancy, motivation, and facilitating situations. However, there are still few examples of this paradigm being used in Arab colleges.

The small number of studies that have looked at acceptability of this technology at Arab universities using UTAUT2 to measure drivers of intention to use suggests a research gap, according to a review of earlier studies in this field. Along with inconsistent explanations of some correlations between model variables, there are relatively few research addressing the function of demographic factors in this context. This necessitates more study and careful examination.

According to this viewpoint, determining the elements that impact university students' adoption of the Metaverse in the context of UTAUT2 and comprehending how organizational, social, and

psychological factors contribute to students' increased motivation and enjoyment constitute the study problem. In the context of Arab universities, it also aims to elucidate the nature of the correlations between these variables.

The purpose of this study is to analyse the degree of Metaverse acceptance among students at Al Qasimia University, find differences based on specific demographic variables, and ascertain the degree to which UTAUT2 variables predict motivation and enjoyment levels. The results might provide information that helps Sharia students and decision-makers incorporate the Metaverse into their education.

Problem of the Study

The Metaverse is regarded as one of the cutting-edge technologies that is anticipated to enhance and advance university education. The use of contemporary instructional technologies nevertheless faces several obstacles in spite of this orientation. The effects of this technology on students' motivation to learn have not been thoroughly studied, and it is still unclear what criteria influence acceptance, especially in Arab colleges. There are still few studies analysing these factors using the UTAUT2 model.

Islamic sciences have not yet investigated this technology in a similar way, despite the fact that medical and technical sciences have found a thriving environment for experimenting with the Metaverse in academic settings—attracting significant scholarly attention. Sharia colleges strive to improve students' learning experiences and higher-order thinking abilities while also staying up to date with the latest advancements in teaching methodologies. Nonetheless, a survey of the literature in Arab universities, particularly in Islamic fields, indicates a relative dearth. This could be ascribed to disciplinary specialization or reluctance to use virtual simulations in Hadith and Seerah studies—an approach that might seem strange or give rise to worries about possible contradictions with Islamic ethical standards.

Furthermore, the majority of earlier research relied on broad descriptive approaches without delving further into demographic variations. Therefore, a study that fills this knowledge gap by investigating the elements impacting the adoption of Metaverse technology in Islamic scientific education within the context of UTAUT2 is obviously needed.

Research Questions

The research attempts to answer the following queries in light of the study problem:

RQ1: How does the sample feel about Metaverse technology being used in Islamic education?

RQ2: How well accepted is Metaverse technology in terms of its various aspects (perceived educational efficacy, perceived usability, perceived institutional and social support, perceived technical and institutional readiness, and motivation and enjoyment)?

RQ3: Are gender (male/female)-related differences in the Metaverse acceptance dimensions statistically significant?

RQ4: Does age have a statistically significant impact on the aspects of Metaverse acceptance?

RQ5: How does the degree of motivation and enjoyment (HM) in utilizing Metaverse technology depend on perceived educational efficacy, perceived ease of use and cognitive effort, and perceived social and institutional support?

RQ6: How does the degree of motivation and enjoyment (HM) in the educational setting relate to past understanding of Metaverse technology?

RQ7: How much does the level of motivation and enjoyment (HM) in utilizing Metaverse technology in education depend on the independent variables taken together—reported educational efficacy, perceived ease of use, perceived social and institutional support, and prior knowledge of the Metaverse?

Tables 1 and 2 clarify the logical connection between the research questions, hypotheses, and variables of the study. Table 1 links the demographic questions to hypotheses concerning possible differences in Metaverse acceptance based on gender and age. It shows that RQ3 corresponds to H1, which examines gender-based differences, while RQ4 corresponds to H2, which examines age-related differences. Table 2 presents the predictive relationships tested in the study, connecting perceived educational effectiveness, ease of use, social and institutional support, and prior knowledge to motivation and enjoyment. Together, both tables demonstrate the coherence of the study's analytical framework.

Table 1

Correlation Between the Relevant Demographic Hypotheses and the Study Questions

Research Question	Hypothesis	Description
RQ3	H1	Differences in acceptance dimensions attributable to gender (male/female).
RQ4	H2	Differences in acceptance dimensions attributable to age.

Source: Authors' analysis.

Table 2

Research Questions, Hypotheses, and Variables in Coherence

Research Question	Hypothesis	Relationship / Variable Link
RQ5	H3	Perceived Educational Effectiveness → Motivation and Enjoyment (HM)
RQ5	H4	Ease of Use and Cognitive Effort → Motivation and Enjoyment (HM)
RQ5	H5	Social and Institutional Support → Motivation and Enjoyment (HM)
RQ6	H6	Prior Knowledge of the Metaverse → Motivation and Enjoyment (HM)
RQ7	H7	Combined predictors → Motivation and Enjoyment (HM)

Source: Authors' analysis.

Objectives of the Study

The study's objectives are to determine university students' desire for studying in relation to Metaverse use; to analyse gender-specific differences in learning motivation that are statistically significant; and to analyse how using the Metaverse affects learning motivation using the UTAUT2 framework.

Significance of the Study

This work makes a contribution by offering a fresh viewpoint on the study of Islamic sciences, specifically Hadith and Prophetic Biography, using the Metaverse. Its conclusions are anticipated to contribute to filling a current knowledge gap in the teaching of Islamic sciences and could promote a change from traditional teaching strategies to more creative ones. Such a change may highlight the Metaverse's possible influence in these fields and promote its use in additional Islamic studies domains.

The topic was chosen in response to the need to engage with advancements in artificial intelligence in the Islamic sciences and to reevaluate conventional teaching methods in this area. It is vital to investigate the anticipated effects of this technology on perceived efficacy in university-level Islamic education because this field has not received as much attention as other fields.

Scope of the Study

This study focuses on examining how Metaverse technology influences the perceived effectiveness and acceptance of teaching Islamic sciences, particularly Hadith and Prophetic Biography, within the framework of the UTAUT2 model. The research was conducted at Al Qasimia University in the United Arab Emirates, which serves as the institutional setting for the investigation. Data collection took place during the second semester of the 2025–2026 academic year, reflecting participants' perceptions within that specific period. The

study population comprised faculty members and students at Al Qasimia University, whose perspectives provided the empirical basis for evaluating the educational, technological, and motivational factors associated with Metaverse adoption in Islamic higher education.

Study Terms

Table 3 presents the operational definitions of the main terms used in the study and clarifies the conceptual framework underlying its variables. The Metaverse is defined as a persistent three-dimensional digital learning environment that supports interaction, simulation, and content production. The table also explains key UTAUT2-related constructs, including perceived educational effectiveness, perceived ease of use, social and institutional support, and institutional and technical readiness. In addition, it defines motivation and enjoyment as learners' affective engagement with Metaverse-based learning, while prior knowledge refers to previous familiarity with related technologies. These definitions ensure conceptual clarity and guide the study's measurement process.

Table 3

Operational Definitions of the Study Terms

Study Term	Definition
Metaverse	A persistent 3D digital educational environment enabling interaction, simulation, and content production for learning purposes.
Perceived Educational Effectiveness (Performance Expectancy)	The extent to which users believe the Metaverse improves learning outcomes and teaching effectiveness.
Perceived Ease of Use / Cognitive Effort (Effort Expectancy)	The extent to which using the Metaverse is perceived as easy and not requiring excessive effort.
Social and Institutional Support (Social Influence / Facilitating Conditions)	The perceived encouragement and support from peers and the institution to use the Metaverse.

Study Term	Definition
Institutional and Technical Readiness	The availability of infrastructure, resources, support, and training enabling Metaverse implementation.
Motivation and Enjoyment (HM)	The degree of enjoyment, excitement, and engagement associated with Metaverse use in learning.
Prior Knowledge of the Metaverse	The learner's prior exposure or familiarity with Metaverse-related technologies and concepts.

Source: Authors' analysis.

THEORETICAL FRAMEWORK AND PREVIOUS STUDIES

Theoretical Introduction to the Study

The need to expedite preparations and ensure preparedness to embrace the new digital era was underscored by the Arab Council for Development during a seminar on January 18, 2022. In order to increase digital awareness and foster creativity and innovation, it emphasized the significance of funding accessible possibilities like training and education (Kaddoura & Husseiny, 2023).

Since it provides a vast area for the development of teaching and learning processes, the Metaverse is regarded as one of the most important innovations in this field. It offers countless chances for experimentation and investigation in three-dimensional settings and opens up new avenues for creative and interactive teaching. These kinds of settings allow students to use innovative teaching strategies to model intricate scientific phenomena (Jamshaid, 2026).

Even if this technology has a lot of advanced educational potential and its educational applications are growing in number, its success still depends on how well people embrace and are ready to utilize it. Because of its ability to describe the variables that may affect users' acceptance of new educational technologies, the UTAUT2 model has become essential.

The Variables of the UTAUT2 Model

One of the most well-known theoretical models created to comprehend the elements influencing people's adoption and practical usage of educational technologies is the Unified Theory of Acceptance and usage of Technology (UTAUT2). The approach stands out for combining contextual, social, and cognitive elements that help explain users' goals and sustained engagement. Because of this, it is a good foundation for examining new technologies, such educational Metaverse environments, especially where technological aspects meet ethical and cultural ones, like in Islamic education.

Because Islamic education is heavily influenced by social and cultural context (Baiza, 2022; Erihadiana & Mahmud, 2025; Marshallsay, 2012), and because the Metaverse is an immersive and experiencing environment (Jafar & Ahmad, 2024; Richter & Richter, 2023; Shamim et al., 2024), UTAUT2 was chosen for this study. Because UTAUT2 takes these dimensions into consideration, it offers a suitable analytical lens.

One of the most important factors is performance expectancy, which is the degree to which a user thinks that technology will help them perform better or accomplish their goals. This factor pertains to the perceived efficacy of digital environments in fostering comprehension and interaction within educational settings.

Prior Research

Reviewing studies that addressed different facets of the Metaverse between 2020 and 2025 makes it clear that scholars have provided a range of viewpoints regarding the practical application of this technology at academic institutions across the globe. This research has looked at how the Metaverse might improve learning experiences and what kinds of educational environments it might offer. These results can help shape the current study's conceptual framework,

especially when it comes to incorporating Metaverse technology into instruction. Additionally, they encourage the development of academic suggestions targeted at improving learning in Hadith and Prophetic Biography courses and help to create a vision that enhances established curriculum.

Recent systematic reviews indicate that the integration of artificial intelligence and the Metaverse can enrich educational environments by improving students' understanding and engagement across diverse academic disciplines, particularly through immersive, interactive, and AI-supported learning experiences (Almeman et al., 2025) shown that the Metaverse can enhance teaching methods by offering cutting-edge learning settings based on knowledge from the technical and medical disciplines. Her conclusions were in line with those of Abukhalaf (2023), who came to the conclusion that, despite the significant cost restraints associated with such breakthroughs, this technology might improve educational quality through interactive learning experiences.

In order to assess how this technology can be used in various scientific contexts and compare it with previous experiences, R. A. Ali et al. (2025) carried out an experimental case study. They came to the conclusion that the Metaverse might offer engaging learning environments that improve educational opportunities and might be expanded to incorporate into conventional courses. In their application involving students at the College of Basic Education in Kuwait, Al-Atal et al. (2021) likewise came to similar conclusions. Joma & Al-Amri (2025) conducted a case study of a university and analysed the advantages and disadvantages of using the Metaverse to enhance the quality of learning at Sultanate Oman universities. While pointing out drawbacks including the requirement for technical training for both instructors and students, he came to the conclusion

that technology can improve student engagement and make learning more advantageous and successful.

Interactivity, immersion, and user acceptance are important considerations, according to several worldwide studies that have examined Metaverse applications in education generally (Buragohain et al., 2023; De Felice et al., 2023; Liu et al., 2024; Mercan & Varol Selçuk, 2024; Sarıtaş & Topraklıkoğlu, 2022; Shi & Park, 2025; Uddin et al., 2025) Additional research concentrated on cybersecurity concerns in the classroom (Zhang, 2023). In order to assess the transferability of skills, Muthmainnah et al. (2025) tested this technology on pupils. The study did, however, raise issues about the usage of avatars, which could make lesson design difficult, and it also pointed out that English is another obstacle.

Teaching Islamic studies in Arabic to non-native speakers may provide a comparable difficulty if the obstacle in that situation is a lack of English ability (Abdul Aziz et al., 2016; Salim, 2024). Some of these researches are not specifically about religious education, but they are nonetheless significant to the current study because they help us understand how users accept the Metaverse and how it might be used to teach Hadith and Seerah. However, because religious content is unique and has ethical implications, care must be taken when extrapolating results from these studies to the Islamic sciences environment. As a result, these findings need to be modified rather than applied immediately.

The review also found that there is hardly any research on the use of this technology to teach prophetic biography and hadith (Mohd Othman, 2024; Priyanto et al., 2025). This does not imply that the topic is unimportant; rather, it highlights its originality and intricacy, which enhances its study value. Furthermore, Islamic sciences have not yet profited greatly from the Metaverse, despite its success in other fields. Their level of involvement is still low, and more study and

improvement are needed (Bahij & Sukari, 2025; Hamilton et al., 2021; Sidik et al., 2023; Yahya et al., 2025). In his study on the continual intention to use the Metaverse in higher education, R. A. Ali et al. (2025) also highlighted this point, coming to the conclusion that there are still relatively few attempts to assess its application in higher education. Meanwhile, without relating this problem to virtual learning environments, Adnan (2024) concentrated on the detrimental effects of technical faults in artificial intelligence on the composition of prophetic hadith.

Furthermore, other investigations looked at other aspects of Islamic sciences. From Islamic economics, the Metaverse's prospective influence on education, its potential use in waqf contexts, and the promotion of small and medium-sized business goods were all examined by Insawan et al. (2025). Similar to this, Yoga et al. (2025) addressed the legal decision on the usage of the Metaverse in topics pertaining to worship and came to the conclusion that it is not acceptable in virtual settings. The same topic was also studied by Ahmad et al. (2025), who emphasized the dangers of this technology's lack of defined bounds as well as the difficulties in enforcing legal regulation. The study also pointed out that bringing together a lot of individuals from many nations at once may have a negative impact on cultures and beliefs, especially among young people, and may even promote behaviours or views that go against good religious principles.

Previous studies using the UTAUT2 model have shown that performance expectancy is a key factor influencing students' acceptance of e-learning platforms (Chu et al., 2025; Duan, 2024; Hasan et al., 2023). This variable refers to users' belief that a technology can improve their learning performance, efficiency, and educational outcomes. Earlier research also indicates a positive relationship between users' acceptance of technology and their perception that the

technology will enhance performance (Aissaoui & Haddaji, 2023; W. S. E.-D. E.-D. Ali et al., 2024). Therefore, performance expectancy was included in the present study as one of the main dimensions for examining acceptance of Metaverse technology in Islamic sciences education. Its inclusion helps explain how perceived educational benefits may shape motivation, enjoyment, and willingness to adopt new learning environments.

For instance, H. Zheng et al. (2025), in a meta-analytic review based on the UTAUT2 model, found that effort expectancy was associated with users' behavioral intention to adopt e-learning in higher education, indicating that perceived ease of use remains an important factor in educational technology acceptance. The term "social influence" describes how a user's institutional and social surroundings, particularly the opinions of teachers and educational institutions, shape their views about technology. Numerous research have demonstrated that, because it is impacted by institutional culture, this characteristic significantly shapes users' intentions to adopt contemporary educational tools. In keeping with the theoretical model's presumptions, previous studies (Xiaomin et al., 2025; Y. Zheng et al., 2024) discovered that social influence influences students' adoption of educational technology.

In Islamic education, where intellectual and social reference frameworks are crucial in determining the reception of novel teaching methods, this feature is especially important. The model also emphasizes motivation, which is the degree to which users experience ease, enjoyment, and immersion. In Metaverse situations, this element is essential. Several research have shown that the intention to use interactive technologies is strengthened by motivation or enjoyment. For example, the influence of this aspect on the use of educational technologies was proven by Al-Azawei & Alowayr (2020).

The availability of institutional support, knowledge resources, and technical instruments necessary for efficient technology use are referred to as facilitating conditions. The degree to which the educational process is prepared to embrace the Metaverse is indicated by this dimension. According to Zwain & Al-Haboubi (2020), enabling conditions are one of the factors influencing students' adoption of e-learning and contribute to the real application of contemporary technology.

Considering the aforementioned, it is evident that UTAUT2 can offer a suitable framework for elucidating the elements that impact the adoption of new educational technologies and for assessing the desire to utilize the Metaverse in Arab university education. It also aids in comprehending how instructors and students view its utility, usability, and level of acceptance in the academic and religious contexts while honoring the unique characteristics of Islamic education.

Study Hypotheses

H1: The aspects of Metaverse technology adoption in education that are related to gender (male/female) differ statistically significantly.

H2: Age-related differences in several aspects of Metaverse acceptance are statistically significant.

H3: Perceived educational efficacy of using Metaverse technology has a statistically significant beneficial impact on students' motivation and enjoyment (HM) of its use in the classroom.

H4: The degree of motivation and enjoyment (HM) for utilizing Metaverse technology is positively impacted by perceived ease of use and cognitive effort in a statistically meaningful way.

H5: The degree of motivation and enjoyment (HM) for utilizing Metaverse technology is positively impacted by perceived social and institutional support in a statistically significant way.

H6: The degree of motivation and enjoyment (HM) for the usage of Metaverse technology in education is negatively impacted by prior understanding of the technology in a statistically significant way.

H7: The degree of motivation and enjoyment (HM) for utilizing Metaverse technology in education is predicted in large part by perceived educational efficacy, perceived ease of use, perceived social and institutional support, and past knowledge of the Metaverse.

Table 4 illustrates the relationship between the study's demographic research questions and their corresponding hypotheses. Specifically, it links the investigation of gender and age differences with the proposed moderating effects on Metaverse technology acceptance. Hypothesis H1 examines whether male and female participants differ significantly in their acceptance of Metaverse-based learning, while H2 evaluates whether acceptance varies across age groups. By organizing these demographic variables alongside the related research questions, the table establishes a clear framework for testing whether personal characteristics influence technology acceptance. This alignment ensures that demographic comparisons are systematically incorporated into the study's analytical design and hypothesis testing.

Table 4

Study Questions and Related Demographic Hypotheses Correlation

Research Question	H	Hypotheses	
RQ1	H1	Statistically significant differences exist in the dimensions of metaverse technology acceptance in education based on the gender variable (male/female).	Gender (Moderator) Motivation

Research Question	H	Hypotheses	
RQ2	H2	Statistically significant differences exist in certain dimensions of metaverse technology acceptance based on the age variable.	Age (Moderator) Motivation

Source: Authors' analysis.

Table 5 presents the correspondence between the remaining research questions, hypotheses, and the key variables derived from the UTAUT2 framework. It specifies the hypothesized relationships between perceived educational effectiveness, perceived ease of use, perceived social and institutional support, prior knowledge of the Metaverse, and learners' motivation and enjoyment. The final hypothesis integrates these variables into a comprehensive predictive model to examine their combined influence on Metaverse acceptance. By mapping each hypothesis to its associated construct, the table demonstrates the internal consistency of the conceptual framework and provides a structured basis for testing the proposed causal relationships using statistical analyses.

Table 5

Consistency of the Research Questions, Corresponding Hypotheses, and Study Variables

Research Question	H	Hypotheses	Variable
RQ3	H3	There is a statistically significant positive effect of perceived educational effectiveness of using metaverse technology on the level of motivation and enjoyment (HM) for its use in education.	Performance Expectancy - Motivation

Research Question	H	Hypotheses	Variable
RQ4	H4	There is a statistically significant positive effect of perceived ease of use and cognitive effort on the level of motivation and enjoyment (HM) for using metaverse technology.	Effort Expectancy → Hedonic Motivation
RQ5	H5	There is a statistically significant positive effect of perceived social and institutional support on the level of motivation and enjoyment (HM) for using metaverse technology	Social Influence Motivation
RQ6	H6	There is a statistically significant negative effect of prior knowledge of metaverse technology on the level of motivation and enjoyment (HM) for its use in education.	Prior Knowledge → Motivation
RQ7	H7	Perceived educational effectiveness, perceived ease of use, perceived social and institutional support, and prior knowledge of the metaverse contribute significantly to predicting the level of motivation and enjoyment (HM) for using metaverse technology in education.	Performance Expectancy + Effort Expectancy + Social Influence / Facilitating Conditions + Prior

Source: Authors' analysis.

METHOD

Research Design

A quantitative descriptive-analytical technique was used in the investigation. Because of its ability to effectively describe educational phenomena and conduct a methodical analysis of the elements impacting them, this design was chosen. It fits in with the goals of the study and makes use of Structural Equation Modelling (SEM) to test hypotheses.

Method of Sampling

Population under this study is Al Qasimia University teachers and students. There were 201 participants in the purposive sample. Male respondents made up 11.4% of the sample, while female respondents made up the majority (88.6%). The highest share (85.1%) of the population was in the 18–24 age group, which was followed by the 25–40 age group (8.0%) and the 41–55 age group (7.0%).

Students made up the largest percentage of participation (83.1%), followed by faculty (10.4%) and other professional categories (6.5%). Because the participants were chosen based on their knowledge with digital educational advancements, their opinions were pertinent to the study's exploratory objectives. It should be mentioned that rather than using the Metaverse experimentally, the study relied on participants' self-reported perceptions.

Additionally, the data showed that 88.6% of participants said they were very interested in learning how to utilize Metaverse technology, and 31.3% had used it before. Furthermore, 80.6% rated their technical proficiency as very good or excellent, and 60.7% had previous familiarity with contemporary instructional tools. This distribution shows a sample that is appropriate for analysing opinions regarding the adoption of contemporary educational technology, especially the Metaverse in a classroom setting.

The study admits that restricting the sample to just one university is a methodological limitation that could limit the study's applicability to other Islamic universities. This restriction is in line with the exploratory character of study on new subjects, though. Therefore, the results should be seen as early markers of acceptability and preparedness, paving the way for more in-depth applied research designs in real-world learning environments. The PLS-SEM study looked at the Variance Inflation Factor (VIF) and Harman's single-

factor test to make sure that the correlations between the variables were legitimate and to reduce any potential Common Method Bias.

Research Instrument

The UTAUT2 model served as the foundation for the questionnaire's development, and its items were modified to fit the study's objectives. It also drew on previous study and pertinent literature, in addition to the academic competence of the researchers. In addition to a section for demographic data, the final instrument had 20 items spread across five primary categories.

Table 6

Dimensions of the Questionnaire and Their Measurement Statements

Dimension	Item (statement)	Response scale
Perceived Educational Effectiveness	1) Employing the Metaverse improves understanding of Hadith/Seerah topics.	Five-point Likert
	2) Metaverse helps clarify theoretical concepts in Islamic sciences.	Five-point Likert
	3) Metaverse increases teaching/learning effectiveness compared to traditional methods.	Five-point Likert
	4) Metaverse enhances academic achievement in Islamic sciences.	Five-point Likert
Perceived Ease of Use & Cognitive Effort	1) Learning to use Metaverse technology in teaching will be easy for me.	Five-point Likert
	2) Using Metaverse tools does not require significant effort.	Five-point Likert
	3) Using Metaverse in teaching is clear and easy to understand.	Five-point Likert
	4) I can use Metaverse in teaching without major technical difficulties.	Five-point Likert
Perceived Social & Institutional Support	1) Colleagues encourage me to use Metaverse in teaching.	Five-point Likert

Dimension	Item (statement)	Response scale
	2) Educational institutions encourage Metaverse use.	Five-point Likert
	3) Metaverse use is increasingly accepted by society.	Five-point Likert
	4) Using Metaverse reflects positive professional development.	Five-point Likert
Institutional & Technical Readiness	1) I have the technical capabilities needed to use Metaverse.	Five-point Likert
	2) The institution providers suitable infrastructure.	Five-point Likert
	3) Technical support is available when needed.	Five-point Likert
	4) Training programs are available.	Five-point Likert
Motivation & Enjoyment (HM)	1) Using Metaverse in teaching is enjoyable and stimulating.	Five-point Likert
	2) I feel excited about using Metaverse to teach Islamic sciences.	Five-point Likert
	3) Metaverse makes teaching more engaging.	Five-point Likert
	4) I enjoy learning in virtual environments.	Five-point Likert

Source: Authors' analysis.

Dimensions of the Questionnaire

Perceived Educational Effectiveness of Using Metaverse Technology

This dimension assessed participants' opinions about how much the Metaverse improves students' academic performance, clarifies theoretical ideas in Islamic sciences, increases comprehension of Hadith and Seerah subjects, and improves teaching and learning efficacy when compared to conventional approaches. A five-point Likert scale was used to score the responses: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

Perceived Ease of Use and Cognitive Effort

This dimension evaluated participants' opinions about how simple it was to understand and use Metaverse technology in the classroom, how clear its tools were, and how much technical or mental work it took.

Perceived Social and Institutional Support

This dimension investigated whether using the Metaverse represents positive professional development, the extent of perceived social acceptance, and the extent to which institutions and co-workers support its use.

Institutional and Technical Readiness

This component assessed the institutional infrastructure, technical assistance, training programs, and technological capabilities required to integrate Metaverse technology into the classroom.

Intrinsic Motivation and Affective Engagement (HM)

This dimension concentrated on the pleasure, zeal, stimulation, and emotional involvement that come with teaching Islamic studies through the Metaverse.

Instrument Development Procedures

There were multiple steps involved in preparing the questionnaire: Item generation: The items were taken from prior empirical research and well-established theoretical theories; Item formulation: To guarantee precise measurement of the intended constructions, statements were constructed in plain, straightforward language; and Pilot testing: A small exploratory sample selected from the research population was given the instrument to test its psychometric qualities and make any required adjustments before it was finally used.

Validity and Reliability

Construct Validity

Using Pearson's correlation coefficients between each dimension and its matching items, construct validity was investigated. The findings showed that there were substantial positive correlations between 0.65 and 0.94, all of which were statistically significant at p <.01. According to these results, the questions measure the desired theoretical constructs underpinning hypotheses H1–H5 and accurately represent their respective dimensions.

Table 7

Pearson's Correlation Coefficients between Scale Dimensions and Their Items (RTL Layout)

Dimension	Item	r	p
Dimension 1	Item 1	0.85	< .01
	Item 2	0.77	< .01
	Item 3	0.81	< .01
	Item 4	0.65	< .01
Dimension 2	Item 1	0.76	< .01
	Item 2	0.85	< .01
	Item 3	0.94	< .01
	Item 4	0.86	< .01
Dimension 3	Item 1	0.82	< .01
	Item 2	0.71	< .01
	Item 3	0.85	< .01
	Item 4	0.77	< .01
Dimension 4	Item 1	0.84	< .01
	Item 2	0.87	< .01
	Item 3	0.90	< .01
	Item 4	0.84	< .01
Dimension 5	Item 1	0.91	< .01
	Item 2	0.85	< .01
	Item 3	0.94	< .01
	Item 4	0.87	< .01

Source: Authors' analysis. Note: The correlation coefficient (r) of Pearson was applied. At p <.01, all correlations are statistically significant.

Confirmatory Factor Analysis (CFA)

Using R Studio, Confirmatory Factor Analysis (CFA) was carried out. The five-factor model demonstrated strong factor loadings (0.639–0.921) and high reliability (Cronbach's alpha = 0.891–0.932; Omega = 0.893–0.937). Although the RMSEA (0.109) was somewhat elevated, the model fit indices (CFI = 0.906; TLI = 0.888; SRMR = 0.044) were largely acceptable, indicating generally acceptable internal model validity with modest reservations.

Reliability

Cronbach's alpha coefficients were computed for the entire scale and for each dimension separately. The overall dependability reached (α =.95), with reliability values ranging from 0.75 to 0.92 across dimensions. By recognized statistical standards, these data show excellent internal consistency.

Table 8

Cronbach's Alpha Reliability Coefficients

Dimension	**α**
Dimension 1	0.75
Dimension 2	0.88
Dimension 3	0.81
Dimension 4	0.89
Dimension 5	0.92
Overall scale	0.95

Source: Authors' analysis. Note: A reliability level of good to excellent is indicated by Cronbach's alpha values (α ≥ 0.70). This high reliability is thought to be crucial for decreasing random measurement error and bolstering the findings of hypothesis testing.

Methodological Consistency Between Instrument and Hypotheses

The instrument's great construct validity and high reliability attest to its good psychometric qualities, offering a reliable methodological basis for testing hypotheses. The implementation of

various regression models and difference tests (t-test, ANOVA) with methodological rigor was made possible by the sample's distribution across demographic factors (gender and age) and technical experience levels. As a result, conclusions on the acceptance or rejection of hypotheses can be regarded as both scientifically sound and indicative of participants' opinions regarding the use of Metaverse technology in the classroom.

Data Analysis Methods

SPSS (Version 26) was used for descriptive statistical analysis, which included calculating means and standard deviations and distributing participants by age, gender, and educational attainment (Alfaisal et al., 2024). One-way ANOVA and independent samples t-tests were used to analyse motivational differences by demographic. In order to assess the links between theoretical variables and their impact on motivation and satisfaction, structural hypotheses were evaluated using Structural Equation Modeling (SEM) with AMOS and SmartPLS.

RESULTS

Table 9 summarizes the demographic and technological profile of the 201 participants. Most respondents were aged 18–24 years (85.1%), female (88.6%), and students (83.1%), indicating that the sample largely represents young university learners. Although only 31.3% had previously used Metaverse technology, 46.8% reported prior knowledge of its educational applications, and 88.6% expressed a desire to learn how to use it. In addition, 60.7% had experience with modern educational technologies. Participants also showed strong self-confidence in their technical abilities, with 36.8% rating their skills as very good and 43.8% as excellent, supporting the study's hypothesis testing.

Table 9

Demographic and Technological Characteristics of the Study Sample (n = 201)

Variable	Category	Frequency (n)	Percentage (%)
Age	18–24 years	171	85.1
	25–40 years	16	8.0
	41–55 years	14	7.0
Gender	Male	23	11.4
	Female	178	88.6
Occupation	Student	167	83.1
	Teacher	21	10.4
	Other	13	6.5
Prior Use of Metaverse Technology	Yes	63	31.3
	No	138	68.7
Prior Knowledge of Metaverse and Its Educational Applications	Yes	94	46.8
	No	107	53.2
Desire to Learn to Use the Metaverse	Yes	178	88.6
	No	23	11.4
Prior Use of Modern Educational Technologies	Yes	122	60.7
	No	79	39.3
Self-Assessment of Educational Technology Skills	Weak	7	3.5
	Average	32	15.9
	Very Good	74	36.8
	Excellent	88	43.8

Source: Primary data. Authors' estimation.

Table 10 presents participants' perceptions of the educational effectiveness of using Metaverse technology in teaching Islamic sciences. The results show consistently high levels of agreement across all four items, with mean scores ranging from 4.26 to 4.35 on a five-point Likert scale. The highest-rated item indicates that participants

strongly believe the Metaverse can make teaching and learning more effective than traditional methods. Similarly, respondents agreed that this technology can improve students' understanding of Hadith and Seerah topics. These findings suggest that participants view the Metaverse as a valuable instructional tool for enhancing comprehension and classroom engagement in Islamic studies.

Table 10

Descriptive Statistics for the Items of Perceived Educational Effectiveness of Using Metaverse Technology (N = 201)

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
I believe that using Metaverse technology contributes to improving students' understanding of Hadith and Seerah topics.	2 (1.0%)	6 (3.0%)	21 (10.4%)	75 (37.3%)	97 (48.3%)	4.29	0.82
Using Metaverse helps clarify theoretical concepts in Islamic sciences.	1 (0.5%)	4 (2.0%)	26 (12.9%)	79 (39.3%)	91 (45.3%)	4.27	0.78

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
Using Metaverse technology increases the effectiveness of teaching and learning compared to traditional methods.	2 (1.0%)	3 (1.5%)	24 (11.9 %)	65 (32.3 %)	107 (53.2%)	4.35	0.80
I believe that Metaverse technology contributes to improving students' academic achievement in Islamic sciences.	1 (0.5%)	5 (2.5%)	26 (12.9 %)	78 (38.8 %)	91 (45.3%)	4.26	0.79
Overall Dimension	–	–	–	–	–	4.29	0.74

Source: Primary data. Authors' estimation.

The remaining items also demonstrate strong positive attitudes toward the educational value of Metaverse technology. Participants agreed that the Metaverse can clarify theoretical concepts in Islamic sciences and contribute to improving students' academic achievement. The overall mean score of 4.29, accompanied by a

relatively low standard deviation of 0.74, indicates a high and consistent level of perceived educational effectiveness among respondents. This consistency suggests that participants shared a common expectation that immersive digital environments could strengthen Islamic sciences instruction. Overall, Table 10 supports the view that Metaverse technology is perceived as pedagogically useful, effective, and promising for Hadith and Seerah education.

Table 11 describes participants' perceptions of the ease of using Metaverse technology and the cognitive effort required to apply it in teaching and learning. The mean scores ranged from 4.00 to 4.17, indicating a generally high level of agreement across all items. The highest mean was recorded for the statement that learning to use Metaverse technology in teaching would be easy, showing that participants were confident in their ability to acquire the necessary skills. Respondents also agreed that Metaverse-based teaching is clear and understandable, suggesting that they did not view the technology as overly complex or inaccessible.

Table 11

Descriptive Statistics for the Items of Perceived Ease of Use and Cognitive Effort (N = 201)

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
I believe that learning to use Metaverse technology in teaching will be	1 (0.5%)	8 (4.0%)	30 (14.9%)	78 (38.8%)	84 (41.8%)	4.17	0.83

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
easy for me.							
I think that handling Metaverse tools does not require much effort.	3 (1.5%)	12 (6.0%)	42 (20.9%)	70 (34.8%)	74 (36.8%)	4.00	0.92
I believe that using Metaverse technology in teaching and learning is clear and easy to understand.	2 (1.0%)	6 (3.0%)	31 (15.4%)	85 (42.3%)	77 (38.3%)	4.14	0.85
I can use Metaverse in teaching without major technical difficulties.	3 (1.5%)	10 (5.0%)	40 (19.9%)	73 (36.3%)	75 (37.3%)	4.03	0.91

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
Overall Dimension	–	–	–	–	–	4.09	0.88

Source: Primary data. Authors' estimation.

The results also show that participants perceived only moderate technical and cognitive barriers to using the Metaverse. Although the item stating that Metaverse tools do not require much effort received the lowest mean score, it still remained within the agreement range, indicating a generally positive view. Similarly, participants agreed that they could use the Metaverse in teaching without major technical difficulties. The overall mean of 4.09 and standard deviation of 0.88 suggest a favorable but slightly varied perception of usability. Overall, Table 11 indicates that respondents considered Metaverse technology manageable, learnable, and suitable for classroom implementation.

Table 12 presents participants' perceptions of social and institutional support for using Metaverse technology in teaching Islamic sciences. The results show a high level of agreement across all items, with an overall mean of 4.13 and a standard deviation of 0.80. The highest-rated item was the statement that using the Metaverse reflects positive professional development, with a mean of 4.25. This indicates that participants associated Metaverse adoption with academic growth, innovation, and professional improvement. The findings also suggest that respondents perceived educational institutions and society as increasingly supportive of Metaverse-based teaching and learning practices.

Table 12

Frequency Distribution, Means, and Standard Deviations for the Items of Perceived Social and Institutional Support (N = 201)

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
My colleagues encourage me to use Metaverse technology in teaching.	4 (2.0%)	12 (6.0%)	37 (18.4%)	71 (35.3%)	77 (38.3%)	4.02	0.93
I believe that educational institutions encourage the employment of Metaverse in teaching.	0 (0.0%)	10 (5.0%)	37 (18.4%)	72 (35.8%)	82 (40.8%)	4.12	0.86
I perceive that using Metaverse technology receives increasing social acceptance.	3 (1.5%)	3 (1.5%)	37 (18.4%)	83 (41.3%)	75 (37.3%)	4.11	0.84
I feel that using Metaverse reflects	2 (1.0%)	4 (2.0%)	21 (10.4%)	89 (44.3%)	85 (42.3%)	4.25	0.78

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
positive professional development.							
Overall Dimension	–	–	–	–	–	4.13	0.80

Source: Primary data. Authors' estimation.

The table further shows that peer encouragement, institutional encouragement, and social acceptance all received positive evaluations. Although the item concerning colleagues' encouragement had the lowest mean score of 4.02, it still fell within the agreement range, indicating that participants generally felt supported by their professional environment. Institutional encouragement and growing social acceptance also recorded high mean scores of 4.12 and 4.11, respectively. These results suggest that social and organizational contexts may play an important role in strengthening acceptance of Metaverse technology. Overall, Table 12 confirms that perceived support can facilitate the integration of Metaverse tools into Islamic sciences education.

Table 13 describes participants' perceptions of institutional and technological readiness for implementing Metaverse technology in Islamic sciences education. The overall mean score of 4.00 indicates a generally positive level of agreement. Respondents believed that they possessed the necessary technical capabilities to use the Metaverse and that their institution had suitable infrastructure to support its implementation. The items related to infrastructure and technical support recorded the highest mean scores, both at 4.01. These findings suggest that participants viewed the institutional environment as

reasonably prepared to accommodate Metaverse-based teaching and learning, especially when adequate resources and support systems are available.

Table 13

Frequency Distribution, Means, and Standard Deviations for the Items of Institutional and Technological Readiness (N = 201)

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
I have the necessary technical capabilities to use Metaverse.	3 (1.5%)	14 (7.0%)	38 (18.9%)	74 (36.8%)	72 (35.8%)	3.99	0.94
There is suitable infrastructure in the educational institution for using Metaverse.	1 (0.5%)	11 (5.5%)	38 (18.9%)	85 (42.3%)	66 (32.8%)	4.01	0.88
Technical support is available to assist me in using Metaverse when needed.	–	15 (7.5%)	39 (19.4%)	75 (37.3%)	72 (35.8%)	4.01	0.85
Training programs are available to help	–	18 (9.0%)	35 (17.4%)	79 (39.3%)	69 (34.3%)	3.99	0.87

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
employ Metaverse in teaching.							
Overall Dimension	–	–	–	–	–	4.00	0.88

Source: Primary data. Authors' estimation.

The table also indicates that training programs and individual technical capabilities received slightly lower but still positive mean scores of 3.99. This suggests that while participants generally felt prepared, some may still need additional training, guidance, or technical assistance before fully integrating Metaverse tools into classroom practice. The standard deviations, ranging from 0.85 to 0.94, show moderate variation in participants' responses, reflecting different levels of confidence and experience. Overall, Table 13 emphasizes that successful Metaverse adoption depends not only on user interest but also on institutional infrastructure, technical support, training opportunities, and sustained organizational readiness.

Table 14 presents participants' motivation and enjoyment in relation to using Metaverse technology in teaching Islamic sciences. The results indicate a very high level of positive response, with an overall mean of 4.26 and a standard deviation of 0.80. The highest-rated item was that the Metaverse makes the teaching process more engaging, with a mean of 4.31. This suggests that participants strongly perceived Metaverse-based learning as attractive, interactive, and capable of increasing classroom involvement. They also agreed that using the Metaverse is enjoyable, stimulating, and exciting for teaching Islamic sciences.

Table 14

Frequency Distribution, Means, and Standard Deviations for the Items of Motivation and Enjoyment (N = 201)

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean	Standard Deviation (SD)
I find using Metaverse in teaching enjoyable and stimulating.	2 (1.0%)	2 (1.0%)	26 (12.9 %)	85 (42.3 %)	86 (42.8%)	4.25	0.79
I feel excited when thinking about using Metaverse in teaching Islamic sciences.	2 (1.0%)	5 (2.5%)	29 (14.4 %)	69 (34.3 %)	96 (47.8%)	4.25	0.82
Using Metaverse makes the teaching process more engaging.	2 (1.0%)	3 (1.5%)	23 (11.4 %)	75 (37.3 %)	98 (48.8%)	4.31	0.78
I enjoy the learning experience in virtual environments.	1 (0.5%)	7 (3.5%)	27 (13.4 %)	76 (37.8 %)	90 (44.8%)	4.23	0.81
Overall Dimension	–	–	–	–	–	4.26	0.80

Source: Primary data. Authors' estimation.

The remaining items further confirm participants' strong affective engagement with virtual learning environments. Respondents expressed enjoyment in learning through virtual settings and excitement about applying the Metaverse to Islamic sciences education. All item means ranged from 4.23 to 4.31, indicating consistent agreement across the dimension. The relatively low standard deviations show that participants' responses were generally stable and not widely dispersed. Overall, Table 14 demonstrates that the Metaverse is perceived not only as an instructional tool but also as a motivational environment that can increase enjoyment, engagement, and emotional involvement in teaching and learning Hadith, Seerah, and related Islamic sciences.

Table 15 reports the independent samples t-test results for gender differences across five dimensions of Metaverse acceptance. Although female participants recorded slightly higher mean scores than male participants in all dimensions, the differences were not statistically significant. All p-values exceeded 0.05, including perceived educational effectiveness, ease of use, social and institutional support, institutional and technological readiness, and motivation and emotional engagement. These findings indicate that male and female respondents had broadly similar perceptions of Metaverse technology in Islamic sciences education. Therefore, gender did not appear to be a meaningful factor influencing participants' acceptance of Metaverse-based learning.

Table 15

t-Test Results for Gender Differences in the Dimensions of Metaverse Acceptance (N = 201)

Dimension	Gender	N	Mean	SD	t	df	Sig. (p)
Perceived Educational Effectiveness of Using Metaverse	Male	23	4.13	0.69	-1.13	199	0.262

Dimension	Gender	N	Mean	SD	t	df	Sig. (p)
Perceived Ease of Use and Cognitive Effort	Female	178	4.31	0.74	–	–	–
	Male	23	3.97	0.77	-0.74	199	0.460
Perceived Social and Institutional Support	Female	178	4.10	0.81	–	–	–
	Male	23	3.90	0.76	-1.49	199	0.138
Institutional and Technological Readiness	Female	178	4.16	0.77	–	–	–
	Male	23	3.74	0.82	-1.64	199	0.102
Motivation and Emotional Engagement	Female	178	4.04	0.81	–	–	–
	Male	23	4.11	0.61	-1.03	199	0.305
	Female	178	4.28	0.77	–	–	–

Source: Primary data. Authors' estimation.

Table 16 presents the results of the one-way ANOVA and Tukey post hoc analyses examining whether Metaverse acceptance differs across age groups. Overall, the findings indicate that age had a limited influence on participants' perceptions. No statistically significant differences were found in perceived educational effectiveness, perceived ease of use and cognitive effort, or motivation and emotional engagement, as all p-values exceeded the 0.05 significance level. Although the mean scores varied slightly across the three age groups, these differences were insufficient to indicate meaningful age-related variation. This suggests that participants of different ages generally shared similar views regarding the educational value and usability of Metaverse technology.

Statistically significant age differences emerged in only two dimensions: perceived social and institutional support ($F = 3.771$, $p = 0.025$) and institutional and technological readiness ($F = 6.035$, $p = 0.003$). Tukey's post hoc analysis revealed that participants aged 18–24 reported significantly higher levels of perceived support and readiness than those aged 41–55. These findings indicate that younger

respondents felt more confident about the availability of institutional resources, technical infrastructure, and organizational encouragement for implementing Metaverse technology. By contrast, older participants expressed comparatively lower perceptions of institutional preparedness and support for adopting immersive educational technologies.

Table 16

One-Way ANOVA and Tukey Post Hoc Test Results for Age Group Differences Across Study Dimensions

Dimension	Age Group	N	Mean	SD	F	Sig.	Significant Differences (Tukey)
Perceived Educational Effectiveness of Using Metaverse	18–24	171	4.31	0.75	0.986	0.375	No significant differences
	25–40	16	4.38	0.65	–	–	–
	41–55	14	4.04	0.60	–	–	–
Perceived Ease of Use and Cognitive Effort	18–24	171	4.11	0.81	1.064	0.347	No significant differences
	25–40	16	4.06	0.83	–	–	–
	41–55	14	3.79	0.74	–	–	–
Perceived Social and Institutional Support	18–24	171	4.18	0.76	3.771	0.025*	18–24 > 41–55
	25–40	16	3.98	0.73	–	–	–
	41–55	14	3.63	0.74	–	–	–
Institutional and Technological Readiness	18–24	171	4.08	0.78	6.035	0.003*	18–24 > 41–55
	25–40	16	3.77	0.99	–	–	–
	41–55	14	3.36	0.81	–	–	–
Motivation and Emotional Engagement	18–24	171	4.27	0.78	0.335	0.716	No significant differences
	25–40	16	4.31	0.63	–	–	–
	41–55	14	4.11	0.52	–	–	–

Source: Primary data. Authors' estimation.

Taken together, the results suggest that age influences only specific aspects of Metaverse acceptance rather than the overall willingness to adopt the technology. Educational effectiveness, usability, and motivation appear to be perceived consistently across age groups, whereas institutional support and technological readiness are more sensitive to age-related differences. These findings imply that younger participants may be more receptive to institutional initiatives and technological innovation, while older users may require additional organizational support and professional development opportunities. Consequently, successful implementation of Metaverse technology in Islamic sciences education should combine adequate institutional infrastructure with targeted training programs that address the needs of different age groups.

Table 17

Stepwise Regression Results Predicting Factors Affecting Motivation and Enjoyment of Using the Metaverse (HM)

Independent Variable	B	SE	β	t	Sig. (p)
Constant	0.770	0.207	—	3.726	0.000
Perceived Educational Effectiveness of Using Metaverse	0.427	0.067	0.415	6.360	0.000
Perceived Ease of Use and Cognitive Effort	0.163	0.065	0.174	2.512	0.013
Perceived Social and Institutional Support	0.295	0.072	0.301	4.087	0.000
Prior Knowledge of the Metaverse	-0.148	0.057	-0.098	-2.609	0.010

Source: Primary data. Authors' estimation.

Table 17 presents the results of the stepwise multiple regression analysis examining the factors that predict motivation and enjoyment (HM) in using Metaverse technology for Islamic sciences education.

The regression model demonstrated strong explanatory power, with a multiple correlation coefficient of $R = 0.858$ and an R^2 value of 0.736, indicating that the independent variables explained 73.6% of the variance in motivation and enjoyment. The adjusted R^2 of 0.731 further confirms the stability of the model, while the overall F-test ($F = 136.676$, $p < 0.001$) shows that the regression equation is highly significant. These findings demonstrate that the selected predictors collectively provide a robust explanation of learners' motivation to adopt Metaverse technology.

Among the individual predictors, perceived educational effectiveness emerged as the strongest determinant of motivation and enjoyment ($\beta = 0.415$, $p < 0.001$). This finding indicates that participants were more motivated to use the Metaverse when they believed it could improve teaching quality, learning outcomes, and academic achievement. Perceived social and institutional support also made a substantial positive contribution ($\beta = 0.301$, $p < 0.001$), highlighting the importance of institutional encouragement, peer support, and a supportive educational environment. In addition, perceived ease of use and cognitive effort showed a positive and statistically significant effect ($\beta = 0.174$, $p = 0.013$), suggesting that technologies perceived as user-friendly and requiring less cognitive effort are more likely to foster enthusiasm and engagement.

A notable finding is the significant negative relationship between prior knowledge of the Metaverse and motivation and enjoyment ($\beta = -0.098$, $p = 0.010$). This result suggests that participants with previous familiarity may experience slightly lower enthusiasm, possibly because prior exposure reduces the novelty of the technology or creates expectations that are not fully satisfied. Despite this negative effect, the overall regression model demonstrates that positive perceptions of educational value, institutional support, and ease of use remain the primary drivers of Metaverse acceptance. Consequently,

successful implementation should prioritize pedagogically effective design, strong institutional support, and intuitive learning environments while providing tailored orientation for users with different levels of prior experience.

DISCUSSION

The purpose of this study was to investigate, using the UTAUT2 paradigm, how Metaverse technology affects the perceived efficacy in teaching Islamic sciences. The results showed that there was no gender-related statistically significant differences in any of the acceptance dimensions. This can be explained by the possibility that contextual and functional factors, such as perceived ease of use and institutional support, may now have a greater influence on the adoption of the Metaverse in education than demographic traits. This finding is in line with earlier research using UTAUT2, which indicated that gender tended to have a minimal impact on educational technology adoption in higher education settings.

Additionally, the results showed statistically significant age-related changes in some aspects of Metaverse acceptability. Given that younger individuals typically exhibit more openness toward immersive virtual environments, this could be explained by variations in experience and preparation between age groups. This result is consistent with a number of UTAUT2-based research that show age has a significant role in determining whether or not people choose to use virtual learning environments.

Additionally, the study found that motivation and enjoyment of utilizing Metaverse technology were positively impacted by perceived educational effectiveness in a statistically significant way. This implies that students' intrinsic motivation to interact and participate rises when they think the Metaverse can assist them in achieving learning goals. This result confirms previous UTAUT2-based studies that

revealed a robust correlation between performance expectancy and increased motivation and engagement in online learning settings.

Perceived ease of use and cognitive effort also had a statistically significant positive impact on motivation and enjoyment, according to the research. This can be explained by the fact that students feel more at ease and satisfied when learning when they believe that the technology is interactive and approachable without being overly complicated. This increases their willingness to interact with the material. This outcome is also in line with earlier research showing that usability boosts motivation and adds to enjoyment in technology-supported learning.

Furthermore, the study discovered that motivation and enjoyment were positively impacted by perceived institutional and social support in a statistically significant way. This can be explained by the fact that resources and institutional support boost students' self-confidence in their capacity to use the Metaverse successfully, which in turn boosts their excitement and involvement. This result is in line with studies that highlight how institutional support can boost acceptability and motivation in online learning environments.

Fascinatingly, the findings showed that motivation and enjoyment were negatively impacted by prior awareness of Metaverse technology in a statistically meaningful way. This could be explained by the idea that those who have previously worked with technology, even if they haven't used the Metaverse directly, would have higher expectations for its functionality and instructional potential. In contrast to new learners, who frequently feel more excited by the novelty of first exposure, their motivation and enjoyment may decline if such expectations are not entirely fulfilled. This result is in line with research indicating that past knowledge is not always a reliable indicator of higher motivation and that new information can

occasionally encourage more involvement from novices than from seasoned users.

The entire study also demonstrated that motivation and satisfaction in Metaverse use are significantly predicted by perceived educational effectiveness, simplicity of use, social and institutional support, and prior knowledge taken together. The results indicate that the combined influence of these variables generates an engaging learning environment in virtual worlds, notwithstanding the unfavourable association with prior knowledge. However, while interacting with the Metaverse for the first time, pupils who have prior knowledge with technology can need more technical assistance and focused motivational techniques.

The results show that the most important elements in raising students' enthusiasm to utilize Metaverse technology in teaching and studying Islamic sciences are perceived efficacy, perceived simplicity of use, and social and institutional support. The findings also indicate that while demographic factors like gender seem to have little bearing, motivation among seasoned students may decline if they have never used the Metaverse. In order to achieve effective, balanced, and ethically appropriate interaction, these results emphasize the significance of creating accessible virtual learning environments that are supported by institutions while maintaining attention to the religious and cultural particular of Islamic content.

Practical Proposals for Teaching Hadith and Prophetic Biography Using the Metaverse

Several scholarly suggestions to improve learning in Hadith and Seerah teaching can be made in light of the study's findings about the influence of the Metaverse on motivation and perceived efficacy.

How Can the Metaverse Be Used in a Hadith Lesson?

Because of the strict standards for verification, transmission accuracy, and narrator appraisal, hadith studies are frequently seen as challenging. Students may become anxious as a result of this complexity. However, using the Metaverse as a teaching environment could improve Hadith learning's responsiveness and engagement, transforming it from a conventional approach to a more contemporary, interactive strategy that is intimately related to educational technology.

An approach like this might help students engage with the material more deeply and realistically, which could lead to better learning results and greater enjoyment. In this regard, the study offers a number of useful recommendations for creating an online Hadith course, such as the following:

Creating the Virtual Environment

Students can experience historical backgrounds relating to the Hadith narration circumstances using the Metaverse. For example, the scene from Bayʿat al-Riḍwān at the Tree of Hudaybiyah, where the Prophet said, "This is the pledge of Riḍwān," after receiving the pledge from Jābir ibn ʿAbd Allāh, may be replicated in a virtual environment.

In the Hadith of Ghadīr Khumm, for instance, a 3D simulation may show the Prophet returning from the Farewell Pilgrimage, halting at Ghadīr Khumm, and giving the Companions his famous long speech. This may help pupils memorize the Hadith by helping them understand the larger context in which it originated.

A cautious approach that steers clear of Sharia-related issues, including the Prophet, his wife, or his daughters, must direct such design. Instead, while maintaining dependence on reliable Sunnah

sources, audio narration or symbolic non-human representations may be employed.

Using Avatars

Avatars are a cutting-edge technology tool that gives education a fresh perspective. Mandić et al (2025) and Zunic (2025) emphasized their importance in bolstering peer engagement and motivation in educational environments, pointing out that they can improve peer interaction and boost motivation in learning processes.

Students can mimic traditional academic sessions of transmission (majālis al-samāʿ) in Hadith teaching by using avatars. In an environment like the Prophet's Mosque, students can build up a virtual learning circle with several avatars standing in for the instructor and pupils. Under the guidance of a Companion or a prominent scholar, like Imam Mālik or al-Bukhārī, students can practice Hadith receiving and transmission techniques in this setting.

Furthermore, in order to better grasp narrator rankings in the science of al-jarḥ wa al-taʿdīl (narrator criticism and validation), the environment may enable students to navigate across historical eras, from that of the Companions to that of the Successors, mimicking narrators.

Additionally, Hadith information can be interactively represented in the Metaverse. While other students take part in the play, one student can pretend to be the Companion recounting the lesson's Hadith. The objective is to assess the student's capacity for memorizing, familiarity with narrators, and comprehension of the narration context.

Avatars can also assist students in investigating how Hadith teachings, such as those pertaining to prayer, fasting, zakāt, and other topics, might be applied practically in everyday life. Additionally, an avatar might serve as a narrator in the chain of transmission, allowing students to engage with every character in the isnād. For instance, if

the instructor creates an avatar of Imam Mālik, it might include comprehensive details about his life story, his approach to narrating Hadith, and his work al-Muwaṭṭaʾ. This would be against Islamic beliefs, and institutional scholarly supervision would guarantee that the content is reviewed before being used.

Through immersive virtual experiences that mimic reality, this suggested method may improve student comprehension while boosting motivation and enjoyment. Avatar design must, however, nonetheless closely follow Islamic ethical rules, which include modesty, proper behaviour, avoiding symbols that are at odds with Islamic doctrine, and institutional scholarly oversight that guarantees content evaluation before deployment.

Additionally, incorporating auditory and visual components into virtual learning environments engages students' senses and may help them recall information more quickly, memorize Hadith texts and narrative chains better, and overcome the difficulties of traditional memory tasks. This could change the student's learning style from passive to active and enhance their understanding of Hadith as scholarly study and as narrative.

How Can the Metaverse be Used in Teaching the Prophetic Biography (Seerah)?

The Prophetic Biography may provide a fruitful educational experience and is a very appropriate topic for Metaverse implementation. This is especially true when historical events and circumstances may be interacted with by students in three-dimensional immersive environments.

The actions listed below could be taken to accomplish this:

Defining Learning Outcomes

Clearly defining the lesson's learning objectives is the first step. These results serve as a reference when choosing educational goals,

whether the goal is to comprehend the Prophet's life in general or to concentrate on particular occasions like a war, the Year of Sorrow, the Conquest of Makkah, the Hijrah, or other significant occasions. Lesson design is more effective when there are clear outcomes.

Selecting an Appropriate Platform

Lessons can be delivered in virtual worlds using a variety of educational platforms made possible by metaverse technology. With the use of these platforms, educators may create engaging social interactions in virtual reality environments. Platforms that offer immersive interactive experiences appropriate for educational usage include VR Chat, Altspace VR, and Horizon Workrooms.

Figure 2

Virtual Platforms for Lesson Delivery (Altspace VR – VR CHAT – Workroom)

Source: Authors' analysis.

Designing the Lesson

Teachers can create settings that align with the lesson's subject while maintaining historical accuracy by using Metaverse technology. This calls for a close examination of historical sources, reliance on genuine accounts from trustworthy Seerah literature, and reverence for the hallowed sites where these incidents occurred. Additionally, it is important to refrain from highlighting contentious historical issues that could detract from the learning objective.

A particular Seerah event may be created by the instructor and made available to the students for first-hand experience. Depending

on the desired learning objectives, students could virtually take part in the building of the Prophet's Mosque, the Hijrah journey, or a military campaign. Students may be given contextual interactive questions to answer during the encounter, and once they have left the virtual setting, they can participate in a reflective analytical discussion session to assess and understand their experiences.

Using Avatars in Seerah Lessons

Another way to use avatars is to provide them details about the character, place, and time that are pertinent to the lesson. A student might, for instance, take on the persona of ʿUmar ibn al-Khaṭṭāb in order to gain a better grasp of his significance in Islamic history and the duties that the early Caliphs had to perform.

As an alternative, using preprogramed instructions, avatars might teach lessons in place of the teacher. They can travel around the 3D environment, teach the course, take students to various historical settings, and engage with the class by answering their questions.

Integrating Interactive Stimuli and Instructional Delivery

Teachers can use interactive questions to encourage participation and competition. Questions about who brought idols to Makkah, the kinds of gods worshipped before Islam, the types of offerings, important details of the Year of Sorrow and the Prophet's family members who perished during it, the number of people who took part in the Conquest of Makkah, the content of the Conquest sermon, and the idea of al-ṭulaqāʾ are a few examples. These kinds of inquiries foster critical thinking in the classroom, improve discussion, and help students meet learning objectives.

Combining Audio and Visual Elements

Multiple media formats can be integrated by educators in metaverse contexts. In order to translate the instructional context from

real-world representation into immersive virtual environments, the instructor may show movies with commentary. Students might be taken to historical sites including Madinah, Hiraa Cave, and others. Particularly in battle-related scenarios, where acoustic effects like soldiers' voices, horses, wind, and swords may generate a vivid impression and enhance students' sense of presence, the experience may also incorporate dramatic aspects to increase realism and emotional impact.

Student Interaction and Assessment

Teachers can plan cooperative group activities and lead students through a variety of virtual worlds that are in line with the instructional objectives. Students could, for instance, take part in a virtual trip to Abyssinia, simulating the conversation between the early Muslim migrants and the King of Abyssinia. The next step in the assessment process is to ask direct spoken questions or use written evaluation tasks and assignments.

CONCLUSION

In light of the UTAUT2 model, this study sought to investigate how Metaverse technology affected the perceived efficacy of teaching Islamic sciences using Hadith and Prophetic Biography as a case study. Perceived educational efficacy, perceived simplicity of use, and social and institutional support were found to be the most significant elements in raising students' motivation and satisfaction.

Additionally, among individuals who had never used the Metaverse before, the results showed that motivation and satisfaction were adversely correlated with prior technical expertise. According to this, students who have previously used technology may have larger expectations, and when those expectations are not entirely satisfied,

their motivation may decline in contrast to first-time users who enjoy the novelty and excitement.

Additionally, age had minimal effects on several dimensions of acceptance, whereas gender did not seem to have a major impact. These results demonstrate that acceptability of Metaverse technology in Islamic educational contexts is not always influenced by demographic characteristics.

All things considered, the results highlight how crucial it is to create virtual learning environments that are encouraging, accessible, and institutionally supported. Additionally, they imply that while utilizing the Metaverse for the first time, pupils who have previously had technical experience could need more technical assistance and encouragement. The findings also support the notion that demographic variations do not have as much of an impact as previously thought.

The study recommends that higher education institutions develop learner-centered Metaverse environments that actively promote participation, collaboration, and communication among students. Such environments should be supported by faculty members through appropriate instructional design, guidance, and continuous academic supervision to maximize educational effectiveness. The study also emphasizes the importance of establishing a comprehensive ethical framework for Metaverse implementation. This framework should ensure that the design and delivery of virtual learning experiences comply with Sharia principles and respect the cultural values of Islamic education, particularly in sensitive disciplines such as Hadith and Prophetic Biography, where historical authenticity and religious integrity must be carefully preserved.

The findings further recommend strengthening cybersecurity measures to safeguard religious educational content against

unauthorized modification, duplication, loss, or misuse within virtual environments. Secure digital infrastructure is essential for maintaining the authenticity and credibility of Islamic educational resources. In addition, universities should continuously monitor emerging technological developments and integrate appropriate innovations into both scientific and humanities disciplines. By embracing immersive technologies while maintaining ethical and religious standards, Islamic higher education institutions can modernize their teaching practices, enhance student engagement, and ensure that Islamic sciences remain aligned with contemporary educational innovation rather than being marginalized in the rapidly evolving digital landscape.

Author Contributions

Conceptualization: S.Z. & M.A.; Data curation: S.Z. & M.A.; Formal analysis: S.Z. & M.A.; Funding acquisition: S.Z. & M.A.; Investigation: S.Z. & M.A.; Methodology: S.Z. & M.A.; Project administration: S.Z. & M.A.; Resources: S.Z. & M.A.; Software: S.Z. & M.A.; Supervision: S.Z. & M.A.; Validation: S.Z. & M.A.; Visualization: S.Z. & M.A.; Writing – original draft: S.Z. & M.A.; Writing – review & editing: S.Z. & M.A. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement

Informed consent was not required for this study.

Data Availability Statement

The data presented in this study are available upon request from the corresponding author due to privacy and ethical restrictions.

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Conflicts of Interest

The authors declare no conflicts of interest.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT and PaperPal to improve the clarity of the language and readability of the article. After using these tools, the authors reviewed and edited the content as needed and took full responsibility for the content of the published article.

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