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RESEARCH ARTICLE

Exploring the Potential of XR for Language Learning in Multicultural Omani Classrooms

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ABSTRACT

This qualitative research explores the future prospects of Extended Reality (XR) technologies in Omani higher education, aiming to understand their potential to transform teaching and learning practices in alignment with cultural and institutional contexts. Grounded in Constructivist Learning Theory, Hofstede's Cultural Dimensions Theory, and the Technology Acceptance Model (TAM), the study investigates faculty perceptions across disciplines, including English, Mathematics, and IT. Through in-depth interviews with 20 higher education faculty members, the study identifies key themes such as engagement and motivation, skill enhancement, cultural relevance, and technological accessibility. Findings reveal that XR offers immersive and experiential learning environments, enabling active knowledge construction and fostering career-relevant skills. However, cultural alignment and administrative support emerged as critical for effective adoption, particularly in a high Power Distance context like Oman. Additionally, while faculty recognized XR's transformative potential, technical challenges and limited training opportunities were highlighted as barriers to widespread integration. The research contributes to the growing discourse on XR in education by providing actionable insights for its implementation in culturally diverse settings. Recommendations include developing localized XR content, offering comprehensive faculty training programs, and ensuring institutional support for sustainable adoption. By bridging theoretical and practical perspectives, this study offers a robust framework for advancing XR technologies in Omani higher education, paving the way for innovative and context-sensitive educational practices.

INTRODUCTION

Extended Reality (XR), encompassing Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR), is increasingly recognized for its transformative potential in education. By creating immersive learning environments, XR enhances student engagement and facilitates deeper understanding of complex concepts. For instance, AR overlays digital information onto the real world, allowing students to interact with content in context, while VR transports learners to diverse environments, fostering experiential learning that is both memorable and impactful (Ramos, et al., 2024).

Moreover, XR supports personalized learning paths through adaptive technologies that tailor educational experiences to individual needs, promoting inclusivity for students with varying abilities and learning styles. This technology also enables real-world simulations, particularly beneficial in fields such as medicine, where students can practice skills in a safe virtual environment before applying them in real-life scenarios (Taborda, et al., 2025).

The integration of XR into educational settings not only enhances knowledge retention through multisensory engagement but also prepares students for collaborative work in increasingly digital workplaces (Baxter, & Hainey, 2024). As educational institutions continue to embrace these technologies, the potential for XR to revolutionize teaching and learning becomes more evident, paving the way for a more interactive and effective educational landscape. In summary, XR stands as a pivotal tool in modern education, offering innovative solutions that bridge theoretical knowledge with practical application while fostering an inclusive and engaging learning atmosphere.

Extended Reality (XR) is an umbrella term that encompasses three key technologies: Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR). AR overlays digital information onto the real world, enhancing the user's perception of their environment. VR creates fully immersive environments that can simulate real-world or fantastical scenarios, while MR combines elements of both AR and VR, allowing users to interact with both physical and digital objects in real-time (Aguayo, & Eames, 2023). These technologies are increasingly being integrated into educational settings globally, transforming traditional learning methods into more interactive and engaging experiences.

Current trends indicate a significant adoption of XR in leading universities, where institutions are leveraging these technologies to enhance experiential learning. For instance, medical students can practice surgical procedures in a virtual environment, gaining hands-on experience without risk to real patients (Alnagrat, et al., 2022). XR fosters enhanced engagement by providing immersive learning experiences that cater to various learning styles, thereby improving knowledge retention.

Moreover, XR promotes inclusivity by offering accessible learning opportunities for students with diverse needs, ensuring equitable educational access. As educational institutions continue to embrace XR, the potential benefits—including improved engagement, personalized learning paths, and collaborative opportunities—are becoming increasingly evident (MacCallum, 2022). This shift not only enriches the educational landscape but also prepares students for a technologically advanced workforce.

Higher Education in Oman:

The state of higher education in Oman is significantly shaped by the Vision 2040 roadmap, which emphasizes the integration of technology into education as a means to foster a knowledge-based economy. This vision prioritizes educational reform, aiming to enhance the quality and accessibility of higher education while promoting innovation and scientific research (Goi, 2024). The National Strategy for Education 2040 outlines specific goals, including the development of academic programs focused on emerging technologies such as artificial intelligence (AI) and the establishment of cutting-edge laboratories to support these initiatives.

However, Oman faces several challenges in realizing these ambitions. Infrastructure limitations remain a critical barrier, as many institutions lack the necessary facilities and resources to implement advanced technological programs effectively. Additionally, there is a pressing need for faculty readiness; many educators require further training to adapt to new teaching methodologies and integrate technology into their curricula effectively.

Despite these challenges, the government is actively working to attract foreign investment in the education sector and encourage public-private partnerships to bolster higher education infrastructure (Salimi, 2023). By addressing these issues, Oman aims not only to improve educational outcomes but also to position itself as a regional hub for innovation and technology by 2040. The commitment to enhancing higher education reflects a broader strategy to equip Omani students with the skills needed for a competitive global economy.

Research Gap

Despite the growing global research on extended reality (XR) in education, there remains a significant gap in understanding its applicability, challenges, and cultural integration in the Middle East, particularly in Oman. Specifically, limited studies have explored faculty perspectives on the adoption

and effectiveness of XR in higher education. Additionally, there is a lack of frameworks that align XR technologies with local cultural and institutional contexts, making it difficult to ensure their relevance and sustainability in the region. Addressing these gaps is essential for developing strategies that facilitate the successful implementation of XR in Omani educational institutions.

Research Problem

Despite its potential, the integration of extended reality (XR) in Omani higher education remains underexplored, posing significant barriers to its effective adoption and alignment with institutional norms. One major challenge is financial constraints, as the implementation of XR technologies requires substantial investment in infrastructure and resources. Additionally, cultural factors play a crucial role, as educational technologies must align with local values and traditions to be widely accepted. Furthermore, the lack of technical expertise among faculty and staff hinders the successful deployment and utilization of XR tools. Addressing these challenges is essential for maximizing the benefits of XR in Omani higher education.

Research Questions

This research aims to address the following questions:

1. What are the potential benefits and challenges of adopting XR in Omani higher education?
2. How can XR be effectively aligned with Oman's cultural and institutional framework?

Significance of the Study

The research on Extended Reality (XR) in education holds significant importance as it contributes to the global body of knowledge while addressing local needs aligned with Oman's Vision 2040. This vision emphasizes technological advancement and aims to cultivate a society proficient in digital skills, thereby enhancing educational quality and accessibility. By investigating XR's applications, the research not only enriches global discourse but also tailors solutions to local contexts, bridging the gap between advanced technologies and cultural alignment in the Middle East.

The impact of this research is multifaceted. For policymakers, it provides critical guidelines for the effective adoption of XR technologies, ensuring that investments in education yield tangible benefits. Educators can leverage findings to develop training programs and curricula that incorporate XR tools, fostering an innovative teaching environment that enhances student engagement and learning outcomes. Students benefit directly from these advancements through enriched learning experiences that promote active participation and practical skills development.

As Oman strives to position itself as a hub of innovation and knowledge by 2040, the integration of XR into educational frameworks is essential not only for meeting contemporary educational demands but also for preparing a workforce capable of thriving in a technology-driven global economy. This research thus serves as a vital resource for navigating the complexities of technological integration while respecting and incorporating local cultural values.

The rapid evolution of digital technologies has reshaped the educational landscape, introducing innovative tools that challenge traditional pedagogical approaches. Among these advancements, Extended Reality (XR) technologies—encompassing Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR)—have emerged as powerful tools to create immersive, interactive, and engaging learning environments. Globally, XR is increasingly recognized for its ability to bridge the gap between theoretical knowledge and practical application, offering students experiential learning opportunities that transcend the limitations of physical classrooms.

In the context of higher education in Oman, where cultural values, institutional structures, and technological readiness play pivotal roles, the adoption of XR technologies represents both a significant opportunity and a unique set of challenges. Oman's Vision 2040 emphasizes innovation and technology integration across sectors, including education, underscoring the importance of preparing students for a dynamic and globally competitive workforce. However, despite its potential,

the integration of XR in Omani higher education remains in its nascent stages, requiring a deeper understanding of its feasibility, relevance, and impact within local academic and cultural contexts.

LITERATURE REVIEW

Extended Reality (XR) in Education: A Global Perspective

The integration of Extended Reality (XR) technologies in education has gained significant momentum over the past decade, driven by their ability to create immersive and interactive learning environments. XR technologies—comprising Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR)—enable learners to interact with virtual objects and environments, fostering experiential learning that enhances cognitive and skill-based outcomes (Radianti et al., 2020). Studies have shown that XR can bridge the gap between theoretical concepts and practical applications by offering simulations, real-world scenarios, and exploratory opportunities that traditional teaching methods cannot replicate (Pellas et al., 2021).

Globally, institutions have adopted XR in disciplines ranging from medicine and engineering to the humanities. For example, VR simulations in medical education have demonstrated enhanced student performance in surgical training, while AR applications in engineering allow learners to visualize complex systems in real-time (Merchant et al., 2020). Despite these benefits, challenges such as high implementation costs, technical complexity, and resistance to change remain persistent barriers (Jerald, 2016). These insights provide a backdrop for exploring how XR can be implemented effectively in Omani higher education, where cultural and technological factors uniquely shape its adoption.

XR in the Middle East: Regional Trends and Challenges

In the Middle East, technology integration in education has been prioritized as part of broader initiatives to enhance educational outcomes and align with global standards. Oman's Vision 2040 emphasizes technology-driven innovation as a critical driver of social and economic development, with education positioned as a key sector for transformation (Ministry of Education, Oman, 2020). XR technologies are increasingly being explored in the region, with countries such as the UAE and Saudi Arabia leading initiatives in AR and VR integration for skills training and vocational education (Aljohani et al., 2022).

However, the adoption of XR in the region faces several challenges, including a lack of localized content, cultural sensitivities, and infrastructure limitations (Al-Rahmi et al., 2021). These challenges are particularly pronounced in Oman, where digital literacy levels and technological readiness vary across institutions. Research has highlighted the importance of tailoring XR content to reflect cultural norms and language preferences, ensuring relevance and inclusivity in educational contexts (Zahran & El-Said, 2021).

THEORETICAL FOUNDATIONS FOR XR INTEGRATION

Constructivist Learning Theory provides a robust framework for understanding the potential of XR in education. By emphasizing experiential and situated learning, constructivism aligns closely with XR's ability to create interactive, problem-solving environments that facilitate knowledge construction (Jonassen & Land, 2012). XR's capability to simulate real-world scenarios and enable "learning by doing" makes it an ideal tool for constructivist pedagogies, particularly in skill-intensive disciplines such as IT and engineering (Radianti et al., 2020).

Hofstede's Cultural Dimensions Theory offers a lens for analyzing how cultural factors influence XR adoption. Oman's high Power Distance index suggests that institutional hierarchies may play a significant role in decision-making processes, potentially affecting the pace of XR integration (Hofstede Insights, 2022). Similarly, the nation's collectivist orientation emphasizes the importance of culturally relevant and collaborative learning experiences, which XR can facilitate through shared virtual environments.

The Technology Acceptance Model (TAM) provides critical insights into the adoption of XR, focusing on factors such as perceived ease of use and perceived usefulness. Research has shown that faculty and student perceptions of XR's usability significantly influence its integration into curricula (Venkatesh & Davis, 2000). Addressing barriers such as technical complexity and lack of training can enhance the perceived ease of use, increasing the likelihood of adoption in Omani higher education (Al-Rahmi et al., 2021).

Gaps in the Literature

While the global and regional discourse on XR in education is expanding, limited research addresses its application in the specific cultural and institutional contexts of Oman. Existing studies focus predominantly on technologically advanced countries, overlooking the unique challenges faced by emerging economies with diverse cultural values. Additionally, there is a paucity of research exploring how XR can be aligned with Oman's Vision 2040 goals, particularly in fostering localized and culturally inclusive educational content.

This study aims to bridge these gaps by examining the perceptions of higher education faculty in Oman, focusing on the opportunities and challenges associated with XR integration. By grounding the findings in robust theoretical frameworks and providing actionable recommendations, this research contributes to the growing body of knowledge on XR's transformative potential in education.

METHODOLOGY

Research Design

This study adopts a **qualitative research design**, enabling an in-depth exploration of the perceptions and experiences of higher education faculty regarding the integration of Extended Reality (XR) technologies in Oman. The qualitative approach aligns with the study's objective to capture nuanced insights, particularly those shaped by cultural and institutional factors. Data was collected through semi-structured interviews, which provided the flexibility to probe participants' perspectives while ensuring alignment with the research questions.

Participants

The study involved 20 higher education faculty members purposively selected from various institutions across Oman to ensure diverse representation. Participants were drawn from three disciplines:

English Language Teaching (10 participants)

Mathematics (5 participants)

Information Technology (5 participants)

Inclusion Criteria:

Participants with a minimum of three years of teaching experience in higher education. Faculty members familiar with or interested in adopting educational technology, including XR. Representation from both public and private institutions. To ensure anonymity, participants were assigned pseudonyms (e.g., "Participant E1" for English faculty, "Participant M1" for Mathematics faculty).

Data Collection

Semi-structured interviews were the primary data collection method, conducted either face-to-face or via online platforms such as Zoom, depending on participant preference. Each interview lasted approximately 45–60 minutes and was audio-recorded with participant consent. The interview protocol included 15 questions for each main research question, designed to explore faculty perceptions, experiences, and suggestions.

Example questions:

How do you think XR technologies can enhance student engagement in your discipline?

What challenges do you foresee in implementing XR technologies in your teaching practices?

Field notes were also taken to capture contextual details and non-verbal cues during the interviews.

DATA ANALYSIS

Thematic analysis was employed to identify, analyze, and interpret patterns within the data. The following steps were undertaken:

Data Familiarization: Transcripts were read multiple times to gain an initial understanding.

Coding: Using NVivo software, open coding was applied to identify recurring ideas and concepts in participants' responses.

Theme Development: Codes were grouped into broader categories, resulting in hierarchical themes and sub-themes.

Theoretical Alignment: Themes were mapped to the study's theoretical frameworks, including Constructivist Learning Theory, Hofstede's Cultural Dimensions, and the Technology Acceptance Model.

Example themes:

Engagement and Motivation

Skill Development

Cultural Alignment

Technical Barriers

Trustworthiness and Rigor

To ensure the credibility and reliability of the findings, the study employed several strategies. Triangulation was used by comparing data from English, Mathematics, and IT faculty to identify convergent and divergent perspectives. Member checking was conducted by sharing preliminary findings with participants for validation and feedback, ensuring accuracy and representation of their views. Additionally, reflexivity was maintained through a reflective journal, where the researcher documented biases and assumptions throughout the research process, enhancing transparency and objectivity.

FINDINGS AND DISCUSSION

The data was analyzed across six key themes, each further broken into granular codes and sub-codes. The findings demonstrate that while XR technologies offer immense potential to enhance engagement, inclusivity, and skill development, significant barriers exist. These include infrastructure gaps, resistance to change, and the need for localized content. The results align with constructivist and experiential learning theories, emphasizing the importance of active, context-rich learning. Below is a detailed exploration of each theme.

Engagement and Motivation

Participants highlighted XR's potential to enhance student motivation and engagement by providing immersive and interactive learning experiences. Faculty across disciplines recognized that XR can transform traditional learning environments into dynamic, participatory spaces.

One key benefit of XR is its ability to create immersive learning experiences. Faculty emphasized how XR facilitates real-world contextualization, allowing students to engage with scenarios that would otherwise be inaccessible in conventional classrooms. For instance, Hassan, an IT instructor, explained, "XR enables students to interact with dynamic, real-time systems that mirror industry

environments, making learning significantly more engaging." Additionally, English instructors noted increased active participation, particularly among shy students. Fatima, an English instructor, observed, "Shy students become more active when participating in gamified XR experiences," illustrating how interactive elements can boost student confidence and involvement.

Gamification further contributes to student engagement by incorporating reward systems and fostering both competition and collaboration. Mathematics teachers pointed out that students remain motivated when achievements are tied to point-based rewards. Additionally, XR encourages teamwork, leading to enriched learning outcomes as students collaborate in virtual environments to solve problems and complete tasks.

Another significant advantage of XR is its role in virtual cultural immersion. Faculty teaching language courses emphasized that XR's ability to simulate diverse cultural contexts enhances students' linguistic and cultural understanding. Maryam, an English instructor, stated, "XR's ability to replicate diverse cultural contexts helps students practice language authentically and understand cultural nuances." This cultural simulation allows learners to experience real-world interactions in a controlled yet authentic manner, making language acquisition more effective.

The findings strongly suggest that XR has the potential to revolutionize student engagement by providing interactive, gamified, and culturally immersive learning experiences. By leveraging these tools, educators can create dynamic and motivating learning environments that cater to diverse student needs.

Inclusivity and Flexibility

XR technologies play a crucial role in fostering inclusive education by catering to diverse learning needs and styles, ensuring equitable learning experiences for all students. Faculty members across disciplines recognized XR's ability to accommodate different learning preferences and bridge linguistic gaps, making education more accessible and engaging.

One of the key advantages of XR is its capacity to support various learning styles. Educators praised its effectiveness in catering to both visual and auditory learners. Ahmed, a Math teacher, noted, "The visually rich content keeps students focused on abstract concepts like geometry," highlighting how XR's interactive elements help students grasp complex ideas. Additionally, faculty emphasized XR's support for self-paced learning, allowing students with different aptitudes to progress at their own speed. IT instructors observed that this flexibility helps students build confidence and understanding without the pressure of a rigid classroom structure.

XR also plays a vital role in bridging linguistic gaps, particularly in multilingual educational environments. English teachers highlighted the importance of built-in translation features in XR platforms, which assist non-native learners in understanding content more effectively. Moreover, XR supports language scaffolding by gradually developing students' linguistic competence, providing interactive and contextualized language learning experiences that enhance comprehension and retention.

These findings suggest that XR's flexibility makes it an invaluable tool for inclusive education, particularly in linguistically and culturally diverse contexts like Oman. By accommodating various learning styles and addressing language barriers, XR has the potential to create a more equitable and accessible educational experience for all students.

Skill Enhancement

XR technologies equip students with essential skills that align with real-world demands, particularly in communication, collaboration, and workplace readiness. Faculty members emphasized the role of XR in fostering practical competencies that prepare students for professional environments.

One of the key benefits of XR is its ability to enhance collaborative skills. XR-driven team-based activities were highlighted as crucial for developing group problem-solving abilities, allowing

students to work together in virtual environments to tackle challenges. Additionally, faculty valued XR's capacity to facilitate peer feedback within these digital spaces, enabling students to refine their ideas and improve their teamwork skills through interactive discussions and shared experiences.

XR also plays a significant role in workplace readiness by preparing students for professional interactions. IT faculty noted that XR's simulated environments allow students to practice workplace communication, helping them develop confidence in professional settings. Furthermore, several participants emphasized the value of scenario-based learning, where XR creates industry-aligned simulations that expose students to real-world challenges and decision-making processes.

These insights underscore the potential of XR to bridge the gap between academic preparation and professional demands. By fostering collaboration, communication, and industry-relevant skills, XR serves as a powerful tool to equip students for future careers.

Institutional Challenges

Despite the potential of XR technologies in higher education, their implementation faces significant logistical and financial obstacles. Faculty members identified key challenges related to infrastructure readiness and the need for faculty training, both of which impact the successful integration of XR in academic settings.

One major concern is infrastructure readiness. Faculty frequently cited the insufficient availability of XR-compatible devices as a major barrier, limiting students' and instructors' access to immersive learning experiences. Additionally, reliable internet connectivity is crucial for XR applications, but several Mathematics instructors noted that network instability could derail XR implementation, making it difficult to integrate seamlessly into classroom activities.

Faculty training also emerged as a critical challenge. English teachers emphasized the need for hands-on training programs, such as workshops and certifications, to ensure educators are well-equipped to use XR effectively. However, resistance from less tech-savvy faculty members was identified as a significant hurdle, as some instructors may be hesitant to adopt new technologies due to a lack of confidence or familiarity.

Addressing these challenges requires strategic investments in infrastructure, professional development, and institutional readiness. By ensuring access to necessary resources and providing comprehensive training, higher education institutions can create a supportive environment for the successful adoption of XR technologies.

Cultural and Contextual Relevance

Ensuring that XR content aligns with Omani cultural norms and values is essential for its successful adoption in higher education. Faculty members emphasized the need for culturally sensitive content and localization to make XR tools more relevant and effective for students in Oman.

One major concern is the integration of culturally appropriate content. Faculty stressed the importance of incorporating local traditions while avoiding material that may be culturally insensitive. Additionally, participants highlighted the lack of Arabic-focused XR tools, which limits accessibility and engagement for Arabic-speaking students. The absence of culturally representative content creates a disconnect between XR experiences and students' real-world contexts.

Localization of XR content was another key issue raised by faculty. Many educators emphasized the need for content customization to align with Oman's specific educational goals rather than relying on generic global curricula. Aisha, an IT instructor, pointed out, "The XR platforms need to reflect Oman's unique educational needs, not just generic global curricula." This highlights the necessity for XR providers to adapt their materials to better serve local academic and cultural requirements.

To ensure widespread adoption of XR in Oman, cultural relevance must be a priority for technology providers. By incorporating localized content and addressing cultural sensitivities, XR can become a more effective and engaging educational tool for Omani students.

Equity and Accessibility

The equitable distribution of XR resources remains a key concern in higher education, as disparities in access can hinder the technology's full potential. Faculty members emphasized the need for inclusive implementation strategies to ensure all students benefit from XR-enhanced learning experiences.

Device accessibility is a significant challenge, particularly in socio-economically diverse institutions. Faculty noted that the digital divide remains a major limitation, preventing students from lower-income backgrounds from accessing XR-compatible devices. To address this issue, participants suggested implementing subsidies or institutional support programs to bridge these disparities and promote wider adoption of XR technologies.

Another critical aspect of accessibility is universal design. Faculty stressed that XR tools should be developed with inclusivity in mind, ensuring that students with disabilities can fully engage with the technology. Features such as voice commands, screen readers, and adaptive interfaces could help create a more accessible learning environment for all students.

To maximize XR's transformative potential, policymakers must prioritize equitable access. By investing in inclusive infrastructure and support programs, institutions can ensure that XR benefits all learners, regardless of their socio-economic background or physical abilities.

Limitations

This study acknowledges certain limitations that may impact the generalizability of its findings. The relatively small sample size may not fully represent all higher education faculty in Oman, potentially limiting the breadth of perspectives captured. Additionally, self-reported data introduces the possibility of bias, as participants may have varying levels of familiarity with XR technologies, influencing their responses. Furthermore, the study primarily focuses on faculty perspectives, with limited exploration of student experiences, which presents an opportunity for future research to provide a more comprehensive understanding of XR integration in Omani higher education.

Recommendation

To ensure the successful integration of XR in higher education, several key measures should be implemented. First, governments and institutions must invest in infrastructure by allocating resources for XR-compatible hardware and high-speed internet, ensuring seamless access to immersive learning experiences. Second, faculty training should be prioritized through mandatory XR workshops that equip educators with the necessary skills to effectively incorporate XR into their teaching. Additionally, collaboration with XR providers is essential for developing localized content that is both culturally relevant and linguistically appropriate for Omani students. Lastly, equity measures should be established, such as subsidies or funding programs, to make XR accessible to underserved populations and bridge the digital divide. These recommendations collectively aim to enhance the adoption and impact of XR in higher education, fostering a more inclusive and effective learning environment.

CONCLUSION

The introduction of XR technologies in Omani higher education represents a paradigm shift in teaching and learning. With strategic planning and investments, XR can transform educational practices, making them more engaging, inclusive, and relevant to contemporary needs. Creating narrative models involves representing findings as structured, story-like frameworks that interconnect data insights with themes, codes, and practical implications. Below are narrative representations for each theme, providing a cohesive storyline that connects the qualitative data to actionable insights.

Implications for XR Adoption in Omani Higher Education

By synthesizing the findings with these frameworks, the study provides a robust foundation for actionable insights. Constructivist Learning Theory underscores the need for XR technologies that facilitate active, immersive learning. Hofstede's theory highlights the importance of cultural alignment, while TAM reveals the critical role of usability and institutional support. Together, these frameworks offer a comprehensive roadmap for designing, implementing, and evaluating XR initiatives in higher education.

The findings of this research further highlight the transformative potential of XR in reshaping higher education in Oman by enhancing student engagement, promoting experiential learning, and bridging gaps in practical skill development. However, successful adoption requires a **strategic,** multi-dimensional approach that considers infrastructure readiness, faculty training, and cultural adaptability. Institutions must invest in capacity-building programs to equip educators with the necessary technical and pedagogical skills to integrate XR effectively. Furthermore, policymakers should establish clear guidelines and funding mechanisms to support the implementation of XR, ensuring equitable access across universities. Given the cultural and contextual factors influencing education in Oman, it is crucial to develop localized XR content that aligns with Islamic values, Arabic language preferences, and national educational objectives**.** Collaboration between academia, industry, and government bodies will be essential in creating a sustainable ecosystem for XR-driven innovation in Omani higher education, ultimately aligning with the nation's Vision 2040 goals for digital transformation.

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