The use of immersive technology in culture and education: A systematic literature review

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Abstract
Immersive technologies like AR and VR have brought new significant changes to the educational and cultural landscape. Still, in Indonesia, their use is still limited and has not been systematically analyzed. The objective of this research is to identify and analyze the application of immersive technology as a medium for learning and the preservation of culture through an SLR approach. Data was collected from the Publish or Perish application using the keywords "augmented reality," "virtual reality," "immersive learning," "culture," and "local language/regional dialect" within the time frame of 2015 to 2025. The results obtained demonstrate that AR/VR use enhances learning motivation and learning outcomes, enabling deeper context-based learning experiences, and makes cultural heritage more accessible, with digitization of artefacts and historical sites. AR/VR has also been applied in additional fields, including tourism and the preservation of regional languages. Overall, the findings suggest that immersive technology holds strong potential as both an educational and cultural medium, supporting interactive learning and the safeguarding of cultural heritage in the digital age.

1. Introduction

Digital technologies developed within the past two decades have revolutionized the way humans interact, learn, and preserve culture. This transformation into a digital age and the 4.0 industrial revolution has placed greater demands on education and cultural systems to adopt new approaches that are more interactive and contextual in nature (Xie et al., 2019; Yeh et al., 2022). However, several studies have documented that traditional textual and passive learning is still dominant in most educational institutions across the world (Shadiev et al., 2020). This leads to shortcomings in mastering 21st-century skills such as critical thinking, creativity, and cross-cultural communication skills. In the global context, another issue arises in the cultural sector, where most cultural heritage is threatened with extinction due to the lack of preservation strategies relevant to the digital era (D'Agnano et al., 2015; Han et al., 2019).

The problem gets even worse if cross-cultural learning and cultural heritage preservation are performed conventionally with no support for immersive technologies. Students in language and cultural learning very often feel it challenging to understand abstract social contexts and culture values due to their limited real-world experience (Shadiev et al., 2020; Xie et al., 2019). On the other hand, cultural preservations in museums or historical sites are not very inclusive with regard to the wider community in terms of people with visual impairments (D'Agnano et al., 2015; Kyriakou & Hermon, 2019). Similar problems can also be found in tourism and higher education, where young people's interest in local cultural heritage seems to be declining due to a lack of attractive and interactive media (Han et al., 2019; Yeh et al., 2022). Therefore, technological innovations are indeed necessary to bridge the gap between real-world experience and digital learning.

Different studies have shown solutions by applying immersive technologies like AR and VR within education and cultural preservation. In the context of language and cultural learning, the integration of VR has been seen to increase engagement, motivation, and cross-cultural understanding because of immersive and authentic learning experiences. In cultural preservation, both AR and VR were used to recreate artifacts and historical sites in interactive digital forms accessible to various groups of people, including people with disabilities. In addition, during cultural tourism, the use of AR Smart Glasses increases visitor interaction with cultural objects in real-time, enriching the educational tourism experience. Other studies reveal that the creation of VR content by students initiates meaningful and contextual learning in local culture.

Immersive technology has a number of advantages that make it potentially applicable in various fields. Indeed, AR and VR are capable of creating interactive, contextual, and multisensory learning environments which not only enhance cognition but also the affections and social skills of learners (Xie et al., 2019; Yeh et al., 2022). The technology makes users feel like they are really at a cultural site or a museum through authentic virtual exploration in a cultural context (D'Agnano et al., 2015; Han et al., 2019). Further, AR/VR was also tested

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to enhance access and inclusivity for groups with physical constraints (Kyriakou & Hermon, 2019) and to support collaborative and reflective learning strategies promoting cross-cultural awareness (Shadiev et al., 2020). These advantages make AR and VR an important innovation to support education, culture, and sustainable tourism.

Although much literature has reviewed and discussed the use of immersive technologies within different contexts, few have systematically summarized trends, benefits, and challenges relative to applying augmented and virtual reality in different fields for learning and cultural preservation. This article was, therefore, compiled using a Systematic Literature Review approach in an attempt to identify patterns of application of immersive technology (AR/VR), pedagogical benefits, and contribution to cultural preservation. Based on the background presented, this study seeks to answer the following four main questions:

a. RQ 1: How is immersive AR/VR technology applied as a medium in learning and/or to help students learn?
b. RQ 2: How is immersive AR/VR technology applied as a medium in preserving culture or cultural heritage?
c. RQ 3: How is immersive AR/VR technology applied in other fields?
d. RQ 4: How is AR/VR applied as an educational medium while also preserving culture?
e. RQ 5: How are other media applied as educational tools and/or for preserving culture?

2. Method

In this respect, the study method employed is SLR, which is a means to identify, synthesize, and conclude prior research that is relevant to the RQ of the author or the core theme of interest for the author (Kitchenham, 2007). In the context of this research, the SLR method is chosen to comprehensively investigate various studies discussing AR and VR immersive technology usage within the culture and education sectors in terms of their implementation, impact, and potential in bolstering cultural preservation and the development of interactive and contextual learning media The SLR method will be applied in this study to provide a conceptual overview of how AR/VR technology is used and described in scientific literature and to what extent it contributes to fostering learning innovation and cultural preservation in the modern era. This process, according to Kitchenham (2007), helps in highlighting the gaps in previous studies to propose the future directions of research.

The stages in implementing the SLR method in this research were systematically carried out to make sure the results obtained would be valid. The first stage the author conducted was problem formulation, where general phenomena in the education and culture fields were observed and studied until the determination of the main topic was found, namely immersive technology as a medium for learning and cultural preservation. Then, the author developed keywords or words which in English are commonly referred to as 'search strings' and translated all these ideas into several primary keywords: Augmented Reality (AR), Virtual Reality (VR), immersive learning, culture/cultural, and local language/regional dialect. The next step is data collection by using the application Publish or Perish to find relevant journals based on keywords. When the database has been compiled, the author formulated RQ to align the study's focus with the context of the reviewed journals. The author then screened the data to filter the articles that had been found and ensure their suitability with the predetermined inclusion and exclusion criteria. After that, they entered the data elimination stage, which was the final selection process to sort out articles that were truly relevant and would be reviewed. The final stage carried out by the author was analysis, in which they read, examined, and reviewed the selected articles to identify the findings and products of previous studies related to the use of immersive technology in the fields of culture and education. The inclusion and exclusion criteria can be seen in Table 1.

Table 1. Table Inclusion and Exclusion

CRITERIATION	INCLUSION	EXCLUSION
LANGUAGE	English	Non-English
TOPIC	Specific to the Research Topic	Non-Specific Topic
KEYWORD	Relevant to the Research Keyword	Non-Keyword/Irrelevant
PUBLICATION TYPE	Scientific Journal Article	Non-article (Book, Thesis, Dissertation)
PUBLICATION YEAR	2015-2025	Under 2015

These criteria were applied in the process of selecting articles in the screening and other stages. In the process of selecting articles, the authors followed the PRISMA guidelines. The PRISMA guidelines are a useful method for ensuring that all research questions mentioned can achieve the objectives set by the author beforehand (Page et al., 2021). The PRISMA guidelines work through three main stages: identification, screening, and determining which articles to review. For transparency regarding these three main stages, the author has created a PRISMA flowchart, as shown in Figure 1.

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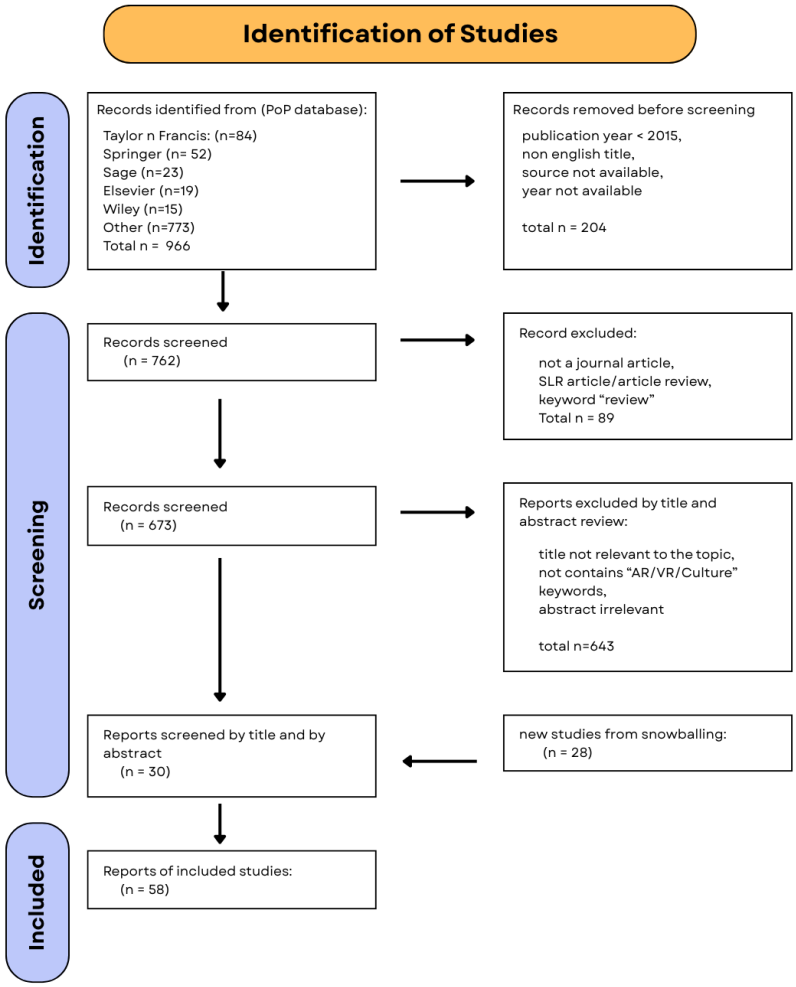

Figure 1. PRISMA flow

2.1. Identification

At this stage, the author collected a database of articles using the Publish or Perish (PoP) application on September 21, 2025. The author selected articles that did not meet the criteria. Previously, the author collected articles from PoP using the keywords "augmented reality" OR AR OR "immersive learning" AND culture AND "Local Language" OR "Regional Dialect" with a time range from 2015 to 2025. A total of 966 articles were collected. There were 204 articles that did not meet the criteria, such as those written in languages other than English, published before 2015, and articles whose publication year was unknown and whose sources could not be detected.

2.2. Screening

In this second stage, the author reselected journals that did not meet the search criteria. There were 89 articles that did not meet the inclusion criteria, such as: not empirical journal articles, SLR articles/review articles, and articles with the keyword "review" in the title. After removing 89 articles, the author began reviewing the remaining articles. There were 762 articles remaining. Information about the publishers of these articles is provided in Table 2. The author reviewed the titles and abstracts of these articles. After review, the author found that many articles still did not meet the inclusion criteria. There were 643 articles with titles that were not relevant to the topic, did not have the keywords AR/VR/culture, and had abstracts that were not relevant to the topic. After this process, only 30 articles remained. This number did not meet the minimum target set by the author. Therefore, the author conducted snowballing in an effort to add related articles. The result of snowballing was 28 articles.

2.3. Included

At this final stage, researchers can review all of the previously selected articles. A total of 58 articles were selected for inclusion in the study. Next, the findings of these articles will be identified, and the results of the review conclusions will be presented in this article.

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Table 2. Publisher Identification

Publisher	Amount
Taylor & Francis	74
Sage	22
Springer	52
Wiley	13
IEEE	10
Elsevier	19
Emerald	17
Eric	14
JSTOR	5
Frontiers	6
Inder Science	2
MDPI	15
MIT	n/a
ACNT	n/a
Oxford	n/a
Others	499
Blank	14
Total	762

The data collected from Publish or Perish is then exported into BibText format. Researchers import the BibText file into Biblioshiny (Bibliometrix) to view graphs of the literature search results that they have gone through. Before viewing the available graphs, researchers go through the process of installing Bibliometrix on the R Gui application. The results of the graph in Figure 2 show that the development of research related to the topic chosen by researchers is mostly in the 2023-2025 range, with a total of 120+ research articles. The results of this process are shown in the graph in Figure 2.

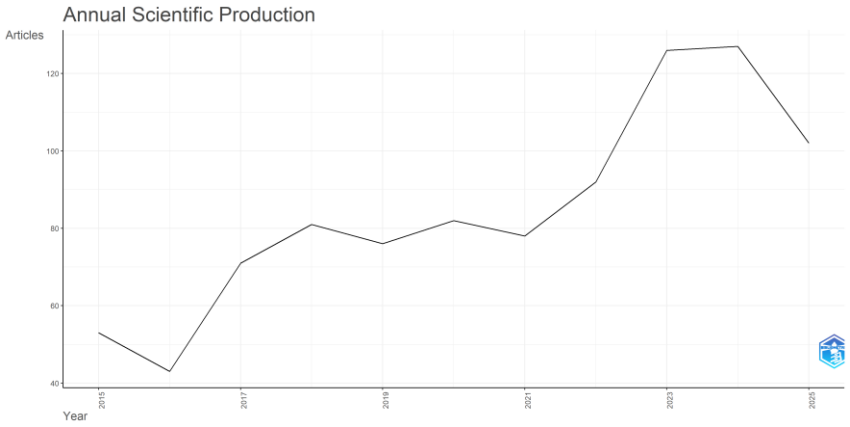

Figure 2. Graph of Annual Scientific Production on Biblioshiny Application

3. Results and Discussion

3.1. Result

The results of this systematic review show that the application of immersive Augmented Reality (AR) and Virtual Reality (VR) technologies has grown rapidly in various fields, especially in education and cultural preservation. Of the over 30 reviewed articles, most studies evidence immersive technologies as a means to potentially enhance contextual, interactive, and real-world learning experiences. These studies also reveal that AR/VR acts not only as a visualization tool but also as a medium, which can create multisensory interactions between the user and the digital objects, thus enhancing the learners' motivation and increasing their engagement with learning (Hasdin et al., 2025).

More specifically, the studies in the framework of cultural preservation, AR/VR plays an important role in digitizing ancient artifacts, historical sites, and manuscripts, thus making them accessible to a wider audience (Argyriou et al., 2020; Panou et al., 2018; Pedersen et al., 2017). This technology contributes to enhancing museology, student learning, and the learning of the general public by providing a new way of investigating the historical and aesthetic aspects of cultural heritage through authentic virtual experiences (Jung et al., 2020). Studies like those stress the benefits of making culture more accessible through AR/VR for people with disabilities, including audio-tactile systems and the dissemination of information through interactive 3D models (Kyriakou & Hermon., 2019; D'Agnano et al., 2015).

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3.2. Discussion

3.2.1. RQ1-The Application of Immersive Technology as a Learning Medium

Research proves that AR/VR has immense positive effects on increasing student motivation, understanding, and learning outcomes. Such studies as Chin & Wang (2021) point to significant benefits in terms of AR-based tour learning systems with respect to students' learning performance and interest. At the AR media usage in science learning at vocational schools improves students' cognitive learning outcomes in comparison with PowerPoint usage (Irfansyah., 2023). Moreover, other findings confirm AR's ability to increase students' interest in science, engineering, technology, and mathematics due to creating inspiring experiences in learning (Hsu et al., 2017). The said results indicate that AR/VR has the ability to create effective, enjoyable contextual experiential learning. Articles found and responding to RQ1 are presented in Table 3 below.

Table 3. Article of The Application of Immersive Technology as a Learning Medium

Ref	Findings
(Prabowo., 2025)	This study shows that learning methods such as reading books and lectures by teachers are considered less interesting. This journal also discusses challenges such as: limitations in students' digital literacy, uneven infrastructure, and others.
(Hasdin et al., 2025)	The Yojo in The Kaili Land educational game based on Augmented Reality, developed in accordance with the Merdeka Curriculum, has been proven to increase student engagement and facilitate understanding of Pancasila values.
(Draxler et al., 2020)	This article shows that there is no significant improvement in grammar learning skills with AR-based media. However, qualitative results show that participants are enthusiastic about using AR media in their learning.
(Mcarthur, 2017)	This study developed a narrative-based AR application to assist non-native kanji learners, with two implementation methods (marker-based and RFID), and the results showed that Storytelling Kanji was able to increase learning interest not only in the characters, but also in their cultural and historical contexts, even though gamification features had not yet been implemented.
(Ahmat Razi & Jamiat., 2023)	AR Picture Book has been proven to increase children's intrinsic motivation, enthusiasm, and learning outcomes, with higher post-test scores than the control group; children also enjoy learning science through AR, although the correlation between happiness and achievement is positive but weak.
(Cahyono, 2020)	Participants in Pekara Japa in the Dhelikan game, which is integrated with Javanese culture and Pancasila values, experienced better character development than non-participants, so it can be concluded that this media is effective in fostering the values of honesty, discipline, responsibility, and cooperation.
(Putra et al., 2022)	The AR-based virtual book product is considered highly suitable as a learning medium, with 95% validation from media experts and 91% from subject matter experts. Furthermore, trial results indicate that this medium is effective in helping students understand Covid-19 prevention in a more interactive and engaging manner.
(Supriyadi et al., 2021)	The Android-based AR application for Lontara script recognition has been proven effective as a medium for learning local culture; markers can be detected well at a distance of 30–69 cm, and 3D visuals, audio, and writing animations make learning more interactive. It can be used without the internet and is capable of increasing the interest of the younger generation in preserving the Lontara script.
(Syahidi, 2021)	BandoAR has no problems detecting text fonts or issues with the background color of the writing, as long as the text and background colors are contrasting. Suboptimal results will be detected if the background of the writing is dark and the text is too small.
(Gonizzi Barsanti et al., 2015)	Researchers noted that through the use of VR, museum visitors can experience interaction with the artifacts on display. Visitors can translate hieroglyphs directly through an interactive interface. However, the use of VR causes dizziness and has limitations, making it difficult for visitors to read small text due to the low resolution of the Oculus Rift DK2.
(Bedewy et al., 2021)	This study shows that experimenting with architectural models through GeoGebra, AR, and 3D printing can help students understand mathematical concepts visually, contextually, and creatively. In addition, this study helps them see the relationship between architectural forms and geometric concepts, an example of which is the Dendera temple model.
(Cheng, 2017)	This study provides three main survey points, namely: cognitive load, motivation, and attitude. The survey results explain that students feel a low level of cognitive load, strong motivation (especially attention), and a positive attitude towards AR books
(Cheng & Tsai, 2020)	The higher the students' confidence and motivational strategies, the stronger the immersion they will feel, for example, by paying more attention to virtual content and expressing more emotional attachment to virtual learning activities.
(Perry, 2015)	Quoted from the results of participant group discussions, students were able to engage in meaningful activities while interacting with learning devices such as Explores. Students found real-world applications for their FL2 learning. Although these applications and analyses are just beginning, the results of the trial and survey show great potential in AR that gamifies French.
(Harsanto & Rifai, 2024)	The results of this study show a significant increase in children's ability to recognize various animal names after interacting with the "Guess the Animal Picture" game. The AR feature not only strengthens their understanding of animals, but also increases their motivation and engagement in learning.

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Ref	Findings
(Siswono et al., 2024)	This research demonstrates that developing Augmented Reality (AR)–based learning media using a Science Inquiry approach is effective in enhancing early childhood science literacy. AR technology has been shown to capture children's interest and motivation by allowing them to explore abstract scientific concepts through engaging and enjoyable interactive visual experiences.
(DÜZYOL et al., 2022)	Interview findings reveal that the children were highly enthusiastic during the AR sessions, showing increased interaction with technology as well as heightened curiosity. The AR activity was carried out with all children in the control group, and the data indicates that every child described the experience as "very fun."
(Nagata et al., 2016)	Both the AR and MPNS approaches were found to be more effective than traditional instructional methods such as books, maps, or lectures. Beyond its technical success, the AR approach also demonstrated strong potential as a valuable educational resource.
(Nincarean et al., 2019)	AR technology had a positive effect on improving students' spatial visualization abilities. The results of this study enable teachers to integrate AR-based learning into their teaching process so that students can understand the rotation and transformation of interrelated objects.
(Ain et al., 2025)	The researchers created an AR application that facilitates and intensifies the learning process of food design technology courses. AR technology is suitable for use anywhere and anytime because it is easily accessible.

3.2.2. RQ2- The Application of Immersive Technology for Cultural Preservation

Several studies show how immersive technology is used to preserve and introduce cultural heritage. A study by developed the Lontar Prasi Bali Virtual Reality Museum, which aims to introduce ancient Balinese manuscripts to the younger generation (Putu et al., 2023). The results show that 84.75% of respondents strongly agree that VR is effective as a medium for cultural education. Developed an AR application for the SMB II Museum in Palembang that allows users to learn about culture without having to visit in person; post-test results showed an increase in cultural understanding from a score of 2.85 to 10 (Puspasari et al., 2021). Another study, such as D'Agnano et al (2015), introduced Tooteko, an audio-tactile-based AR system that allows visually impaired people to enjoy cultural artifacts in a multisensory way. Thus, AR/VR has proven to be effective in preserving cultural heritage while expanding public access to it. Articles found and answering RQ2 are compiled in Table 4.

Table 4. Article of The Application of Immersive Technology for Cultural Preservation

Ref	Findings
(Ariyani et al., 2022)	This study shows that the Android-based Lampung language dictionary application has successfully contributed to the maintenance and preservation of the Lampung language. However, this application has not been fully explored. The prototype used received feedback for improvement in terms of design, content, and functionality.
(Cheng et al., 2017)	The researcher used marker less AR tracking in the implementation of the project. The researcher designed an AR project that can display 3D models of historical buildings at their locations. To realize this idea, the researcher used a geo-location system and tracking sensors.
(Pedersen et al., 2017)	Tomb Seer is a holographic augmented reality application. Simply put, this application provides 3D visualizations of historical artifacts. This application has features that are a plus point, namely "stare to select," "pinch to scale," and "grab and move," so that visitors can experience its interactivity.
(Boboc et al., 2019)	Researchers developed an application called OvidAR based on mobile augmented reality (MAR). OvidAR underwent a survey process with four indicators. The highest score was obtained on the enjoyment indicator (95.88), indicating that users enjoyed the experience of using the application and found it entertaining.
(Jung et al., 2020)	The results of the assessment of 251 online participants indicate that visual design has a statistically significant positive influence on technology suitability and perceived usefulness. This article states that when using immersive media such as AR/VR, consumers will focus more on hedonistic values (experience, pleasure, etc.) than utilitarian values (efficiency, functionality, etc.).
(Kyriakou & Hermon, 2019)	The results of this study indicate that the application of AR is well accepted by environments that preserve cultural heritage, such as museums. Using smartphones mounted on Head-Mounted Displays (HMDs) and Leap Motion devices, as well as software created in Unity3D, researchers implemented an AR application that enables interaction with specific 3D models from museum collections.
(Sudrajat et al., 2024)	The results of this study show that local cultural values based on augmented reality are in line with the principles of independent curriculum, namely character development. The development of this learning model incorporates augmented reality (AR), which helps students more easily access learning materials related to local culture.
(Wang et al., 2020)	Through the use of the "HoloLens mixed reality helmet," users are able to learn about and experience Huangmei opera within a familiar setting. Researchers provided textual and visual explanations of Huangmei opera, accompanied by performances and interactive, self-directed cultural learning experiences presented realistically to HoloLens users.
(Sudipa et al., 2022)	Overall UEQ test results regarding AR application performance and user experience fell into the Good category. The user experience data also suggests that AR applications can serve as effective tools for preserving Bali's cultural heritage.
(Cheng et al., 2017)	In implementing their project, the researchers utilized markerless AR tracking. They created an AR system capable of presenting 3D representations of historical buildings at their actual locations by employing a geo-location system and tracking sensors.

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Ref	Findings
(Paliokas et al., 2020)	The study's findings indicate that the e-Tracer AR application was successfully implemented from a technical standpoint, enabling it to detect museum artifacts at distances of up to 1.5 meters through marker-based detection. A preliminary evaluation with four museum technology experts concluded that the system functions effectively, is engaging, and has the potential to improve the museum visitor experience.

3.2.3. RQ3- Application of Immersive Technology in Other Fields

In addition to education and culture, AR/VR is also applied in various other fields such as tourism and science. The Jeju View application, a VR/AR mixed media for promoting the cultural heritage of Jeju Island in Korea (Jung et al., 2020). The results from 251 participants showed that immersive experiences in AR/VR increased hedonistic value and tourist appeal. The developed an AR application for biology and anatomy learning, which was proven to improve students' understanding of laboratory material (Arslan et al., 2020). In general, these results confirm that the application of AR/VR has high flexibility to be adapted in various disciplines and industrial sectors. The articles found and answering RQ3 are compiled in Table 5.

Table 5. Article of Application of Immersive Technology in Other Fields

Ref	Findings
(Schott & Marshall, 2018)	In this study, participants mentioned that VR provides a sense of "being there" and creates an engaging environment, thereby creating a more meaningful learning experience. VR implements the concept of a situated experiential education environment (SEEE), where the audience is expected to experience education through a specific environment.
(Yuan, 2018)	The Foodie's app was created to help tourists who have difficulty reading or ordering menus in the countries they visit. After testing, researchers found that tourists could translate menu boards by scanning them with this app.
(Fajri et al., 2018)	The results of this study show that MAR apps can offer an entertaining experience, but they have the disadvantage of limited interaction with the real world. This was a disadvantage that respondents did not like about the Pokémon GO app.
(Series, 2018)	From a trial with 30 respondents, over 80% stated that the app was interesting, and 85% of respondents rated ARGOT as useful as a daily translation tool. However, the study also found that detection was sometimes unclear, especially with text that had overly spaced letters, which could cause confusion for users.

3.2.4. RQ4 - The Application of AR/VR as a Learning Medium and a Means of Preserving Culture

Several studies here integrate educational and cultural functions. That VR can improve intercultural understanding and student motivation through immersive experiences such as a "virtual walk through London" or language and culture learning (Shih's., 2015). Meanwhile, research by confirms that AR systems at cultural sites not only increase interest in learning but also strengthen understanding of the historical values of these places (Chin & Wang., 2021). The creation of AR/VR content by students increases local cultural awareness and cross-cultural communication skills (Liu et al., 2016; Sudrajat et al., 2024; Yeh et al., 2022). This confirms that AR/VR serves a dual purpose as a learning tool and a medium for cultural preservation. The articles found and answering RQ4 are compiled in Table 6.

Table 6. Article of The Application of AR/VR as a Learning Medium and a Means of Preserving Culture

Ref	Findings
(Hasbi et al., 2020)	AR-based learning media using the Think-Pair-Share model has been proven to be highly feasible and effective, with 89% validation from media experts, 95% from subject matter experts, and a student usability score of 96.91%. It is compatible with various Android devices and has the potential to increase students' interest and motivation in learning the Bugis Lontara language and letters
(Kurniawan, 2024)	The solution to low student interest in learning regional languages can be aided through the implementation of digital technology. Wordwall is one such digital technology that helps students understand Ternate regional vocabulary.
(Liu et al., 2016)	The researchers created an AR-based game, Guardians of the Mo'o, specifically designed for research on students to improve their cultural understanding, communication skills, and language development.
(Ahdhianto et al., 2025)	This study reveals that AR acts as a crucial mediator that bridges the gap between theoretical knowledge and practical application, thereby increasing students' awareness and appreciation of cultural diversity.

3.2.5. RQ5-Application of Other Media as Educational Media and/or for Cultural Preservation

Besides AR/VR, other media innovations support cultural preservation. For instance, a study conducted an open source, Web3D-based platform called ATON which allows the making of interactive digital

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applications in the service of cultural heritage preservation (Fanini et al., 2021). This technology allows collaboration amongst users across different devices without having to install anything more than what is already on the device, thus enabling easier ways to provide access to cultural artefacts for the general public. In addition, Ariyani et al (2022) reported the results of developing an Android-based digital dictionary of Lampung language as part of their attempt to preserve a regional language that is highly endangered. Such initiatives illustrate that using other types of digital media, such as mobile apps and interactive websites, also greatly contributes to maintaining local culture sustainability. Articles identified and addressing RQ5 will be compiled into Table 7.

Table 7. Article of Application of Other Media as Educational Media and/or for Cultural Preservation

Ref	Findings
(Jaelani et al., 2024)	This study shows that the game design created by the researchers has received a positive response from students. The game's design combines local cultural elements with an engaging gameplay style. This allows students to enjoy a fun, immersive experience while learning.
(Argyriou et al., 2020)	This study discusses the application of 360° immersive video used to preserve culture. This study suggests that human-guided navigation has proven to be more efficient in guiding users to find points of interest (POI) than without assistance, and that the teleportation technique is perceived as more comfortable than walking simulations.
(Rahaman et al., 2019)	The use of open-source software such as Regard3D and MeshLab proves that the quality of the resulting 3D models can support cultural preservation without the need for expensive professional equipment. In addition, participants who provided feedback validated that the product is easy to understand, functional, and effective.
(Elmunsyah et al., 2019)	The results of the pop-up book are still unsatisfactory. The 3D display that appears in the book is still not optimal and impressive. Therefore, it is necessary to revise the 3D form that will appear in the book as an added value in attracting students' interest

4. Conclusion

Based on the results of the Systematic Literature Review (SLR) that has been conducted, the author concludes that immersive technologies such as Augmented Reality (AR) and Virtual Reality (VR) have great potential in the fields of education and culture. The author observes that the application of this technology has been proven to increase motivation, conceptual understanding, and student engagement through interactive and contextual learning experiences. Meanwhile, in the field of culture, this technology also plays an important role in preserving and disseminating cultural heritage through digitized artifacts, historical sites, and regional languages, enabling the community to access cultural values.

However, from the results of the author's literature review, it was found that most of the research found still focuses on specific fields separately between the application of immersive technology in the context of education or culture alone. The author concludes that there is still little research that explicitly combines the two fields in one medium that functions as both a means of education and cultural preservation. Therefore, the author recommends that future research develop more immersive technology-based learning media that integrate cultural content as part of the educational process. The development of such media can take the form of culture-themed AR books, interactive virtual museum tours, or other AR/VR-based digital media. It is hoped that this will make learning about culture more interesting, contextual, and relevant to technological developments, so that cultural values are not easily forgotten amid the tide of global digitalization.

Author Contributions

All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

Data Availability

The datasets generated during and/ or analysed during the current study are available from the corresponding author on reasonable request.

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Declaration on AI Use

The authors declare that no artificial intelligence (AI) or AI-assisted tools were used in the preparation of this manuscript.

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