

Assessing Students' Educational Needs for Virtual Cultural Exhibitions: A Case Study of South Sumatran Local Wisdom Integration via Artsteps in High School History Learning

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ABSTRACT

The integration of local wisdom in digital learning is essential to preserve cultural identity among younger generations. However, history education in Indonesian high schools often lacks engaging and contextual media, resulting in low student interest and weak cultural attachment. This study investigates the educational needs of high school students for virtual cultural exhibitions incorporating South Sumatra's local wisdom through the Artsteps platform. This preliminary study employed a mixed-method exploratory design involving 128 students from SMA LTI IGM Palembang. Data were collected through validated questionnaires comprising Likert-scale and open-ended items. Quantitative data were analyzed using descriptive statistics, while qualitative responses underwent thematic analysis. Findings reveal that 87% of students expressed strong needs for technology-based, flexible, and interactive learning media. YouTube (79.7%) and historical simulations (66.4%) were the most frequently used, but virtual tours were rarely accessed. Students showed high interest in features such as interactive quizzes (68%), traditional music backgrounds (68.8%), and 3D visualizations (62.5%). Local cultural elements most favored included historical figures (68.8%) and culinary traditions (68%). The results underscore the urgent need for immersive and culturally relevant learning innovations. Artsteps-based virtual exhibitions align well with students' digital preferences and can foster deeper engagement with local history. The findings provide a strong foundation for developing virtual learning media that support cultural education and enhance historical understanding.

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1. INTRODUCTION

Indonesia is widely recognized for its rich cultural diversity, reflected in the persistence of local wisdom traditions across its many regions. As an archipelagic nation composed of hundreds of ethnic groups, Indonesia maintains a wide range of customs, traditional arts, architectural forms, and social values that continue to shape community life. South Sumatra, one of the provinces located on the island of Sumatra, exemplifies this cultural wealth. Administratively consisting of 13 regencies and 4 cities, the province is known for its distinctive limas traditional houses, songket woven fabrics, traditional dances, culinary heritage, folklore, and customary institutions that remain embedded in local society. These cultural assets constitute not only historical heritage but also living traditions that contribute to regional and national identity. However, the rapid acceleration of globalization and digitalization has significantly influenced the cultural orientation of younger generations, who are increasingly exposed to global popular culture through digital media. This shift is exacerbated by educational approaches that are often insufficiently contextual and less engaging, limiting students' meaningful connection to their local cultural heritage (Bloembergen & Eickhoff, 2020; Indah & Rohmah, 2022).

In the context of history education, this challenge becomes more pronounced. History subjects are frequently perceived as complex, abstract, and delivered through monotonous, text-centered instruction. Such approaches tend to emphasize memorization rather than critical engagement and contextual understanding, resulting in limited relevance to students' lived experiences. Consequently, students may fail to develop an emotional attachment to their cultural roots and local historical narratives. In the era of Society 5.0, where digital technology is deeply integrated into social life, educational transformation must incorporate innovative technological approaches that enhance both interest and comprehension. Digital learning environments that are interactive, immersive, and student-centered are increasingly regarded as effective strategies for engaging the digital generation (Asmayawati et al., 2024; Xing & Sun, 2024). Within this framework, virtual exhibitions emerge as a promising alternative, offering interactive three-dimensional spaces that enable users to explore cultural content dynamically rather than passively consuming information.

The Artsteps platform represents a particularly relevant tool for developing such virtual exhibitions. It allows educators to design accessible three-dimensional exhibition spaces without requiring specialized hardware, thereby making it feasible for school-based implementation. Through Artsteps, teachers can present local wisdom materials in narrative and visual formats that align with contemporary students' multimodal learning preferences. Current classroom practices in many schools, however, remain dominated by textbook-based instruction and limited use of interactive digital media. As a result, students' exposure to South Sumatra's local cultural heritage is often superficial, and cultural content is perceived as static and less meaningful. This condition underscores the urgent need for innovative instructional media that can provide contextual, engaging, and relevant learning experiences suited to the characteristics of digital-native learners (Villamil & King, 2024).

Local wisdom plays a strategic role in character education and in the formation of national cultural identity. In Indonesia, the Independent Curriculum emphasizes the Pancasila Student Profile, which includes values such as global diversity awareness, mutual cooperation, critical reasoning, and appreciation of cultural heritage. The integration of local cultural content into learning activities is therefore essential to achieving these educational goals (Hindaryatiningsih et al., 2025; Ilham & Rahman, 2024). Nevertheless, a significant challenge persists in bridging traditional cultural values with the appeal and interactivity of digital technology. Without appropriate learning media, efforts to preserve and internalize local wisdom among students may remain ineffective. The development of Artsteps-based digital learning media thus represents a strategic initiative to ensure that local cultural values are not only documented but also meaningfully understood, accessed, and appreciated by learners (Sakti et al., 2024).

Although several studies have explored the development of virtual history content, relatively few have conducted systematic educational needs analyses prior to media development, particularly within culturally embedded contexts such as South Sumatra (Riley et al., 2025). A comprehensive needs analysis is essential to ensure that digital learning innovations align with students' characteristics, technological readiness, curricular objectives, and institutional contexts. Without such preliminary analysis, there is a risk that digital interventions may prioritize technological novelty over pedagogical relevance. Therefore, understanding students' perceptions, learning preferences, and existing challenges constitutes a critical foundation for the effective design of virtual cultural exhibitions.

This study focuses on high school students in Palembang, the capital city of South Sumatra, who represent urban youth closely connected to global culture yet increasingly distant from their regional heritage. Given their familiarity with digital platforms, interactive media such as Artsteps are considered particularly appropriate for reintroducing local cultural narratives in ways that resonate with their daily experiences. The planned virtual exhibition incorporates elements of South Sumatran local wisdom, including traditional houses, clothing, cuisine, dances, music, and folklore. By integrating text, images, audio, video, and three-dimensional objects, the platform enables immersive and exploratory learning experiences unconstrained by physical space and time. However, prior to full-scale development, an initial study examining educational needs within the school environment is necessary to ensure contextual relevance and effectiveness.

The research employs a purposive sampling technique, selecting SMA LTI IGM Palembang as the research site due to its availability of Virtual Reality (VR) devices and supportive technological infrastructure. The school's commitment to strengthening cultural content in education further supports its suitability as a research setting. Despite these advantages, history instruction in many schools, including this context, has not fully succeeded in fostering students' understanding, engagement, and appreciation of South Sumatra's local wisdom. Predominantly conventional learning media remain insufficiently aligned with the expectations and characteristics of the digital generation. This situation risks deepening students' detachment from regional culture and weakening their emotional connection to cultural identity. Addressing this issue is crucial, as the preservation of local wisdom forms a strategic component of character education and cultural resilience amid ongoing globalization and digital transformation.

Based on this background, the central research question guiding this study is: How can educational needs be analyzed in the development of a virtual cultural exhibition based on Artsteps that integrates South Sumatra's local wisdom for history learning at SMA LTI IGM Palembang?

2. METHOD

This study applied a descriptive qualitative method to analyze the educational needs of virtual learning media based on South Sumatra's local wisdom. The research was conducted at SMA LTI IGM Palembang using purposive sampling, in which the school was purposely selected due to (a) its readiness to implement the Merdeka Curriculum, (b) the availability of technological infrastructure such as computer laboratories and VR devices, and (c) its active integration of digital-based learning, making it a relevant context for testing the development of an Artsteps virtual exhibition. The participants consisted of 128 students from grades X and XI who met the inclusion criteria (actively enrolled and willing to complete the questionnaire), while students who were absent or did not provide consent were excluded. Data were collected through a Google Form questionnaire designed to identify students' learning needs related to history and local cultural content. The quality of the instrument was ensured using a two-stage validation process: (1) content and construct validity through expert judgment involving specialists in educational technology and cultural education, and (2) reliability testing using Cronbach's Alpha in a preliminary trial with an expected coefficient of >0.70 . Ethical approval and formal permission were obtained from school

authorities before data collection. The questionnaire consisted of 1–5 Likert scale items and several open-ended questions to obtain both quantitative and qualitative insights. Quantitative data were analyzed using SPSS (version 26), whereas qualitative responses were processed through thematic reduction techniques using Microsoft Excel, following the stages of data condensation, data presentation, and conclusion drawing. Data analysis will follow the stages of data condensation, data presentation, and conclusion drawn (Ria & Susilowati, 2023; Alfiyah et al., 2025)

3. FINDINGS AND DISCUSSION

This research was conducted to determine the educational needs of students in the development of virtual cultural exhibitions based on the Artsteps platform, with the content of South Sumatra local wisdom as a form of innovative learning media in the subject of History and local culture. Data was obtained from 128 respondents of high school students in grades X and XI LTI IGM Palembang through a structured questionnaire. After conducting a needs analysis at SMA LTI, IGM Palembang, the results of the study showed the following key findings: The majority of respondents were aged 15-16 years, with the proportion of females sex (53.12%) higher than males (46.88%). This reflects that the early adolescent age group is a potential target for the use of visual-based educational digital media. The results of the analysis are in Tables 1 and 2 below.

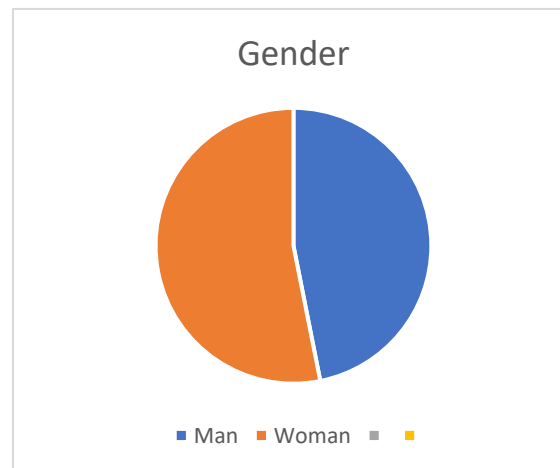
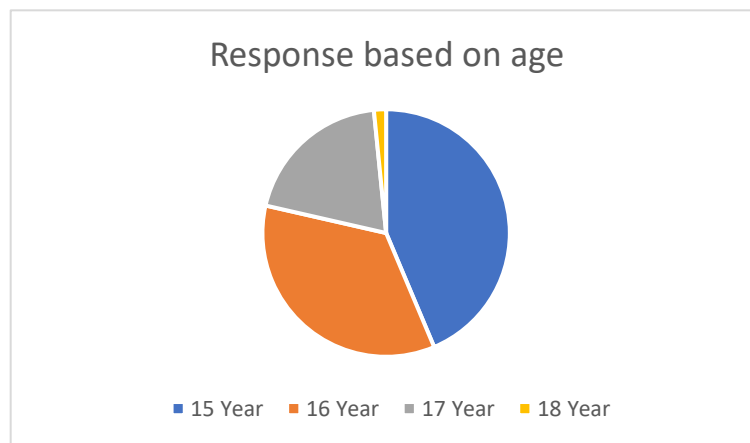


Figure 1. Respondents based on Gender

Source: Processed Researcher 2025

Characteristics of Respondents by Gender. Of the total 128 respondents, the majority were women (53.12%), while men were 46.88%. This shows that the distribution of respondents is fairly evenly divided between the two sexes, and there is no significant dominance that can affect the perception bias in the analysis results. The following is a table of respondent characteristics by Age.



Source: Process Researcher (2025)

Figure 2. Respondents based on Gender

Respondent Characteristics by Age Respondents were dominated by 15-year-olds (55%) and 16-year-olds (44%), with only 2 students aged 17. This means that the majority of respondents are in the early stages of adolescence, an ideal phase for visual and interactive learning. Other aspects that are also studied in this study can be seen in Table 1.

3.1 Student’s Media Preferences

Students' media preferences were analyzed to identify the types of learning media they consider most effective and engaging. This analysis provides insight into whether current instructional practices align with students’ digital learning habits and whether the use of an Artsteps-based virtual exhibition is compatible with their needs. The following section presents the percentage distribution of student media preferences.

Table 1. Respondent Results Based on Media Used in History Learning

Variable	Frequency	Percentage
Video Youtube	102	79.7%
Google Eart/Maps	29	22.7%
Digital timeline	29	22.7%
Educational Games	76	59.4%
Virtual Tour/ Virtual Reality	61	47.7%
Historical Animation	78	60.9%
Narrator/Interactive	33	25.8%
Interactive Maps	36	28.1%
Photo Gallery and Exhibitions	56	43.8%
Quizzes or history games	70	54.7%
Simulation of Historical Events	85	66.4%

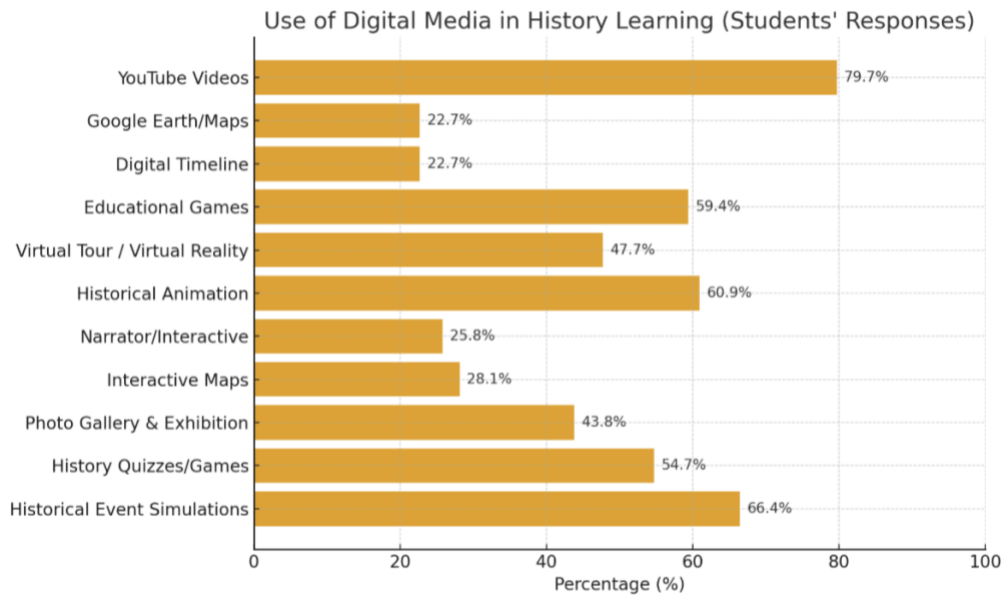


Figure 3. Digital media in History Learning

Source: Process Researcher (2025)

Based on the data displayed, the digital media that teachers most often use in learning is YouTube videos, with a frequency of 102 respondents or 79.7%. This shows that YouTube is a favorite platform because it is able to present learning content in a visual, dynamic, and easily accessible way for students and teachers. In addition, educational games are also a fairly high choice, used by 76 teachers (59.4%), which reflects that game-based learning approaches are starting to be widely adopted to increase student engagement and motivation. Meanwhile, virtual tours or virtual reality (VR) are used by 61 teachers (47.7%), which shows that immersive technology is beginning to be introduced in learning, although its application is still not as optimal as other media.

Interestingly, the use of Google Earth/Map and digital timelines showed the same number, namely 29 respondents (22.7%). These two media actually have great potential in the learning of history or geography because they allow for the exploration of places and events visually and chronologically. However, the low percentage of its use can be due to teachers' limited understanding of the technicalities of its use or the lack of supporting infrastructure.

In addition, from the survey obtained, the most often used method by teachers in the learning process is the use of digital media such as e-books, websites, and other digital platforms. This method was chosen by 82 respondents, or 64.1% of the total teachers involved in this study. This high number shows that the digitization of learning has become an important part of teachers' teaching strategies, especially in delivering historical materials. This also shows that teachers are increasingly adaptive to technological developments and use digital media as a means to enrich the teaching and learning process.

In addition, the screening of documentation videos took second place with 22 respondents or 17.2%. This method is considered quite effective because it is able to present historical events in an attractive and contextual visual form. On the other hand, lectures and discussions, which are conventional methods, are still used by 14 teachers (10.9%). Although not dominant, this method is still relevant in conveying information directly and building two-way interaction between teachers and students.

Interestingly, the method of direct visits to historical sites was only used by 8 teachers (6.3%). In fact, this method has great potential in providing an authentic and meaningful learning experience for students. This low percentage is likely due to limited access, cost, and time required for field visits. Meanwhile, there were 2 teachers (1.6%) who stated that they did not have a special method

in the learning process. This condition reflects that there are still teachers who have not developed a structured learning approach.

From this data, it can be concluded that digital media has become the main method in teaching history, replacing conventional methods such as lectures or direct visits. This shows a paradigm shift in the world of education, which prioritizes a digital-based approach and information technology. According to Putri's research, the lack of digital media leads to low motivation and critical thinking skills, as well as communication with students which reveals a strong need for technology-based media. The focus of the analysis is directed to the following aspects, as presented in Table 4 below. Media Used in History Learning. Most students use YouTube (79.7%) and educational games (59.4%) to learn history. Simulations of historical events are also quite popular (66.4%). This suggests that students prefer to learn with a visual and practical approach, rather than text or lectures (Putri, 2023)

In conclusion, teachers tend to favor practical, visually engaging, and easily accessible digital media—such as YouTube videos and educational games—over more complex tools, including digital map-based applications or detailed historical timeline platforms. This preference highlights both opportunities and challenges in strengthening teachers' competencies to optimize a wider range of contextual and innovative digital media within 21st-century learning environments. Empirical evidence supports this trend; for instance, a study by Eka D et al. (2023) reported that 71.8% of students expressed strong interest in virtual tours of history museums, underscoring the demand for interactive and accessible digital resources in history education. Building on these findings, the following analysis examines additional indicators that influence the study's outcomes, as presented in Table 5. To further explore the complexity of the research topic, an additional dimension is introduced through the data displayed in Table 2 below (Eka D et al., 2023).

Table 2. Student Needs Questionnaire Results

No	Question	Result	Information
1.	Do you need media that can be accessed anytime, anywhere? <ul style="list-style-type: none"> • Indispensable • Necessary • Quite necessary • Less needed • No need 	1. 56.3% or 72 students Required answers 2. 31.3% or 40 students Answers are indispensable	From the results of the study, it can be seen that many students need media that can be accessed anywhere and anytime in the
2.	Have you used virtual tour media before? <ul style="list-style-type: none"> • Very often • Often • Sometimes • Infrequently • Never 	1. 33.6 % of students answered never 2. 30.5% of students answered Rarely	From the results, it can be seen that students rarely use virtual tour media
3.	How often do you use virtual-based technology in learning? <ul style="list-style-type: none"> • Very often • Often • Sometimes • Infrequently • Never 	1. As many as 32% or 41 students occasionally Answer 2. As many as 26.6% or 34 students Rare Answers	From these results, it was obtained that students often use virtual technology in learning.

4.	<p>Do you want history learning to be delivered through technological media such as virtual tours, AR, or simulations?</p> <ul style="list-style-type: none"> • Yes, very much want to • Want • Usual • Not want • No need 	<p>1. As many as 38.3% or 49 students answered that they really wanted it</p> <p>2. 51.6% or 66 students answered that they wanted or needed to</p>	<p>From these results, it was found that students want history learning to be delivered with technological media such as virtual tours, AR, or simulations.</p>
5.	<p>Do you find it beneficial with technology-based media (video, animation, simulation, VR, etc.)</p> <ul style="list-style-type: none"> • Very helpful • Help • Quite helpful • less helpful • Not helped 	<p>1. 42.2% or 54 students answered that it helped</p> <p>2. 38.3% or 49 students answered that it was quite helpful</p>	<p>From Results It was found that students felt helped by technology-based media (video, animation, simulation, VR, etc.).</p>
6.	<p>What do you think about the effectiveness of virtual tours compared to conventional learning methods</p> <ul style="list-style-type: none"> • Much more effective • More effective • Just as effective • Less effective • Effective 	<p>1. 46.9% or 60 students were equally effective</p> <p>2. 44.5% or 57 students answered more effectively.</p>	<p>From these results, it was obtained that the use of virtual tourm was more effective than convection learning.</p>
7.	<p>I feel enthusiastic if I learn to use virtual tours</p> <ul style="list-style-type: none"> • Strongly agree • Agree • Neutral/stupid • Disagree • Strongly disagree 	<p>1. 48.4% or 62 students answered yes</p> <p>2. 33.6% or 43 students are neutral</p>	<p>From the results of the study, it was found that students feel enthusiastic if they learn using virtual tours.</p>
8.	<p>Are you interested in reusing virtual tours if this medium continues to be developed with better features?</p> <ul style="list-style-type: none"> • Very interested • Quite interested • Neutral • Less interested • Not interested 	<p>1. 38.3% or 49 students answered that they were very interested</p> <p>2. 35.9% or 46 students answered that they were quite interested</p>	<p>From these results, it was obtained that students are interested in using virtual tours again if the media continues to be developed with better features</p>
9.	<p>In your opinion, how important is it to learn local history (local wisdom of South Sumatra) in school?</p> <ul style="list-style-type: none"> • Very important • Important • Quite important • Not important • Very unimportant at all 	<p>1. 45.3% or 58 students answered that it was important</p> <p>2. 37.5% or 48 students answered that it was very important</p>	<p>From these results, it was obtained that students are important to learn local history or local wisdom of their respective cultures, namely South Sumatra at SMA LTI IGM Palembang.</p>

10	Have you ever learned about the local history of South Sumatra through visits or observations? <ul style="list-style-type: none"> • Very often • Often • Sometimes • Infrequently • Never 	1. 37.5% or 48 students rarely answered 2. 32% or 41 students answered occasionally	From the results of the study, it was found that students rarely learn about the local history of South Sumatra through direct visits.
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Based on the results of the needs analysis above, it can be concluded that most students really need learning media that can be accessed anytime and anywhere, with 86% of students stating this. However, the use of virtual tour media is still relatively low, where 33.6% of students having never used it, and 30.5% only rarely using it. Most students only use virtual technology in learning at an occasional (32%) and infrequent (26.6%) level, indicating a gap between the need and optimal use of digital media.

However, students' interest and enthusiasm for technology-based learning is very high, as seen from 89.9% of students who stated that they wanted or really wanted to use media such as virtual tours, AR, or simulations in learning history. In addition, 80.5% of students feel helped or quite helped by technology-based media. *Virtual* effectively enhances understanding and changes the perception that history is boring. They concluded that this medium is suitable for the needs of the 21st century and facilitates a deeper understanding of the concept of history. The students' responses also showed that they were interested in continuing to use virtual tours if the media were further developed and considered that learning the local history of South Sumatra was very important. Therefore, it can be concluded that students have a high need and potential for acceptance of innovative media, but there is a need for increased integration and assistance in the use of digital media in learning history, especially based on local wisdom. In an effort to further examine the complexity of the topic under study, new aspects are introduced through the presentation of the data in the Table 3 (Herdin et al., 2022)

3.2 Local Cultural Content Needs

The analysis of Local Cultural Content Needs aims to identify the types of South Sumatran cultural heritage that students expect to be incorporated into history learning. This section provides insight into which cultural elements students consider most relevant and meaningful for enhancing their understanding and appreciation of regional identity.

Table 3. Student Interest Aspect Results

1	I am interested in learning about local culture through technology-based media <ul style="list-style-type: none"> • Indispensable • necessary • Quite necessary • Less needed • No need 	1. 40.6% or 52 students answered occasionally. 2. 28.1% or 36 students rarely answered	From the results, it was found that students sometimes find it difficult to understand the local wisdom of South Sumatra only through textbooks.
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2	How interesting is the concept of virtual tours for you in understanding historical materials and local wisdom <ul style="list-style-type: none"> • Very interesting • Pull • Quite interesting • Less attractive • Pull 	<ol style="list-style-type: none"> 1. 58.6% or 75 students answered yes 2. 25.8% or 33 students answered neutral 	From the results, students agreed that virtual tour-based media would make it easier for me to learn about the local culture visually.
3	Are you interested in using new technologies like Artsteps in learning <ul style="list-style-type: none"> • Indispensable • Necessary • Quite necessary • Less needed • No need 	<ol style="list-style-type: none"> 1. 48.4% or 62 students answered that it was necessary 2. 30.5% or 39 students answered that it was quite necessary 	From the results, students answered that they needed to learn local culture through Artsteps-based media.
4	Do you need training or guidance before using Artsteps-based virtual tours <ul style="list-style-type: none"> • Sense of Urgency • Necessary • Quite necessary • Less needed • No need 	<ol style="list-style-type: none"> 1. 50.8% or 65 students answered that it was necessary 2. 30.5% or 39 students answered that it was quite necessary 	From the results, it was obtained that students answered that they needed training or guidance before using Artsteps-based virtual tours.
5	Do you feel that using Artsteps-based virtual tours can improve your understanding of the local wisdom of South Sumatra? <ul style="list-style-type: none"> • Very helpful • Quite petrified • Neutral • Less helpful • Not helpful 	<ol style="list-style-type: none"> 1. 43% or 55 students answered yes 2. 36.7% or 47 students answered neutral 	From these results, it was obtained that students felt that the use of Arsteps-based virtual tours could increase their understanding of local wisdom in South Sumatra.

Based on the questionnaire data, it can be concluded that the majority of respondents have a high interest in learning about local culture through technology-based media. Respondents also considered the concept of virtual tours to be very interesting and relevant in helping to understand historical materials and local wisdom. This is reinforced by the high interest in the use of new technologies such as Artsteps in learning. Proving that the application of VR makes history learning more *interactive*, *immersive*, and increases students' motivation and conceptual understanding (Almada et al., 2024).

In addition, respondents are aware of the importance of training or guidance before using virtual media such as Artsteps, indicating that technical readiness is a supporting factor for the successful implementation of this media. In general, respondents felt that the use of Artsteps-based virtual tours greatly improved their understanding of South Sumatra's local wisdom, which shows that this medium has great potential to be developed as an innovative learning resource. The next variable that is the focus of this study is presented in the form of the following table 8 as the basis for strengthening the analysis argument.

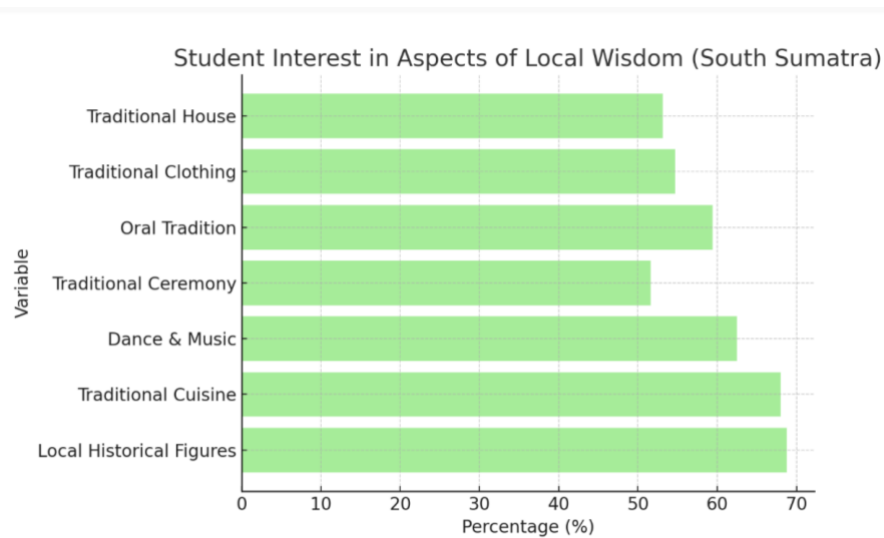


Figure 4. Student Interest in Aspects of Local Wisdom

Source: *Process Researcher* (2025)

Based on the data obtained, it can be seen that the aspects of local culture that are most known and in demand by students are local historical figures (68.8%) and traditional cuisine (68%). This suggests that these two elements have a high appeal, likely because local historical figures are often discussed in lessons or because culinary is more easily recognizable and associated with everyday experience. In addition, traditional dance and music also received considerable attention (62.5%), followed by oral traditions (59.4%) and traditional clothing (54.7%). Meanwhile, traditional houses (53.1%) and traditional ceremonies (51.6%) have slightly lower levels of interest compared to other cultural aspects.

In general, this data shows that students have a fairly good interest and cultural awareness of various elements of local wisdom, especially in concrete and easily accessible aspects such as food, music, and historical figures. However, aspects that are symbolic or ceremonial, such as traditional ceremonies and traditional houses, still need to be introduced more deeply in the learning process. This shows that learning media based on local wisdom is able to increase student involvement, strengthen material understanding, and strengthen local cultural identity (Gunawan et al., 2023). In conclusion, a more creative and contextual approach to learning is needed so that all elements of local culture, both physical and non-physical, can be known, understood, and appreciated equally by students. The following table presents data that reveal new perspectives in the context of this study.

3.3. Expectations for Features in the Virtual Exhibition

The analysis of Expectations for Features in the Virtual Exhibition aims to identify the interactive elements that students consider crucial for improving their learning experience. These expectations provide valuable insights for designing a virtual exhibition that is not only informative but also engaging and enjoyable to explore.

Table 4. Visualizations that must be present in Artsteps

Variabel	Frequency	Percentage
360 Navigation	68	53.1%
Description text information	70	54.7%
Audio Narration	76	59.4%
Short Videos	66	51.6%
3D Drawing/Animation	80	62.5%
Interactive Quiz	87	68%
Traditional music background sound	88	68.8%

Source: Process Researcher (2025)

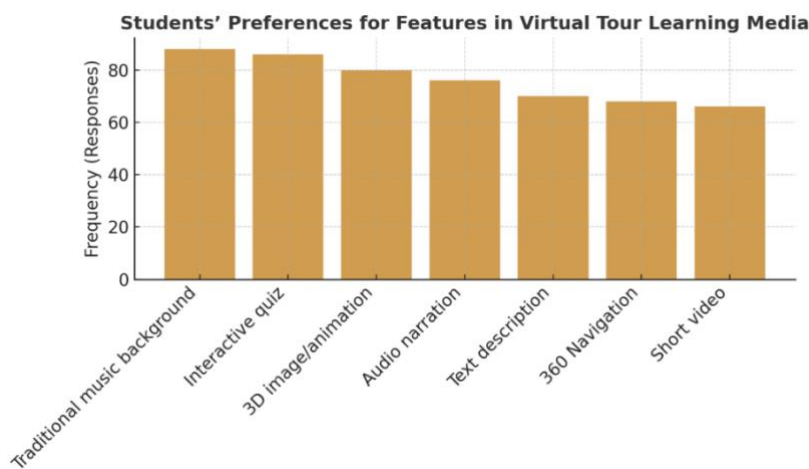


Figure 5. Students' Preferences for Features in Virtual Tour Learning Media

Based on the data above, the most popular feature by respondents in virtual learning media was traditional music background with a frequency of 88 respondents (68.8%), followed by interactive quizzes (68%) and 3D or animated images (62.5%). This shows that students like audio-visual and interactive learning elements, as they are able to provide a more lively and enjoyable learning atmosphere. Audio narration was also quite popular with 76 respondents (59.4%), while descriptive text information (54.7%) and 360-degree navigation (53.1%) had almost a balanced level of interest. Meanwhile, short videos were the least chosen feature (51.6%), although overall it was still quite high.

From these results, it can be concluded that students tend to like virtual media that present information in an interactive, immersive, and multisensory way, such as traditional music, quizzes, and 3D animation. This shows the importance of integrating audio-visual and participatory elements in the development of learning media, especially in the context of local culture. Develop interactive multimedia to write descriptive texts with local cultural content. This medium integrates animated images, music, and audio that students can control according to their learning style. In conclusion, to increase the effectiveness of virtual tour-based learning media, developers must prioritize features that not only convey information, but also evoke students' emotions, engagement, and active learning experiences. The focus is now directed to the new dimension outlined in the next table (Dayyana et al., 2022)

From these findings, it can be concluded that history learning still faces challenges in terms of presenting interesting and easy-to-understand material. The reliance on memorization without visual support and the lack of technology-based media makes it difficult for students to understand

and visualize historical events contextually. Using images, maps, videos, and infographics significantly improves students' learning experience and understanding. Visual media help visualise historical events, chronologies, and relationships between events that are difficult to achieve through text alone. In conclusion, history learning requires more visual, interactive, and contextual media innovations in order to bring historical narratives to life in a real and interesting way for students. Technology-based approaches such as virtual tours or interactive simulations have the potential to answer this challenge. As an extension of the analysis, the data in the next table shows the new dimension (Simbolon et al., 2024).

Table 5. What information is most expected in the *Virtual Tour* of local wisdom

Variabel	Frequency	Percentage
History and origin of tradition	26	20.3%
Social life and customs	30	23.4%
Local Arts and Culture (Dance, Music, Culinary)	31	24.2%
The influence of local wisdom in modern life	57	44.5%
All of the above aspects	22	17.2%

Source: Process Researcher (2025)

Based on the data obtained, the aspect of local wisdom that most attracts students to learn is the influence of local wisdom in modern life, with 57 respondents (44.5%) choosing this aspect. This suggests that students tend to be more interested in material that is relevant to their current life, as well as being able to relate directly to their social realities. Other aspects, such as local arts and culture (dance, music, culinary) also attracted a high level of interest, with 31 respondents (24.2%), followed by social life and customs as many as 30 respondents (23.4%), and history and origin of traditions as many as 26 respondents (20.3%). Meanwhile, only 22 respondents (17.2%) expressed interest in learning all aspects of local wisdom as a whole.

From these findings, it can be concluded that students prefer to study contextual and applicative local wisdom, which shows how local cultural values are still alive and influential in modern life. This shows the importance of preparing learning materials that not only display historical aspects but also connect local cultural values with the dynamics of contemporary life. The use of materials directly related to local culture and current issues increases students' interest in learning, learning relevance, and language skills among Lestari & Azizah students. Thus, learning local wisdom will be more meaningful if it is delivered in a way that is relevant, actual, and touches the current reality of students. The following table presents another important indicator in media development (Lestari & Nugraheni, 2022).

3.4 Barriers to Digital-based Learning

The subsection *Barriers to Digital-Based Learning* analyzes the obstacles that prevent students from fully benefiting from technology-assisted learning. These findings help determine what challenges must be addressed to ensure the effective implementation of the Artsteps virtual exhibition.

Table 6. Visuals to expect from *ArtSteps-based* Virtual Tour Media

Variabel	Frequency	Percentage
Modern design with attractive colors	26	20.3%
Featuring classic songs that describe local culture	30	23.4%
Simple and easy-to-use layout	31	24.2%
A beautiful color combination	57	44.5%
Have no special preferences	22	17.2%

Based on the data, students' preference for the display of learning media showed that most of the respondents, namely 57 students (44.5%), preferred colour combinations that were comfortable

to look at. This shows that the visual aspect, especially the convenience of viewing media displays, is a major factor that influences students' learning experience. In addition, 31 students (24.2%) preferred a simple and easy-to-use layout, while 30 students (23.4%) chose a classic look that depicts the local culture, reflecting an interest in aesthetic values that contain elements of tradition. Meanwhile, 26 students (20.3%) liked modern design with attractive colours, and 22 students (17.2%) stated that they had no special preferences.

From these findings, it can be concluded that in designing learning media, especially those based on local culture, convenient visual design and simple layout are important factors to improve the comfort and effectiveness of learning. While some students appreciate the aesthetic value of local culture as well as modern design, a user-friendly visual approach remains a top priority. Therefore, the combination of functional and aesthetic design, as well as considering cultural values and visual comfort, is an ideal strategy in the development of learning media that is attractive and easy to use by students. The following table is used to outline additional findings that support the analysis of this study.

Table 7. What is the most important aspect of *the Virtual Tour* of South Sumatra's local wisdom

Variabel	Frequency	Percentage
Completeness of historical and cultural information	26	20.3%
3D visualization and interactive design	30	23.4%
Suitable for learning purposes	31	24.2%
Accessibility and ease of use	57	44.5%
All of the above aspects	22	17.2%

Source: Processed Researcher 2025

Based on the data shown, the most prioritized factors for students in the use of learning media are accessibility and ease of use, with 57 respondents (44.5%) choosing this aspect. This shows that students prefer media that is easily accessible and uncomplicated in its use, especially in the context of digital learning. In addition, 31 students (24.2%) considered the suitability of media for learning purposes, followed by 30 students (23.4%) who prioritised 3D visualisation and interactive design, and 26 students (20.3%) who wanted complete historical and cultural information in the media used. Meanwhile, 22 students (17.2%) stated that all of these aspects were important to them.

In conclusion, it can be said that the effectiveness of learning media is not only determined by its content and visual appearance, but also by how easily accessible and usable it is by students. Accessibility is the key to media being used widely and optimally, especially in diverse learning environments. Therefore, the development of learning media, especially those based on local history and culture, must integrate elements of ease of use with visualizations and attractive content that are in accordance with learning objectives, in order to answer the overall needs of students.

Table 8. Game-Based Learning in *this Virtual Tour*, which feature do you want the most

Variable	Frequency	Percentage
Interactive quiz after exploring the museum	46	35.9%
An interactive adventure with puzzles that will	75	58.6%
Awards (digital badge or certificate) After	57	44.5%
Competition modes between users to test	53	41.4%
No need for gamification as a medium	14	10.9%

Accessible without internet (offline mode)	51	39.8%
Can be used on a variety of devices (Laptop, HP, Tablet)	88	68.8%
No additional apps needed to access	38	29.7%
Can be combined with tasks or discussions	37	28.9%
Have no special expectations	15	11.7%

Based on the data displayed, the gamification element that students most interested in in virtual museum-based learning media was an interactive adventure with a puzzle about culture, which was chosen by 75 respondents (58.6%). This shows that students like challenging, exploratory, and fun learning experiences, as they can increase curiosity and make the material easier to remember. In addition, awards in the form of badges or digital certificates were also quite attractive to students, with 57 respondents (44.5%), followed by the competition mode between users chosen by 53 students (41.4%). The interactive quiz after exploring the museum received 46 votes (35.9%), while only 14 respondents (10.9%) felt that the media did not need gamification and was only presented as a regular source of information.

The technical feature most expected by students in learning media is the ability to be used on a variety of devices such as laptops, mobile phones, and tablets, with 88 respondents (68.8%) choosing this option. This shows that the flexibility of access between devices is a major need, considering that students have different devices in their learning activities. In addition, as many as 51 students (39.8%) stated that the media must be accessible offline, which indicates that there is still limited internet access among students. Other features that are also desired are access without additional applications (29.7%) and the ability to be combined with assignments or discussions (28.9%), while only 11.7% of students stated that they did not have special expectations for the technical features of learning media.

In conclusion, it can be said that students very much welcome the integration of gamification elements in learning media, especially those packaged in the form of interactive adventures and challenges. Elements such as quizzes, competitions, and digital awards not only increase engagement, but also motivate students to be more active and competitive in understanding the material. Therefore, in designing technology-based learning media such as virtual tours or digital museums, it is important to strategically include gamification features to make the learning experience more immersive, fun, and meaningful.

3.5 Level of Need for Innovative Media in Learning

As many as 87% of students stated that they need or urgently need more innovative and interactive history learning media. This shows the perceived gap between the conventional methods used so far and expectations for technology-based media.

Table 9. Analysis of Student Facilities and Infrastructure

No.	Indicator	Percentage
1.	Video YouTube	79.7%
2	Educational Games	59.4%
3.	Tour Virtual/VR	47.7%
4	Historical simulation	66.4%

Based on a study of 128 high school students in grades X and XI, the majority of respondents reported using digital media in their learning history. The highest percentages showed that YouTube (79.7%), educational games (59.4%), historical simulations (66.4%), and virtual/VR tours (47.7%) were the most frequently used media by students. These findings show a shift in learning preferences from conventional methods to digital technology-based approaches. However, the majority are not yet familiar with *virtual exhibitions* as a whole, which suggests that this approach is relatively new but has potential in the context of learning local history and culture. Thus, the development of an Artsteps-based Virtual Cultural Exhibition that integrates 3D visualization elements, local cultural narratives, event simulations, and interactive features is a strategic answer to the needs of students, as well as an innovative solution in preserving and transforming South Sumatra's local wisdom through educational and interesting digital technology.

The findings of this study show that most students are more interested in visual-based and interactive learning, especially through the medium of virtual tours, animations, and historical simulations. These results are in line with the research of Almada, Puspita, and Susilo (2024), who found that the use of virtual reality-based media improves students' conceptual understanding and involvement in history learning. However, in contrast to the findings of Herdin et al. (2022) which highlight the low readiness of teachers in integrating digital media, this study shows that most students and teachers at SMA LTI IGM already have a high awareness of the importance of learning technology, although it is still limited to popular media such as YouTube (Almada et al., 2024; Herdin et al., 2022).

In addition, these findings expand the research results of Dewie, Syarifuddin, and Oktarina (2022) regarding the development of a virtual tour of the Sriwijaya museum. Their study focuses more on the practicality of media and improving learning outcomes, while this study emphasizes the analysis aspect of students' initial needs and preferences towards the features and content of South Sumatra's local wisdom. Thus, this research makes a new contribution in the form of empirical data on how virtual media can be adapted to more specific local contexts, before the development process is carried out (Dewie et al., 2022).

4. CONCLUSION

In conclusion, this study demonstrates that a substantial majority of students (87%) express a strong need for technology-based learning media, particularly those that are visual, interactive, and easily accessible. Most respondents, aged 15–16 years, show high familiarity with digital platforms such as YouTube and historical simulations, and they exhibit strong enthusiasm for virtual tours, with more than two-thirds indicating that such media enhance their understanding of local culture. Students particularly favor content related to local historical figures, traditional culinary heritage, and traditional dance and music, as well as features such as interactive quizzes, gamification elements, 3D visualizations, narration, audio-visual integration, and offline accessibility. Furthermore, the majority perceive virtual tours as more effective than conventional media, a finding supported by previous research demonstrating the practicality and effectiveness of virtual museum-based learning resources in improving student outcomes. These results confirm that the development of Artsteps-based virtual exhibitions is highly relevant for strengthening engagement in local history learning and supporting cultural preservation within the Independent Learning (*Merdeka Belajar*) framework. Nevertheless, this study is limited to a specific school context with relatively adequate technological infrastructure, which may restrict the generalizability of the findings to schools with limited digital resources. Future research should therefore focus on developing and testing a comprehensive Artsteps-based prototype across diverse educational settings, conducting experimental evaluations of its impact on learning outcomes and cultural identity formation, and exploring long-term implementation strategies to ensure scalability, inclusivity, and pedagogical sustainability.

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