



DEVELOPING VIRTUAL TOUR REALITY-BASED LEARNING MEDIA FOR INTRODUCING THE LOCAL CULTURAL SITE OF THE *PUTRI PUKES* CAVE FOR YOUNG LEARNERS

Eliza Sapitri¹, Dewi Fitriani², Umar bin Abd Aziz³

^{1,2,3} Universitas Islam Negeri Ar-Raniry Banda Aceh, Indonesia

Email: es7009673@gmail.com

Abstrak

Pengenalan budaya lokal pada anak usia dini memerlukan media pembelajaran yang menarik dan kontekstual. Keterbatasan media pembelajaran yang mampu menghadirkan objek budaya lokal secara visual dan interaktif merupakan sebuah tantangan bagi guru dalam mengenalkan budaya lokal tersebut. Penelitian ini bertujuan mengembangkan media pembelajaran berbasis *Virtual Tour Reality* (VTR) bagi anak usia dini dalam mengenal budaya lokal Gua Putri Pukes yang berada di Aceh Tengah. Penelitian ini menggunakan metode *Research and Development* dengan model ADDIE yang meliputi tahap analisis, desain, pengembangan, implementasi, dan evaluasi. Penelitian melibatkan 1 validator ahli materi dan 1 validator ahli media serta di ujicobakan pada 39 anak usia 5-6 tahun. Media pembelajaran dikembangkan menggunakan aplikasi 360 Sphere Camera Foxpoi dan software Lapentor yang dapat diakses melalui handphone dan laptop. Hasil penelitian menunjukkan kelayakan validasi dari ahli materi sebesar 90%, ahli media 82,5%, dan uji respon anak 90% sehingga media pembelajaran VTR dinyatakan sangat layak digunakan sebagai media pembelajaran pengenalan budaya lokal Gua Putri Pukes untuk anak usia dini.

Kata Kunci: Media Pembelajaran; Virtual Tour Reality; Budaya Lokal; Anak Usia Dini

Abstract

Introducing local culture to early childhood requires engaging and contextual learning media. The limited availability of learning media capable of visually and interactively presenting local cultural objects poses a challenge for teachers in introducing such local culture. This research aims to develop Virtual Tour Reality (VTR)-based learning media for early childhood children to introduce the local culture of Putri Pukes Cave located in Central Aceh. This study employs the Research and Development method with the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation. The research involved 1 subject matter expert validator and 1 media expert validator, and was trialed with 39 children aged 5-6 years. The learning media was developed using the 360 Sphere Camera Foxpoi application and Lapentor software, which can be accessed via mobile phones and laptops. The results indicate validation feasibility scores of 90% from the subject matter expert, 82.5% from the media expert, and a child response test score of 90%; thus, the VTR learning media is deemed highly suitable for use as a learning medium to introduce the local culture of Gua Putri Pukes to early childhood learners.

Keywords: Learning Media; Virtual Tour Reality; Local Culture; Early Childhood

Corresponding author :

Email Address : es7009673@gmail.com

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A. INTRODUCTION

Learning media is one of the essential components in the learning process that functions to effectively convey messages and information from teachers to learners¹. The use of learning media not only helps teachers deliver instructional content, but also creates learning experiences that are engaging, interactive, and meaningful². This is consistent with the learning characteristics of young learners, which are concrete, contextual, based on direct experience, and closely related to play activities as the primary mode of learning³.

One important subject that needs to be introduced from an early age is local culture. Conceptually, local culture represents the identity of a region that is passed down from generation to generation and functions to preserve social values amid the rapid flow of globalization⁴. The diversity of local culture is very broad, encompassing: arts, traditions, customs, folklore, tourism, handicrafts, traditional foods, traditional clothing, local games, cultural heritage, and various other elements related to regional identity⁵.

However, challenges in the digital era indicate that children tend to be more familiar with popular culture obtained through digital media, while

¹ R. Rupnidah and Dadan Suryana, 'Media Pembelajaran Anak Usia Dini', *Jurnal PAUD Agapedia*, 6.1 (2022), pp. 49-58.

² Safira Aini, Dewi Fitriani, and Rani Puspa Juwita, 'Pengaruh Media Digital Terhadap Pengenalan Mitigasi Bencana Banjir Pada Anak Usia Dini Di TK Pembina Negeri Singkil', *Bunayya : Jurnal Pendidikan Anak*, 10.1 (2024), pp. 88-98, doi:10.22373/bunayya.v9i2.23997.

³ Sri Rezki Amanda and others, 'Pengaruh Media Pembelajaran Interaktif Wordwall Terhadap Kemampuan Berfikir Logis Anak Usia 5-6 Tahun Di Taman Kanak-Kanak Hang Tuah Kota Padang', *Bunayya :*

Jurnal Pendidikan Anak, 11.2 (2025), pp. 299-310, doi:10.22373/bunayya.v11i2.31731.

⁴ Rudolf Dekha Silaen, Apri Junaidi, and Ely Purnawati, 'Aplikasi Pengenalan Budaya Jawa Tengah Menggunakan Virtual Reality Berbasis Android', *Journal of Dinda : Data Science, Information Technology, and Data Analytics*, 1.2 (2021), pp. 63-72, doi:10.20895/dinda.v1i2.230.

⁵ Syartika Sri Wahyuni Syartika and Delfi Eliza Delfi, 'Pengembangan Informational Book Untuk Pengenalan Budaya Minangkabau Melalui Makanan Khas Pesisir Selatan', *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 6.5 (2022), pp. 4803-19, doi:10.31004/obsesi.v6i5.2728.

their understanding of local culture is gradually declining and at risk of being neglected⁶.

Introducing cultural site from an early age helps children to understand, appreciate, and value cultural diversity, while also encouraging them to play an active role in preserving cultural heritage⁷. Culture-based learning is also consistent with Vygotsky's theory, which states that children's development is influenced by the socio-cultural context in which they grow. Therefore, learning experiences that refer to culture site contribute to the development of social skills, ways of thinking, and memory⁸.

One cultural site heritage that has strong historical value and folklore is *Putri Pukes Cave* in Central Aceh

Regency. The *Putri Pukes Cave* is not only representing the local wisdom of the Gayo community, which has been orally transmitted and constitutes an important, but also serves as tourism destination⁹. Tourist sites do not only function as recreational spaces, but also contribute significantly to the preservation of traditions and local wisdom¹⁰.

The results of the initial observations conducted by the researcher in early childhood education settings indicate that most children are familiar with the name of *Putri Pukes Cave*; however, they do not yet have a deep understanding of the cave's physical form, its internal features, or the cultural values embedded in the story of *Putri Pukes Cave*.

⁶ Heri Kurnia, Felisia Lili Dasar, and Intan Kusumawati, 'Nilai-Nilai Karakter Budaya Belis Dalam Perkawinan Adat Masyarakat Desa Benteng Tado Kabupaten Manggarai Barat Nusa Tenggara Timur', *Satwika : Kajian Ilmu Budaya Dan Perubahan Sosial*, 6.2 (2022), pp. 311-22, doi:10.22219/satwika.v6i2.22300.

⁷ Arief Cahyo Utomo and others, 'Pengenalan Kebudayaan Tradisional Melalui Pendidikan Seni Tari Pada Anak Usia Dini Di BA Aisyiyah Ngadirejo, Sukoharjo', *Buletin KKN Pendidikan*, 1.2 (2020), doi:10.23917/bkkndik.v1i2.10791.

⁸ Jhoni Warmansyah and others, *Perkembangan Kognitif Anak Usia Dini* (Bumi Aksara, 2023).

⁹ Moh. Abdan Syakuro and others, 'Pengenalan Tradisi Roket Tase' Dalam Meningkatkan Kecintaan Budaya Lokal Anak Usia Dini', *Satwika : Kajian Ilmu Budaya Dan Perubahan Sosial*, 7.2 (2023), doi:10.22219/satwika.v7i2.27334.

¹⁰ Syakuro and others, 'Pengenalan Tradisi Roket Tase' Dalam Meningkatkan Kecintaan Budaya Lokal Anak Usia Dini'.

The learning media currently used by the teachers are still limited to videos, storybooks, pictures, and several concrete forms of Acehese cultural media such as traditional clothing and traditional tools. In addition, direct visitation to cultural sites cannot be conducted regularly due to limitations of time, cost, safety considerations, and learning schedules. These conditions emphasize the need for alternative learning media that can provide virtual cultural environment. It gives a chance to explore without requiring direct visitation to the sites.

The development of technology in educational field have encouraged the use of multimedia and digital visualization in learning. They are considered capable of supporting more interactive and easily understood learning processes for learners¹¹. One technology that has the potential to

support cultural introduction is Virtual Tour Reality (VTR), which is a 360° panoramic visualization medium that allows children to explore environments virtually through a combination of images, audio, and multimedia information¹². With those characteristics, VTR is considered suitable for children's cognitive development stages, which require concrete learning experiences that are closely related to real-life contexts¹³.

Several previous studies have demonstrated the effectiveness of using Virtual Tour Reality (VTR) media for early childhood learning activities. A study conducted by Lukmanulhakim, which focused on the development of Safari media based on VTR to introduce places of worship. It's proved that it capable of enhancing children's interest and understanding through interactive and immersive 360-degree

¹¹ Rahman Abidin, Nunuk Suryani, and . Sariyatun, 'Students' Perceptions of 360 Degree Virtual Tour-Based Historical Learning About The Cultural Heritage Area of The Kapitan and Al-Munawar Villages in Palembang City', *International Journal of Social Sciences and Management*, 7.3 (2020), pp. 105-12, doi:10.3126/ijssm.v7i3.29764.

¹² Tika Sari Dewi, 'Virtual Reality Tour Sebagai Media Promosi Dan Pembelajaran

Alur Pelayanan Rumah Sakit', *Journal of Information Systems for Public Health*, 8.1 (2023), p. 21, doi:10.22146/jisph.72039.

¹³ Resti Maharani, Dian Miranda, and Ariyani Ramadhani, 'Pengaruh Penggunaan Media Pembelajaran Berbasis Virtual Reality Terhadap Motivasi Belajar Anak Usia 5-6 Tahun Di PAUD Melati Kabupaten Sintang', *Indonesian Research Journal on Education*, 5.1 (2025), pp. 1194 - 1201 7 <<https://irje.org/index.php/irje>>.

visualization¹⁴. Another study by Kamilia et al. on the introduction of the Equator Monument using 360-degree photos also indicated that VTR media utilizing 360-degree panoramic images are valid and effective in helping children to understand environmental objects that are difficult to access directly¹⁵.

The development of VTR-based learning media for early childhood has been the focus of various studies; however, based on the researcher's search across multiple platforms such as YouTube, Google, Google Scholar, Play Store, TikTok, and other learning applications, no learning media specifically developed for early childhood that introduces the local culture of *Putri Pukes Cave* using VTR has been found.

This situation highlights a research gap regarding the availability of digital

learning media that provide direct and interactive exploration of local culture for early childhood. Therefore, this study focuses on the development of VTR-based learning media for introducing the culture site of *Putri Pukes Cave* to young children. This media are expected to serve as an engaging and interactive technology-based learning alternative, helping children gain a more concrete understanding of local culture, while also supporting teachers in implementing innovative and meaningful cultural learning.

B. RESEARCH METHOD

This study employs a Research and Development (R&D) method, focusing on the design, development, and feasibility testing of learning media prior to its implementation¹⁶. The development procedure refers to the ADDIE model (Analysis, Design,

¹⁴ Lukmanulhakim, 'Inovasi Savari (Sistem Informasi Virtual Reality) Pengembangan Media Virtual Tour Tematik Bagi Anak Usia Dini', *Jurnal Visi Ilmu Pendidikan*, 16.2 (2024), p. 424, doi:10.26418/jvip.v16i2.79621.

¹⁵ Insan Kamilia, Aunurrahman, and Lukmanulhakim, 'Pengembangan Media Virtual Tour Berbasis Foto 360 Derajat Tugu Khatulistiwa Untuk Pengenalan

Lingkungan Sekitar Bagi Anak Usia 5-6 Tahun', *Jurnal Edukasi*, 2.3 (2024), pp. 126-37, doi:10.60132/edu.v2i3.296.

¹⁶ Okpatrioka, 'Research And Development (R&D) Penelitian Yang Inovatif Dalam Pendidikan', *Dharma Acariya Nusantara: Jurnal Pendidikan, Bahasa Dan Budaya*, 1.1 (2023), pp. 86-100, doi:10.47861/jdan.v1i1.154.

Development, Implementation, Evaluation), which provides a systematic flow and evaluation at each stage¹⁷.

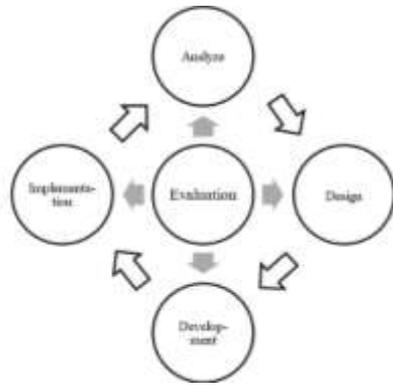


Figure 1. Stages of ADDIE Development¹⁸

The research subjects consisted of 39 children from Group B at TK IT Baitusshalihin Banda Aceh who participated in the media trial during the odd semester of the 2025/2026 academic year. The trial was conducted on a large scale due to the relatively high number of participants involved.

Data were collected through observation to observe children's

engagement and enthusiasm, as well as through a feasibility assessment questionnaire to evaluate the VTR media¹⁹. The validation questionnaire was evaluated by two lecturers of Early Childhood Islamic Education. They evaluate the content and media, using a Likert scale to determine the feasibility of the media. Children's responses were obtained through observation using a developmental assessment scale (scores 1-4) which is adapted to the characteristics of early childhood.

The content validation instrument comprised five assessment aspects namely the relevance of the material, the curriculum alignment, the ease of understanding, the clarity of learning objectives, and the creativity and visualization aspects²⁰. The media validation instrument consisted of four

¹⁷ Marinu Waruwu, 'Metode Penelitian Dan Pengembangan (R&D): Konsep, Jenis, Tahapan Dan Kelebihan', *Jurnal Ilmiah Profesi Pendidikan*, 9.2 (2024), pp. 1220-30, doi:10.29303/jipp.v9i2.2141.

¹⁸ Waruwu, 'Metode Penelitian Dan Pengembangan (R&D): Konsep, Jenis, Tahapan Dan Kelebihan'.

¹⁹ Ardiansyah, Risnita, and M. Syahrani Jailani, 'Teknik Pengumpulan Data Dan

Instrumen Penelitian Ilmiah Pendidikan Pada Pendekatan Kualitatif Dan Kuantitatif', *IHSAN: Jurnal Pendidikan Islam*, 1.2 (2023), pp. 1-9 <<https://ejournal.yayasanpendidikandzurriyatulquran.id/index.php/ihsan>>.

²⁰ Cecep Kustandi and Daddy Darmawan, *Pengembangan Media Pembelajaran* (Kencana, 2020).

assessment aspects: images, video, audio, and interactive feature²¹.

The instrument for testing children's responses comprised six assessment components: student's interest, the ability in recognize shapes, objects, and character names, the ability in retelling stories, the ability in identifying the navigation buttons and features, the ability to understanding the steps involved in using the media, as well as children's focus and curiosity during the use of the *Putri Pukes Cave VTR media*²².

The learning media was developed using the 360 Sphere Camera Foxpoi application for capturing 360° panoramic photos and software Lapentor to integrate visuals, audios, and videos into a Virtual Tour Reality (VTR) format. The data obtained were analyzed using quantitative descriptive analysis by calculating the percentage of feasibility scores to determine the

quality and suitability of the developed learning media²³. The formula used is as follows:

$$X = \frac{\Sigma M}{Mm} \times 100\%^{24}$$

Description:

X = Percentage

ΣM = Total score for each assessment aspect

Mm = Maximum score for each assessment aspect

Table 1. Feasibility Criteria

Score Range	Category
82%-100%	Very Feasible
63%-81%	Feasible
44%-62%	Less Feasible
25%-43%	Not Feasible

Source: Sugiyono, 'Metode Penelitian Pendidikan', 2021²⁵

C. RESULTS AND DISCUSSION

The development of VTR-based learning media for introducing the culture site of *Putri Pukes Cave* to children used the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The following is a detailed

²¹ Rika Widya, Salma Rozana, and Viridyra Tasril, *Permainan Tradisional Berbasis Multimedia* (Jejak Pustaka, 2022).

²² Dewi Fitriani, Heliati Fajriah, and Arnis Wardani, 'Mengenalkan Pendidikan Seks Pada Anak Usia Dini Melalui Buku Lift the Flap "Auratku"', *Gender Equality: International Journal of Child and Gender*

Studies, 7.1 (2021), p. 33, doi:10.22373/equality.v7i1.8683.

²³ Sudirman and others, *Metodologi Penelitian 1* (Media Sains Indonesia, 2023).

²⁴ Sudirman and others, *Metodologi Penelitian 1*.

²⁵ Sugiyono, *Metode Penelitian Pendidikan* (ALFABETA, 2021).

explanation of the five stages of the ADDIE development model:

1. Analysis Stage

In the analysis stage of developing VTR-based learning media for introducing the local culture of *Putri Pukes Cave*, the researcher examined the process of local cultural learning in schools as well as the students' needs for learning media. Observations and discussions with the classroom teacher indicated that the introduction of local culture was still limited. The availability of supported concrete media need to be improved. The media currently used to introduce *Putri Pukes Cave* only the video of *Putri Pukes*, illustrated books, and printed images of *Putri Pukes Cave*.

The learning media currently used still have the limitations. The video of *Putri Pukes* only focuses more on the storyline and does not yet present the actual visual forms and environment of *Putri Pukes Cave*. Meanwhile, the illustrated books and printed images are static. Therefore, they cannot provide a comprehensive visualization of the cave's place and situation.

This limitation in visualization makes it difficult for children to imagine the actual shape, size, and environmental conditions of the cave, and it has not yet helped them to understand the cultural values contained in the *Putri Pukes* story.

The school occasionally organizes the visitation to local cultural destinations; however, this activity can only be conducted at certain times. They are difficult to do the visitation frequently because must be adjusted according to time availability, conditions, and other weekly learning activities that cannot be postponed.

Based on this needs analysis, students require learning media that are visual, concrete, and interactive to better understanding of cultural contexts. Therefore, VTR media was developed as a learning alternative, allowing children to explore cultural environments virtually and immersively without having to make

frequent direct visitation to the location²⁶.

Furthemore, the researcher also conducted a market analysis regarding the availability of VTR-based learning media on the culture site of *Putri Pukes* Cave. The results of the analysis indicated ther is VTR media specifically about *Putri Pukes* Cave has been found.

The selection of *Putri Pukes* Cave as the object for media development is based on its cultural and educational value as part of Aceh’s local cultural heritage. This aligns with the Merdeka Curriculum, particularly the Pancasila Student Profile element on global diversity, which encourages the introduction and cultivation of respect for cultural diversity from an early age.

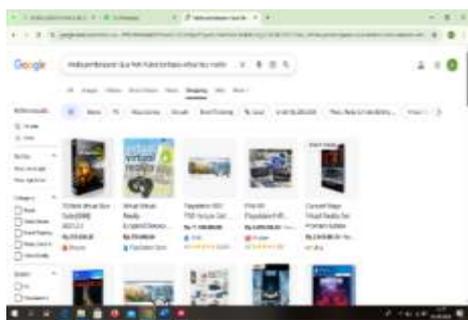


Figure 2. Google Market Analysis

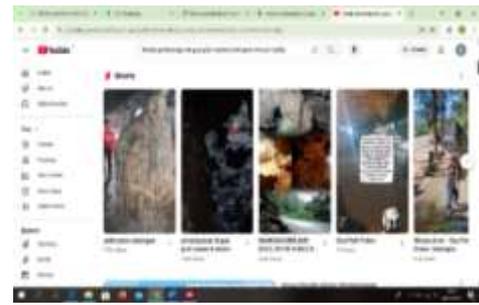


Figure 3. YouTube Market Analysis



Figure 4. TikTok Market Analysis

2. Design Stage

In the design stage, the researcher developed the initial form of the Virtual Tour Reality (VTR)-based learning media as a reference for media development. The media design focused on organizing the structure, features, and usage flow to align with the characteristics of young children. The media was designed in the form of a virtual tour, allowing children to gradually explore *Putri Pukes* Cave through 360° visual displays.

²⁶ Adi Putra Parlindungan Simamora, I Made Ardwi Pradnyana, and P Wayan Artha Suyasa, 'Pengembangan Media Pembelajaran Pengenalan Jenis-Jenis

Pekerjaan Berbasis Virtual Reality', *INSERT: Information System and Emerging Technology*, 2.1 (2021), pp. 35–45, doi:10.23887/janapati.v6i3.12030.

The initial VTR media design was planned to consist of three main locations: the front or entrance of the cave, the first floor of the cave, and the second floor of the cave. These three locations were arranged sequentially to create a systematic exploration flow that is easy for young children to follow.

At this design stage, the VTR media was planned to include a single navigation system for location transitions and four main features: an audio feature (narration and background sounds), an image feature, a video feature, and a digital storybook link feature. All these features were designed to support an interactive learning experience, facilitate understanding of the story and cultural information, and make it easier for children to follow the virtual exploration flow.

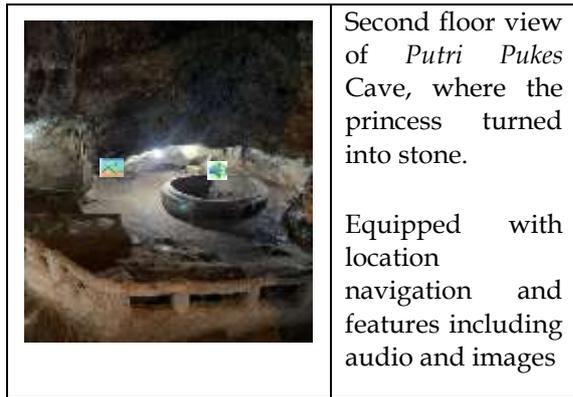
The sequence of story presentation and cultural information in the media was arranged based on official sources from the Central Aceh Tourism Office website to ensure that the content presented is accurate and aligns with the local cultural context. This design

aims to provide a structured, and interactive learning experience that simulates a virtual visit to the cultural destination.

In addition to media design, the researcher also prepared the research instruments, namely the content and media expert validation sheets and the children's response sheets to evaluate the quality of the media. The entire design process was carried out with attention to the standards for developing early childhood learning media and the achievement of the set objectives for introducing local culture.

Table 4. Initial Design of VTR-Based Learning Media for Introducing the Local Culture of Putri Pukes Cave

Visual Design	Description
	Front view of Putri Pukes Cave includes an explanatory audio feature and background sound
	First floor view of Putri Pukes Cave. Equipped with location navigation and features including audio, images, digital storybook links, and video



3. Development Stage

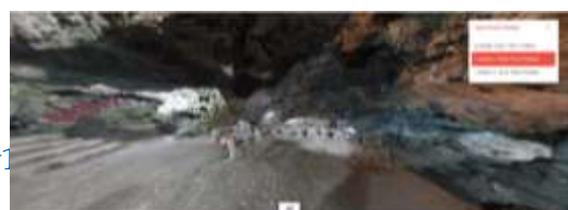
In the development stage, the initial design of the Virtual Tour Reality (VTR)-based learning media was realized into a usable media product for learning. The development focused on creating a 360° visual virtual representation of *Putri Pukes* Cave and integrating features and navigation flow according to the design across the three main locations.

The VTR media was developed by capturing panoramic photos using the Foxpoi application, which were then combined and integrated into a VTR format using the web-based Lapentor application.

Each location was equipped with navigation for transitioning between one location to another, as well as supporting features, including an audio

feature for a brief explanatory narration and background sounds to create a more immersive exploration experience. At the second point, the first floor of the cave, additional supporting features were developed, including a digital storybook link with narrated audio, a video of the *Putri Pukes* Cave story, and supporting images to enhance children's understanding of the story and the cultural values of *Putri Pukes* Cave.

During the development process, the media was also refined with the addition of a new feature, namely an article feature, placed at the third location (the second floor of the cave). This article feature presents brief and simple cultural information as content enrichment, complementing the visual and audio features already developed at that location. The results of the VTR media development can be seen in Figures 5 and 6 below:



media of *Putri Pukes Cave* can be accessed through the following link:

<https://app.lapentor.com/sphere/gua-putri-pukes>

After the product was developed, the researcher conducted an initial validation by content experts, media experts, and instrument experts (children's response sheets) to assess the feasibility of the content, appearance, developmental appropriateness, and ease of use of the VTR media for introducing the local culture of *Putri Pukes Cave*. The validation results were used as the basis for revising and refining the media before it was trialed in learning activities. The results of the content expert validation are presented in the following table.

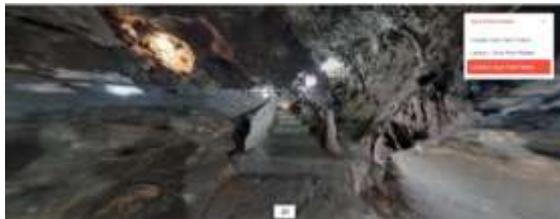


Figure 5. Virtual Tour Reality (VTR) Media for Introducing the Local Culture of *Putri Pukes Cave* before Revision

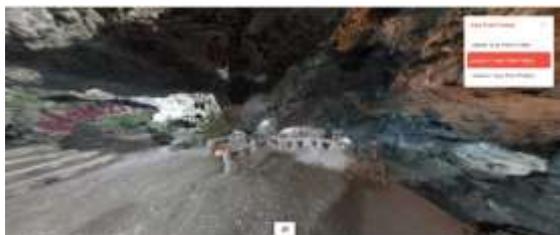


Figure 6. Virtual Tour Reality (VTR) Media for Introducing the Local Culture of *Putri Pukes Cave* after Revision

The post-revision development involved modifying the base display on the second floor of *Putri Pukes Cave* so that when children enter this area, they can directly see an icon indicating that they have entered a different room. The developed Virtual Tour Reality (VTR)

Table 5. Content Expert Validation Results

Category	Score in %
Maximum Score	50
Obtained Score	45
Result	90%

Based on the validation results from the content expert, the VTR-based learning media for introducing the local culture of *Putri Pukes Cave* obtained a score of 45 out of a maximum score of 50, with a feasibility percentage of 90%,

categorizing it as highly feasible. These results indicate that the developed VTR media presents content that aligns with the learning objectives, the characteristics of young children, and the local cultural context, with a clear, structured, and easily understandable presentation through virtual visualization.

Next, media validation was conducted by a media expert to assess the feasibility of the developed media based on four aspects and eight assessment indicators. The results of the media expert validation are presented in the following table:

Table 6. Media Expert Validation Result

Category	Score in %
Maximum Score	40
Obtained Score	33
Result	82,5%

Based on the media expert validation results, the VTR-based learning media for introducing the local culture of *Putri Pukes Cave* obtained a score of 33 out of a maximum score of 40, with a feasibility percentage of 82.5%, categorizing it as highly feasible. Thus, the media features are considered appropriate for use in learning activities.

4. Implementation Stage

In the implementation stage, the media that had been deemed feasible was trialed with students at TK IT Baitusshalihin, involving two classes: Class B1 with 20 children and Class B2 with 19 children during the odd semester of the 2025/2026 academic year.

The implementation was conducted in a classroom setting, presenting the Virtual Tour Reality (VTR) media through a laptop and projector. The researcher acted as a facilitator, guiding the exploration of *Putri Pukes Cave*, while the classroom teacher assisted and managed the students. Through the VTR media, children were encouraged to observe various parts of the cave and cultural information visually, providing a learning experience that closely resembles a direct visit to the cultural destination.

During the activity, the researcher used observation sheets to systematically assess children's interest, focus, and engagement. To complement this quantitative data, brief oral interviews were conducted at the end

of the lesson. The qualitative insights gathered from these interviews, such as children's verbal expressions of excitement and spontaneous comments about the cave, helped contextualize the scores recorded on the observation sheets.

The results of the children's response assessments for the *Putri Pukes Cave* VTR media are presented in Tables 7 and 8.

Table 7. Results of Children's Response Sheets for Class B1

Category	Score in %
Total Score	22
Maximum Score	24
Result	92%

Table 8. Results of Children's Response Sheets for Class B2

Category	Score in %
Total Score	21
Maximum Score	24
Result	87,5%

Based on the trial results, Class B1 obtained a score of 22 out of a maximum score of 24, with a percentage of 92%, while Class B2 obtained a score of 21 out of a maximum score of 24, with a percentage of 87.5%. Overall, the average response percentage of students from both classes reached 90%, categorizing the media as highly feasible.

These results indicate that during the implementation stage, students in both classes responded positively to the use of the *Putri Pukes Cave* VTR media, as evidenced by their enthusiasm, focus and attention, as well as their active participation in the learning activities.

5. Evaluation Stage

The evaluation stage is the final stage in the development of Virtual Tour Reality (VTR)-based learning media, aimed at assessing the quality of the product and its feasibility for use in early childhood learning. The evaluation was conducted comprehensively through feedback and suggestions from content and media expert validators, as well as the results of the media trial in Classes B1 and B2, involving 39 children at TK IT Baitusshalihin.

Feedback from the content and media experts was used as the basis for refining the media, particularly in terms of content clarity, visual presentation, audio, and ease of navigation. In addition, the trial results indicated that the VTR media was able to capture attention, enhance focus, and

encourage active participation. This aligns with the characteristics of immersive virtual media, which, as noted by Lukmanulhakim provide engaging and interactive 360-degree visualization that holds children's attention²⁷. The children's curiosity in exploring the cave visuals and cultural information further supports the findings of Maharani et al who demonstrated that VR-based media can significantly boost learning motivation in young children by providing concrete, explorable environments²⁸.

These evaluation results are consistent with previous research findings, which state that VTR-based media can provide a more concrete and immersive learning experience for young children²⁹. A study by Hasanah et al. demonstrated that VTR media can

help children explore cultural objects or places of worship without having to visit them directly, allowing learning to remain effective despite limited access³⁰. The findings of this study are also consistent with the research by Kamilia et al., which stated that 360-degree photo-based VTR can enhance children's understanding of cultural objects and the surrounding environment due to its realistic and engaging visual presentation³¹.

The *Putri Pukes Cave Virtual Tour Reality (VTR)* media offers advantages in presenting local culture in a concrete and interactive manner without requiring direct visits to the site. This media is developed as a web-based platform; therefore, its use requires the availability of an internet connection. The VTR media can be accessed

²⁷ Lukmanulhakim, 'Inovasi Savari (Sistem Informasi Virtual Reality) Pengembangan Media Virtual Tour Tematik Bagi Anak Usia Dini'.

²⁸ Maharani, Miranda, and Ramadhani, 'Pengaruh Penggunaan Media Pembelajaran Berbasis Virtual Reality Terhadap Motivasi Belajar Anak Usia 5-6 Tahun Di PAUD Melati Kabupaten Sintang'.

²⁹ Lukmanulhakim, 'Inovasi Savari (Sistem Informasi Virtual Reality) Pengembangan Media Virtual Tour Tematik Bagi Anak Usia Dini'.

³⁰ Jumiratul Hasanah and others, 'Pengembangan Pembelajaran Immersive Virtual Reality Untuk Anak Usia Dini Dalam Mengenal Rumah Ibadah Agama Hindu', *Decode: Jurnal Pendidikan Teknologi Informasi*, 4.2 (2024), pp. 489-501, doi:10.51454/decode.v4i2.570.

³¹ Kamilia, Aunurrahman, and Lukmanulhakim, 'Pengembangan Media Virtual Tour Berbasis Foto 360 Derajat Tugu Khatulistiwa Untuk Pengenalan Lingkungan Sekitar Bagi Anak Usia 5-6 Tahun'.

through various digital devices, including smartphones, laptops, desktop computers, and tablets. In classroom learning implementation, the use of a laptop and projector is necessary to ensure that visual displays can be viewed clearly and optimally by all children, as screen sizes on smartphones are relatively small and less effective for classical learning settings.

Overall, the *Putri Pukes Cave* VTR media is considered highly feasible for use as a local culture learning tool. For future research, it is recommended that the VTR media be developed with a wider variety of interactive features, optimized for user-friendliness across different devices, and tested with a broader range of subjects and local cultural contexts to strengthen the research findings.

D. CONCLUSION

The VTR-based learning media for introducing the local culture of *Putri Pukes Cave* was developed using the Research and Development (R&D) method with the ADDIE model, which includes the stages of analysis, design,

development, implementation, and evaluation.

The media was designed as a 360° panoramic virtual tour, equipped with location navigation and features such as narrated audio, background sounds, visual images, story videos, and a digital storybook for media enrichment. The integration of visual and audio features was designed to provide a more concrete and interactive learning experience.

Based on the validation and trial results, the *Putri Pukes Cave* VTR media was deemed highly feasible for use as a learning tool. The content expert validation achieved a percentage of 90%, while the media expert validation reached 82.5%, both categorized as highly feasible. In addition, the trial results showed an average student response percentage of 90%, indicating that the media was very well received.

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