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Interactive articulate storyline application based on real world problem and local Ngada wisdom

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Abstract: Teachers need quality online learning for practical, fun, and contextual science learning. Therefore, this research aims to analyze product suitability retrieved from validation results by material, media, learning design, and language experts, as well as product trial results by user candidates. A research and development (R&D) approach based on Kurt's ADDIE model was used to achieve this research aim. The subjects were 5 teachers and 20 Citra Bakti Junior High School students. We employed data collection strategies through the use of validation sheets, questionnaires, validation evaluation sheets, and prospective user response surveys. The data analysis employed descriptive and inferential statistics. The research results show that the average validation score from material experts is 4.60, media experts are 4.50, learning design experts are 4.35, and language experts are 4.48, all of which are in the very good range. Additionally, teachers' and students' average outcomes trial scores were 4.49 and 4.54, respectively, at an excellent level. Given this information, the interactive, articulate storyline product based on real-world problems and the local wisdom of "Ngada" is suitable for application in the online learning process.

Keywords: Articulate storyline, local wisdom of Ngada, real world problem

Abstrak: Guru memerlukan pembelajaran daring yang berkualitas untuk pembelajaran IPA yang praktis, menyenangkan, dan kontekstual. Oleh karena itu, penelitian ini bertujuan untuk menganalisis kesesuaian produk yang diperoleh dari hasil validasi oleh ahli materi, media, desain pembelajaran, dan bahasa, serta hasil uji coba produk oleh calon pengguna. Pendekatan penelitian dan pengembangan (R&D) berdasarkan model ADDIE Kurt digunakan untuk mencapai tujuan penelitian ini. Subyek penelitian ini adalah 5 orang guru dan 20 orang siswa SMP Citra Bakti. Kami menggunakan strategi pengumpulan data melalui penggunaan lembar validasi, kuesioner, lembar evaluasi validasi, dan survei respon calon pengguna. Statistik deskriptif dan inferensial digunakan untuk menganalisis data. Hasil penelitian memperoleh rata-rata skor sebesar 4,60 (validasi ahli materi), ahli media sebesar 4,50, ahli desain pembelajaran diperoleh skor 4,35, dan dari ahli bahasa diperoleh skor 4,48, yang semuanya berada pada rentang sangat baik. Selain itu, rata-rata nilai uji coba hasil guru dan siswa masing-masing sebesar 4,49 dan 4,54 yang berada pada tingkat sangat baik. Dengan adanya informasi tersebut maka produk alur cerita yang interaktif dan artikulatif berdasarkan permasalahan nyata dan kearifan lokal "Ngada" ini cocok untuk diterapkan dalam proses pembelajaran daring

Kata kunci: Articulate storyline, kearifan lokal Ngada, masalah dunia nyata

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INTRODUCTION

Society 5.0 is the current era that the world is experiencing. This era is characterized by a human-centric technological paradigm that combines artificial intelligence and the Internet of Things to address social issues by integrating cyberspace and the physical world (Rouf, 2019). A crucial prerequisite for engaging with Society 5.0 is the acquisition of technological expertise (Arianti et al., 2023, Yunita et al., 2023). Humans must address the formidable challenge posed by the rapid advancement of technology and information,

coupled with widespread accessibility. During this era, the ability of humans to effectively control both virtual and tangible technology will serve as a measure of an individual's and a country's advancement (Ariastika, 2022). The emergence of society 5.0 will exert influence on various facets of human existence, encompassing health, urban planning, transportation, agriculture, industry, and education (as stated in the Law of the Republic of Indonesia pertaining to the National Education System).

Educational institutions have made substantial progress in response to the emergence of Society 5.0. The transition from in-person to online learning, initially implemented in response to the COVID-19 pandemic, has now become an essential requirement (Laksana, 2020). Kua et al. (2021) assert that digital transformation has become a tangible aspect of the learning process. Traditional learning methods that rely on manual books, limited learning resources, and outdated approaches no longer restrict educators in the present era (Leszczyński et al., 2018; Nasir, et al., 2020; Sadikin & Hakim, 2019). Researchers anticipate that educators will integrate various technological innovations into the learning process (Kumari et al., 2020).

Various innovative offerings are available in the realm of education during the present era of society. Educators may leverage the potential of innovation in the creation of learning materials using information and communication technology (Ogunmokun, 2021). Teachers should possess the ability to arrange online learning across various subjects, providing students with the flexibility to access necessary information at any time and from any location (Hwang et al., 2020; Muhaimin et al., 2019; Sirait et al., 2022). Researchers Lumbantobing et al. (2020) acknowledge online learning as a practical, flexible, enjoyable, and personalized educational approach for students. Online learning is an educational method that utilizes the internet to provide accessible, connected, and flexible learning experiences. It offers a wide range of interactive, enjoyable, and practical learning interactions (Dewi, 2020; Sadikin et al., 2020; Sadikin & Hakim, 2019).

Science is an academic field that can now be learned not only through traditional offline or face-to-face methods but also through online platforms. Students often find science material challenging because it emphasizes reasoning, comprehension, and analysis, which can pose difficulties for teachers (Ady & Warliani, 2022; Lelasari et al., 2021; Nasir, et al., 2023; Yurida et al., 2021). The study of temperature and heat requires teachers at Citra Bakti Junior High School to possess the ability to generate diverse learning opportunities, ensuring that the online learning process is conducted with high quality. Teachers must ensure that students' learning needs are met, allowing them to access information easily and flexibly, regardless of the constraints of place and time. Hence, there is a requirement for educational resources that can adequately address the demands of both students and teachers.

Utilizing digital learning media is a viable approach for educators to implement online science learning (Kua et al., 2022). Students' specific learning requirements can be met by customizing multiple available digital media options (Gonibala et al., 2024; Rahayu, et al., 2024; Setyantoko, et al., 2023). The teacher's role in determining learning strategies is a crucial determinant of the learning quality in this case. An example of a useful application is an interactive, articulate storyline. This medium facilitates opportunities for educators and learners to enhance the caliber of online education.

This multimedia authoring tool offers engaging and enjoyable interactive learning content that incorporates text, images, graphics, sound, animation, and video (Amiroh, 2020). This application enables the creation of interactive quizzes, simulations, screen recordings, and other e-learning objects. Users can build interactions that directly engage students with the material being studied (Safira et al., 2021). Amiroh (2020), and Hasanah et al. (2022) present the outcomes of this media publication as HTML 5/flash files that are compatible with various devices, including laptops, smartphones, and tablets. The utilization of this application is straightforward as it mirrors the functionality of Microsoft Power Point (Putri et al., 2022).

According to Indriani et al. (2021), articulate storylines in interactive media offer several advantages. Users with varying levels of experience can easily create articulate storyline interactive media. Secondly, it allows for the inclusion of various file types such as text, images, graphics, sound, animation, and video. Thirdly, this program enables individual student usage, promoting independent learning based on their abilities. Fourthly, it provides a personalized affective climate. Lastly, students have control over its usage while studying. Recognizing that learning conducted through technological media often lacks real-world experience, teachers must effectively devise strategies for incorporating technology-based learning methods, as students are guided to comprehend information solely presented through technological devices (Umami, 2021). In order to address these limitations, a teacher must possess the ability to effectively devise strategies for incorporating technology-based learning methods.

An effective strategy to enhance the efficacy of articulate storyline interactive media is to adopt a real-world problem-solving approach. Tangible problems serve as a framework for students to discover solutions and acquire knowledge in this approach. Kua et al. (2019) further elucidated that "real-world problems serve as an alternative approach to familiarizing students with authentic challenges in comprehending scientific concepts." Real-world problems prioritize the consideration of interconnected real-life contexts, including the local knowledge and wisdom of a specific area (Kua et al., 2015; Laksana et al., 2019; Nunaki et al., 2023).

Laksana et al. (2019) elucidates that the indigenous elements of Ngada culture, namely reba, moke, and hui wu'u events, have the potential to elucidate the concept of science learning. Reba is a traditional ritual of the Bajawa people that is part of the Ngada traditional New Year celebration. It is a way of expressing gratitude for the successful harvest. Moke is a traditional drink of the Ngada people, made from the sap of trees. Hui wu'u is a type of preserved meat prepared by coating it with corn flour and storing it in bamboo containers (Daeng, 1997; Leba, 2013). The REBA program elucidates the notion of equilibrium between organisms and their surroundings, as well as the utilization of natural resources. Moke serves to illustrate the concept of alterations in the state of substances as well as the concepts of volume and discharge. Employing Hui wu'u helps in comprehending the concept of food preservation.

Utilizing media that emphasizes practical issues in daily life as part of learning activities will afford students the chance to acquire knowledge from their immediate surroundings (Samri et al., 2020; Kua et al., 2021). Active participation of students in science learning enables them to effectively assimilate and reconstruct the knowledge or concepts they acquire, thereby fostering the development of advanced cognitive abilities (Nonggi et

al., 2021). High-level cognitive abilities encompass creative and critical thinking, problem-solving, reasoning, and decision-making (Heong et al., 2011; Irham & Wiyani, 2013; Kurniati et al., 2016). Developing higher-level thinking in science learning is crucial as it equips individuals with the capacity to effectively solve the challenges they encounter in their lives (Istiyono et al., 2014; Saraswati & Agustika, 2020).

According to the explanation, it is deemed essential to develop an interactive articulate storyline application that focuses on real-world issues and the local wisdom of Ngada in the field of science.

METHOD

This type of investigation was conducted in the field of Research and Development (R&D). The outcome of this research is an interactive, articulate storyline media product that focuses on the local wisdom of Ngada and real-world problems. It specifically targets the science subject of substances and their changes, designed for seventh-grade junior high school students. This learning medium has been developed using the ADDIE model, created by Kurt (2017).

The product development process employed the ADDIE model, which encompassed five distinct stages: analysis, design, development, implementation, and evaluation. We conducted the model selection systematically, considering the theoretical foundations of the ADDIE model in the learning design process. An illustration of the research design is displayed in the subsequent Figure 1 (Kurt, 2017).

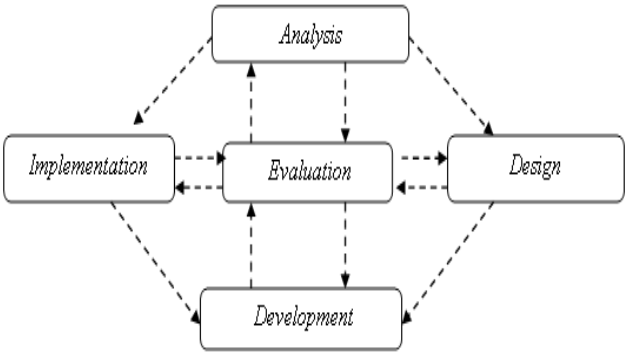

Fig. 1. ADDIE model

Researchers conducted the study at Citra Bakti Junior High School, situated in the Golewa Sub-district at Ngada Regency, Nusa Tenggara Timur Province. The participants in this study consisted of 5 educators and 20 students from Citra Bakti Junior High School. The data collection methods employed were expert validation sheets and prospective user response questionnaires. The assessment sheets and questionnaires were the instruments utilized. The researchers deemed these instruments valid and reliable.

We used the SPSS program to conduct instrument validity testing. The decision-making process relies on a value known as the corrected item-total correlation, which must be greater than 0.378 for a given degree of freedom (df = 18) and a significance level (α) of 0.05. In this case, all statements for each assessment are considered valid. Subsequently, assess the dependability of the instrument by employing the Cronbach's alpha formula within the SPSS software. All instruments possess a Cronbach's alpha value greater than 0.600, thereby confirming their reliability.

We qualitatively analyzed the data collected in this research using descriptive methods. (1) This data pertains to the quality of interactive articulate storyline applications that focus on real-world problems and local wisdom of Ngada in science learning material. The qualitative analysis of the reviews from four validators was conducted to demonstrate the validity of the product under development in terms of temperature and heat. (2) The analysis technique involves categorizing the acquired information into critical input and suggestions to ensure the production of high-quality products. The product quality data, obtained from a limited trial involving 5 teachers and 20 students using the interactive articulate storyline application, is based on real-world problems and Ngada's local wisdom. Various questionnaires assess media and learning design, content presentation, language, as well as product impact and functionality, compiling this data. The analysis of this data involves converting scores using a Likert scale. We converted the assessment results from a qualitative format to a quantitative format using a scale ranging from 1 to 5 to demonstrate the practicality of the product under development.

The analysis phase was carried out first in product development. The activities conducted encompassed (a) assessing the requirements of educators and students in the online learning procedure and (b) evaluating science educational resources within the Merdeka curriculum framework. In addition, the design stage activities involve creating a theoretical and conceptual framework using the findings from material and needs analysis. This framework provides an overview of the product that needs development, incorporating elements that help teachers deliver practical, interactive, and enjoyable online learning experiences centered around real-world problems and Ngada local wisdom. The development phase entailed the creation of an interactive and articulate storyline product that draws upon real-life scenarios and leverages Ngada's local knowledge. We used Adobe Flash CS6 software on a single Intel Core i5 PC for development. The outcomes of this media publication are presented in the format of HTML 5/flash files, which are compatible with various devices, including laptops, smartphones, and tablets.

The implementation stage involved the validation of the product by proficient experts in various fields, including material, media, learning design, and language experts in both Indonesian and Ngada regional languages. In addition, we administered trials to both teachers and students using storylines rooted in real-world problems and the Ngada local wisdom. During the evaluation phase, we made adjustments to the product trial outcomes until we achieved the ultimate research product. Table 1 (Widoyoko, 2014) illustrates the conversion of scores into qualitative values.

Table 1. Conversion of scores

Interval Score	Criteria
$\bar{x} > 4.2$	Very Good
$3.4 < \bar{x} \leq 4.2$	Good
$2.6 < \bar{x} \leq 3.4$	Enough
$1.8 < \bar{x} \leq 2.6$	Less

RESULTS AND DISCUSSION

The research began with several analyses, as follows: (a) the needs of teachers and students at Citra Bakti Junior High School, Ngada district, East Nusa Tenggara province, in

the online science learning process; (b) class VII science learning materials in the Merdeka curriculum framework. The science material analyzed is temperature and heat. Learning achievements are that students are able to make measurements of the physical aspects they encounter and utilize various movements and forces; understand the concept of the relationship between work and energy; measure the amount of temperature caused by the heat energy provided; and differentiate between insulators and heat conductors.

In addition, during the design stage, activities involved creating a theoretical and conceptual framework based on an analysis of the needs of teachers and students at Citra Bakti Junior High School, as well as an analysis of temperature and heat material. This resulted in a draft research product that included elements aimed at facilitating an effective learning process for teachers and students. Internet-based. Adobe Flash CS6 is used for the software, while a single set of Intel Core i5 personal computers is used for the hardware. Subsequently, develop a research instrument consisting of an expert validation sheet and a questionnaire soliciting responses from potential users and evaluate the instrument's accuracy and consistency. The instruments employed in this study possess both validity and reliability. There were twenty participants in the sample in our research.

The development phase involves the creation of research products. The developed learning medium possesses the following characteristics: 1) It integrates the delivery method, practicum method, and learning style, thereby enabling participants to engage in active interactions during online practicum activities. This application offers online learning through interactive quizzes, simulations, and screen recordings. Users can actively engage with the material being studied, promoting direct interaction and enhancing the learning experience. These media publications present the outcomes as HTML 5/flash files compatible with laptops, smartphones, and tablets. 4) Utilizing this application is straightforward as it closely resembles the functionality of Microsoft Power Point. 5) Learning activities that incorporate narrative storytelling enable students to engage in unhindered, high-quality learning processes, unrestricted by time constraints. 6) This clear storyline incorporates case examples, animations, and motion simulations that utilize Ngada's local wisdom. The purpose is to create an educational setting that is both intriguing and enjoyable to enhance students' higher-order thinking skills (HOTs). Figures 2 – 4 illustrate the articulate storyline products.

Fig. 2. Product cover display

Fig. 3. Main menu display

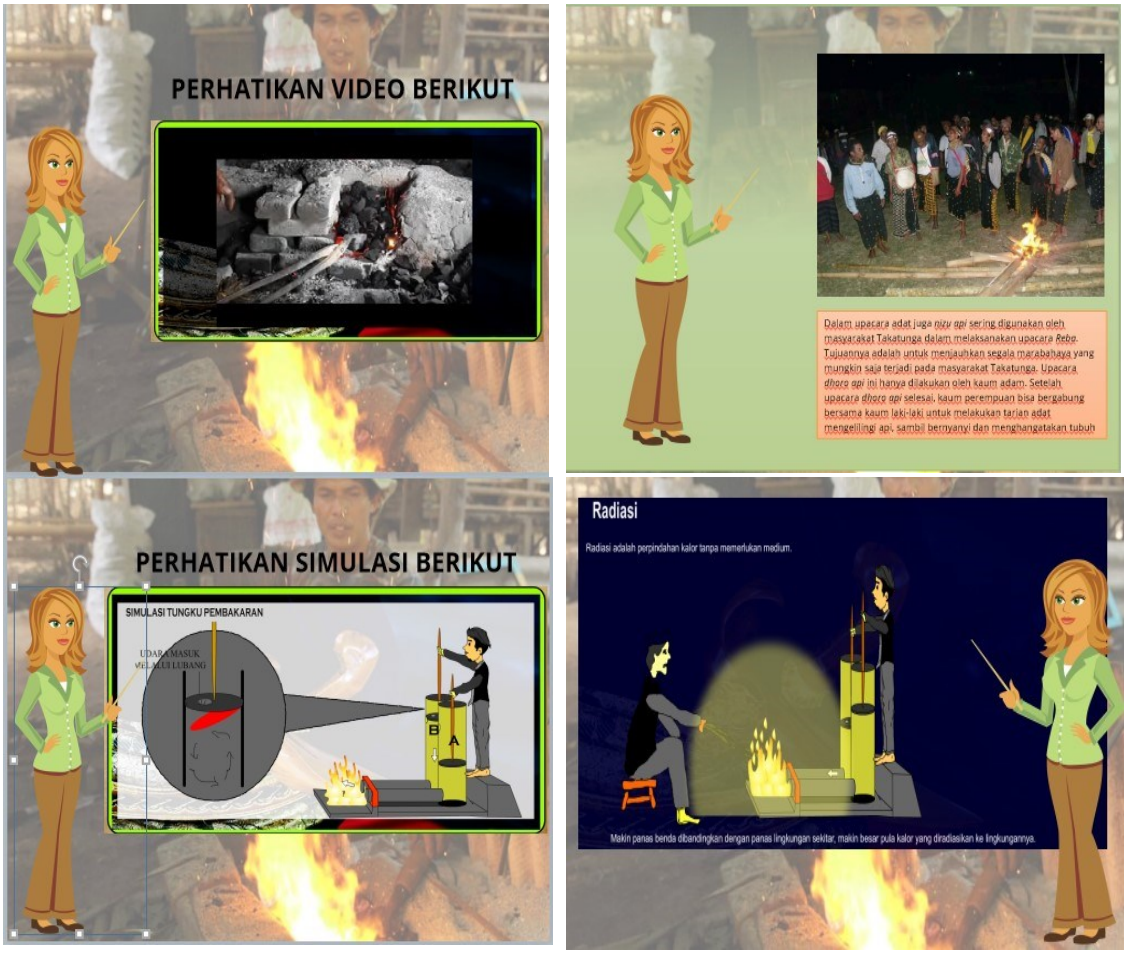

Fig. 4. Material display

Four experts have verified that this articulate storyline is derived from authentic real-world issues and indigenous knowledge of Ngada. The assessment results of the products developed by the four validators fall into the excellent category. Figure 5 displays the average score data obtained from the validation results of the four validators.

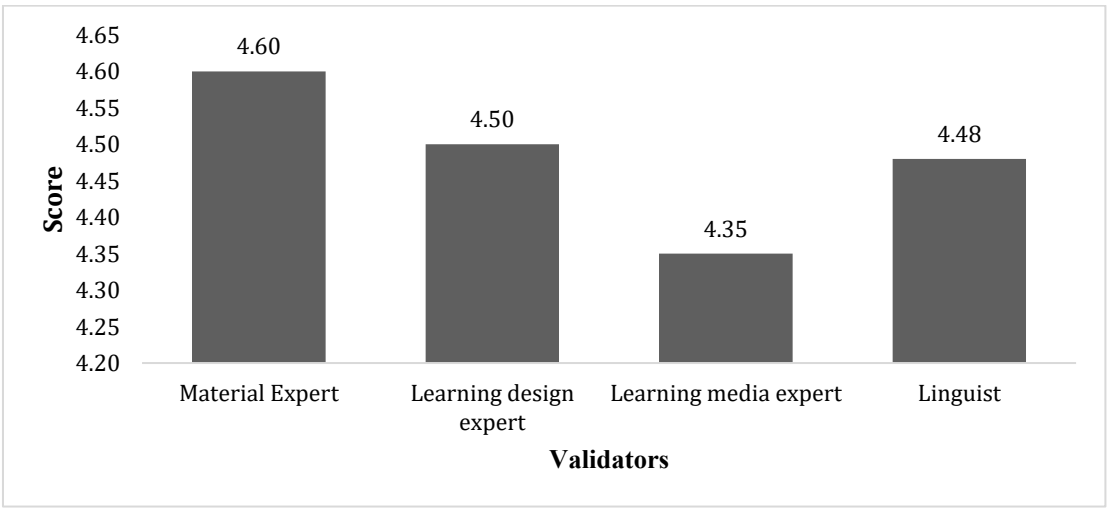

Fig. 5. Validation result from the experts

Subsequently, this educational tool underwent testing with a sample size of 5 teachers and 20 students at Citra Bakti Junior High School. Table 2 displays the data regarding the outcomes of product trials conducted by teachers. 5 teachers provided feedback on the utilization of media in terms of media design, material presentation, learning design, use of language, and usability, resulting in an average score of 4.49. This score falls within the "very good" category.

Table 2. Result of product trial by teacher

Assessment Aspects	Average score	Category
Learning Design	4.43	VG
Material Presentation	4.62	VG
Media Design	4.52	VG
Language Using	4.47	VG
Usability	4.45	VG
Average	4.49	VG

Note: VG = Very Good

Table 3 illustrates the data regarding the outcomes of product trials conducted by students. The students' feedback on the product yielded a mean score of 4.54, indicating excellent satisfaction.

Table 3. Result of product trial by students

Assessment Aspects	Average score	Category
Learning Design	4.50	VG
Material Presentation	4.64	VG
Media Design	4.53	VG
Language Using	4.50	VG
Usability	4.55	VG
Average	4.54	VG

Note: VG = Very Good

Ensuring the successful implementation of online science learning with a challenging level of material requires careful consideration and focused effort. An articulate storyline was developed for online learning, incorporating real-world problems and local wisdom from Ngada based on the analysis of teachers' and students' needs. This digital medium was created to facilitate convenient access to educational resources. The current state of education, known as society 5.0, promotes the integration of digital technology into the learning process (Faudi, et al., 2023; Omotayo & Haliru, 2020; Zengin et al., 2021). This facilitates an internet-based educational process that offers wider learning prospects for both educators and learners (Gambari et al., 2018; Manu, 2023; Nolen & Koretsky, 2018).

This shift in learning patterns poses a challenge for educators to effectively implement a high-quality online learning process. The effectiveness of the learning process depends on various factors, including the teacher's proficiency in designing learning activities such as setting learning goals, choosing appropriate strategies and learning

materials, and evaluating the learning outcomes (Han & Ellis, 2019; Purnomo & Wilujeng, 2016; Roosyanti & Suryarini, 2024). This capability is necessary to ensure the attainment of effective and efficient learning during the online learning process. Hence, it is imperative for an educator to possess a precise understanding of the specific requirements that students necessitate in order to facilitate a successful online learning experience. The articulate storyline incorporates the indigenous knowledge of the "Ngada" community to address real-world issues. Students can engage in independent learning activities without being limited by physical or temporal constraints. The learning process is engaging and innovative, as it utilizes various multimedia elements such as text, art, sound, images, animation, movement, and videos, all inspired by the cultural heritage of the "Ngada" people.

The articulate storyline derived from this research has been formulated, verified by specialists, and evaluated by prospective users. The process of expert validation involved the participation of specialists in materials, learning design, media, and language. Experts in materials, learning design, media, and language conducted the validation. Material experts evaluate various attributes, such as cognition, material composition, applicability of material to practical issues, coherence of material with "Ngada" indigenous knowledge, delivery techniques, and instructional support. The mean score of evaluations conducted by material experts falls within the "excellent" range. The assessments conducted by learning media experts encompass various aspects such as cover design, typography, visual aesthetics, visual communication elements, and software development. The media expert assessments have an average score that falls within the "very good" category. Linguists have evaluated the use of Indonesian and the regional language "Ngada" in this medium and have found that it possesses the necessary elements for online learning: enrichment, interactivity, accessibility, and independence (Anandari et al., 2019; Nisa et al., 2020; Sriyanto et al., 2019). The media expert assessments have an average score that falls within the "very good" category.

The primary objective of developing this educational resource was to assist educators, particularly teachers at Citra Bakti Junior High School, in effectively implementing high-quality online learning activities, unrestricted by constraints of physical space and time. Students can conveniently access learning materials at any time and from any location, tailored to their specific needs and pace in comprehending information, in the form of educational resources (Mastroleo et al., 2020; Ningsih & Mahyuddin, 2021). The efficacy of digital learning media employed by educators and learners significantly influences the attainment of educational objectives. The survey results from prospective users, including both teachers and students at Citra Bakti Junior High School, indicated a favorable reception. The attainment of the mean score in each dimension of the evaluation falls within the "very good" classification, demonstrating a favorable reception.

The articulate storyline offers a distinct advantage by incorporating the local wisdom of "Ngada" into the presentation of learning material, thereby integrating real-world problems and local knowledge. By engaging students in learning activities rooted in authentic local cultural experiences, they will effectively apply and integrate this knowledge into their understanding of the subject matter (Kua et al., 201; Laksana et al., 2019; Lidi et al., 2020; 9). In addition, the implementation of digital learning tools that incorporate high-quality audio-visual elements will facilitate students in comprehending and interpreting information, thus reducing the likelihood of misconceptions (Dinatha & Kua, 2019; Setiyani

et al., 2020). The results of product trials conducted by potential users have confirmed several advantages of the product. These advantages demonstrate that the articulate storyline media, which is based on real-world problems and the local wisdom of "Ngada," is well-prepared to tackle the challenges of online learning. Consequently, the product under development is well-suited for facilitating the implementation of online learning activities.

CONCLUSION

The interactive, articulate storyline product developed for this research incorporates real-world problems and local wisdom from the "Ngada" community. The development process follows the ADDIE model, which includes stages such as needs and material analysis. Additionally, it aligns with the Merdeka curriculum framework, encompassing design, development, implementation, and evaluation. The development of this learning medium yielded an average score in the "very good" category, as evaluated by three experts in the fields of material, media, and language, both in Indonesian and the Ngada regional language. Furthermore, the candidates' trial outcomes were classified as highly commendable. According to this data, the interactive, articulate storyline product, which is based on real-world problems and the local wisdom of "Ngada," is appropriate for use in online learning.

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