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From Design to Evaluation: Authentic HOTS Reading Literacy Instruments with Quizizz Paper Mode

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ABSTRACT

This study aims to develop higher-order thinking skills (HOTS)--based authentic reading literacy instruments using paper mode in the Quizizz application at Metro Public Elementary School 9, Lampung. This study used the Research and Development (R&D) method with the ADDIE design including the stages of Analysis, Design, Development, Implementation, and Evaluation. The results showed that the instruments developed met the criteria of good validity and reliability. The content validity and the language of the instrument were evaluated by experts with the results showing conformity with HOTS indicators, while the instrument's reliability was measured using Cronbach's Alpha coefficient with a value of 0.77, indicating adequate consistency. The implementation of the instrument in the 5th grade of Metro Public Elementary School 9 showed that the majority of students were able to understand the text well, as well as increased students' interest and motivation to learn through the use of paper mode Quizizz. However, some students still had difficulty in understanding the implied meaning and providing critical interpretation of the text. Teachers gave positive support to the use of this instrument, which was considered effective and interactive in improving higher-order thinking skills in students. The findings suggest that the development of technology-based instruments such as Quizizz can be an innovative solution in reading literacy assessment, although further refinement is needed to increase the effectiveness in measuring all spectrums of students' HOTS abilities.

Keywords
Authentic Reading
Literacy
Higher-Order Thinking
Skills
Quizizz Paper Mode

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Introduction

Understanding authentic reading literacy is one of the essential competencies that students must have in facing the current digital era. Ref. [1] states that authentic reading literacy is the ability to understand and interpret texts that reflect language use in real-life contexts. Authentic reading literacy allows students to engage with texts in a meaningful social context so that they can more easily relate what they learn to their personal experiences [2]. In addition to experience, students' prior knowledge also plays an important role in reading activities. Reading comprehension is obtained due to cognitive processes and is strongly related to students' academic success [3].

By understanding the context behind the text, students can develop the ability to critically evaluate information and apply it to real life. Authentic texts such as news articles, essays, and literature, provide students with opportunities to interact with language used in real situations. Ref. [4] points out that authentic texts are characterized by natural rather than constructed language, allowing students to learn the language as it is used by native speakers. Authentic reading literacy helps students develop skills that they can apply in everyday life. Therefore, authentic reading literacy is not only about understanding texts but also about connecting knowledge to real contexts, which is very important in shaping students' academic abilities and life skills.

Authentic reading literacy can be implemented with a HOTS (Higher-Order Thinking Skills)-based approach. These are important concepts that not only emphasize in-depth and contextual understanding of texts, but also encourage students to develop higher-order thinking skills such as analysis, evaluation, and creativity in processing the information they read. Ref. [5] revealed that HOTS texts encourage students to think critically, solve problems, and make decisions, which are important skills in the 21st century. HOTS includes higher cognitive abilities required for complex problem-solving and creative thinking. When students engage with HOTS reading texts, they are invited to question and scrutinize information in depth, which later increases their understanding and ability to apply knowledge in various contexts [6].

However, in practice, teachers still face problems when creating instruments or assessments for learning HOTS-based authentic reading learning. For instance, teachers who taught in the 5th grade of Metro Public Elementary School 9 Lampung focused on teaching students to understand the text cognitively. This is not enough to prepare students for their real-world challenges. Therefore, for teachers, integrating higher-order thinking skills (HOTS)-based authentic reading literacy is very important in their teaching. One of the efforts to facilitate teachers in their teaching implementation is the need for media. Digital learning media plays an important role in improving students' reading literacy. Ref. [7] states that multimedia learning, which utilizes a combination of text, images, and audio, can help students understand and remember information better.

Quizizz is one of the educational application media that applies the concept of gamification [8]. Quizizz can bring multiplayer activities into the classroom and make classroom exercises interactive and fun [9]. Quizizz also allows students to compete with each other and motivates them to learn. Students take the quiz simultaneously in class and see their live ranking on the leaderboard. Quizizz can be used to organize classroom activities and prepare tests [10] [8]. Ref. [11] implemented Quizizz in an Arabic language classroom and found that Quizizz was effective in improving student learning as a game-based learning tool. In their research, [12] found that students were more focused and attentive to quizzes when using Quizizz. The response rate of in-class exercises using Quizizz was higher compared to using other applications.

The development of HOTS-based literacy reading instruments using Quizizz media not only increases student engagement in the learning process but also assists teachers in conducting more accurate and efficient assessments. Thus, students can effectively implement HOTS-based authentic reading literacy, while teachers obtain better data to measure and improve learning outcomes. This study aimed to develop HOTS-based authentic reading literacy instruments with Quizizz paper mode. Therefore, this study focused on the following points.

- What is the validity of the questions made by the teachers from the instrument product created?
- What is the reliability of teacher-created questions?
- Is the design to evaluate of HOTS-based authentic reading literacy instrument using Quizizz paper mode feasible to use as an assessment of students' literacy skills?

Literature Review

A. Authentic Reading Literacy

Reading literacy emphasizes the importance of text comprehension, context understanding, and language- and culture-centered learning [13]. Reading literacy involves deep text comprehension. This includes the ability to identify and understand the main ideas, details, and structure of the text. Snow also emphasizes the importance of context understanding in reading. Ref. [14] states that reading literacy includes text comprehension, vocabulary development, letter recognition, and phoneme skills. Understanding text is a critical aspect of reading literacy as it helps individuals interpret and give meaning to their reading materials. Vocabulary development also plays an important role in reading literacy as having an extensive vocabulary allows individuals to understand and relate the concepts contained in the text.

Meanwhile, authentic reading literacy is a reading ability that involves active interaction between the reader and the text in a meaningful and authentic context. According to the theory proposed by Ref. [2], authentic reading literacy has several characteristics, namely the reader is actively involved in constructing meaning from the text; the text read has relevance to the reader's real life; the purpose of reading is not only to obtain information but also to fulfill the reader's personal needs and interests; and the reading process involves critical thinking skills and creativity. Authentic reading literacy and higher-order thinking skills are intertwined in the context of modern education. Authentic reading literacy encourages students to not only understand the text literally but also to analyze, evaluate, and create meaning from the text.

Education is not only about transferring knowledge from teacher to student but also about active experiences where students actively construct their understanding through interaction with texts and their environment [15]. Integrating authentic texts that are relevant to students' daily lives can motivate them to use higher-order thinking skills in understanding and interpreting information.

B. Quizizz as Assessment Media

Media is an intermediary in the form of individuals, materials, or events that help create conditions that enable students to gain knowledge, skills, or attitudes. The definition of media in learning activities is more concentrated on its function as an intermediary that can assist students in understanding the material in the learning process. Learning media includes not only tools but also environments that are explicitly created to meet learning objectives, whether developed for learning or not [16]. Media can be used as an effective assessment tool, allowing teachers to evaluate student understanding through various formats such as videos,

interactive quizzes, and online discussion forums. Assessment is a teaching and learning process design that has the aim of measuring the extent of student abilities from before to after the teaching and learning process is carried out regarding the level of student competence that has been achieved [17] [18].

Assessment tools can be online, allowing more flexible assessment and easy access for students from various locations, as well as providing quick and automatic feedback to improve the learning process. Quizizz is an online assessment tool that teachers can use to determine the understanding of their students. As online software, Quizizz can be used as an evaluation medium [19] [20]. The questions can be designed in various forms such as true or false, multiple choice, and others. Teachers have the option to set the quiz as public or private. If the quiz is set as public, it can be shared with other teachers or instructors [9].

Teachers can use Quizizz paper mode to test HOTS-based authentic reading literacy. By projecting the quiz questions on the computer, students can attempt to answer the questions using personalized QR Codes. This Paper Mode not only makes it easy to collect answers but also provides immediate insight into student responses (https://quizizz.com/home/solutions/paper-mode-on-quizizz?lng=en).

Material and Methods

This study on the development of HOTS-based authentic reading literacy instruments using Quizizz paper mode was an R&D (Research and Development) research using ADDIE design. This study was to organize the development of instruments or products so that later it produced effective and reliable instruments for students to use. The ADDIE design has systematic stages in the form of analysis, followed by design, development, then implementation, and finally evaluation [21]. The study ensures that the instrument developed can be integrated through Quizizz paper mode. The following are the stages carried out by researchers in this study.

A. Analysis

The analysis stage involved activities to understand the needs and problems faced in HOTS-based authentic reading literacy. Several steps taken included the researchers conducting surveys or interviews to identify the need for authentic reading literacy in students. The researchers analyzed the expected reading literacy competencies according to the curriculum standards. The researchers also understood the learning context and environment where the instrument would be applied. After that, the researchers identified the available resources, such as teaching materials, technology, and time.

B. Design

The design stage aims to design the HOTS-based authentic reading literacy instrument to be developed. The steps included formulating specific and measurable learning objectives. The researchers designed the format of the instrument which included HOTS-based authentic reading literacy questions. Then, the researchers created a grid of questions that included HOTS indicators. With the help of the Quizizz paper mode application, the researchers designed an attractive and easy-to-understand instrument display. In addition, it made it easier for students to answer questions with the help of a piece of barcode paper to answer all the questions tested.

C. Development

The development stage involved making and testing instruments that had been designed. The steps included compiling HOTS-based authentic reading literacy questions according to the design that had been made. The researchers also involved experts in the field of education. After getting suggestions from the experts, the researchers revised the products that had been made previously.

D. Implementation

The researchers used instruments that had been revised based on the expert suggestions. The questions given to the 5th-grade students at West Metro Public Elementary School 9, Lampung were multiple-choice questions. The number of students who worked on the HOTS-based authentic reading literacy instrument was 14 students. The researchers collected data on the results of using the instruments, including feedback from learners and teachers.

E. Evaluation

The evaluation stage involved assessing the effectiveness and efficiency of the instruments that had been developed. The steps included analyzing the data from the use of the instruments to know the extent to which the research objectives had been achieved. The researchers also evaluated the quality of the instruments based on the results of data analysis and feedback.

Results and Discussion

A. Needs Analysis

To improve the quality of education at West Metro Public Elementary School 9, Lampung, in-depth interviews were conducted with school officials to understand the need for developing a HOTS (Higher-Order Thinking Skills)-based reading literacy instrument. The results of the interviews showed that the teaching methods currently applied emphasize students' understanding of the knowledge contained in the text. Teachers in this school tend

to focus on students' ability to identify information and understand content directly from the text.

Although basic comprehension of the text is important, the interviews revealed that aspects of higher-order thinking skills such as problem-solving, creativity, and critical thinking received less attention. Students were not given enough opportunities to develop analytical, evaluative, and creative skills through the texts they read. These skills are very important in preparing students to face future challenges, both in the context of further education and in everyday life.

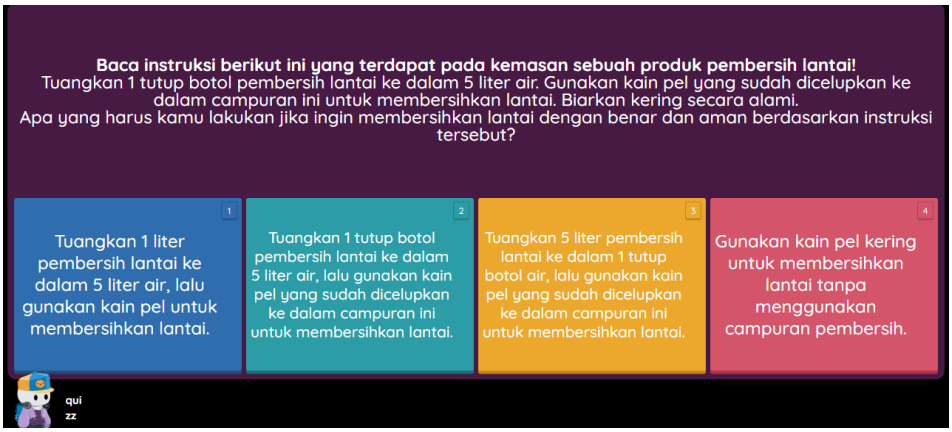
Furthermore, the results of the interviews with teachers showed that there was an urgent need to develop evaluation instruments that were able to measure and encourage higher-order thinking skills in students. The teachers realized the importance of instilling HOTS skills but felt that they did not have effective tools to systematically evaluate and develop these skills in the daily learning processes. To answer this need, Quizizz paper mode was chosen as a medium for developing HOTS-based reading literacy instruments. Quizizz paper mode allows teachers to develop challenging and varied questions that can measure students' analytical, evaluative, and creative skills. It also provides flexibility in delivery and assessment, which is very helpful in the context of classroom learning.

By utilizing Quizizz paper mode, teachers can create authentic and contextual questions that not only test students' basic comprehension of the text but also challenge them to think critically. This instrument is expected to help teachers design more holistic and comprehensive teaching strategies so that students can develop higher-order thinking skills that are urgently needed in this era of globalization.

B. Design

The instruments developed by the researchers were based on the learning outcomes of phase C of primary school. Each question was designed to assess HOTS-based authentic reading literacy skills. The learning objectives were identified based on phase C learning outcomes, which include the ability to understand denotative and connotative meanings; identify moral values contained in prose and rhymes; be able to analyze values in literary texts presented through audiovisuals; explain the main character in narrative texts; read a text with proper intonation, expression, and tempo; read a poem with good appreciation; identify new vocabulary in the text and explain its meaning; identify the main object discussed in the text; describe the phenomenon described in the text; explain the main character in a narrative text; identify the main object discussed in the text; identify the main idea of a descriptive, narrative,

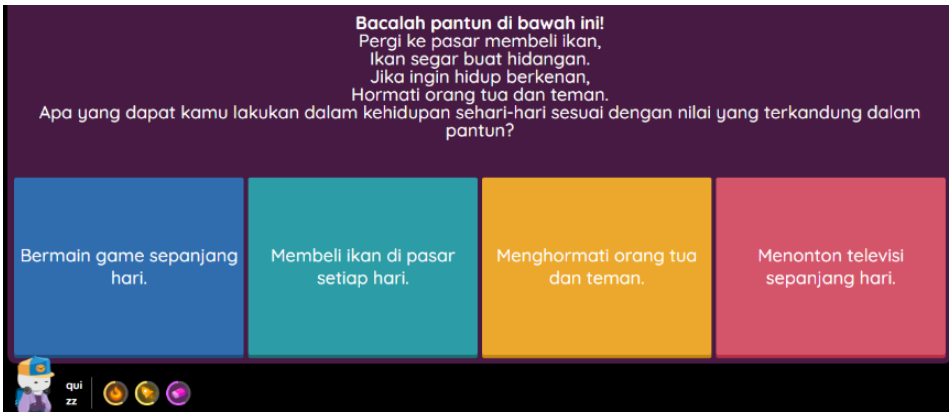
and expository text; and be able to explain the meaning and message contained in a poem. The following is an example of the instrument designed by the researchers.



English Version:
Read the following instructions found on the floor cleaning product packaging.
Pour 1 bottle cap of floor cleaner into 5 liters of water. Use a mop dipped in this mixture to clean the floor. Let it dry naturally.
What should you do if you want to clean your floor safely and properly based on those instructions?
Pour 1 liter of floor cleaner into 5 liters of water, then use a mop to clean the floor.
Pour 1 bottle cap of floor cleaner into 5 liters of water, then use a mop dipped in this.
Pour 5 liters of floor cleaner into 1 cap bottle of water, then use a mop dipped in this mixture to clean the floor.
Use a dry mop to clean the floor without using a cleaning mixture.

Fig. 1. Procedural text

Fig. 1 shows the question design of the questions in Quizizz about procedural text. Procedural text helped students in grade 5 at Metro Public Elementary School 9 to understand the steps in doing something. Procedural text teaches the students to follow instructions sequentially. It helps them understand that to achieve a result, it is necessary to follow certain steps in the right order. They can apply this in real life.



English Version:
Read the rhyme below!
Go to the market to buy fish
Fresh fish for dishes
If you want to live pleasingly
Respect parents and friends appropriately
What can you do in your daily life according to the moral values contained in the rhyme?
Playing games all day; Buying fish at the market every day; Respect parents and friends; Watching television all-day

Fig. 2. Moral values in rhymes

The question in the Quizizz (Fig. 2) is part of the learning indicator showing that students can identify moral values contained in prose and rhymes. Identifying moral values contained in prose and rhymes has important benefits for students. By identifying moral values in prose and rhymes, students learn to recognize and understand various ethical and moral principles such as honesty, responsibility, hard work, and respect. This helps form good character, which is crucial for their personal and social development.



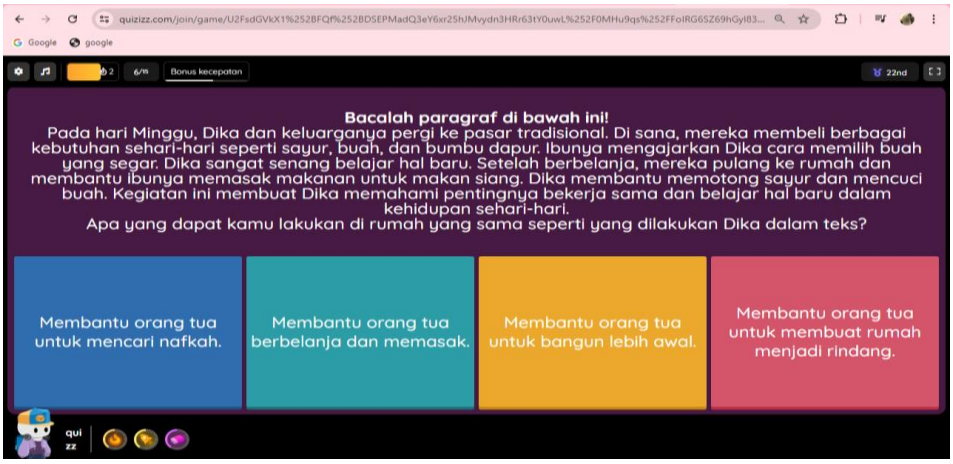
English version:

Based on the video, what values can you learn and apply in your daily life?
The importance of being fast at everything
The importance of not being arrogant and continuing to strive
The importance of resting while traveling
The importance of joining the race every day

Fig. 3. Moral values in the children's story video

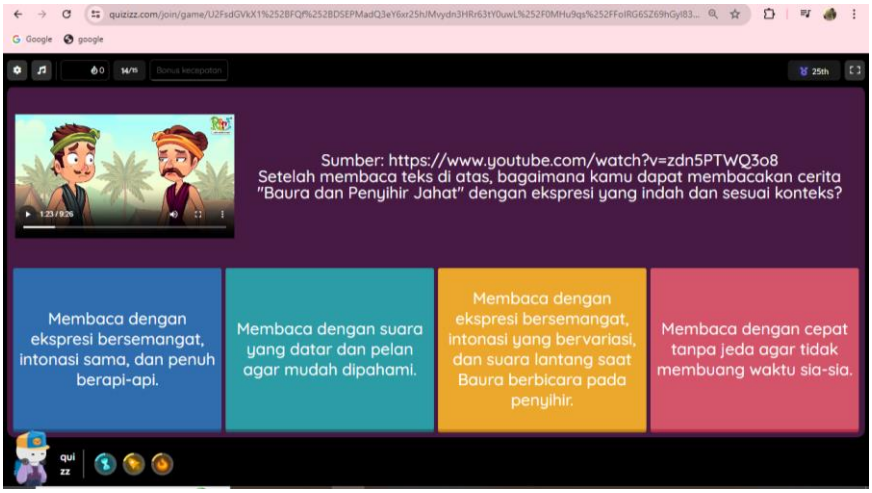
The question in the Quizizz (Fig. 3) is part of the learning indicator showing that students are able to analyze moral values in literary texts presented through audiovisuals. Analyzing moral values in an audiovisual context requires students to combine different types of information from visual, audio, and textual. It trains them to think critically and analytically, examining how elements such as images, sound, music, and dialog work together to convey a particular message or value.

The question in Quizizz (Fig. 4) is part of the learning indicators of students' ability to explain the main characters in a narrative text. When students analyze the main characters, they often try to understand the feelings, motivations, and challenges the characters face. This can increase the students' empathy for others and help them develop a deeper emotional understanding.



Read the paragraph below!
On Sunday Dika and his family went to the traditional market. There, they bought various daily necessities such as vegetables, fruits, and spices. His mother taught him how to choose fresh fruit. Dika loves to learn new things. After shopping, they went home and Dika helped his mother cook food for lunch. Dika helped with cutting vegetables and washing fruit. This activity made Dika understand the importance of working together and learning new things in everyday life.
What can you do at home that is similar to what Dika did in the text?
Helping parents to earn a living
Helping parents shop and cook
Helping parents wake up earlier
Helping parents to make the house shady

Fig. 4. Characters of the narrative text



After reading the text above, how can you read the story "Baura and the Wicked Witch" with beautiful expressions and in context?
Reading with excited expression, equal intonation, and full of passion
Reading in a flat and easy voice for easy understanding
Reading with an excited expression, varied intonation, and a loud voice as Baura talks to the witch.
Reading quickly without pausing so as not to waste time.

Fig. 5. Reading stories in context

The question in the Quizizz (Fig. 5) is part of learning indicators indicating that students can read texts with the right intonation, expression, and tempo. When students can read with the right intonation, expression, and tempo, they tend to feel more confident. This confidence

can have a positive impact on their participation in other learning activities such as class discussions or presentations.

C. Development

In the development phase, the main priority was to verify that the authentic reading literacy instrument using the Quizizz paper mode application that was being developed met the validity and reliability standards. This step involved a series of testing and evaluation by experts. The criteria for content validity based on the assessment by the experts comprising of material, construction, and language were calculated using the CVR formula.

$$CVR = \frac{ne-\frac{N}{2}}{\frac{N}{2}} \quad (1)$$

Based on the expert assessment in terms of material, construction, and language, the majority of questions were rated quite good to very good with scores between 3 and 4 in both validity documents, indicating that the question material was following the expected learning outcomes. The scores given for suitability to the indicators were also consistent between 3 and 4, indicating that the questions had been prepared by considering the relevant indicators.

The assessment of the material section asked follows the competency being measured, although several questions need to be improved. The main questions are generally well formulated, as indicated by the values ranging between 3 and 4, although several aspects can still be improved. In addition, the instruments developed are quite good by not providing answer clues to the answer choices submitted. Overall, the language used in the question instrument is communicative, as proved by the values received from the validator.

Validation assessment in terms of language, the language used in questions with the values of assessment ranging between 3 and 4 indicates that the language used is in accordance with Indonesian language rules. In addition, the development of the instrument shows that the language used is quite communicative. The questions also show that the use of taboo language is avoided. The consistency of values 3 and 4 also indicates that the answer choices do not repeat the same words or groups of words, unless they are a single meaning, indicating that the questions have implemented the language rules well.

$$r\text{pbis} = \frac{\text{Mp}-\text{Mt}}{\text{Sdt}}\frac{\sqrt{\text{p}}}{\text{q}} \quad (2)$$

Then, based on the calculation of the biserial correlation coefficient (rpbis), the value obtained was greater than the r table with a value of 0.74, so it can be concluded that the questions made are valid. Furthermore, the reliability test was conducted using the following Cronbach's Alpha formula.

$$\mathbf{r11} = \frac{k}{k-1} x \left(1 - \frac{\Sigma Si}{St}\right)^2 \quad \text{.....(3)}$$

The results of the reliability test using Cronbach's Alpha obtained a value of 0.77. This indicates that the items in the test are generally consistent in measuring the same construct. A reliability score of 0.77 is considered good in many research and evaluation contexts. It indicates that the test has an adequate level of reliability, although improvement is still needed to make the results more consistent. In conclusion, the instruments developed have met the criteria for good validity and reliability.

D. Implementation

In the implementation stage, the development of HOTS-based authentic reading literacy instruments using Quizizz paper mode was implemented at Metro Public Elementary School 9 Lampung which involved 14 students. The implementation stage of the HOTS-based authentic reading literacy instrument includes the following stages.

1. Preparation

Preparation is a crucial initial step to ensure that the implementation of the instrument runs well. At this stage, the activities are Preparing Quizizz instruments in Paper Mode, and Converting questions.

The questions that had been created in Ms.Word were converted to the Quizizz platform. The type of Quizizz used was paper mode. This makes it easier for the students to answer the questions. Then, the students were given a piece of coded paper by the researcher to answer all the questions. Thus, students are facilitated quickly and easily. The answers from each student were automatically saved in the researcher's quizizz account.

2. Implementation

The implementation stage is the core of the instrument implementation. At this stage, the main activities carried out are as follows. The researchers opened the session by giving a brief introduction and ensuring that all students were ready to work on the questions. The researchers distributed barcode sheets to the students to answer the questions given. The students worked on HOTS-based authentic reading literacy questions presented in multiple-choice form.

The questions were displayed on the projector and the students answered the questions using the barcode sheet. The researchers ensured that all students answered each question by rotating the barcode paper according to the chosen answer. The students' answers were immediately saved automatically in the Quizizz application and students

immediately knew whether the chosen answer was right or wrong. After finishing answering the questions, students were allowed to leave the test room.

3. Data Collection

Data collection is the final stage of implementing the instrument, aiming to collect students' answers and other supporting information. In this stage, the researchers also provide feedback to students and teachers. Based on the tests conducted regarding the authentic reading literacy assessment instruments, the results indicated that the results of HOTS-based authentic reading literacy skills in the 5th-grade students at West Metro Public Elementary School 9, Lampung showed quite satisfactory results. Most of the students were able to understand the text as evidenced by the questions answered correctly. The students were able to answer the questions related to figurative language, rhymes, literary values in audiovisuals, etc. However, some students still had difficulties in understanding HOTS-based authentic reading literacy.

Regarding the students' responses to the implementation of HOTS-based authentic reading literacy instruments using Quizizz paper mode, the students were very happy with the new methods introduced in the learning processes. The use of Quizizz paper mode makes learning processes more fun and challenging. The questions given are very interesting and different from usual, so the students become more eager to answer the questions. Using Quizizz paper mode feels more exciting than regular tests, so the answering process is not boring. The use of Quizizz paper mode not only increases interest in learning but also creates a fun learning experience.

Regarding the teachers' response, the teachers provided full support for the implementation of the HOTS-based authentic reading literacy instrument. They also showed enthusiasm when accompanying students during the assessment. According to the teachers, the use of the Quizizz application in the authentic reading literacy assessment has been proven to be effective. The interactive and digital assessment format simplifies the assessment process and data collection. The teachers greatly appreciate the innovation in the authentic reading literacy assessment and express a desire to continue to develop its use in the future.

E. Evaluation

The evaluation stage of the implementation of the HOTS-based authentic reading literacy development trial using Quizizz paper mode is as follows.

1. Feedback Data Collection

Feedback data was collected from the students involved in the trial stage. The students gave their views regarding the enjoyment, engagement, and challenges they faced while

using the Quizizz paper mode. The Quizizz app has been proven to be effective in managing and presenting authentic reading literacy assessment instruments.

2. Analysis of Assessment Results

The results of the authentic reading literacy assessment showed that most students had a fairly good understanding of the reading text. However, some students still had difficulties in understanding the implied meaning and providing critical interpretation. Therefore, further efforts are needed to improve students' abilities in terms of deep understanding and critical interpretation.

3. Evaluation of Student and Teacher Responses

During the assessment process, students showed high enthusiasm and active involvement. They provided positive feedback on the use of the Quizizz application and they expressed that the interactive assessment format helped improve their reading comprehension. Teachers also provided full support and felt that the implementation of this authentic reading literacy assessment was quite effective and had the potential to be further developed.

In other words, the implementation of authentic reading literacy assessment using the Quizizz application can be considered successful, has been proven effective in measuring students' reading literacy skills, and receives positive responses from students and support from teachers. However, improvement is still necessary, especially in improving students' ability to understand implied meanings and provide critical interpretations.

This study on authentic reading literacy instruments using Quizizz paper mode was carried out at West Metro Public Elementary School 9. The results of this study showed that the use of Quizizz paper mode as an evaluation tool was effective in measuring higher-order thinking skills in students. Learning processes that integrate HOTS help students develop deeper thinking skills, improve their understanding of reading materials, and prepare students for more complex challenges in the future [22]. The implementation of this instrument is based on the need to improve students' critical, analytical, evaluative, and implementative thinking skills in reading texts, which are the essence of authentic reading literacy.

Authentic reading literacy focuses on comprehension and active interaction between students and texts in meaningful contexts. Ref. [2] emphasizes that authentic reading literacy requires readers to engage in the process of constructing meaning from texts that are relevant to real life and involve critical thinking and creativity. This is in line with the results of a study conducted by Ref. [23] showing that when students actively take action in reading activities, they do not just passively receive information, but also relate it to their prior knowledge.

Authentic reading literacy assessment instruments can effectively measure students' reading skills in developing language competencies [24].

The results of this study also showed that the use of Quizizz paper mode increased student interest, and motivation to learn, and developed higher-order thinking skills. This is in line with the results of a study carried out by Ref. [16] which revealed that interactive media can increase student participation in the learning process, thereby creating a more dynamic and interesting learning environment. Interactive learning media, such as Quizizz, provides opportunities for students to get immediate feedback which is very important in the HOTS-based learning process. Ref. [9] in his study revealed that interactive learning media such as Quizizz can provide fast and automatic feedback, thereby increasing learning effectiveness. Ref. [11] in their study found that more than 57% of students liked the use of Quizizz in learning processes. The use of Quizizz helps students to think faster to devise problem-solving strategies.

The instruments developed in this study had gone through a series of validity and reliability tests involving experts. Validity and reliability are two crucial aspects to ensure that the instruments used truly measure what should be measured and can generate consistent data. Validity relates to the extent to which the instrument reflects the concept to be measured. In this study, the validity of the questions was assessed through various stages of testing by the experts of material, construction, and language. Ref. [25] conveyed that content validity must be evaluated to ensure that each item in the instrument is relevant to the purpose of measurement. In this study, the use of the CVR formula to assess content validity showed that the instruments met the criteria for good validity, in which most of the questions assessed were following the relevant indicators. This means that the instrument can be used effectively to measure students' reading literacy skills, especially in the context of higher-order thinking. The results of this study are in line with what Ref. [13] emphasizes on the importance of validity in reading literacy instruments to ensure that the instrument truly measures the abilities to be measured.

Reliability refers to the consistency of the results obtained from authentic reading literacy instruments when used under the same conditions. The reliability of an instrument can be measured using Cronbach's Alpha coefficient showing the internal consistency of the items in the instrument [26]. In this study, the reliability of the HOTS-based authentic reading literacy instrument tested using Cronbach's Alpha was obtained with a value of 0.77, which indicates that the instrument has sufficient consistency in measuring students' literacy skills. In terms of reliability, the use of the biserial correlation coefficient (rpbis) and the calculation of Cronbach's Alpha showed that the instrument has a good level of consistency in measuring

students' literacy skills. This high reliability ensures that the measurement results are reliable and consistent if applied to the same population under similar conditions. This is in line with what Ref. [14] emphasizes on the importance of reliability in evaluation instruments to ensure reliable results.

Successful instrument development to achieve adequate validity and reliability indicates that the questions developed are by the competencies measured and can be used consistently in various situations. This is very important in the context of educational assessment. Valid and reliable instruments provide an accurate picture of student abilities, as well as a strong basis for pedagogical decision-making. Then, assessment using Quizizz has been proven effective in measuring HOTS abilities, as stated by Ref. [19] and Ref. [20]. The instrument developed using Quizizz allows flexible assessment with questions designed to assess students' analytical, evaluative, and creative skills. Quizizz also allows students to compete with each other to motivate them to learn so that learning outcomes can improve. Quizizz is like learning while playing which is fun for elementary school students. A study conducted by Ref. [27] showed that learning using games has great potential to be an effective learning medium because it can stimulate visual and verbal components [28]. In addition, the use of technology in the form of Quizizz paper mode also provides flexibility in assessment, allowing teachers to adapt the instrument according to the student's needs. This is in line with what Ref. [9] emphasizes that the use of technology in education can provide more adaptive and responsive solutions to students' needs.

The implementation results showed that most students were able to understand the text well and responded positively to this assessment method. However, there are still challenges in improving students' ability to understand the implied meaning and provide critical interpretation of the text. This indicates that the instrument developed still requires refinement to be more effective in measuring the entire spectrum of HOTS abilities. Although the use of Quizizz has been proven effective, this study also identified some challenges in its implementation, especially related to the variation in students' ability to understand HOTS-based reading literacy. Further efforts are needed to develop more inclusive and adaptive instruments to students' needs. In addition, the use of technology in learning processes, such as Quizizz, must continue to be systematically integrated into the curriculum to ensure that all students can develop the skills needed to succeed in the educational milieu.

Conclusion

The results of this study on the development of an HOTS-based authentic reading literacy instrument with Quizizz paper mode in learning processes showed that the development and implementation of an HOTS-based reading literacy instrument using Quizizz

paper mode can improve critical, analytical, and evaluative thinking skills in students. The instrument was designed to assess authentic reading literacy skills that not only focused on basic comprehension of the text but also encouraged students to engage in higher-order thinking processes, such as problem-solving, creativity, and evaluation. Regarding the implementation, the results of this study showed that the use of Quizizz paper mode as an evaluation tool has been effective in measuring higher-order thinking skills in students. This instrument provides immediate feedback and makes the learning process more interesting and challenging. This aligns with the goal of authentic reading literacy which emphasizes deep understanding and relevance of texts to real life. By engaging students in authentic and meaningful reading activities, the instrument can relate learning to real-world contexts, so that students not only learn to understand the text but also apply that understanding in everyday situations. Further, this study also revealed the challenges in improving students' ability to understand the implied meaning and provide critical interpretation of the text. Nonetheless, this instrument has been proven valid and reliable and received positive responses from students and teachers. These results suggest that the instrument developed using Quizizz can be an effective tool in improving HOTS-based authentic reading literacy, with the potential to be continuously developed and refined to be more inclusive and adaptive to students' individual needs.

Conflict of Interest

The authors declare that there is no conflict of interest.

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