



# Analysis of the Development Needs of HOTS-Based Electronic Student Worksheets with Culturally Responsive Teaching Approach in Elementary Schools

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## ABSTRACT

**Objective:** To address this issue, this research explores the integration of HOTS with the Culturally Responsive Teaching approach in developing Electronic Student Worksheets as a holistic and relevant learning solution. This research analyzes the preliminary development of HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching Approach. **Method:** This research adopts a qualitative descriptive approach and involves fourth-grade teachers in Pasuruan Regency as research subjects. Sampling is done through purposive sampling. Data collection includes observation, documentation, and interviews. **Results:** The research begins with a preliminary study to identify the foundations that strengthen the development of electronic Student Worksheets. Then, a field study is conducted by directly observing the teaching materials teachers use in their instruction. Curriculum analysis focuses on Student Worksheets and learning materials. The Student Worksheets teachers use need to integrate HOTS and the Culturally Responsive Teaching approach. This preliminary study findings suggest the need for developing HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach so that students can improve their critical thinking skills, learn about the culture of their local area, and appreciate both their own culture and the cultures of others. **Novelty:** This research implies that implementing HOTS with the Culturally Responsive Teaching approach in elementary education can provide a solid foundation for producing students who are not only academically intelligent but also possess character, critical thinking skills, and an understanding and appreciation of cultural diversity.

## INTRODUCTION

Education is one of the crucial aspects of a nation's development. It plays a vital role in the progress of society and the nation and serves as the foundation for creating competitive individuals on a global scale (Prayogi et al., 2019). The quality of education serves as a vital foundation in shaping learners' intellectuality and social skills, preparing them to meet the demands of an ever-evolving world (Prayogi et al., 2019). Through education, individuals can develop their potential and gain a profound understanding of the social, political, and cultural environment around them (Yuliatin et al., 2022). In nation-building, education plays a crucial role in achieving sustainable development goals. Through quality education, a country can enhance the quality of its human resources, reduce social disparities, strengthen political participation, drive innovation and technological advancement, as well as promote awareness and understanding of human rights (Adawiyah et al., 2021; Puriasih & Rati, 2022).

Education in Indonesia has undergone significant changes with technological advancements and globalization. One of the significant challenges in the current education system is integrating information and communication technology into

learning, especially at the elementary school level. The education system in Indonesia today encourages learners to acquire the skills necessary to face the complex challenges of the 21st century (Abdurrahman et al., 2020; Pebriani et al., 2022). Rapid social, economic, and technological changes characterize the 21st century. The fourth industrial revolution, digitalization, and global transformation have altered how individuals work, communicate, and learn. Therefore, the education system must be capable of producing graduates who possess not only basic knowledge but also high-level skills such as critical thinking, creativity, collaboration, and digital literacy, often referred to as HOTS (Herlina & Ihsan, 2020; Muskita et al., 2020).

Critical thinking skills are vital in facing an increasingly complex and changing world. Critical thinking skills are essential in this fourth industrial revolution to prepare learners to tackle increasingly complex life challenges (Abdurrahman et al., 2020). Primary education, especially at the elementary school level, plays a crucial role in shaping the foundation of critical thinking skills for learners. Critical thinking is analyzing, evaluating, and solving problems carefully, logically, and critically. This critical thinking ability significantly impacts helping learners face various challenges in daily life, including understanding information, making decisions, and pursuing success in education and work (Darwin et al., 2024).

Critical thinking skills will assist learners in thinking profoundly and enable them to carefully evaluate ideas or arguments, make better decisions, and present solutions clearly and logically. When faced with complex problem-solving, learners with critical thinking skills can analyze the problem quickly, evaluate various pieces of information, and connect them to different concepts (Bacanlı et al., 2011; Sebastian et al., 2023). Learners with critical thinking skills are better prepared to understand scientific methods and can formulate questions with broader insights. Critical thinking skills are not only crucial for solving academic problems but also for everyday life and the future careers of learners. They form the foundation of self-directed learning and the ability to conduct research, significantly impacting their academic and professional success. These skills help individuals make informed decisions, understand information more deeply, and confront various challenges in the complex modern world. Therefore, developing critical thinking skills is crucial in the learning process.

However, the challenges in developing critical thinking skills in elementary school students have become increasingly complex with the advancement of time. The digital age and the rapid access to information through technology have transformed the learning paradigm. Learners in the current era require high-level thinking skills known as higher-order thinking Skills (HOTS) (Ramadhan et al., 2020; Yusuf & Widyaningsih, 2019). HOTS encompasses problem-solving abilities, critical thinking, creative thinking, and decision-making skills, which are crucial in facing complex challenges across various aspects of life.

The low level of critical thinking skills at the elementary school level is a profound issue that must be addressed. Most elementary school learners need help to critically analyze information, formulate strong arguments, and solve problems more profoundly. One of the reasons is that the learning approach at the elementary school level often tends to be more focused on understanding basic concepts rather than developing critical thinking skills (Mulyati et al., 2021). The lack of attention to this aspect can lead learners to need help meeting the increasingly complex demands of education at higher levels.

The issue currently faced by fourth-grade students at Elementary School Gununggangsir 1 is the low level of critical thinking skills. Many students are passive, merely listening to the teacher present or explaining the learning material. Teachers also encounter challenges in developing students' critical thinking skills. The proficiency of fourth-grade students varies, leading each student to respond differently to the questions posed by the teacher during lessons. As orchestrators of learning, teachers often face challenges in designing lessons that support the development of critical thinking skills. The primary obstacles in teaching include a need for more suitable teaching materials and methods tailored to the needs and characteristics of the students. Teachers highlight that integrating students' cultural aspects into critical thinking instruction poses an additional challenge. Critical thinking skills need to be applied in a way that is relevant to the cultural background and experiences of the students, which can vary significantly in multicultural classrooms.

Additionally, technical issues and teachers' skills in integrating technology into learning are significant challenges. The continuously evolving digital era requires teachers to have the skills to leverage technological tools for effective teaching (Ratu et al., 2022; Yerizon et al., 2021). However, not all teachers have sufficient understanding or training in this regard. Amid the complexity of modern educational challenges, education practitioners must take a deeper look at the education system in Indonesia (Subali et al., 2023). One solution that can be implemented to address challenges and enhance the quality of learning in elementary schools is using instructional materials (Ali et al., 2022). In learning, instructional materials are crucial for achieving learning objectives.

Instructional materials play a very significant role in the teaching and learning process. One of their functions is to serve as tools to achieve learning outcomes that align with the goals and achievements outlined in the teaching module. The benefits of instructional materials include making learning activities more engaging, providing learners with opportunities for independent learning, reducing dependency on the teacher's presence, and facilitating a better understanding of learning outcomes (Jannah & Suciptaningsih, 2023). Various types and forms of instructional materials, one of which is the Student Worksheet, can enhance the quality of learning. Student Worksheets are activities designed to maximize students' understanding of specific subjects or topics to achieve the desired learning objectives (Rakhmawati et al., 2022). Student Worksheets contain instructions for learners on sheets that include materials and exercises to be completed, aiming to enhance competency in the cognitive aspect (Bakri et al., 2020; Finali et al., 2020).

Using Student Worksheets in learning is a familiar strategy teachers employ to support the learning process in the classroom. However, there are still challenges in developing Student Worksheets that can tap into learners' critical thinking abilities by integrating Higher Order Thinking Skills and a Culturally Responsive Teaching approach (Tressyalina et al., 2023; Zhang et al., 2023). Information and communication technology has significantly changed the education landscape in the current digital era. The development of the digital era greatly influences the implementation of learning in schools. The widespread use of digital instructional materials is a form of leveraging technology in education (Wahyuni et al., 2021). With these advancements, educational institutions are making quick efforts to adapt and provide innovative learning experiences to students (Ihwono et al., 2023). To keep up with these developments, the

utilization of Student Worksheets must be packaged in a technology-based format, such as electronic Student Worksheets (Kholifahtus et al., 2022).

Electronic Student Worksheets are presented in electronic format and can be accessed through electronic devices. Electronic Student Worksheets are worksheets presented in electronic format containing activities to facilitate learners in understanding the material, and they can be accessed through devices such as laptops, notebooks, or smartphones (Adnyani & Tegeh, 2023). The presence of electronic Student Worksheets can facilitate learners' ability to study anywhere and anytime. The optimal use of interactive instructional materials can capture learners' attention, thus motivating them in their learning process (Artini et al., 2023; Yani, 2021). Learning that utilizes electronic Student Worksheets can create an enjoyable learning atmosphere. Learners will feel comfortable during the learning process, reducing tension and making the learning experience more enjoyable (Putra et al., 2023; Suryaningsih & Nurlita, 2021). Electronic Student Worksheets can present material supplemented with videos and animations, strengthening learners' understanding of the conveyed content (Asmaryadi et al., 2022; Kholifahtus et al., 2022).

Previous research has indicated that HOTS-based learning, involving critical, analytical, synthetic, and creative thinking skills, is vital in preparing learners for success in this digital era (Wahyuningsih et al., 2023). Other opinions also support that HOTS-based electronic Student Worksheets can create an active and enjoyable learning environment (Pramana et al., 2022). HOTS-based electronic Student Worksheets make learners more enthusiastic and interested in participating in the learning process, leading to increased focus and reduced boredom (Rahayu et al., 2022). Developing HOTS-based electronic Student Worksheets is highly worthwhile as it can enhance learners' academic achievements and critical thinking skills (Mahmudah & Bahtiar, 2022). The use of Student Worksheets has implications for enhancing learners' HOTS. Using Student Worksheets, learners can analyze, evaluate, discover concepts, and experience the process directly in the learning activities (Yusuf & Widyaningsih, 2022).

Meanwhile, Culturally Responsive Teaching is an instructional strategy that acknowledges and respects the cultural diversity of learners in the learning process. Previous research indicates that the Culturally Responsive Teaching approach in education can stimulate learner participation and enhance their engagement in the learning process (Maryono et al., 2021). The research conducted by Nasution et al. (2023) successfully demonstrated that the Culturally Responsive Teaching approach with social-emotional learning can enhance learners' communicative character and discipline. The Culturally Responsive Teaching approach can also improve the scientific literacy of learners (Salma et al., 2023). However, it should be noted how the integration of Culturally Responsive Teaching can be enhanced in the electronic Student Worksheets.

More learning resources that integrate HOTS with the Culturally Responsive Teaching approach still need to be developed. The existing curriculum and learning materials have yet to fully tap into the holistic potential of learners, especially in presenting high-level thinking challenges that involve a deep understanding of the subject matter and the cultural experiences of learners. The use of electronic Student Worksheets that combine HOTS with Culturally Responsive Teaching has the potential to address this situation effectively.

The development of electronic Student Worksheets at the elementary school level faces a gap that needs to be addressed. The gap in this research lies in integrating HOTS

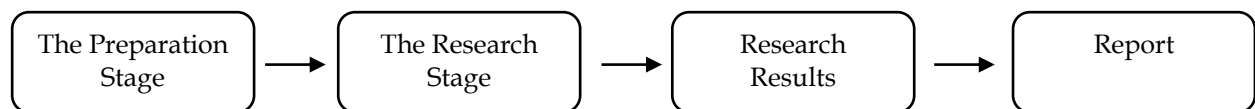
and Culturally Responsive Teaching in electronic Student Worksheets to enhance learners' critical thinking skills. This study aims to fill the void in the literature by integrating two key concepts, namely HOTS and Culturally Responsive Teaching, into electronic Student Worksheets. This integration aims to create a learning environment that promotes conceptual understanding and develops learners' abilities in critical thinking, problem-solving, and responding to cultural diversity.

This research contributes significantly to the elementary education context by developing electronic Student Worksheets based on HOTS with a Culturally Responsive Teaching approach. The novelty of this research lies in the approach used, namely the Culturally Responsive Teaching approach. The developed HOTS-based electronic Student Worksheets will emphasize culturally responsive learning, valuing the students' backgrounds. Combining HOTS with Culturally Responsive Teaching creates a learning environment that stimulates critical thinking skills and enables students to understand and appreciate their culture.

This research aims to identify the need for developing HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach. The study is conducted to understand how integrating HOTS with culturally responsive teaching in electronic student worksheets can positively contribute to learner education, improve mastery of learning materials, and stimulate students' interest in learning. This research will help bridge the knowledge gap in education literature and provide much-needed guidance for curriculum developers, teachers, and policymakers to create an inclusive, responsive learning environment that builds high-level thinking skills in elementary school learners.

## RESEARCH METHOD

This research is a qualitative descriptive study and serves as an initial stage in developing HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach. This study aims to identify the needs of teachers in developing HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach. The data source for this research is elementary school teachers in the Pasuruan district. Sampling is conducted using purposive sampling techniques. Data collection methods include observation, interviews, and documentation. Observation is carried out to understand the conditions and issues in learning. Interviews are conducted to gain a deeper understanding of the problems that arise in the learning process. The research procedures are outlined in Figure 1.



**Figure 1.** Research procedure.

The preparation stage of this research involves creating observation and interview guidelines. The interview guidelines for teachers are presented in Table 1.

**Table 1.** Interview guidelines for classroom teachers.

No.	Questions
1	What is your usual teaching process when delivering material to fourth-grade students?

No.	Questions
2	Have you ever encountered any obstacles in the teaching process as a fourth-grade teacher?
3	Have you tried or included elements of HOTS in your teaching before? If yes, could you provide concrete examples?
4	How do you assess the critical thinking skills of fourth-grade students currently?
5	Do you see any specific constraints or issues in the development of critical thinking skills for students? If yes, what are those constraints?
6	What do you know about the Culturally Responsive Teaching (CRT) approach, and have you ever implemented the CRT approach in fourth-grade classes?
7	Do you consider it essential to integrate HOTS elements with the CRT approach in fourth-grade learning?
8	How do you involve students in learning and motivate them to think critically?
9	Are there specific challenges in developing critical thinking skills for fourth-grade students?
10	How do you usually choose or design teaching materials for instruction in fourth grade?
11	Do you see the potential for improving students' critical thinking skills by developing HOTS-based electronic Student Worksheets with a CRT approach?
12	Do you have any suggestions or recommendations for developing electronic Student Worksheets, especially in the context of fourth-grade learning?
13	Are any specific factors influencing fourth-grade learning that need to be considered in this research?

The research stage involves conducting a preliminary study by analyzing the curriculum, preparing materials for use in electronic Student Worksheets, and determining the learning objectives. Before developing electronic Student Worksheets, a preliminary study needs to be conducted. Data is obtained based on needs analysis through field studies and literature reviews. The variables in this research are HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach and electronic instructional material in worksheets. The worksheet includes instructions for using electronic Student Worksheets, learning objectives, summary of materials, instructional videos, and tasks for learners. Data collection is done through observation and interviews. Data analysis techniques include data reduction, data presentation, and conclusion.

The results analysis stage involves analyzing the findings based on observations and interviews, concluding the research, and compiling the report. The indicators of the preliminary study stage are presented in Table 2.

**Table 2.** Indicators for needs analysis of HOTS-based electronic student worksheets with culturally responsive teaching approach.

No.	Aspect of Needs	Indicators
1	Literature Review	Analysis of theoretical studies on a. Electronic Student Worksheets b. HOTS c. Culturally Responsive Teaching d. Learning materials
2	Field Study	a. Observation of teaching materials used by teachers b. Observation of teaching activities carried out by teachers
3	Curriculum Analysis	Learning tools used by teachers

## RESULTS AND DISCUSSION

### *Result*

This research analyzes the need for HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach. This research is the foundation for further studies to develop HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach. The preliminary study aims to find the foundation that strengthens the HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach by exploring the literature study. Based on the theoretical review that has been conducted, the development of HOTS-based electronic Student Worksheets with Culturally Responsive Teaching approach requires a solid theoretical basis. The initial analysis is essential to understand the definition of electronic Student Worksheets and the significance and implementation of the HOTS and Culturally Responsive Teaching approaches in the context of electronic Student Worksheet development. Electronic student worksheets have been adapted into an electronic format, which learners can access and use through computer devices or other electronic devices (Sumanik, 2022). Electronic student Worksheets are designed to help students in the learning process by providing guides, exercises, and structured learning activities in digital form. Electronic student Worksheets are not just a digital version of traditional worksheets but a tool that has the potential to stimulate student engagement, encourage creativity, and expand learning accessibility. This understanding is the primary basis for designing effective and relevant electronic Student Worksheets.

HOTS emphasizes developing learners' higher-order thinking skills, including analysis, synthesis, evaluation, and creativity. In the context of electronic Student Worksheet development, HOTS opens the door to designing tasks and activities that trigger learners' deep thinking and problem-solving. By integrating HOTS, electronic Student Worksheets can be a tool that allows learners to understand facts and develop much-needed critical thinking skills. Meanwhile, the Culturally Responsive Teaching approach recognizes the diversity of learners' cultures, values, and experiences in learning. By paying attention to this diversity, the electronic Student Worksheets produced can create content relevant to the learners' reality. This includes not only cultural aspects but also learners' social and environmental contexts, ensuring learning is informative, contextual, and meaningful to them. By combining an in-depth understanding of electronic Student Worksheets, HOTS, and the Culturally Responsive Teaching approach, this study builds a solid conceptual foundation for developing electronic Student Worksheets that is both technological, pedagogical, and cultural. The results of this theoretical analysis will be a strong foundation for designing electronic Student Worksheets that meet the needs of learners holistically, take learning to a higher level, and make a real contribution to improving the critical thinking skills of learners in elementary schools.

The results of a field study involving direct observation of the Student Worksheets used by teachers in the field highlight a crucial problem. These observations revealed that the Student Worksheets currently being used by teachers still need to integrate HOTS with the Culturally Responsive Teaching approach. The importance of combining HOTS with Culturally Responsive Teaching in learning is to ensure that students not only gain a deep understanding of the subject matter but are also able to develop high-level thinking skills and appreciate the cultural diversity around them. However, the results of interviews with teachers revealed the difficulties they faced in

developing electronic Student Worksheets that combined these two approaches. Based on the results of interviews, teachers experienced difficulties in developing HOTS-based electronic Student Worksheets and a Culturally Responsive Teaching approach. Teachers tend to be limited by busy schedules and daily teaching demands, making it challenging to design electronic Student Worksheets that focus on HOTS and are responsive to students' culture. This finding is in line with the results of previous research, which shows that teachers are often limited to the material provided by the school. This limitation limits teacher creativity in designing learning that explores students' potential.

HOTS invites learners to understand, apply, and explore concepts in depth. With HOTS, learners understand what they are learning and develop critical skills to solve problems, evaluate information, and generate new ideas. Culturally Responsive Teaching is a learning approach that values, responds to, and utilizes the diversity of cultures, languages, and experiences of learners in the learning process. It ensures that the curriculum, teaching, and learning materials reflect the diversity of learners, making learning more relevant and exciting to them. Culturally Responsive Teaching encourages teachers to build positive relationships with learners, recognize and understand learners' backgrounds, and create a safe, inclusive, and supportive environment. The developed electronic Student Worksheets will be packaged and presented by integrating HOTS with the Culturally Responsive Teaching approach; this is needed because this approach ensures that learning not only improves students' HOTS but also respects and responds to their cultural diversity, creating relevant learning, inclusive, and deep. The results of the field studies carried out are presented in Table 3.

**Table 3.** Findings of results

<b>Data Collection Technique</b>	<b>Results</b>
Observation	The teaching materials used by teachers in learning are textbooks and Student Worksheets. The student worksheets used are still printed and not colored; apart from that, they do not contain HOTS and the culturally responsive teaching approach. However, the content of the material and assignments in the Student Worksheets are by the set learning objectives. HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach are expected to improve students' critical thinking skills.
Interview	Teachers experience limited time in developing electronic Student Worksheets; besides that, teachers need to improve in using technology.

### **Discussion**

The curriculum used in Pasuruan district primary schools is the Merdeka Curriculum. Through applying HOTS with the Culturally Responsive Teaching approach, learners can improve their critical thinking skills and increase their understanding of the diverse cultures and values in society. The Culturally Responsive Teaching approach allows teachers to connect learning with learners' cultural backgrounds, experiences, and daily lives (Aisah et al., 2023). Meaningful learning will cause knowledge to be embedded in long-term memory, which in turn will have a positive impact on improving understanding of learning materials. The results show that using HOTS in electronic



Student Worksheets has many positive effects on learning, collaborating with the Culturally Responsive Teaching approach that respects the cultural diversity of learners so that the developed learning tools are effectively implemented in learning. This approach increases learners' knowledge and empowers them as agents of change with character and culture in facing future challenges (Khasanah et al., 2023). This research shows that cultural values can be integrated into character education applied during the learning process (Taher, 2023).

The current learning situation in schools shows a challenge in developing critical thinking skills in learners (Fadhilah et al., 2022; Lestari et al., 2023; Ximenes et al., 2023). Classroom observations and evaluation of learning outcomes show that many learners demonstrate low critical thinking skills. This is reflected in their need for more ability to analyze information, evaluate arguments, and solve problems independently. In class discussions, learners need help constructing coherent and supportive arguments and more ability to question information or look at a problem from different perspectives. In addition, learning outcome tests show that learners often rely on factual knowledge without being able to relate it to real situations or identify underlying patterns and relationships. When faced with questions or tasks that require analytical thinking, most learners show confusion and lack of creativity in finding solutions. Some factors that could explain this low level of critical thinking skills include less interactive teaching methods, lack of learning approaches that trigger critical thinking, and lack of practice in dealing with problem situations (Rapti & Sapounidis, 2024; Rosmaini, 2023; Sholihah & Amaliyah, 2022; Triansyah et al., 2023). In addition, possible limitations in resources and teacher training in developing learning strategies that promote critical thinking skills are also contributing factors to this situation.

Developing HOTS-based electronic student worksheets with a culturally responsive teaching approach is the right solution to enhance students' critical thinking skills. The integration of HOTS allows students to develop high-level thinking skills such as analysis, synthesis, and evaluation (Mahmudah & Bahtiar, 2022; Nur et al., 2023; Putra et al., 2023), while the Culturally Responsive Teaching approach ensures that learning is relevant to the culture and experiences of the students (Kurniasari et al., 2023). Interactive electronic Student Worksheets allow students to actively engage in learning (Putra & Agustiana, 2021; Sumanik, 2022). Through online discussions, group projects, and reflective assignments, students can share their cultural perspectives and build shared knowledge with their peers. Electronic Student Worksheets can provide direct feedback to students about their performance (Sumanik, 2022). This enables teachers to provide specific guidance, help students understand their weaknesses, and develop effective problem-solving strategies. Students also develop essential technology skills in the modern world using electronic Student Worksheets. They learn to navigate digital platforms, access online resources, and participate in online discussions.

HOTS-based electronic Student Worksheets are designed with tasks and activities that trigger analytical thinking and problem-solving. Through in-depth questions and challenging case studies, students are encouraged to think critically, relate information, and seek creative solutions (Nur et al., 2023; Susiana & Renda, 2021). The Culturally Responsive Teaching approach ensures that the electronic Student Worksheet content reflects the cultural diversity of students. Learning material presents examples relevant to students' daily lives and cultural values. This makes students feel valued and connected to the learning. By integrating HOTS with the culturally responsive teaching approach in electronic student worksheets, learning will be interactive, engaging, in-

depth, and relevant to the needs and diversity of students. This solution creates a learning environment that triggers students' critical thinking skills while respecting their cultural diversity, preparing them for success in an increasingly complex and global world.

## CONCLUSION

**Fundamental Finding:** The main finding of this study highlights the success of integrating HOTS and Culturally Responsive Teaching in creating a holistic and relevant learning experience. This integration provides a strong foundation for developing HOTS-based electronic Student Worksheets with a Culturally Responsive Teaching approach, opening the door to deeper and more inclusive understanding.

**Implication:** The implications of this study are substantial. By combining HOTS and Culturally Responsive Teaching, the learning approach enhances students' critical thinking skills and stimulates appreciation for cultural diversity. Teachers are encouraged to become learning facilitators who understand and value students' cultural backgrounds, creating an environment where every student feels acknowledged and supported. **Limitation:** There are challenges in implementation, including teacher preparation, development of suitable teaching materials, and adequate resource allocation. Understanding these limitations forms an essential foundation for future improvements and adjustments. **Future Research:** Future research should involve further exploration of concrete strategies to integrate HOTS and Culturally Responsive Teaching more effectively. Thus, this research is not just an end but the beginning of a journey towards better and inclusive learning. Integrating HOTS and Culturally Responsive Teaching becomes a key pillar in steering education toward more excellent responsiveness to the diversity and complexity of the continually evolving world.

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