Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

Management of Teaching Modules Based on Culturally Responsive Teaching Toward Education for Sustainable Development

Awiria[1], Elly Sukmanasa[2*], Lina Novita[2], Faridatul'al[1], Eka Suhardi[2], Asrori Yudha Prawira[1], Aries Maesya[2]
[1] PGSD, Universitas Bhayangkara Jakarta Raya, Jakarta, Indonesia
[2*] PGSD, Universitas Pakuan, Bogor, Indonesia

Article Info

Article history:

Received: 25 August 2024
Revised: 30 September 2024
Accepted: 17 October 2024

Keywords:

Culturally Responsive Teaching
Elementary School
Learning Module

ABSTRACT

The quality of learning materials that are not in accordance with the local culture affects the learning outcomes of students in elementary schools. This research aims to develop a responsive cultural teaching (CRT) learning module that is in accordance with the Independent Curriculum. The research method used is Research and Development (R&D) with the ADDIE model which includes analysis, design, development, implementation and evaluation. The subject of the study was a fourth-grade students of SD Negeri Julang Tanah Sareal. The results showed that CRT-based learning modules improved student learning outcomes with an average score of 4.1 in the indicators of knowledge and learning experience. In addition, the aspect of teacher support scored 4.04, and students' communication empathy skills scored 4.06, indicating that culture-based learning creates an inclusive and appropriate learning environment. This module also supports the formation of students' soft skills, such as collaboration and critical thinking, although the critical thinking aspect has not been improved. Finally, the development of CRT-based modules supports the implementation of Education for Sustainable Development (ESD) in primary schools, integrating local cultural values to create meaningful and sustainable learning experiences. This module is expected to be the basis for continuing education at the elementary level and can be replicated in a variety of other educational contexts.

Corresponding Author:

Elly Sukmanasa
PGSD, Universitas Pakuan, Bogor, Indonesia
Email: ellysukmanasa@unpak.ac.id

INTRODUCTION

Learning will be carried out well if it is carried out in a good teaching module, fulfilling components based on student characteristics, material content, and also learning resources of the surrounding environment. These teaching materials play an important role in supporting the effectiveness and effectiveness of learning in the educational environment (Sadjiati, 2012:12). The quality of learning materials is the key to optimal learning. According to the National Education Standards (BNSP, 2010), high-quality teaching materials should refer to basic skills, integrate knowledge according to students' cognitive stages, be interactive, and encourage critical and creative thinking processes. In addition, the presentation of teaching materials must attract the attention of students.

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

So far, textbooks and student worksheets have remained the main teaching materials used by teachers in many schools, as evidenced by the results of the needs analysis at SDN Julang Tanah Sareal, Bogor. Although the materials offered are consistent with basic skills, they do not reflect the concept of cultural response or cultural responsive education (CRT) in terms of sustainable development. Dahuri et al. (2013) emphasized the importance of the concept of CRT in 21st century education. CRT not only prepares students for the challenges of modern education but also motivates them to live a sustainable lifestyle. Therefore, it is necessary to develop learning materials that can overcome the response to the culture and concept of CRT and sustainable development.

The related research shows relevance to previous studies that highlight the importance of managing culture-based learning modules in supporting continuing education. For example, Arends & Kilpatrick (2019) argue that culturally responsive learning modules are able to increase student engagement in local and global contexts. This is in line with the findings of Xie et al. (2029) which show that local culture-based modules have a positive impact on the formation of students' social skills in Southeast Asia. Another study by Lopez et al. (2021) highlights that teaching approaches that respect students' cultural backgrounds encourage more inclusive and relevant learning for educational sustainability. Furthermore, Hashemi & Ghasemi (2022) emphasized the importance of incorporating local wisdom values into learning modules to integrate sustainability more effectively at the school level. Finally, a study by Rokhim et al. (2023) shows that modules designed with sustainability principles can increase students' environmental awareness through local solution-oriented project-based learning. Based on the study, research related to the management of culturally responsive teaching-based modules has great potential to support the development of sustainable education.

The learning modules in the Independent Curriculum offer possible solutions. Learning modules can be designed to meet learning needs and have the flexibility to integrate the concepts of CRT and ESD (UNESCO, 2016). The teaching module not only presents the teaching material in a systematic and structured manner, but also accommodates cultural diversity among students.

However, the creation of learning modules is not just about visual performance; It's also about how messages and content can be accommodated from different students' cultural backgrounds. Therefore, the concept of Culturally Responsive Teaching (CRT) is very important in the creation of learning modules. This approach allows students to engage more deeply in their learning, while helping them understand the relationship between their learning concepts and culture. For example, research conducted by Sutrisno & Yulianti (2020) examines how cultural learning frameworks in Indonesian schools can adapt to encourage student engagement and support sustainable development goals. Their findings highlight the culturally important role of teaching materials in increasing student participation, especially among marginalized communities, similar to Maharani (2021), whose work in teacher education highlights the need for inclusive cultural pedagogy to address educational inequalities. In addition, Nurhayati & Prabowo (2022) show how local cultural values can be integrated into the curriculum to promote not only academic success but also environmental and social sustainability. The study underscores the importance of contextually relevant learning practices that go beyond the integration of cultural knowledge but also prioritize equity and long-term educational sustainability, which was also identified in a global study by Green et al. (2023) on teacher development in the context of continuous learning.

The importance of culturally responsive education is explained by Gay (2010) who stated the fundamentals of CRT: forging partnerships between educators and students to drive better learning. Culturally sensitive education also includes three statements according to Ladson-Billings

Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

(1995): achieving academic success, developing cultural competence, and building critical awareness.

Wlodkowski & Ginsberg (1995) show that CRT occurs when there is respect for the student's background and circumstances, regardless of the individual's status and power. Thus, educational practices that emphasize cultural pluralism seek to create learning experiences that protect the knowledge, skills, and experiences that students have.

This study expands the research framework by integrating the thoughts and findings of several previous researchers, such as Buchori & Harun (2020), which focuses on the development of CRT-based modules; Rahman, Heryanti, and Ekanara (2019), who have worked on ESD-based modules; Sukmanasa & Novita (2023), which explores teacher innovations in learning; and (Novita et al., 2022), Setiawan et al. (2022), Merta sari et al. (2022), and Maulinda (2022), who are involved in the development of relevant learning modules for learning.

The urgency of this research is a response to the urgent need to improve the quality of teaching materials in elementary schools that are less sensitive to local culture and school environment. By implementing the Cultural Responsive Teaching (CRT) module in Education for Sustainable Development (ESD), this research not only provides concrete solutions to improve the quality of education, but also supports the vision of sustainable education realized through the Merdeka program. Responding to the urgent need for more culturally and environmentally relevant learning materials in primary schools, the proposed solution is to develop and implement culturally responsive education (CRT) modules integrated into Education for Sustainable Development (ESD). This approach is in line with the vision of the Independent Program, which encourages flexibility and the importance of learning. By paying attention to local cultural values and sustainability, this module can improve the quality of education, increase environmental awareness, and strengthen students' engagement with the context of daily life. The solution of the research on the management of teaching modules based on Cultural Responsive Teaching (CRT) in Education for Sustainable Development (ESD) is to develop learning modules that integrate aspects of local culture, sustainability and student needs. These modules should be designed to provide learning relevant to the student's cultural and social context, as well as to promote awareness of sustainability issues. This approach will enrich the learning experience, promote active student engagement, and support more holistic continuing education goals in primary schools.

LITERATURE REVIEW

Integrating culturally responsive education into Education for Sustainable Development (ESD) is an important aspect to ensure that ESD is inclusive and effective in promoting the sustainability of education in diverse populations. Culturally responsive learning involves adapting educational approaches to cultural backgrounds and students' experiences, which is important in ESD as it aims to foster a sense of responsibility and action towards sustainable development in students (Zainal Abidin et al., 2024; Reunamo & Suomela, 2013; Mejtoft et al., 2020).

Several literature highlight the challenges of implementing ESD in existing educational systems, including the need for systemic change, resistance to change, awareness, and preparedness among educators and learners (Zainal Abidin et al., 2024). These challenges are particularly significant in the context of diverse cultural societies, where educators must adapt their teaching methods to meet the diverse needs and backgrounds of students.

The importance of cultural teaching in ESD is underscored by the need to address social and environmental issues often rooted in cultural practices and beliefs. For example, in the context of

Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

education for sustainable development in Finland, the study found that ESD is not only about environmental issues but also includes social and economic aspects, stressing the need for a holistic approach that takes into account cultural context (Reunamo & Co. Suomela, 2013).

The use of technology to enhance the development of culturally responsive learning to welcome ESD can be done by creating a knowledge management system. The system provides cost-effective technological and methodical solutions that can enhance the success of educational institutions by providing the best knowledge-sharing practices and improving decision-making processes in learning. (Noor et al., 2019).

Integrating culturally responsive teaching into ESD is essential to ensure that ESD is inclusive and effective in promoting sustainability across diverse populations. The literature highlights the challenges of ESD implementation, the importance of cultural learning, and the role of technology in improving ESD. These findings highlight the need for educators and policymakers to take a holistic approach to ESD that takes into account the cultural context and the need for systemic change to promote sustainability. Integrating culturally responsive teaching into Education for Sustainable Development (ESD) is essential to creating education that is inclusive and relevant to diverse populations. Real-world problem-based ESD approaches that are relevant to local cultural contexts show effective results in value-based sustainability learning (Mogren et al., 2019). Teachers must be trained to integrate cultural values and sustainability into learning in a balanced manner (ESCAP, 2023). Technology can help connect students with global sustainability challenges while considering local cultural contexts (Huckle, 2020). Teaching that emphasizes the importance and sustainability of culture increases student engagement and community participation (UNESCO, 2020). Educators need resources and adaptive strategies to support culture-based ESD in different regions (Borg & Mogren, 2023).

Making learning modules based on a culturally responsive learning approach with a problem-based learning model has several advantages, namely that students can better understand concepts related to the surrounding culture, find concepts with students who are learning, actively engage in problem-solving, and strive for high thinking skills of students, realizing students' knowledge based on their experience so that learning is more meaningful, and students can feel the benefits of learning because problems solved are directly related to real life (Sari & Co. Ningsih, 2023).

Culturally Responsive Teaching

Cultural teachers who use CRT practices value the cultural and language resources of students and see this knowledge as capital to build rather than as a barrier to learning. These teachers use this capital (i.e., personal experience and interests) as a basis for learning connections to facilitate the learning and development of students (Aceves & Orosco, 2014). There are several frameworks for culturally sensitive approaches (p.sh., culturally responsive education, culturally relevant learning, and culturally congestive learning), each describing different components (Muñiz, 2019). Responsive cultural pedagogy is an approach to teaching and learning that "uses the cultural traits, experiences, and perspectives of ethnically diverse students as conduits to teach them more effectively" (Morrison et al., 2019).

The results of the study (Cruz et al., 2020) Teachers are more confident in building personal relationships and increasing self-efficacy with students through culture-specific knowledge, such as validating students in their native language and teaching students about their cultural contributions. This is evidenced through years of experience in positively connected relationships between teachers and students.

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

Abacioglu et al. (2020) Our results show that positive attitudes and awareness about diversity and perspective-taking skills are associated with increased cultural and social sensitivity in teaching. Thus, strengthening these skills can improve the educational position of students with a history of migration, as well as benefit their peers without a history of migration. Based on the results of our analysis, the basic research is that the application of the CRT approach is needed, especially to emphasize the importance of love for local culture or local wisdom in the area, because elementary school students have the future potential to maintain the culture in Indonesia, especially.

The application of cultural education seems promising for all students and the professional development of educators in multicultural environments. Culture-sensitive learning helps teachers identify and maximize the cultural resources students bring to the classroom, leading to the creation of a more competent and equitable society (Portes et al., 2018).

METHOD

This research is classified as R&D research. The developed product is a thematic learning module for 4th graders in elementary schools. The researchers adopted the ADDIE development model, which includes analysis, design, development, implementation, and evaluation, to ensure the quality of the products produced, focusing on three important aspects: competence, practicality, and efficiency. The five phases of the ADDIE model should be systematic and organized, they should be implemented systematically (Cahyadi, 2019; Ragazzi et al., 2012).

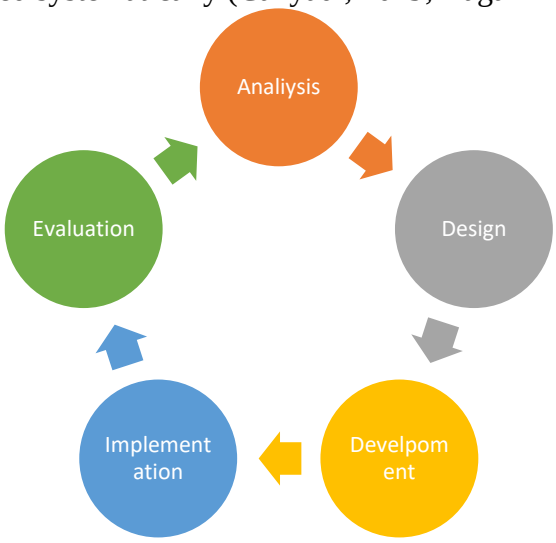

Figure 1. R&D Research Stages

ADDIE R&D model research was conducted in Phase 5, Phase 1 namely needs analysis: Literature review and interviews with teachers, students, principals, and parents to understand the needs of students and schools. Phase 2 will move to Design: Revised Theory, designing learning modules as needed and independent curriculums, and designing CRT (Culturally Responsive Teaching) models. Phase 3 develops learning modules after designing prototypes, and incorporates CRT models into activity steps, learning media, learning materials, worksheets, and evaluation tools. The 4th validation test was conducted by media and material experts, followed by a limited trial with 10 students and subsequent reviews. Finally, 5th Phase of Implementation: Product Implementation After Review By Conducting Comprehensive Testing on 25th Grade 4 Students in SDN Julang Tanah Sareal

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

In this study, modules were evaluated based on an expert evaluation column comprised of materials experts, linguists, and media experts. Validation results are used to determine the feasibility of learning modules developed based on Cultural Responsive Teaching or CRT. The validity of the teaching modules is assessed against an instrument in the form of expert validation sheets. The criteria and indicators for evaluating this teaching module consist of a) media experts: module size, module cover design, and module content design. b) Materials experts: self-guided, independent, detachable, attractive, and user-friendly.

The R and D research of the ADDIE model consists of the following stages:

1. Needs analysis is a phase consisting of a review of literature related to curriculum analysis, the teaching materials or teaching aids used, and articles related to the issues to be considered. At this point, preliminary studies are also conducted by interviewing teachers, students, principals, and parents about the needs of students and the school.
2. Design is a phase that begins with revising theory as the basis for designing learning modules, designing learning modules as needed and independent curriculum, designing Culturally Responsive Teaching (CRT), designing tools to measure the success of learning modules products, and assembling tools to validate experts.

The following is the design of the application of the culture-based learning module method.

Table 1 CRT-Based Teaching Module Design (Hernandez et al., 2013)

Content Integration		
Content statements from other cultures	Maintaining positive relationships between teachers and students	Provide high expectations
1. Combine information or examples from different cultures 2. Make connections with students' daily lives 3. Connecting the cultural and linguistic background of teachers with students through the same language and culture	1. Build positive relationships between teachers and students 2. Build a comfortable learning environment so that students can participate in class discussions without fear or negative responses from the teacher	1. Provide high expectations for all students in science and mathematics classes 2. Identify the importance of high expectations in helping students achieve academic achievement so that it is as good as their social relationships.

Facilitating Knowledge Construction		
Building on what students know	Use of real-life examples	Helping students learn to become critical, independent thinkers who are more open to other knowledge
Demonstrate the ability to build students' initial background knowledge to create easily accessible concepts of subject matter.	Use real-life examples during learning especially when introducing new concepts.	1. Helping students in effective communication 2. Motivate students to learn and think independently
Prejudice Reduction		
Supports the use of regional languages	Positive interactions between students	Comfortable learning environment

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

1. Using regional languages for instruction 2. Communication with parents uses regional languages	Maintain positive interactions between students.	Create a comfortable learning environment.
Social Justice		
The teacher's willingness to act as an agent of change	Encourage students to ask or show their status to develop social politics or fulfill awareness by criticizing.	
Supporting students, acting as agents of change	Encouraging students to ask questions and/or dare to show their status in a multicultural learning environment	
Academic Development		
The teacher's ability to create opportunities in the classroom to help all students achieve academic success	Using research-based learning strategies that can reflect the needs of a variety of backgrounds and learning styles	
1. Using a variety of methods to create opportunities for learning 2. Using visuals, grouping 3. Using models to instruct difficult material concepts	1. Use real-life models such as rocks, plants, clocks, etc., when introducing something new or difficult 2. Using large and small group collaborations	

Table 1 above describes aspects of the application of culturally responsive teaching to learning modules. The indicators are feelings, knowledge, learning experience, and support of the learner's teacher.

1. Development, is the stage of development from learning modules to prototype design. The development is carried out by introducing the CRT approach to the activities steps of learning modules, learning media, learning materials, student worksheets, and assessment tools. After this phase was completed, a validation test was conducted by media and material experts, following which a limited trial of 10 students was conducted to find the students' answers. Then, a mirror is made and the product of the teaching module is ready for application.
2. Implementation is the phase after review of the product by conducting extensive testing on SDN Grade 4 students Julang Tanah Sareal.
3. The evaluation is the latest phase after extensive testing to determine the pros and cons of learning module products.

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

The stages of development research using the ADDIE model can be seen in the Figure below.

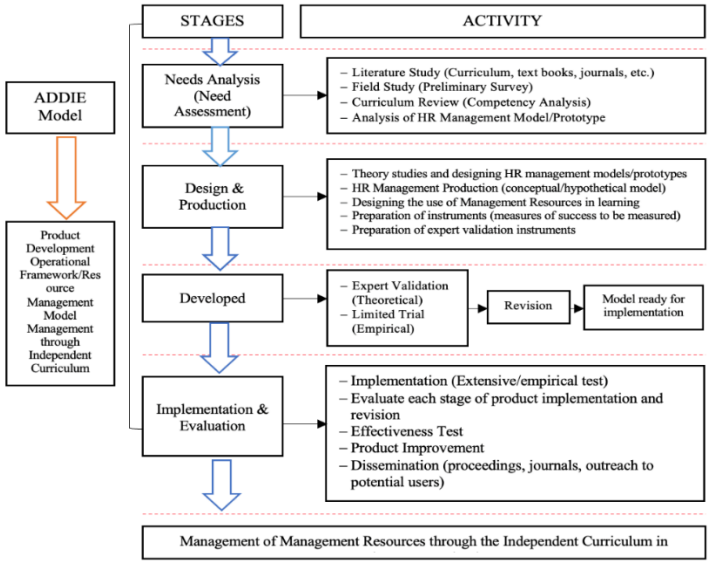

Figure 1 Research Stages

The development plan is shown in Table 2 below.

Table 2 CRT-Based Teaching Module Development Plan

No	Stages	Activity	Parties Involved	Produced Products
1.	*Needs Analysis (Need Assessment)*	Literature/library studies, observations, interviews, FGDs	Research team and school	Results of observations, interviews, and FGDs
2.	*Design & Production*	Discussion and creation of teaching module product designs	Research team	Design/draft of teaching modules
3.	*Development*	Development of teaching modules using the CRT approach at the stages/steps of learning activities	Research team	The teaching module uses a CRT approach based on development according to IKM/Implementation of the Independent Curriculum.
4.	*Implementation*	Validation testing, limited testing, and extensive testing	Research team, students, teachers and schools	The teaching module product is by the validation and response of students and teachers.
5.	*Evaluation*	Evaluate the results of implementation and then revise (if there are notes from student and teacher responses)	Research team and school (teachers and students)	Revised teaching module product

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

RESULTS

In this study, in-depth analysis, module design, development, implementation, and evaluation with a systematic approach were carried out, which were explained as follows:

1. **Analysis**

   The researcher analyzed to understand the learning needs related to the local context and culture of students, as well as the educational needs that support Education for Sustainable Development (ESD). Some of the steps taken in the analysis include Identifying **the needs of students** and evaluating the cultural diversity, socioeconomic background, and psychological state of the students to ensure a comprehensive approach to learning. **Curriculum analysis** examines existing curricula to determine whether the material studied is relevant to the principles of Education for Sustainable Development and the implementation of CRT. **Identifying the goals of ESD** is to analyze the educational components for sustainable development, including developing the skills needed for sustainability, such as social awareness, critical thinking skills, and natural resource management.

2. **Design**

   The researcher developed the concept of a learning module that integrates the principles of CRT and ESD. The module design is realized by paying attention to the following components: Learning **goal development** is the definition of learning objectives which includes cognitive, affective, and psychomotor aspects related to sustainability, as well as sensitivity to students' cultural diversity. **The preparation of teaching materials** is artificial materials that are relevant to local contexts, cultural values, and sustainability issues, ensuring that the content taught can build global awareness without neglecting students' cultural roots. **A learning strategy** is a strategy design that combines participatory methods, project-based learning, and group discussions to develop critical and collaborative thinking skills that are essential for ESD. **The initial assessment** is the design of a tool to evaluate students' understanding of the material being taught and to measure the extent to which this module creates a culturally responsive learning environment.

3. **Development**

   The development of learning modules begins after the design is prepared. This stage of development includes **Prototype modules,** i.e. modules developed, which include a variety of teaching materials related to sustainable development and translated into relevant cultural contexts for students. **Technology integration** is the integration of educational technology to increase the effectiveness of learning, such as web-based or multimedia applications that support the provision of cultural materials. Initial testing: Modules are launched on a small group of students to identify any technical or pedagogical issues that may arise. The feedback from these tests is used to improve and refine the module. This design process involves content selection, module structure development, and integration of CRT principles at each stage. The design scores were then tested on a test limited to 10 students. It aims to assess the effectiveness of the module in achieving learning objectives and how well it can meet the cultural needs of students. After a limited trial, a wider trial of 25 students was conducted. This comprehensive assessment aims to gain a deeper understanding of the effectiveness of CRT modules in the context of daily learning.

4. **Implementation**

   Once the module is fixed, the implementation phase begins. At this stage, the learning modules are used in a real classroom environment with the following steps: **Teacher training**, which

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

trains teachers to ensure they understand and can apply CRT and ESD approaches in their teaching, as well as master the use of newly developed modules. **The use of modules in the classroom** is a module that is tested in hands-on classroom learning, engaging students in discussions that prioritize aspects of sustainability and cultural diversity. Learning is carried out using methods that support active student engagement, such as problem-based learning and teamwork. **Supervision and support**, researchers conduct continuous monitoring to ensure modules are implemented effectively and to support teachers to address issues that arise during implementation.

5. **Evaluation**

The assessment stage aims to determine the extent to which the module has successfully achieved the set objectives. The assessment is carried out in two main aspects: The Learning Assessment assesses students' learning outcomes to see how effective the modules are in improving their understanding of Education for Sustainable Development and how sensitive the modules are to students' cultural differences. This assessment is carried out through tests, interviews, observations, and assessments of student projects. **The evaluation of the teaching process** is to measure the effectiveness of implementing the CRT approach in teaching, as well as whether teachers can adapt culture-based and sustainability-based learning strategies well. This includes feedback from students and teachers on the use of modules and learning methods. **The review of the modules** is based on the results of the assessment, a review is carried out to improve the shortcomings found during the implementation and improve the modules to be more effective and in line with the needs of students and ESD goals.

Based on the results of the trial on the learning process with CRT-based teaching modules. The teaching module provides practical guidance for teachers to integrate CRT into daily learning. The results of the research are based on the results of development, namely through the application of responsive culture-based learning materials carried out at various meetings. To measure the application of this CRT-based teaching module, the researcher used an observation sheet instrument during learning with indicators: Content Integration, facilitating knowledge construction, prejudice reduction, social justice, and academic development. This observation was carried out in 4 lessons. The results of the observation of the implementation of Cultural Responsive Instruction (CRT) for each meeting are illustrated in the table below.

Table 3 Implementation of Learning with the CRT Approach.

Stages of aspect	Meeting to			
	I	II	III	IV
Content Integration	√	√	√	√
Facilitating Knowledge Construction	√	√	√	
Prejudice Reduction	√	√		√
Social Justice	√		√	√
Academic Development	√	√	√	√

Table 3 describes in general terms the integration of aspects of Responsive Cultural Teaching into teaching modules. In general, aspects of responsive cultural education are integrated into each lesson. The learning process carried out by teachers in every aspect of responsive cultural learning can be explained in the following table:

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

Table 4. Results of the Learning Process with the CRT Approach

Content Integration		
Content statements from other cultures	Maintaining positive relationships between teachers and students	Provide high expectations
1. The teacher asks questions about the science material 2. The teacher creates stories that are related to traditions or students' lives 3. Students use materials consumed daily for practice/experiments	1. The teacher responds to students' questions 2. The teacher monitors students' work or assignments in each lesson	1. Teachers motivate students during the learning process 2. The teacher provides motivation and suggestions for the assignments that students will carry out 3. The teacher gives rewards to students.
Facilitating Knowledge Construction		
Building on what students know	Use of real-life examples	Helping students learn to become critical, independent thinkers who are more open to other knowledge
1. Students connect habits at home with stories from the teacher 2. Students look for references on the internet regarding material	The teacher provides examples from everyday life when explaining the lesson material.	1. Using discussion methods, and experiments, to stimulate students' critical thinking skills 2. The teacher gives problem-based questions 3. The teacher guides students in understanding difficult words
Prejudice Reduction		
Supports the use of regional languages	Positive interactions between students	Comfortable learning environment
Some students use regional languages when with their parents.	Using discussion and experimental/trial methods so that students are more communicative	Using varied learning methods and interactive media so that students are interested in a learning environment
Social Justice		
The teacher's willingness to act as an agent of change	Encourage students to ask and show their status to develop social politics or fulfill awareness in criticizing.	
The teacher's explanation makes students want to study harder.	Teachers always provide opportunities for students to ask questions.	
Academic Development		
The teacher's ability to create opportunities in the classroom to help all students achieve success	Using research-based learning strategies that can reflect the needs of a variety of backgrounds and learning styles	
1. Teachers use varied learning methods 2. The teacher uses parables to explain difficult material	1. Use real-life examples to explain the material 2. Do learning with small groups	

Based on Table 4, the teaching of teachers in all aspects of responsive cultural education is taught. By learning scientific material with culturally reactive learning related to tradition and

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

students' daily lives, learning is conducted in groups to support students' soft skills, such as collaboration, communication, and tolerance. In general, learning using culturally responsive learning modules has succeeded in supporting the formation of soft skills that support ESD (Education for Sustainable Development). Education for Sustainable Development encourages teachers and students to have indicators in CRT-based learning.

Based on the results of the implementation of culturally responsive teaching, the culture-based learning tools developed, namely the teaching module and the student workbook, have been declared effective and have a good level of effectiveness. This effectiveness is determined by the learning outcomes performed with students. The learning tools developed meet effectiveness, meaning they are consistent with existing curriculum requirements, including learning outcomes and learning goals to be achieved by students in learning and tailored to cultural interactions. In addition, this unit of learning also meets learning objectives. This means that the learning tools in the development are with relevant concepts and then combined with culture-based learning.

The results of data analysis from the test of certain things are as follows: (1) Learning tools developed based on culture through a cultural learning approach (2) Learning aids are also practical in their application; (3) Culture-based learning tools through an effectively developed culture-sensitive learning approach.

The success of the management of developing learning modules can be seen in the response of learners to the learning process as a form of product implementation phase. It can be said that the implementation of the products of the teaching modules conducted in the 4th grade with a total of 25 students is a simple comprehensive test because it is performed in a classroom in a school, namely SD Negeri Julang Bogor. The implementation results were reviewed through the constructivist Chemistry Values Learning Environment Survey (CCVLES) questionnaire. The questionnaire contains several statements regarding aspects of culturally responsive learning that students generally observe. Students choose their level of agreement with the statement. The results of the questionnaire are shown in the graph below.

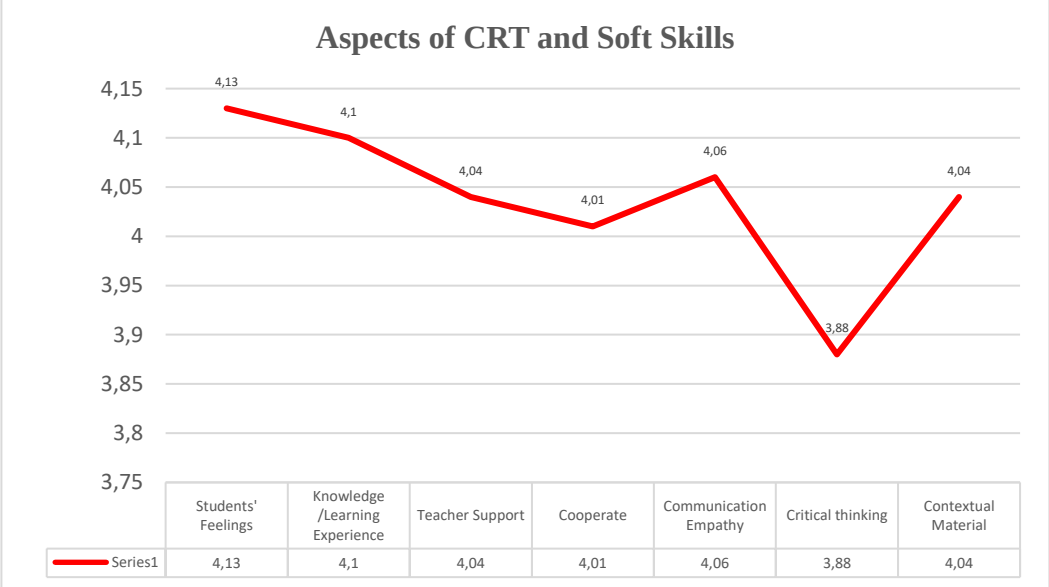

Figure 2 Average Student Responses

Journal Of Teaching And Learning In Elementary Education
Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

Figure 2 shows the average aspect of cultural reactive learning observed by students. Based on the results of research related to the application of culturally responsive teaching (CRT) in the teaching of natural and social sciences (IPAS) at the elementary school level, the average positive score is shown in several ways. Here's an explanation for each indicator:

1. The students' feelings scored 4.13, indicating that students felt comfortable and emotionally engaged in CRT-based learning. This shows that this approach has succeeded in creating an inclusive and supportive learning environment.
2. The learning experience achieved a score of 4.1, indicating that the student learning experience was considered positive, with materials and methods that allowed students to understand in-depth concepts relevant to their culture and aroused interest in learning.
3. Teacher support scored 4.04, indicating that teachers provide optimal support, both academically and emotionally, to help students understand the material. Teacher-student interaction builds and encourages student confidence.
4. The collaboration achieved a score of 4.01, which shows the ability of students to collaborate in groups and shows good results. Collaborative learning activities support students' social skills and teamwork.
5. Communication empathy scored 4.06, indicating that the empathy aspect of communication showed appropriate results. Teachers and students can communicate with full understanding and pay attention to cultural differences and individual needs.
6. Critical thinking achieved a score of 3.88, indicating that students' critical thinking needs to be further strengthened. While it has evolved, this aspect has not yet been optimal, which will likely require a more diverse approach to challenging students' analytical skills.
7. The contextual material scored 4.04, indicating that the learning material that was contextual and relevant to the student's cultural background was assessed quite well. This approach helps students connect learning concepts with everyday life.

   Overall, the CRT approach has a positive impact on IPAS learning, especially in creating an inclusive, supportive, and culturally relevant learning environment. However, strengthening the student's critical thinking aspect should be at the core of further development.

In addition to aspects of cultural learning, questionnaires can identify the soft skills that emerge in students during the lesson. Soft skills assessed through questionnaires are collaboration, communication, empathy, critical thinking, and contextual materials. Based on the results of the questionnaire, it was found that teaching scientific materials with culturally responsive learning generally managed to support the formation of the students' soft skills. The most dominant soft skill experienced by students is communication empathy with an average of 4.06.

Culturally reactive learning recognizes the importance of culture in learning and uses methods that reflect the diversity of students. By connecting learning with students' lives, respecting their identities, expanding collaboration, empowering students, and using cultural resources, students' interest in learning, skills, and soft skills can increase significantly. Culturally responsive learning creates an inclusive, relevant, and student-centered learning environment, ultimately encouraging high interest in learning, soft skills and skills, and better academic achievement. Culture-based education has a great potential to strengthen students' understanding of their cultural heritage and foster cultural diversity. This concept is capable of preserving and preserving local identity, including language, culture, traditions, and values in the local community. Incorporating these elements into the curriculum makes education more important to students' daily lives, reinforcing their sense of connection to their cultural roots (Zahrika &

Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

Andaryani, 2023).

DISCUSSION

The learning module has several key features, including a systematic structure of modules (Rahman et al., 2019). This module is designed with a systematic structure, making it easier for students to follow the CRT learning steps. In addition, the application of the CRT model is integrated into modules, ensuring adaptation to the student's cultural background and enriching their learning experience (Theoharis & Scanlan, 2015). In turn, this module covers various types of learning media, including images, illustrations, text, and videos, providing a more immersive and interactive learning experience. Finally, the module has a comprehensive student worksheet that helps students measure and monitor their learning intensity and skills (Turculeţ, 2015).

The results of the study showed a positive response from students to the Cultural Responsive Teaching (CRT) module. The application of cultural teaching (CRT) to the teaching of science and technology in primary schools has had a significant positive impact. Students feel comfortable and emotionally engaged with class 4.13, learning experiences are rated relevant and engaging with class 4.1 and optimal teacher support with class 4.04 successfully increases students' confidence. Effective collaboration with a score of 4.01 and empathetic communication with a score of 4.06 supported the development of social skills, while contextual materials 4.04 made it easier for students to connect learning concepts with daily life. However, reinforcing critical thinking with a score of 3.88 has not been improved for more optimal results. CRT's holistic approach creates lessons that are inclusive, relevant, and supportive of diversity. This is consistent with previous research by integrating elements of local culture into the learning material, students have demonstrated a higher level of engagement and understanding of the learning concept (Buchori & Harun, 2020)). In addition, the implementation of CRT modules in schools that adopt an independent curriculum shows a high level of conformity (Setiawan et al., 2022). This module not only adheres to the principles of the curriculum but also enriches the contextual approach to learning. This is reflected in students' larger understanding of topics that are in harmony with the cultural and local context (Maulinda, 2022)

Research on *Culturally Responsive Teaching* (CRT) continues to show the importance of improving the quality of learning, especially in science and technology education in elementary schools. Recent research results support the finding that CRT approaches can improve students' emotional engagement, trust and collaboration, and communication skills. The results of the study show that the *Culturally Responsive Teaching* (CRT) module has a positive impact on teaching in elementary schools, especially in the field of science and technology. Previous research supports these findings. For example, a study by Ingen et al. (2018) showed that integrating STEM lessons with CRT reinforces cultural importance in learning, encourages student engagement, and helps them connect learning to the context of their lives. Another Thomas study (2024) highlights that teachers who receive CRT training show improvements in building partnerships and inclusive learning communities, although challenges remain in improving students' critical thinking skills. In addition, CRT experience strategies as outlined by EdWeek (2021) also show that using a context-based cultural approach can increase students' emotional engagement as well as increase their confidence. Overall, the CRT approach not only improves academic outcomes but also helps students feel more valued and socially connected in the classroom, creating a more inclusive learning environment and supporting diversity.

Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

CONCLUSION

This study concluded that the development of the CRT module for the Independent Curricula in SD Negeri Julang Tanahsareal yielded positive results. This module not only enhances the cultural response of students but also relates to the broader approach to the curriculum. Such steps may therefore be the foundation for the realization of continuing education by implementing ESD at the primary level. Although the study yielded positive results, it is important to recognize limitations, such as the limited number of research subjects and school coverage. Future research may therefore include more subjects and more schools to gain a more holistic understanding. The study's findings have important practical implications. Education teachers and policymakers can use the guidelines developed to integrate CRT into the learning process, while education researchers and practitioners can adopt the ADDIE model for developing responsive learning materials.

In addition, it contributes significantly to the implementation of the CRT concept, which is effective in creating meaningful learning experiences. The novelty of this research is that by integrating CRT and ESD aspects, this research is expected to provide an understanding and application of education that is more inclusive, sustainable, and culturally relevant in the context of primary schools. As a result, this research is expected to serve as a practical guide for teachers, schools, and education policymakers in developing learning materials that cover not only academic aspects but also social, cultural, and environmental dimensions.

CRT modules pave the way for continuing education by introducing students to local values and the surrounding environment. The research findings show pupils' increasing awareness about sustainability and their responsibility to the environment and build a strong foundation for developing ESD at the primary school level. This research contributes to valuable insights into educational literature by describing the successful development of CRT modules through the ADDIE model. The application of this model can be considered as a positive step in the development of culturally responsive learning methods.

REFERENCES

Abacioglu, C. S., Volman, M., & Fischer, A. H. (2020). Teachers' multicultural attitudes and perspective taking abilities as factors in culturally responsive teaching. *British Journal of Educational Psychology*, *90*(3), 736–752. https://doi.org/10.1111/bjep.12328

Aceves, T. C., & Orosco, M. J. (2014). Innovation Configuration Culturally Responsive Teaching. *Ceedar Center*, *2*(IC), 1–37. http://ceedar.education.ufl.edu/tools/innovation-configurations

Arends, J., & Kilpatrick, R. (2019). Cultural Responsiveness in Teaching: A Global Perspective. *Journal of Educational Research*, *112*(3), 456–467.

BNSP. (2010). *Paradigma Pendidikan Nasional Abad XXI*. Kementrian Pendidikan dan Kebudayaan. http://www.bsnp-indonesia.org/id/wp-content/uploads/2012/04/Laporan-BSNP-2010.pdf

Borg, C., & Mogren, A. (2023). *Rethinking education for sustainable development: Research, policy, and practice*. Springer.

Buchori, A., & Harun, L. (2020). Desain E-Modul Flipbook Berbasis Culturally Responsive Teaching (CRT) Pada Materi Transformasi Geometri Di Sekolah Menengah Kejuruan. *Lebesgue : Jurnal Ilmiah Pendidikan Matematika, Matematika Dan Statistika*, *1*(1), 63–73. https://doi.org/10.46306/lb.v1i1

Cahyadi. (2019). *Pengembangan Media dan Sumber Belajar*. Laksita Indonesia.

Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

Cruz, R. A., Manchanda, S., Firestone, A. R., & Rodl, J. E. (2020). An Examination of Teachers' Culturally Responsive Teaching Self-Efficacy. *Teacher Education and Special Education*, *43*(3), 197–214. https://doi.org/10.1177/0888406419875194

Dahuri, R., Rais, J., Ginting, P. S., & Sitepu J, M. (2013). *Pengelolaan Sumber Daya Wilayah Pesisir dan Lautan Secara Terpadu*. Balai Pustaka.

EdWeek. (2021). *Ten Culturally Responsive Teaching Strategies for the Science Classroom*.

ESCAP. (2023). *Integrating Education for Sustainable Development (ESD) in Teacher Education in South-East Asia*. SDG Help Desk.

Gay, G. (2010). Culturally responsive teaching: Theory, research, & practice. *Teachers College Press : New York*.

Green, D., Price, D., & Musa, R. (2023). *Culturally responsive pedagogies: learners as assets*. Cambridge University Press.

Hashemi, M., & Ghasemi, A. (2022). Local Wisdom and Environmental Awareness in Sustainable Education. *Environmental Education Research*, *28*(1), 75–89.

Hernandez, C. M., Morales, A. R., & Shroyer, M. G. (2013). The development of a model of culturally responsive science and mathematics teaching. *Cultural Studies of Science Education*, *8*(4), 803–820. https://doi.org/10.1007/s11422-013-9544-1

Ingen, S., Davis, J., & Arndt, K. (2018). The Synergy between Integrated STEM Lessons and Culturally Responsive Teaching in Elementary Classrooms. In *Research in the Schools*.

Ladson-Billings, G. (1995). But that's just good teaching! the case for culturally relevant pedagogy. *Theory Into Practice*, *34*(3), 159–165. https://doi.org/10.1080/00405849509543675

Lopez, R., Gonzalez, A., & Fernandez, M. (2021). Enhancing Inclusivity through Culturally Responsive Teaching in Multicultural Classrooms. *International Journal of Inclusive Education*, *25*(2), 239–252.

Maharani, R. (2021). Teacher training for culturally responsive pedagogies in Indonesia: The integration of local cultural knowledge into the curriculum. *Journal of Educational Practices*, *39*(3), 77–89.

Maulinda, U. (2022). Pengembangan Modul Ajar Berbasis Kurikulum Merdeka. *Tarbawi*, *5*(2), 130–138.

Mejtoft, T., Cripps, H., Berglund, S., & Blocker, C. (2020). Sustainable Intenational Experience: A Collaborative Teaching Project. *The 16th International CDIO Conference*, *2*(2).

Merta sari, N. komang lina, Widiratini, N. K., & Anggendari, M. D. (2022). Pengembangan Bahan Ajar Embroidery Berbasis Merdeka Belajar Kampus Merdeka. *Jurnal BOSAPARIS: Pendidikan Kesejahteraan Keluarga*, *13*(1), 28–36. https://doi.org/10.23887/jppkk.v13i1.43939

Mogren, A., Gericke, N., & Scherp, H. A. (2019). *Whole-school approaches to sustainable development*. Taylor & Francis.

Morrison, A., Rigney, L.-I., Hattam, R., & Diplock, A. (2019). Toward an Australian culturally responsive pedagogy: A narrative review of the literature. In *University of South Australia*. https://www.researchgate.net/profile/Anne-Morrison/publication/335101498_Anne_Morrison_Lester-Irabinna_Rigney_Robert_Hattam_Abigail_Diplock_Toward_An_Australian_Culturally_Responsive_Pedagogy_A_Narrative_Review_Of_The_Literature/links/5d4f4c3da6fdcc370a8c

Muñiz, J. (2019). Culturally Responsive Teaching: A 50-State Survey of Teaching Standards. *New America*, *March*, 2–51. https://eric.ed.gov/?id=ED594599

Noor, A. S. M., Younas, M., & Arshad, M. (2019). A review on cloud based knowledge

Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

management in higher education institutions. *International Journal of Electrical and Computer Engineering*, *9*(6), 5420–5427. https://doi.org/10.11591/ijece.v9i6.pp5420-5427

Novita, L., Sundari, F. S., Vonti, L. H., & Purnamasari, R. (2022). E-books as Assistive Technology for Children with Learning Disabilities. *Jurnal Pendidikan Dan Pengajaran*, *55*, 377–386.

Nurhayati, S., & Prabowo, D. (2022). Integrating cultural values into teaching modules for sustainable education. *Indonesian Journal of Education for Sustainable Development*, *15*(1), 33–42.

Portes, P. R., González Canché, M., Boada, D., & Whatley, M. E. (2018). Early Evaluation Findings From the Instructional Conversation Study: Culturally Responsive Teaching Outcomes for Diverse Learners in Elementary School. *American Educational Research Journal*, *55*(3), 488–531. https://doi.org/10.3102/0002831217741089

Ragazzi, S., Crescentini, A., & Castelli, L. (2012). Evaluation and Monitoring of Innovation in school: A Case Study. *Procedia - Social and Behavioral Sciences*, *69*(Iceepsy), 414–421. https://doi.org/10.1016/j.sbspro.2012.11.428

Rahman, A., Heryanti, L. M., & Ekanara, B. (2019). Pengembangan Modul Berbasis Education for Sustainable Development pada Konsep Ekologi untuk Siswa Kelas X SMA. *Jurnal Eksakta Pendidikan (Jep)*, *3*(1), 1. https://doi.org/10.24036/jep/vol3-iss1/273

Reunamo, J., & Suomela, L. (2013). Education for sustainable development in early childhood education in finland. *Journal of Teacher Education for Sustainability*, *15*(2), 91–102. https://doi.org/10.2478/jtes-2013-0014

Rokhim, N., Rusdiyani, I., & Sholih, S. (2023). E Modul Guru Pjok Berbasis Canva Materi Gerak Dasar Untuk Anak Tunagrahita Di Sekolah Khusus Se-Kabupaten Tangerang. *Vox Edukasi: Jurnal …*. http://jurnal.stkippersada.ac.id/jurnal/index.php/VOX/article/view/2285

Sadjiati. (2012). *Pengembangan Bahan Ajar*. Universitas Terbuka.

Sari, D. K., & Ningsih, Y. (2023). The effect of problem based learning (PBL) model on fourth-grade students' learning outcomes of data presentation. *Journal Of Teaching And Learning In Elementary Education*, *6*(1), 46. https://doi.org/10.33578/jtlee.v6i1.7961

Setiawan, R., Syahria, N., Andanty, F. D., & Nabhan, S. (2022). Pengembangan Modul Ajar Kurikulum Merdeka Mata Pelajaran Bahasa Inggris Smk Kota Surabaya. *Jurnal Gramaswara*, *2*(2), 49–62. https://doi.org/10.21776/ub.gramaswara.2022.002.02.05

Sukmanasa, E., & Novita, L. (2023). Teacher Innovation through Knowledge Management and Personality Strengthening. *Al-Tanzim: Jurnal Manajemen Pendidikan Islam*, *7*(2), 478–491. https://doi.org/10.33650/al-tanzim.v7i2.4114

Sutrisno, D., & Yulianti, D. (2020). Culturally responsive teaching in Indonesia: Exploring its potential for inclusive education. *Indonesian Journal of Education*, *35*(2), 112–128.

Theoharis, G., & Scanlan, M. (2015). Leadership for increasingly diverse schools. In *Leadership for Increasingly Diverse Schools*. https://doi.org/10.4324/9781315767574

Thomas, C. A. (2024). District Certified Culturally Responsive Elementary Teachers and Their Mathematics Teaching Practices. *Journal of Urban Mathematics Education*.

Turculeţ, A. (2015). Teachers for the 21st Century. Will Emotional Intelligence Make the Difference? *Procedia - Social and Behavioral Sciences*, *180*(November 2014), 990–995. https://doi.org/10.1016/j.sbspro.2015.02.188

UNESCO. (2016). *Education as global public good. The Global Education and Skills Forum*.

UNESCO. (2020). *Global Education Monitoring Report: Inclusion and education*. UNESCO.

Wlodkowski, R. J., & Ginsberg, M. B. (1995). A Framework for Culturally Responsive Teaching.

Vol. 8, No.1, February 2025, pp. 11 - 28
DOI: http://dx.doi.org/10.33578/jtlee0802
ISSN : 2615-4528 (Print) 2622-3023 (Online)

Educational Leadership, *September*, 17–21.

Xie, J., Liu, S., & Wang, Y. (2029). Integrating Local Culture into Educational Modules for Sustainable Development: Case Studies from Southeast Asia. *Sustainability*, *12*(10), 8976.

Zahrika, N. A., & Andaryani, E. T. (2023). Kurikulum Berbasis Budaya untuk Sekolah Dasar : Menyelaraskan Pendidikan dengan Identitas Lokal. *Pedagogika: Jurnal Ilmu-Ilmu Kependidikan*, *3*(2), 163–169.

Zainal Abidin, M. S., Mokhtar, M., & Arsat, M. (2024). Unraveling the challenges of education for sustainable development: a compelling case study. *Qualitative Research Journal*, *1*. https://doi.org/10.1108/QRJ-05-2023-0090