Differentiated Learning Based on Culturally Responsive Teaching (CRT) in Elementary Schools

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Abstract—**The world of education is faced with global challenges that impact the diversity of each individual background based on interests, life experiences, perspectives, cultural knowledge, and language. The main objective of this study is to provide information from the literature on differentiated learning based on Culturally Responsive Teaching (CRT) in the latest Elementary Schools through a Systematic Literature Review (SLR). Overall, 1,099 articles with the keyword "Culturally Responsive Teaching (CRT)", 61 articles with the keyword "Differentiated learning based on Culturally Responsive Teaching (CRT)", and 10 articles with the keyword "Differentiated learning based on Culturally Responsive Teaching (CRT) in elementary schools" were published in Scopus during the period 2020-2024. This study provides the main tendencies that are relevant to the current global challenge conditions that elementary school teachers need to design differentiated learning based on Culturally Responsive Teaching (CRT) by considering the diversity of interests, life experiences, perspectives, cultural knowledge, and language of students in the classroom. The novelty of this research is centered on the analysis of differentiated learning and Culturally Responsive Teaching (CRT) applied in elementary schools. Teachers can design differentiated learning and Culturally Responsive Teaching (CRT) through self-identification, cultural understanding, collaboration, critical reflection, and transformative construction.**

Keywords— *differentiated learning; Culturally Responsive Teaching (CRT); elementary school*

I. INTRODUCTION

The world of education is increasingly heterogeneous, the cultural diversity of students has become a necessity [1]. Indonesia is a country with a large population and has a wealth of cultural diversity that is recognized by the world [2][3]. Each individual has a unique cultural background, language, and life experience. Diversity is reflected in schools that are diverse from interests, life experiences, perspectives, cultural knowledge, and language in multicultural classroom [4][5].

This condition requires teachers to be able to create an inclusive and responsive learning environment to the needs and diversity of every student in the classroom. Learning that teachers can use to understand the diversity of students in the classroom can use different learning approaches through Culturally Responsive Teaching (CRT) [6][7][8][9]. This learning allows teachers to carry out a series of activities that are meaningful to students. Learning is challenged by differences in students' cultural backgrounds and characteristics which are reflected in the skills that students bring to learning activities [10].

Differentiated learning is a pedagogical strategy that acknowledges the diverse learning styles, interests, and proficiency levels of individual students [11][12][13]. Teachers can design flexible and adaptive learning, so that it can meet the individual needs of each student [14]. Teachers initiate learning according to the student's abilities by modifying, adapting, or designing new approaches in response to the student's learning needs, interests, and preferences [15]. However, differentiated learning is more meaningful if it is integrated with an approach that considers cultural aspects.

Differentiated learning is a pedagogical strategy that acknowledges the unique needs of each student. Culturally Responsive Teaching (CRT) is an educational method that appreciates and honors the cultural diversity present within the classroom environment [16][17][18][19]. Culturally Responsive Teaching (CRT) focuses on how teachers can create a learning environment that respects, values and leverages students' knowledge, experiences and cultural perspectives [20][21]. In other words, Culturally Responsive Teaching (CRT) in learning carried out by teachers connects students' learning experiences with their daily lives.

The experience of elementary school students is fundamental in understanding what it means to be a student in a classroom learning community. Students need to have an

awareness of cultural differences, especially the differences between home and school [22]. Students can feel whole as individuals by utilizing cultural and language learning resources while participating in classroom learning [23]. The integration between differentiated learning and Culturally Responsive Teaching (CRT) has great potential in improving the quality of learning [7][24]. Culturally Responsive Teaching (CRT) a concern in the school environment in supporting culturally underrepresented Shiva justice [25]. By integrating differentiated learning and Culturally Responsive Teaching (CRT), teachers can create a learning environment that understands different cultures, languages, and different ways of learning [6].

The implementation of differentiated learning based on Culturally Responsive Teaching (CRT) still faces various challenges. Some of them are teachers' lack of understanding of CRT concepts, limited resources, and lack of support from the school environment [26][27]. In addition, the curriculum that is often uniform is also an obstacle in implementing more flexible and responsive learning [7].

Previous research has also found that learning by integrating culture can reduce problems related to discipline, attendance, class participation, and racial attitudes [28]. Understanding CRT can expand self-awareness of cultural identity, enhance culturally mediated emotions of social situations; and develop teaching practices for cultural sensitivity [17]. Several studies highlight that learning by integrating Culturally Responsive Teaching (CRT) can develop students' critical thinking skills [10] and improving mathematics learning outcomes [29]. Teachers can encourage culturally diverse student engagement by designing learning by assigning complex tasks, integrating self-regulation and Culturally Responsive Teaching (CRT) [4].

The importance of research on CRT-based differentiated learning is increasingly urgent. This research is expected to contribute to the development of more inclusive and effective learning practices. In addition, the results of this research can also be the basis for the development of education policies that are more responsive to the diverse needs of students.

II. METHOD

This research is a Systematic Literature Review (SLR) research. A systematic literature review (SLR) was followed to select relevant publications on differentiated learning and Culturally Responsive Teaching (CRT) approaches in developed and developing countries in 2020-2024. Systematic literature review is an independent research and does not require the use of theory such as empirical research but contributes by developing a model or conceptual framework [30][31][32][33].

The Scopus database was selected for literature search relevant to the research topic and involved three steps, namely data collection, analysis, and synthesis [34][33]. The data analysis technique uses the PRISMA method with a flow diagram covering the steps of the SLR process, namely

identification, screening, feasibility, and inclusion [30][35]. For more details, please see Figure 1 below.
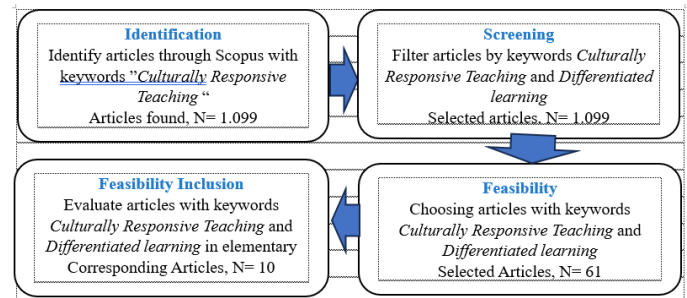

Figure 1. PRISMA Method

Figure 1 above shows that the research was identified using the Scopus database. The total number of records identified from these sources is 1,099 articles. The screening process was carried out by searching more deeply related to Culturally Responsive Teaching and Differentiated learning, and 61 articles were found that were feasible according to keywords. Each journal is studied in depth, finding findings and contributions. Finally, the end result of this analysis is 10 articles that fit the research objectives.

III. RESULTS AND DISCUSSION

Differentiated Learning

Teachers significantly influence the success of the learning process. Teachers have the opportunity to employ a range of strategies that address the diverse needs and expectations of students through differentiated instruction [36][37]. Differentiated learning represents a strategy employed by teacher to adapt the instructional approach within the classroom, ensuring that the distinct learning requirements of every student are addressed effectively [38]. However, differentiated learning does not require teachers to teach 30 students in 30 different ways [39]. It does not imply that educators should assign additional questions to students who finish their assignments more quickly than their peers. To enhance the quality of classroom learning via differentiated instruction, educators must exercise creativity in selecting models, techniques, and strategies for teaching [40].

Differentiated educational strategies represent a contemporary approach to teaching that acknowledges the individual differences among students. These strategies focus on varying skill levels and aim to foster a sense of responsibility in decision-making regarding corrections. Additionally, they create opportunities for students to offer feedback and enhance social interactions among peers through the implementation of differentiated education methods [41]. Differentiated learning involves tailoring the educational experience within the classroom to accommodate the unique learning requirements of each student. Differentiated learning offers adaptability and can meet the diverse needs of students, thereby enhancing their potential in alignment with their readiness to learn, interests, and various learning profiles [42].

The implementation of differentiated learning can take into account several factors, with learning readiness, interests, and

student profiles serving as the primary reference points [43]. The application of differentiated learning in the Independent Curriculum is in line with the educational philosophy of Ki Hajar Dewantara that students can learn according to their nature, namely the nature of nature and the nature of the times [44]. Students can participate through learning activities that leverage prior knowledge and abilities demonstrating readiness to learn more to succeed [45]. The teacher gives the student the freedom to develop his potential in a way that appeals to him so that the student can express himself according to his or her uniqueness [46].

Differentiated learning has four characteristics are as follows: 1) learning focuses on basic concepts and principles, it focuses on basic learning competencies; 2) evaluation of student readiness and learning development is accommodated into the curriculum so that there is a need to map student needs and then included in the learning strategy; 3) the grouping of students is carried out flexibly, for example based on independence, grouping based on intelligence level, grouping based on learning modalities, etc.; and 4) students actively explore under the guidance and direction of the teacher. This differentiated learning is student-centered [42].

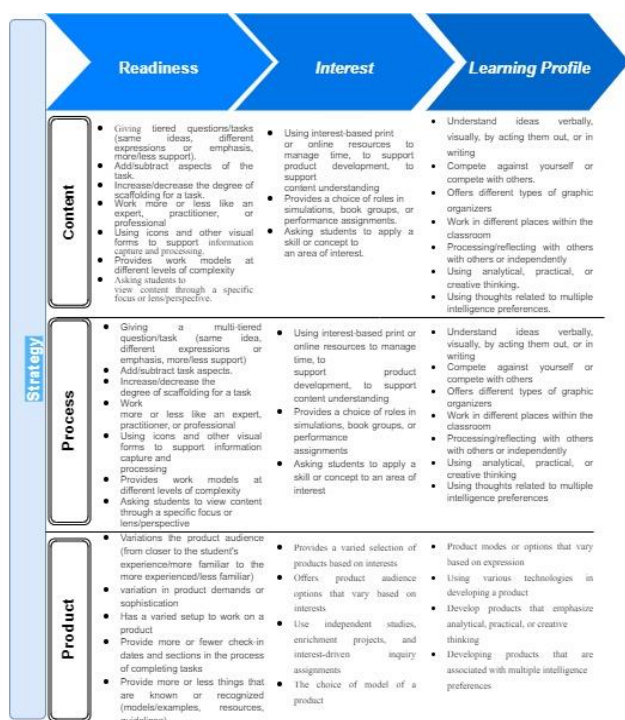Strategies in the implementation of Differentiated Learning are cited [47] as follows:

Figure 2. Differentiated Learning

Culturally Responsive Teaching Approach (CRT)

Culturally Responsive Teaching (CRT) is an educational methodology that acknowledges and incorporates the diverse cultural backgrounds, experiences, and viewpoints of students into the instructional process. This approach seeks to foster a more inclusive and equitable educational environment, ensuring that all students feel appreciated and have the opportunity to thrive [48]. Culturally Responsive Teaching can

motivate and increase student involvement in the learning process. In addition, it can improve students' communicative character, discipline, and science literacy through social-emotional learning [24].

Culturally Responsive Teaching as one of the main techniques in connecting students' culture, language, and life experience with learning so that students gain meaningful and relevant knowledge from the material taught in the classroom. Teachers in classroom learning are important to centralize students' cultural references in all aspects of learning [26]. CRT is an educational approach that prioritizes students and employs a learning community framework to structure classroom environments. This methodology is based on an equity-focused pedagogy aimed at enhancing educational environments that currently hinder the learning experiences of numerous students from racially, culturally, and economically diverse backgrounds [49]. Teachers who can successfully apply the CRT approach in learning need to train themselves to increase socio-cultural awareness.

Learning steps with the CRT approach, they are as follows: 1) Student self-identity: students are invited to get to know their cultural identity related to the material to be delivered; 2) cultural understanding: students construct cultural understanding with new knowledge obtained from various sources; 3) collaboration: students work in groups to discuss cultural concepts and perspectives; 4) Critical thinking for reflection: students compare the results of their discussion with existing theories with teacher guidance; 5) Transformative Construction: Students present their understanding through a project [50]. The application of the CRT approach in learning by: 1) Teaching cultural context by discussing diverse cultural values, traditions, and histories in the classroom; 2) culture-based assignments by asking students to research different school cultures and present them; 3) relevant teaching materials by using teaching materials that reflect the diversity of students; 4) an inclusive classroom environment by designing a classroom that reflects the diversity of students and uses inclusive language.

Research on the application of the Culturally Responsive Teaching (CRT) approach has been carried out by many previous researcher source www. scopus.com (2020-2024) there are 61 documents. For more details, please see Figure 1 below.
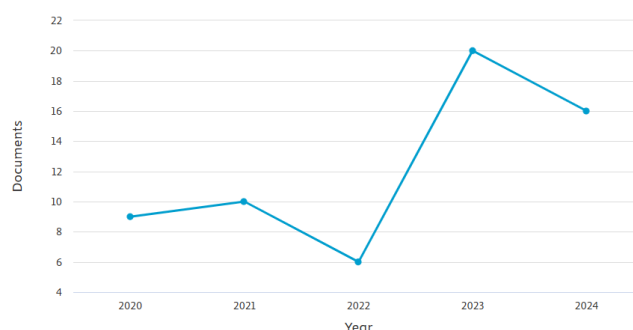

Figure 3. Culturally Responsive Teaching Research

Based on Figure 1 above, the research documents from 2020 to 2024 show an increase from 2020-2023, from 9

research articles to 10 research articles. In 2022-2023, there was a significant increase, from 6 research articles to 20 research articles related to differentiated learning based on Culturally Responsive Teaching (CRT). However, in 2021-2022 and 2023-2024 there was a decrease, from 10 research articles in 2021 to 6 research articles in 2022 and a decrease occurred in 2023 from 20 articles to only 16 research articles in 2024.

Differentiated learning research based on Culturally Responsive Teaching (CRT) is widely carried out in various countries. The following productive countries conducting research from 2020-2024 can be seen in Table 1 below.

TABLE I.　　　PRODUCTIVE COUNTRY

Country	Document	Country	Document
United States	49	Indonesia	1
Canada	3	Mexico	1
Netherlands	3	Pakistan	1
Germany	2	Singapore	1
Costa Rica	1	Taiwan	1

Table 1 above, shows that the most productive country is the United States with 49 research articles, Canada and the Netherlands only 3 research articles have been published, Germany has only 2 research articles published, while Costa Rica, Indonesia, Mexico, Pakistan, Singapore, and Taiwan have only 1 published article.

Differentiated learning research based on Culturally Responsive Teaching (CRT) was carried out by researchers in various countries. The following productive researchers conducting research from 2020-2024 can be seen in Table 2 below.

TABLE II.　　　PRODUCTIVE RESEARCHERS

Researchers	Country	Citations	Document	H-index
Butler, Deborah L.	Kanada	3.811	39	18
Jugert, Philipp	Jerman	1.782	50	22
Ketelhut, Diane Jass	Amerika	1.550	59	16
Civitillo, Sauro	Netherlands	469	22	11
Cabrera, Lautaro	Amerika	197	13	7
Ialuna, Francesca	Jerman	66	7	4
Cima, Francisco	Amerika	26	17	3
Anyichie, Aloysius C.	Kanada	15	3	2
Mak, Janice	Amerika	3	9	1

Table 2 above shows that the productive researcher who has the most citations in first place is Butler, Deborah L. from Canada with a total of 3,811 citations. In second place is Jugert, Philipp is from Germany with a total of 1,782 citations. In third place, Ketelhut, Diane Jass from America with a total of 1,550 citations.

Implementation of Differentiated Learning based on the Culturally Responsive Teaching (CRT) Approach in Elementary Schools

The implementation of differentiated learning based on Culturally Responsive Teaching (CRT) can be used through elementary school student activities in the classroom such as:

storytelling, group discussions, or other activities that are not only relevant to the student's culture, but also responsive to the needs and cultural diversity that exist around the student's environment [51][50][52]. Research on the differentiated implementation of Culturally Responsive Teaching (CRT) in elementary schools can be seen in Table 3 below.

TABLE III.　　　RESEARCH ON THE DIFFERENTIATED IMPLEMENTATION OF CRT IN ELEMENTARY SCHOOLS

No	Article Title	Researcher and Year	Journal
1	User experience testing and co-designing a digital game for broadening participation in computing with and for elementary school children	Arastoopour Irgens et al (2024)	International Journal of Child-Computer Interaction
2	"Reimagining education for our dreamchasers": creating a humanizing education space through culturally relevant teaching for Latin(x) and black elementary students	McGinnis et al (2024)	Journal for Multicultural Education
3	Culturally responsive teaching, teacher-student relationship and school belongingness: A multi-informant study in ethnically diverse classrooms	Ialuna et al (2024)	Learning, Culture and Social Interaction
4	Impact of Professional Development in Culturally Relevant Engineering Design for Elementary and Middle School Teachers (RTP, Diversity)	Bowman et al (2024)	ASEE Annual Conference and Exposition, Conference Proceedings
5	District Certified Culturally Responsive Elementary Teachers and Their Mathematics Teaching Practices	Thomas (2024)	Journal of Urban Mathematics Education
6	Developing critical consciousness for culturally responsive teaching: an international teacher exchange program	González-Carriedo et al (2024)	Teacher Development
7	Developing culturally responsive teaching self-efficacy through engaged, asset-based teacher preparation	Paulick et al (2024)	Teaching Education
8	Exploring teacher practices for enhancing student engagement in culturally diverse classrooms	Anyichie et al (2023)	Journal of Pedagogical Research
9	Computational thinking-integrated elementary science with culturally responsive teaching: A vignette study	Xin et al (2023)	SIGCSE 2023 - Proceedings of the 54th ACM Technical Symposium on Computer Science Education
10	Predicting the Quality of Perception Assessment Instrumentsfor Prospective Elementary School Teachers on the Culturally Responsive Teaching Approach	Kawuryan (2023)	New Educational Review

Based on Table 1 above, The teachers can design learning by utilizing cultural-based sustainable digital games can develop the computational literacy needed and meaningful in the future in participating in society [53]. Culturally relevant pedagogical values create mutual growth in understanding between teachers and students [54]. Culturally Responsive Teaching (CRT)-based learning can improve the close relationship between teachers and students, thereby increasing the sense of belonging of students in school [60].

Culturally responsive STEM-based learning with engineering design in a variety of subjects (Science, Mathematics, Language Arts) can improve the development of self-efficacy and collective efficacy for teachers in primary schools [56]. Mathematics learning can gain an in-depth

understanding of how elementary school teachers can enforce CRT in Mathematics based on their background and experience with the certification model [22]. Primary school teachers can participate in international teacher exchange programs so that they have experience in teacher professional development in teaching practices, school systems and policies related to language, culture, and ethnicity [57].

Learning modules used by primary school teachers with Culturally Responsive Teaching (CRT) teaching can consistently improve teacher effectiveness [21]. Learning that integrates culture has the essence of maintaining the way of life and language of students in the classroom. This asset-based learning addresses culturally diverse student learning challenges such as systemic racism, achievement gaps, learning disconnections, and outcomes. Teachers have the ability to create classroom activities that resonate with diverse cultural backgrounds, interests, and student experiences, thereby fostering a positive learning environment for all students [4].

The combination of computational thinking (CT) and culturally responsive teaching practices (CRT) in science education, through the analysis of various science learning scenarios, can enhance educators' comprehension of how to effectively implement Culturally Responsive Teaching [58]. The curriculum implemented by educators should create avenues for students to regularly incorporate cultural elements throughout their learning experiences, grounded in traditional values and philosophies, in order to foster beneficial educational transformations for all learners [59].

The application of differentiated learning based on Culturally Responsive Teaching (CRT) can be applied to learning in elementary schools. Deployment using steps as follows [50][10].
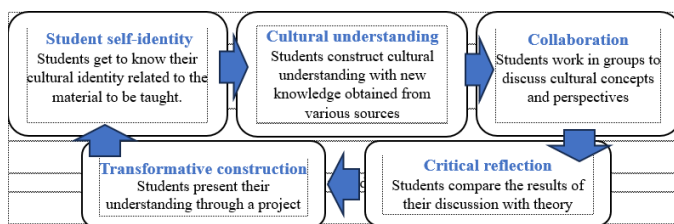

Figure 4. Differentiated learning steps based on CRT

Figure 4 above, shows the stages of CRT-based differentiated learning. The first stage of this process is for students to understand themselves and their background. Teachers can use questionnaires to find out their readiness, interests, and learning profiles to find out the characteristics of students. Teachers can also invite students to play games related to material in understanding culture in the student environment. In the second stage, students are involved in cultural understanding and knowledge construction through various sources that can be used in information gathering. Teachers can facilitate students to give students the freedom to determine the learning resources they are interested in according to the student's learning style. In the third stage, students can collaborate in discussing the cultural concepts and perspectives they find with the sources they get. In the fourth stage, students presented the results of the project results of the discussion to other groups according to the cultural background

of each group. Students can respond with an attitude of appreciation and respect for each student's opinion. In the final stage, teachers can invite students to conclude and reflect on the learning activities carried out

IV. CONCLUSIONS

In total, 1,099 articles were published with the keyword "Culturally Responsive Teaching (CRT)", 61 articles with the keyword "Differentiated learning based on Culturally Responsive Teaching (CRT)", and 10 articles with the keyword "Differentiated learning based on Culturally Responsive Teaching (CRT) in elementary schools" published in Scopus during the 2020-2024 period. Differentiated learning is an effort made by teachers in modifying the learning process in the classroom to meet the unique learning needs of each student. Culturally Responsive Teaching is a learning approach that connects students' culture, language, and life experiences so that students gain meaningful and relevant knowledge. Teachers in classroom learning are important to centralize students' cultural references in all aspects of learning. Teachers can design differentiated learning and Culturally Responsive Teaching (CRT) in elementary school through self-identification, cultural understanding, collaboration, critical reflection, and transformative construction.

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