
Teachers' self-efficacy and perceived practices on technology-enhanced differentiated instruction (TEDI)**Agatha Christiyanti Manullang*, Sukarno, Intan Widora**

Universitas Negeri Yogyakarta, Indonesia

*Corresponding Author, Email: agathanamanullang80@guru.smk.belajar.id

ABSTRACT

Today's ELT classrooms are becoming more diverse and technology-mediated, requiring teachers to blend digital tools with differentiated instruction to accommodate learners' varying readiness levels, interests, and learning profiles. This study investigates teachers' self-efficacy and perceptions of the tactics used in implementing Technology-Enhanced Differentiated Instruction (TEDI) in English Language Teaching (ELT). A sequential explanatory mixed-methods design was conducted in this study. The quantitative stage comprised 124 Indonesian English instructors, and the qualitative phase included six teachers. We used questionnaires and semi-structured interviews to find out how teachers felt about using TEDI. Quantitative data were analysed using descriptive statistics and a one-sample t-test. Interview data were analysed thematically to interpret survey results and identify teachers' practical challenges with implementing TEDI. The findings indicate that many teachers face several problems, including not being very good at differentiated instruction, having too much work to do, and not receiving enough support from technology and institutions. These problems make it hard for teachers to use technology and differentiated education in different kinds of classrooms. Even with these limitations, teachers agree that TEDI is important for meeting children's diverse learning needs and for getting them more engaged in their learning. The study emphasizes the necessity to enhance teacher professional development, upgrade technological infrastructure, and offer institutional support to ensure the efficient deployment of TEDI in English language teaching environments.

Keywords: ELT, Differentiated instruction, TEDI**Article history**

Submitted:

18 February 2025

Accepted:

28 July 2026

Published:

31 July 2026

Citation (APA Style):

Manullang, A. C., Sukarno, S., & Widora, I. (2026). Teachers' self-efficacy and perceived practices on technology-enhanced differentiated instruction (TEDI). *LITERA*, 25(2), 184-196. <https://doi.org/10.21831/ltr.v25i2.83435>

INTRODUCTION

The idea of differentiated instruction (DI) has garnered more attention lately. Offering students "different avenues to acquiring content, to processing or making sense of ideas, and to developing products so that each student can learn effectively" is the goal of this teaching strategy (Tomlinson, 2001, p. 1). It is founded on a constructivist view of education. Differentiation is founded on the assumption that students will learn relevant content if they are allowed to build on what they already know to generate their own knowledge and understanding (Smith & Throne, 2007).

Differentiated education is now required in Indonesian classrooms. The Minister of Education, Culture, Research, and Technology stresses that one of the main goals of the teaching and learning process should be to deal with the diversity of students (Permendikbudristek No. 12, 2024). This policy says that teachers need to change how they teach to meet the different needs, skills, backgrounds, and interests of their pupils. The rule fits well with the bigger picture of Indonesian society, which is known for its wide range of cultural, economic, linguistic, and geographic variety across its areas. Because of this, teachers need to use flexible, inclusive teaching methods that take these variances into account and make sure that all students have the same chances to learn.

Differentiated instruction is a learning approach that offers broad choices for diverse learners by providing a variety of strategies and approaches to guide students in demonstrating the learning objective in various forms (Tomlinson, 2017). There are four basic elements of Differentiated Instruction that can be adapted to meet students' needs: content, process, products, and learning environment (Campbell et al., Tomlinson, 2001). The content is the knowledge or concept that the student must acquire; it can also

serve as the resources for teaching and learning activities. The process involves activities that assist students in comprehending and grasping the concepts of their learning and in achieving the learning objectives. The product refers to opportunities offered for students to demonstrate their learning achievement, language comprehension, and proficiency. The learning environment refers to the classroom's overall ambience and the interaction among students.

DI is relevant to teachers in English Language Teaching, too, as more than ever before, EFL learners come to class with diverse cultural and educational experiences. Students often vary greatly in their target language proficiency, learning styles, motivation, and interests, which calls for greater responsibility to students' needs and preferences in the classroom (Benson, 2012). DI practices in English Language Teaching (ELT) have a variety of challenges that hinder teachers from meeting the effectiveness of this approach (Suwastini et al., 2021). Wahyudi et al. (2023) stated that most teachers worldwide, regardless of their teaching level, struggle to incorporate DI into the teaching and learning process. Additionally, teachers faced difficulties due to scarce resources, including time, space, teaching materials, and costs per class (Campbell et al., 2016). Teachers also encountered challenges in evaluating the students' achievement of varying learning requirements. Furthermore, teachers often struggle to create a nurturing and supportive environment that fosters students' growth in knowledge and skills while also providing extra support to students with limited capabilities.

Improving language proficiency and raising the standard of education require the incorporation of ICT in English language teaching and learning (Ahmadi, 2018). It offers numerous advantages, including enhanced learning outcomes, dynamic and engaging content, genuine communication, and time-saving features.

The concept of technology-enhanced differentiated instruction (TEDI) is already being used in the professional discourse (e.g., Haymon & Wilson, 2020; Ritter, 2018), and the potential affordances of ICT for DI are highlighted in the Hungarian National Core Curriculum too, as the policy document refers to "modern, 21st century tools" as "indispensable" elements of a personalized approach to teaching (Government of Hungary, 2020, p. 314). To date, only a few studies have investigated how ICT may be used for DI in the teaching of English as a foreign language (TEFL) (e.g., Hustinx et al., 2019; Rapti, 2018; Vargas-Parra et al., 2018). Most of them adopted an experimental or action research design and examined the use of specific applications (apps) and their effects on students' learning outcomes and motivation. Little is known, however, of how practitioners of TEDI describe their practices and what benefits and challenges they see in this type of instruction. Such an investigation would be warranted to gain a closer understanding of teachers' lived experiences with TEDI and to identify themes that unite practitioners of this novel approach.

Despite the potential benefits, the application of ICT-based tools in promoting differentiated instruction in ELT remains underexplored. Many English language teachers struggle to effectively implement differentiated instruction due to constraints such as limited resources, varying student abilities, and the complexity of managing individualized learning plans. ICT for DI in ELT has only been the subject of a small number of studies so far (e.g., Hustinx et al., 2019; Rapti, 2018; Vargas-Parra et al., 2018). Furthermore, little is known about how TEDI practitioners explain their methods and the advantages and difficulties they see with this kind of training. To better understand instructors' real-world experiences with TEDI and identify commonalities among those using this innovative technique, such an inquiry would be necessary.

To fill this research gap, the current study examined the self-efficacy beliefs and perceived behaviours of English teachers in Indonesia regarding differentiated instruction. The following research question was considered by the researchers to fulfil this purpose: How confident are teachers in their ability to implement differentiated instruction? What are the main elements that prevented them from achieving the effective implementation of TEDI? What are the main elements that prevented them from achieving the effective implementation of DI?

METHOD

This study applied a sequential explanatory mixed-methods research design. The first phase employed a quantitative survey to find out how English teachers feel about and use Technology-Enhanced Differentiated Instruction (TEDI). We collected the data through an online survey based on the one created by Zelalem et al. (2022), which examines how teachers think about and use differentiated education. Some parts were revised to align with English Language Teaching (ELT) in Indonesia and

to include guidance on using Information and Communication Technology (ICT) in differentiated education.

The questionnaire has three main parts, each with 69 questions. The first group of questions asked about the respondents' age, gender, teaching experience, province, and school level. The second group had closed-ended questions using a five-point Likert scale from 1 (Never) to 5 (Always). These categories examined what teachers thought and did when they used technology to support varied education. They looked at important aspects such as content, process, product, and learning environment differentiation. The third category included open-ended questions designed to elicit more information about instructors' experiences, problems, and ways of using TEDI in their classrooms.

A small group of English teachers reviewed the questionnaire before the main data collection to ensure it was clear. Two experts in English language education and educational technology reviewed the questionnaire to ensure it was content valid. They looked at how relevant, clear, and representative each category was for measuring teachers' practices and views of technology-enhanced differentiated education. Having reviewed, the questionnaire was sent online via convenience–purposive sampling to identify English teachers who had taught in Indonesian schools. A total of 124 English teachers from various provinces in Indonesia took part in the study. Their answers provided us with numbers on how teachers felt about and used TEDI, which were later supplemented by qualitative data obtained in the next phase of the study.

Table 1. Respondents Profile

Factor	Categories	Frequency	Percentage
Gender	female	107	86.3
	male	17	13.7
Age	Under 25	6	4.8
	25-34	22	17.7
	35-44	55	44.4
	45-55	31	25
	Above 55	10	8.1
Region	D.I Yogyakarta	42	33.87
	Central Java	27	21.77
	North Sumatera	20	16.13
	East Java	8	6.45
	DKI Jakarta	7	5.65
	Other provinces	20	16.13

Note. Other provinces are: West Java (4), Riau (3), South-East Sulawesi (3), Central Sulawesi (2), Lampung (2), Banten (2), Bengkulu (1), Bali (1), South Sumatera (1) and West Kalimantan (1).

To collect qualitative data, in-depth interviews were conducted with six English teachers from vocational high schools in Indonesia. The participants had teaching experience ranging from 17 to 24 years. The interviews explored teachers' perceptions and their implementation of Differentiated Instruction (DI) in English language teaching. Semi-structured interview questions were developed based on the four elements that can be modified in the DI approach proposed by Santangelo and Tomlinson (2012), namely content, process, product, and learning environment. These elements guided the discussion on how teachers adapt instructional strategies to accommodate students' diverse learning needs. The interviews were conducted in Bahasa Indonesia to ensure that participants clearly understood the questions and could provide detailed, meaningful responses. This approach also allowed the participants to express their experiences and perspectives more comfortably and accurately.

For quantitative data analysis, IBM SPSS Statistics was used. To analyse teachers' responses, descriptive statistics, which included frequencies, percentages, means, and standard deviations, were calculated. Furthermore, a one-sample t-test was applied to analyse teachers' self-efficacy in implementing differentiated instruction by calculating the examined mean scores with the expected mean value.

Interview responses were analysed thematically. Initially, transcripts were reviewed for accuracy, then coded and analysed category by category through data familiarization, reduction, coding, and theme development. This process analysed recurring patterns and themes related to teachers' experiences, perceptions, and challenges in implementing Technology-Enhanced Differentiated Instruction (TEDI).

RESULTS AND DISCUSSION

Results

Teachers' self-Efficacy toward DI

From the quantitative data, it was revealed that teachers were less efficacious in implementing DI, with the computed mean score was 3.396, SD=0.829, which was lower than the expected mean (4). The highest was on the teacher's capability in making the assignment that caters the diversity of students' interest (3.47) and the lowest was teacher's capability in making lesson plan which caters students' diverse interest (3.32).

Table 1. One-sample t-test for teachers' self-efficacy to Differentiated Instruction

Items	min.	max.	expected mean	mean	Std Deviation
Teacher's capability to make lesson plan which caters students' diversity in interest	1	5	4	3.32	.822
Teacher's capability to prepare learning materials that cater the diversity of students' interest	1	5	4	3.34	.845
Teacher's capability to prepare learning materials that cater to the diversity of students' readiness	1	5	4	3.40	.845
Teacher's capability to implement learning strategies that cater to the diversity of students' learning style	1	5	4	3.38	.822
Teachers' capability to make instruments to measure students' learning achievement that cater to the diversity of students' interest	1	5	4	3.44	.809
Teachers' capability to make rubric instruments to measure students' learning achievement that cater to the diversity of students' interest	1	5	4	3.38	.842
Teacher's capability to implement class management which caters to the diversity of students' learning styles (visual, audio-visual, and kinaesthetic)	1	5	4	3.44	.858
Teacher's capability to make assignments that cater to the diversity of students' interest	1	5	4	3.47	.831
Teacher's capability to make assignments that cater to the diversity of students' readiness	1	5	4	3.42	.866
Teacher's capability to make assignments that cater to the diversity of students' learning styles	1	5	4	3.37	.781
Overall mean value				3.396	.829

Note. Likert Scale value: 1= very low, 2= low, 3= average, 4= high, 5= very high

Teachers' Self-Efficacy in TEDI

The data in Table 2 show that many teachers found it challenging to implement Technology-Enhanced Differentiated Instruction (TEDI). The most frequently examined challenge was differentiating the learning process, observed by 66.9% of teachers. This was followed by challenges in differentiating instructional content (61.3%). However, fewer teachers found difficulties in differentiating learning products (46.8%) and using ICT tools in teaching (38.7%). These findings recommend that although teachers were aware of the importance of differentiated instruction, many still had practical challenges when adapting instructional processes and content to accommodate students' diverse learning needs.

Table 2. Summary of whether or not teachers had problems in the practice of TEDI

Challenges	Yes		Not	
	Frequency	Percentage	Frequency	Percentage
Differentiated of Content	76	61.3	48	38.7
Differentiated of Process	83	66.9	41	33.1
Differentiated of Product	58	46.8	66	53.2
Using ICT tools in teaching	58	38.7	76	61.3

Challenges in the use of ICT tools in teaching

Based on the data, the challenges in the use of ICT tools can be classified into 4 major challenges, as shown in the table below:

Table3. Challenges in ICT tools used in teaching

Problems	Frequency
Insufficient facilities	25
Lack of internet access	15
Lack of competence	16
Extra time for preparation	4

Note. Some respondents mentioned more than one challenges

Discussion

Lesson Planning and Learning Material Preparation

The results indicate that teachers' confidence in developing lesson plans that accommodate the needs of all their students is relatively low. The average score for teachers' capacity to create differentiated lesson plans was 3.32 (SD = .822), while the average score for their confidence in organizing learning resources that meet the needs of various students was 3.34 (SD = .845). Even though both scores are in the middle range, they are both below the expected mean value of 4. This means that teachers still don't feel very confident about using differentiated instructional planning. This moderate level of self-efficacy suggests that teachers may still be unsure whether they can change their teaching methods, activities, and resources to meet the needs of all their students.

Bandura (1993) states that self-efficacy is a key factor in how people make decisions, work hard, and persist in difficult activities. Teachers with high self-efficacy are more likely to try new teaching methods, whereas those with low self-efficacy may avoid complex teaching methods. Differentiated instruction is a well-known, challenging approach to education because it requires teachers to constantly adapt their instruction to how their students learn. Teachers need to integrate evaluation, planning, and instructional adaptation into a single learning process to implement differentiated instruction. These educational requirements might elucidate why educators in this study expressed only moderate confidence in formulating differentiated lesson plans.

The study's mean scores were rather low, indicating the difficulty of implementing differentiated teaching. Before choosing the right teaching methods, teachers need to consider about the students readiness, what they like to study, and what interests them. Santangelo and Tomlinson (2021) state that teachers often struggle to implement differentiated instruction because they must address both curriculum standards and student diversity simultaneously. Their research revealed that teachers often find it challenging to provide various learning pathways within a single course, especially in classrooms with students possessing diverse skills. Moreover, the study by Pozas, Letzel, and Schneider (2021) reveals that teachers frequently experience uncertainty about how to implement differentiation principles in effective classroom activities. Such ambiguity may diminish teachers' confidence in their capacity to design successful differentiated lesson plans.

Additionally, teachers who lack sufficient training or access to teaching materials may not feel confident in creating differentiated learning materials. Dixon et al. (2021) emphasize that professional development programs that provide instructors with useful tips for creating varied activities and resources have a significant effect on how confident teachers are in using differentiated instruction. Teachers who have received training are more likely to feel confident about adapting lesson plans to accommodate diverse student needs. De Neve and Devos (2021) support this by stating that effective professional development programs are essential for helping instructors understand how to teach in ways that work for kids with varying levels of readiness, learning styles, and interests.

Readiness and Learning Style Differentiation

The results also suggest that teachers are somewhat confident they can adjust their teaching based on their pupils' readiness and interest. Teachers said they were fairly confident in making learning materials that were right for each student's level of readiness (mean = 3.40, SD = .845) and in using teaching methods that worked for varied learning styles (mean = 3.38, SD = .822). These scores, on the other hand, are still below the expected mean of 4, indicating that teachers are still unsure how to use

readiness-based differentiation. Teachers who think they are only moderately good at teaching may not always use complex instructional adaptations, such as differentiated instruction.

Teachers need to keep an eye on how well their students are doing and adjust the difficulty of tasks accordingly. Teachers need to know a lot about teaching and have enough time to prepare in order to do this procedure correctly. It is very significant for teachers to adapt their lessons to students based on Formative assessment and flexible instructional design. However, prior research shows that teachers frequently face constraints when implementing readiness-based differentiation in classroom settings. Smets and Struyven (2020) discovered that teachers' confidence in their pedagogical expertise and classroom environments substantially affect the effective implementation of differentiated teaching.

Assessment and Rubric Development

The results also show that teachers have moderate confidence in their ability to create differentiated assessment methods. Teachers said they could design assessments that fit students' interests (3.44, SD = .809) and rubric-based assessments that work for a range of learning styles (3.38, SD = .842). Even though these scores are a little higher than those in other areas of instruction, they are still below the expected mean of 4. This means that teachers still don't feel very confident about using differentiated assessment strategies. Bandura's (1993) theory of self-efficacy states that teachers' perceptions of their competence in carrying out effective teaching and learning activities strongly affect their ability to adjust the range of teaching and learning methodologies, including differentiated assessment for students with varying readiness and competencies.

In differentiated instruction, assessment serves not only as a means to measure student achievement but also as a tool for teachers to design pedagogical instruction that effectively accommodates students with varying levels of learning readiness, styles, and interests. Teachers need to use a range of assessment methods, such as formative assessments, alternative performance tasks, and flexible evaluation criteria that account for students' varying levels of readiness, interests, and learning styles (Heitink et al., 2021). But it's still hard to make these kinds of tests in many classroom settings. Previous studies have shown that teachers often find it difficult to design assessment or alternative evaluation formats that are effective to measure diverse student learning outcomes while remaining aligned with curriculum standards (Gaitas & Martins, 2021).

Additionally, contextual limitations, including large class sizes, limited instructional time, and inadequate professional development, may additionally hinder teachers' capacity to effectively implement differentiated assessment practices. Subban and Round (2020) noted that large classes and substantial teaching responsibilities often diminish teachers' ability to create varied assessment tasks tailored to each student's needs. Dixon et al. (2021) also note that teachers' confidence in using differentiated instruction is strongly influenced by the availability of professional development and institutional support. If teachers don't receive sufficient training in differentiated assessment strategies, they may depend on more established methods that don't fully account for students' differences. The moderate level of self-efficacy identified in this study indicates that enhancing teachers' assessment literacy and professional development opportunities is key to improving the implementation of differentiated instruction in English language teaching contexts.

Classroom Management

With a mean score of 3.44 (SD = .858), the results also show that teachers have a low level of self-efficacy in running classrooms that accommodate a variety of learning preferences. This score falls short of the expected mean of 4, indicating that classroom management throughout varied settings remains difficult, even as teachers feel quite secure in managing differentiated learning environments. Teachers must concurrently lead multiple learning activities, monitor student participation, and adjust instructional support in differentiated classrooms based on students' preparedness, interests, and learning profiles.

Because it allows teachers to set up flexible learning environments where students can work individually, collaboratively, or in small groups, effective classroom management is therefore an essential part of differentiated instruction. However, effective organizing abilities and flexible teaching techniques are needed to manage such changing classroom environments. Teachers frequently find it difficult to manage multiple learning activities while maintaining a welcoming, encouraging learning atmosphere, according to prior research. Kaur (2022) states that because teachers must use flexible

grouping techniques, extend tailored support, and maintain student engagement through a variety of learning activities, classroom management becomes more complicated.

In addition, Teachers find it difficult to oversee diverse learning environments more effectively due to contextual factors such as workload and class size. According to Subban and Round (2020), crowded classrooms often hinder teachers' ability to monitor various learning groups and provide specialized attention. Sometimes, teachers may find it difficult to focus on these important factors in the classroom while accommodating diverse student learning preferences and maintaining classroom structure. The low level of self-efficacy observed in this study recommends that teachers may take advantage of having targeted professional development programs focused on classroom management strategies for differentiated instruction, including flexible grouping techniques, collaborative learning structures, and effective monitoring of multiple learning activities.

Assignment Creation

With a mean score of 3.47 (SD =.831) for tasks that accommodate students' interests, 3.42 (SD =.866) for assignments addressing students' readiness, and 3.37 (SD =.781) for assignments tailored to different learning preferences, the results also show that teachers reported their highest level of self-efficacy in creating differentiated assignments. These ratings fall short of the expected mean of 4, indicating that teachers' confidence in regularly creating differentiated tasks remains moderate, even though it is the highest among the instructional dimensions this study examined.

A key component of differentiated teaching is the provision of differentiated assignments, which enable students to show their comprehension through a variety of learning products that correspond with their learning profiles, interests, and readiness levels. It has been demonstrated that this kind of task design flexibility increases students' participation and engagement in educational activities. Differentiated tasks that offer contextual diversity and reflect students' unique talents and interests may positively affect students' motivation and academic achievement.

Teachers frequently encounter practical difficulties when creating assignments that reflect various aspects of student diversity, even when they acknowledge the importance of differentiated assignments. It takes more preparation time, instructional creativity, and the ability to match tasks to curriculum objectives and evaluation criteria to develop diverse assignments. According to earlier research, teachers often find it difficult to strike this equilibrium, especially in classes with many students and few teaching resources (Dixon et al., 2021; Subban & Round, 2020). As a result, the study's moderate level of self-efficacy indicates that teachers need more professional assistance and training to create differentiated learning activities that effectively meet students' diverse learning needs in English language instruction settings.

Challenges in TEDI implementation

Challenges in Differentiating Content

The results show that a significant percentage of teachers (61.3%) had difficulty distinguishing instructional content. This indicates that one of the most difficult aspects of implementing Technology-Enhanced Differentiated Instruction (TEDI) is content differentiation. To accommodate students with diverse learning profiles, interests, and readiness levels, content differentiation entails altering the complexity and presentation of educational resources (Tomlinson, 2017). Teachers must be aware of students' learning needs and provide diverse teaching materials that can be adjusted to various learning needs and interests to implement this technique successfully. However, this can be exceedingly challenging, particularly in heterogeneous learning situations.

Similar findings from earlier research indicate that teachers often struggle with content differentiation due to inadequate instructional support and pedagogical preparation. For instance, Smit and Humpert (2020) found that many teachers struggle to modify curricular content because they are not sufficiently trained to create adaptable teaching resources. Teachers may find it difficult to modify instructional materials to accommodate students' varied preparation levels and learning preferences if they lack good pedagogical understanding and curriculum design skills.

Additionally, providing content differences into practice frequently necessitates a significant amount of planning time and access to a variety of teaching tools. Instructors must create several iterations of their lesson plans, choose suitable teaching resources, and make sure the modified material stays in line with curricular requirements. In situations where teachers have a lot on their plates or few

resources for instruction, these demands may become very difficult. These contextual limitations often make it more difficult for teachers to successfully apply flexible instructional strategies, according to studies on differentiated instruction (De Neve & Devos, 2021; Dixon et al., 2021). In order to improve teachers' abilities to create flexible learning materials that can accommodate student diversity in English language teaching contexts, specific professional development programs and institutional support are necessary, as evidenced by the high percentage of teachers reporting difficulties with content differentiation.

Challenges in Differentiating Process

The data indicate that providing differentiation in the learning process is the most frequently encountered problem faced by teachers (66.9%). This implies that teachers find it difficult to modify teaching and learning activities to accommodate diverse student needs and interests. To accommodate variations in readiness, interests, and learning profiles, process differentiation involves changing how students interact with instructional materials through a variety of learning activities, adaptable grouping techniques, and alternative learning pathways (Tomlinson, 2017). To put these techniques into practice, teachers must oversee multiple learning activities simultaneously while ensuring that every student is actively participating.

Implementing a variety of teaching methodologies in diverse classes requires extra effort for teachers. To maintain efficient classroom organization, teachers must focus not only on various instructional methods, such as peer cooperation, individual work, and small-group learning, but also on classroom management. These educational demands frequently become difficult in classrooms with huge student numbers or little teaching time, according to prior studies. Smit and Humpert (2020) observe that teachers often find it difficult to distinguish between learning processes and careful classroom management to be adjusted to adequate classroom activities, as it requires significant pedagogical knowledge.

Moreover, teachers' comprehension of the diversity of teaching strategies and their ability to adjust to students' needs are one of the main components of successful process differentiation. Teachers who have insufficient professional development opportunities may find it challenging to use flexible instructional techniques, according to studies on differentiated instruction (De Neve & Devos, 2021; Dixon et al., 2021). Therefore, improving teachers' pedagogical knowledge, classroom management skills, and professional training in differentiated instructional strategies may be crucial to enhancing the implementation of differentiated instruction in English language teaching contexts, as indicated by the high percentage of teachers who face difficulties in this area.

Challenges in Differentiating Products

Designing differentiated products can be challenging for teachers, which is shown in the result that is 46.8%. To develop varied learning outputs, teachers must create adaptable tasks that ensure all products accommodate the diversity of students' needs and are aligned with the learning objectives and assessment criteria. Previous studies have shown that teachers often find it difficult to design assignments that accommodate diverse student abilities while maintaining fairness and consistency in evaluation.

Furthermore, teachers' pedagogical competence in adapting instructional tasks and their understanding of students' diversity are strongly related to their ability to design differentiated products. Wan (2021) emphasizes that, in differentiated instruction, teachers are required to develop a deep awareness of students' diverse learning readiness, learning styles, and interests, and to provide flexible learning opportunities that allow students to demonstrate their knowledge in meaningful ways. In language learning contexts, this flexibility is particularly important because students may express their understanding through different communicative modes.

However, practical constraints may limit teachers' ability to consistently design differentiated learning products. Studies in English as Foreign Language (EFL) classrooms indicate that teachers often face challenges such as time constraints, limited instructional resources, and the need to adhere to standardized assessment practices. Suwastini et al. (2021) reported that although teachers recognize the benefits of differentiated instruction, they frequently struggle to implement varied learning products due to heavy workloads and limited institutional support. Therefore, the findings of the present study suggest that enhancing teachers' pedagogical knowledge and providing professional development opportunities

may help teachers design more effective differentiated learning products in English language teaching contexts.

Challenges in Using ICT Tools

The data show that 61.3% of teachers had problems using ICT resources to differentiate their lessons in the classroom. This indicates that Technology-Enhanced Differentiated Instruction (TEDI) remains a major constraint in incorporating technology. Digital technologies have significant potential to support differentiated learning. They can create personalized learning paths, provide students with a variety of instructional materials, and make assessments more flexible. Still, many teachers struggle to incorporate these tools into their lesson plans. There could be many reasons why educational technology isn't used as much as it could be. These include insufficient technology infrastructure, insufficient professional training, and teachers lacking expertise with digital tools intended to support differentiated learning.

Prior research indicates that educators' ability to integrate ICT into their instruction is significantly influenced by their technological skills and the availability of professional development opportunities. Drossel, Eickelmann, and Gerick (2020) found that teachers' knowledge of ICT, their ability to use it effectively, and support from the school are strongly linked to the use of ICT in the classroom. Research on technology integration in differentiated education indicates that insufficient training may impede teachers' capacity to select and use digital tools that effectively meet diverse learning needs (Heitink et al., 2021).

Many teachers report problems with ICT tools, insufficient technology resources, limited school support, and professional development focused on the right areas as crucial factors in the implementation of ICT tools in the classroom. Improving teachers' digital pedagogical skills may be necessary for them to effectively incorporate technology into a variety of instructional techniques in English language Teaching.

Challenges in the implementation of DI

Teacher's lack of understanding on the context and implementation of DI

The results obtained from the interviews revealed that most of the teachers did not sufficiently understand the concept. There are still doubts whether they have implemented DI in their ELT class or not. For instance, one of the interviewees (TE 2) said, *"Frankly speaking, I am not sure whether I have implemented DI in my classes. I don't fully understand the concept of DI, but I am trying to get a full understanding about the concepts and the implementation of DI. (When I was teaching in the classroom) when a student was slow in understanding the lesson, I gave remedial learning when she/he got a bad score. When she/he has a satisfying score, I design follow up activities"*. The same case happened to (TE 1), she described DI *"In my opinion, If I am not mistaken, DI is different learning activities, it means that, it is in accordance with students' needs, according to their different level of readiness. But for me, I haven't implemented it yet. I, myself, am still confused because students' conditions are different from each other, that's why, the implementation of DI is according to students' needs."* One of the interviewee, however, already had considerably sufficient understanding and implementation about DI, although, still she was not sure whether the method that she had implemented was DI or not, *"I don't know whether it is called DI or not, but one thing for sure that, I sometimes I gave more difficult questions for those who have better understanding (about the lesson), but sometimes I asked student to make power point presentation, or maybe they could choose to make a video or anything else based on their passion"*.

Research findings suggest that a considerable number of teachers receive inadequate training regarding the effective implementation of Differentiated Instruction (DI). The professional development opportunities pertaining to DI are frequently insufficient or excessively theoretical, thereby depriving teachers of practical methodologies to employ within the classroom (Brighton et al., 2021). Although a significant portion of teachers comprehends the theoretical framework surrounding DI, they frequently encounter challenges when attempting to translate this knowledge into routine practice. A study conducted by Tomlinson and Moon in 2019 identified that teachers experience difficulties in adapting content, processes, and assessments in a manner that is congruent with the fundamental principles of DI.

Overcrowded Classes

Overpopulated classrooms considerably obstruct the effective application of DI. Elevated class sizes present considerable challenges for teachers attempting to tailor instruction to the unique needs of individual students. Based on the interviews, overcrowded classes of teachers make the process of DI difficult to implement. Providing different activities focusing on different language skills, interests and learning preferences is difficult to conduct. One of the interviewees (T 4) said, *“To provide activities for listening, reading, writing and speaking in one class with 36 students is very hard to do, except we have small classes or we have a co-teacher who can help us in the class”*. This challenge was also mentioned by Teacher 2, *“What prevent me to implement DI is the challenge to accommodate students according to their needs, in one time, we have to share (give attention) to many students with different needs by focusing on different language skill like writing, etc., according to what students wants, except there is one “specialized teacher” for teaching one language skill, it means that in one class, there should be one teacher.*

In an overcrowded classroom environment, the management of diverse activities and individualized learning trajectories becomes increasingly arduous. Research conducted by Subban and Round (2020) emphasizes that substantial class sizes restrict teachers' capacity to provide personalized attention, monitor student development, and furnish constructive feedback. A study undertaken by Mills and Morton in 2020 illustrated that overcrowded classrooms result in an excessive workload for teachers, who find it difficult to implement DI effectively when they are responsible for 30 or more students simultaneously. This disproportionate responsibility detracts from the quality of differentiation.

Extra Time in preparing the lesson

The implementation of DI necessitates supplementary time for lesson preparation, as teachers must devise multiple pathways for students to attain their educational objectives. The pressure of making the preparation for the teaching and learning activities including providing various content regarding students' interest and readiness, creating different class activities considering students learning preferences and styles, preparing different assignments and assessment to measure students learning achievement, is one of the challenges faced by the teacher. *“Time to make different media, learning material, assessment instruments according to students' learning profile, namely auditory, visual and kinaesthetic”, is the problem that I face in the implementation of DP*”, said one of the interviewees (T5).

According to McQuarrie and McRae (2020), the preparation of differentiated lessons entails the design of diverse instructional strategies, the creation of multiple assessments, and the modification of materials in accordance with individual student requirements. Teachers often perceive this undertaking as time-intensive and demanding. Elyas & Ahmed (2020) noted that numerous teachers experience feelings of being overwhelmed due to the additional workload associated with planning lessons that incorporate DI. This increased burden has the potential to induce burnout and diminish instructional efficacy.

Limited time in the class

The teaching and learning process in the classroom should follow time duration determined by the government. This limited time duration in the classroom has become one of the challenges faced by the teachers to implement DI. Temporal limitations during instructional sessions create obstacles for teachers striving to implement DI strategies effectively. One interviewee (T3) said that, *“If we really implement DI, the most challenging factor is time, because at least we provide opportunities for all students while we don't have enough time in the class to do that”*

Research conducted by Tondeur et al. (2019) indicates that teachers frequently experience a sense of urgency and encounter difficulties in providing individualized instruction within the constrained time allocated for each class. When time is limited, teachers may resort to more conventional, whole-class instruction, which undermines the principles of DI. Teachers are subjected to persistent pressure to cover substantial amounts of curricular content, which may conflict with the time required for differentiated activities. According to a study by Heacox (2019), the restricted class duration leaves teachers in a quandary between delivering content and addressing the needs of individual students.

Teacher's misconception about DI

Many teachers possess misunderstandings regarding the true nature of differentiated instruction (DI), resulting in ineffective application. DI is solely concerned with adjusting the difficulty level of tasks. Several teachers maintain the belief that DI is exclusively focused on crafting tasks that are either simpler or more complex for students according to their abilities. Nevertheless, DI encompasses the differentiation of content, process, product, and learning environment to address the diverse learning profiles of students. Brighton and others (2021) revealed that this constrained outlook on DI tends to produce superficial tweaks, such as easier worksheets, rather than true differentiation. Another prevalent misconception is that DI demands the formulation of individualized lesson plans for each student. Tomlinson and Moon (2019) elucidate that while DI entails acknowledging and responding to the variances in student learning, it does not imply that teachers are required to develop unique lessons for every individual student. Rather than that, teachers can think up dynamic instructional approaches that allow scholars to relate to the content via various channels.

Based on the interview, it is revealed that the teacher's misunderstanding about the concept and practice of teaching using DI is one of the constraints of the implementation of DI in ELT classes. One of the interviewees (T 3) said, " *But it is impossible (in teaching and learning process) to meet each of the students' needs. If we try to do so, it is difficult for every teacher to cater, the learning process will not be effective, we are obliged to teach as usual, teaching classically, trying to meet students' needs generally.*"

The quantitative and qualitative findings combined meet the research objectives by not only illustrating the level of teachers' self-efficacy in differentiated instruction but also the practical barriers that shape the implementation of TEDI in Indonesian ELT classrooms. The moderate mean score of teachers' self-efficacy indicates teachers have started to recognize the importance of differentiated practices, but they still need more sound pedagogical and technological support to shift from awareness to consistent implementation in classrooms. This finding is consistent with Bandura's view that self-efficacy influences teachers' willingness to try out complex instructional practices. It also supports previous studies that differentiated instruction requires sustained professional development, sufficient resources and contextual support.

The results also show the importance of TEDI in the current educational setting, especially as Indonesian classrooms are becoming more diverse and digital learning tools are expected to enable more flexible instruction. Yet, teachers' reported challenges, such as a lack of understanding of DI, crowded classrooms, preparation demands, a lack of time for class, and ICT constraints, suggest that technology alone cannot ensure effective differentiation. TEDI calls for a mix of teacher skills, institutional support, infrastructure and practical classroom management strategies. This study, in contrast to those that indicate the positive potential of ICT for personalization, shows that this potential can only be realized if teachers are supported with practical training, readily available digital resources and policies that acknowledge classroom realities. Thus, the study contributes to the discussion of TEDI by emphasizing the importance of teachers' instructional confidence and the wider learning context within which they function for effective technology-enhanced differentiation in ELT.

CONCLUSION

Teacher major challenges in the practices of TEDI were the lack of understanding about the main concept of DI and how it is the most effective and practical implementation of DI. This leads to teachers' misconceptions on this approach. Besides that, overcrowded classes, extra time and effort in preparing the class were also the challenges faced by the teachers. In the context of ICT tools used in teaching, the challenges could be classified into four, namely, insufficient competence of using ICT in teaching, lack of facility and internet access, and extra time for the preparation. To deal with these challenges, it is recommended that a teacher development program and the enhancement in facilities should be conducted. To achieve this purpose, the government may get help from non-government institutions as well as individuals by offering them programs with mutual benefits for each.

ACKNOWLEDGEMENTS

We want to thank the English teachers from across Indonesia who shared their thoughts, experiences, and professional knowledge with us. We also want to thank the Department of Education, our academic colleagues, and mentors for their help, feedback, and guidance during the research process.

REFERENCES

- Gregory, G. H., & Chapman, C. (2020). Differentiated instructional strategies: One size doesn't fit all. *Journal of Education and Learning*, 9(3), 1–9.
- König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: Teacher education and professional development in times of crisis. *European Journal of Teacher Education*, 43(4), 608–622. <https://doi.org/10.1080/02619768.2020.1809650>
- Parsons, S. A., & Vaughn, M. (2020). Instructional differentiation: An integrative literature review of one teacher's practice. *Teaching and Teacher Education*, 91, 103046. <https://doi.org/10.1016/j.tate.2020.103046>
- Smets, W., & Struyven, K. (2020). Teachers' beliefs about differentiated instruction and related classroom practices. *Teaching and Teacher Education*, 88, 102961. <https://doi.org/10.1016/j.tate.2019.102961>
- Suwastini, N. K. A., Artini, L. P., Adnyani, N. L. P. S., & Padmadewi, N. N. (2021). Differentiated instruction in EFL classrooms: Teachers' practices and challenges. *International Journal of Instruction*, 14(3), 781–796. <https://doi.org/10.29333/iji.2021.14345a>
- Wan, S. W. Y. (2021). Differentiated instruction: The diversity of learners and classroom practice. *International Journal of Inclusive Education*, 25(8), 927–944. <https://doi.org/10.1080/13603116.2019.1597186>
- Ahmadi, M. R. (2018). The use of technology in English language learning: A literature review. *International Journal of Research in English Education*, 3(2), 115–125. <https://doi.org/10.29252/ijree.3.2.115>
- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, 28(2), 117–148. https://doi.org/10.1207/s15326985ep2802_3
- De Neve, D., & Devos, G. (2021). The role of teacher professional development in fostering differentiated instruction: A systematic review. *Educational Research Review*, 33, 100401. <https://doi.org/10.1016/j.edurev.2021.100401>
- Dixon, F. A., Yssel, N., McConnell, J. M., & Hardin, T. (2021). Differentiated instruction, professional development, and teacher efficacy. *Journal for the Education of the Gifted*, 44(1), 20–46. <https://doi.org/10.1177/0162353220981412>
- Drossel, K., Eickelmann, B., & Gerick, J. (2020). School-level predictors for the use of ICT in teaching: A multilevel analysis of teachers in secondary schools in 20 European countries. *Computers & Education*, 157, 103970. <https://doi.org/10.1016/j.compedu.2020.103970>
- Gaitas, S., & Martins, P. (2021). Teacher perceptions of differentiated instruction: A qualitative study. *Teaching and Teacher Education*, 102, 103338. <https://doi.org/10.1016/j.tate.2021.103338>
- Heitink, M. C., Van der Kleij, F. M., Veldkamp, B. P., Schildkamp, K., & Kippers, W. B. (2021). Understanding teachers' use of assessment tools in the context of differentiated instruction. *Educational Assessment*, 26(3–4), 189–209. <https://doi.org/10.1080/10627197.2021.1945488>
- Instefjord, E., & Munthe, E. (2020). Preparing teachers for digital competence: A systematic review. *Teaching and Teacher Education*, 90, 103030. <https://doi.org/10.1016/j.tate.2020.103030>
- Kaur, A. (2022). Classroom management strategies for differentiated instruction: Challenges and best practices. *Journal of Educational Practice*, 13(2), 64–78.
- Pozas, M., Letzel, V., & Schneider, C. (2021). Teachers and differentiated instruction: Exploring differentiation practices to address student diversity. *Journal of Research in Special Educational Needs*, 21(3), 217–230. <https://doi.org/10.1111/1471-3802.12519>
- Santangelo, T., & Tomlinson, C. A. (2021). Investigating the impact of differentiated instruction on teacher self-efficacy. *Educational Psychology*, 41(5), 598–614. <https://doi.org/10.1080/01443410.2020.1845607>
- Smit, R., & Humpert, W. (2020). Differentiated instruction in small schools. *Teaching and Teacher Education*, 88, 102971. <https://doi.org/10.1016/j.tate.2019.102971>
- Smets, W., & Struyven, K. (2020). Teachers' beliefs about differentiated instruction and related classroom practices. *Teaching and Teacher Education*, 88, 102961. <https://doi.org/10.1016/j.tate.2019.102961>

- Subban, P., & Round, P. (2020). Addressing the challenges of differentiation in overcrowded classrooms. *Australian Journal of Education*, 64(1), 1–16. <https://doi.org/10.1177/0004944119894097>
- Suwastini, N. K. A., Artini, L. P., Adnyani, N. L. P. S., & Padmadewi, N. N. (2021). Differentiated instruction in EFL classrooms: Teachers’ practices and challenges. *International Journal of Instruction*, 14(3), 781–796. <https://doi.org/10.29333/iji.2021.14345a>
- Tomlinson, C. A. (2017). *How to differentiate instruction in academically diverse classrooms* (3rd ed.). ASCD.
- Tomlinson, C. A., & Moon, T. R. (2019). *Assessment and student success in a differentiated classroom*. ASCD.
- Tondeur, J., Scherer, R., Siddiq, F., & Baran, E. (2020). Enhancing preservice teachers’ technological pedagogical content knowledge (TPACK): A mixed-method study. *Computers & Education*, 145, 103727. <https://doi.org/10.1016/j.compedu.2019.103727>
- Wan, S. W. Y. (2021). Differentiated instruction: The diversity of learners and classroom practice. *International Journal of Inclusive Education*, 25(8), 927–944. <https://doi.org/10.1080/13603116.2019.1597186>
- Zelalem, A., Melesse, S., & Seifu, A. (2022). Teachers’ self-efficacy and perceived practices of differentiated instruction in Ethiopian primary teacher education programs. *Cogent Education*, 9(1), 2018909. <https://doi.org/10.1080/2331186X.2021.2018909>