Jurnal Teknologi Pendidikan, December 2024, 26 (3), 873-886
DOI: http://dx.doi.org/10.21009/JTP2001.6
p-ISSN: 1411-2744 e-ISSN: 2620-3081
Accredited by Directorate General of Strengthening for Research and Development
Available online at http://journal.unj.ac.id/unj/index.php/jtp

How Is It Done: A Qualitative Analysis of Teachers Strategies in Meeting the Challenges of Differentiated Instruction

Ratna Juwita[1(*)], Fatma Sukmawati[2], Eka Budhi Santosa[3], Budi Tri Cahyono[4], Relly Prihatin[5], Suparmi[6]
[1,2,3,4,5,6]Universitas Sebelas Maret, Surakarta, Indonesia

Received: : October 18, 2024
Revised: : November 28, 2024
Accepted: : December 26, 2024

Abstract

Differentiated Instruction (DI) is considered an important but challenging task which many teachers feel unprepare. A list of requisite skill of DI is needed to eliminate teachers' unpreparedness. This study aimed to explore requisite skills for DI implementation and to identify best practices across various school levels. Using 112 self-reported essays, subsequent interviews, videotaped DI practices, and experts meeting, this article employed Cognitive Task Analysis (CTA) to capture a description of the knowledge that experts use to carry out differentiations. The result revealed that CTA of DI implementation contained four essential skills in the preparation phase, nine skills in the implementation phase, and two skills in the evaluation phase. Despite of highly different contexts of school levels, this study found similarities in DI practices across all levels. This study contributes to the existing body of knowledge on DI by highlighting the effectiveness of CTA in identifying and implementing DI strategies across different educational levels. Future research should explore the long-term impacts of DI on student achievement and engagement, as well as investigate DI practices in different educational settings.

Keywords: Differentiation; cognitive task analysis; diversity; leaning preferences; expert teachers.

(*) Corresponding Author: ratna_juwita@staff.uns.ac.id

How to Cite: Juwita, R., Sukmawati, F., Santosa, E. B., Cahyono, B. T., Prihatin, R., & Suparmi, S. How Is It Done: A Qualitative Analysis of Teachers Strategies in Meeting the Challenges of Differentiated Instruction. *JTP - Jurnal Teknologi Pendidikan*, *26*(3), 873–886. https://doi.org/10.21009/jtp.v26i3.49907

INTRODUCTION

Teachers all over the globe have an exceptionally difficult task to accomplish, that of providing for the various needs of each individual student (Smets & Struyven, 2020; Eysink et al., 2017). They need to change their practices as schools become more and more multilingual and multicultural. Especially students differ in their abilities, culture, language competence, gender-based preferences, learning styles, motivation, interests, self-regulation capacity, etc. (Dijkstra et al., 2016; Tomlinson et al., n.d.). Factors like students' prior knowledge, intellectual type and study applicability of achieved learning results per pupil led to the formulation of Differentiated Instruction (DI) (Smit & Humpert, 2012). DI helps the teachers in considering every learner's need and using different mode of learning (Dijkstra et al., 2016). Additionally, students' cultural backgrounds also shape their interactions with learning materials, making it imperative for teachers to teach with culture to promote equity and inclusiveness (C. A. Tomlinson, 2001).

In teaching, meeting students' diversity is a fundamental requirement, as it is not a matter of choice but an aspect to be embraced and integrated in the way we teach (Moon, T. R., Tomlinson, C. A., Callahan, 1995; Boelens et al., 2018). This idea is captured by the word "equality of condition" as Lynch & Baker define it; it has to do with aspects other than mere provision of equal quantities of resources in a classroom (Lynch & Baker, 2005). It includes but is not limited to respect, recognition, power, love, care, and solidarity which are essential ingredients for a healthy learning atmosphere. This wider concept of equality raises the issue of not only ensuring correct access to facilities and treatment but also providing proper results equally for every category of learners (Valiandes, 2015). In the end, real equality comes from not just equal opportunity, but also equal ability to provide a satisfactory outcome, which leaves no child alienated from the educational process (Hasanah et al., 2023).

It is the fundamental right of every child to be educated in an inclusive learning teaching environment, which emphasizes differentiation and personalization (Sharma et al., 2012; Shemshack & Spector, 2020). These principles are very important as they enable the teachers to transform their approaches to fit each pupil as people learn differently. Boelens et al., (2018) includes that effective use of differentiated learning in such settings requires, "a simultaneous motivation and boost for all students to achieve individual goals." Students help in laying down this forth with affirmative response as this enhances their confidence (M. Tomlinson, 2006).

Differentiation can be said to be a kind of teaching that contains many different aspects including flexible grouping such as 'same ability' or 'mixed class', tracking students` ongoing achievements, using computer or non-computer-based technologies that allow customizing teaching material, content modification, assistance to at-risk learners, and even enrichment activities for at or above average learners (M. Tomlinson, 2006). These techniques of differentiation can be applied at multiple levels of learning – the content level, process level and the product level of learning (Roy et al., 2013).

When considering the barriers to successful implementation of DI, one cannot forget to consider the various teachers' countries contexts. A survey by Meutstege et al., (2023) in 50 secondary schools, which involved school leaders, lesson department heads, and other colleagues, found that teachers were above average at providing DI. However, this perspective sharply contrasts with a nationwide survey of elementary school teachers, where some of them indicated they do not use various skills in preparing, during, and evaluating the lesson. This gap reveals a significant misunderstanding about the value of DI across different educational levels.

Additionally, several studies have pointed out various barriers to effectively implementing DI (Magableh & Abdullah, 2020; Pozas et al., 2020). Many teachers report feeling unfamiliar with the tools available to them, struggling with insufficient preparation time, and facing limited resources. On top of that, the process can feel overwhelming and time-consuming, especially without support from colleagues (Smets & Struyven, 2020). When teachers do attempt to differentiate, their efforts often fall short, leading to practices that are limited and ineffective (Magableh & Abdullah, 2020) . As a result, modifications to instruction

tend to be more reactive than proactive, lacking the thoughtful planning needed to truly benefit all students (Hootstein, n.d.; Mcintosh et al., 1993; Moon, T. R., Tomlinson, C. A., Callahan, 1995; Schumm & Vaughn, 1995). This highlights a pressing need for better support and training for educators, enabling them to implement effective differentiation strategies in their classrooms.

There are many frameworks that showcase a wide range of DI implementations, which can greatly influence how teachers design their learning objectives, teaching strategies, instructional activities, media usage, evaluation methods, and grouping techniques. Prast's framework stated that teachers should pay attention on difference in learning objectives and learning pace (Prast et al., 2018). Moore's framework emphasized on difference in content, process, product, and learning environment (Moore, 2016). M. Tomlinson, (2006) expand on the strategies available for DI practice by emphasizing the importance of varying the content, process, and products of learning based on individual students' learning profiles, readiness levels, and interests. The learning profiles, readiness levels, and interests measured by diagnostic test held by teachers before the lesson.

Additionally, Tomlinson highlights the use of varied students grouping techniques to provide more personalized learning experiences. Each of these frameworks emphasizes the importance of adapting instruction to meet the diverse needs of students. However, there's a significant gap: it's still unclear what "high-quality" adaptations look like, how they actually are put practice in classrooms, and what support teachers need to make this happen (Deunk et al., 2018; Park & Datnow, 2017). Besides, (Reis et al., 2011) found out that the unforeseen weight of many possible practices is too much for many teachers. This feeling of hesitation indicates how urgent it is for educators to have better advisories and resources when dealing with the complexity of differentiated instruction.

In addressing the gaps in DI practices, this research proposes a systematic approach comprising several major steps. First, DI methods or techniques being applied in real classrooms will be observed and identified. Second, by comparing these observations with established theories and frameworks, perpetrators may be pinpointed on specific discrepancies and areas prone to improvement.

The objective of this research is to use the regionally representative large-scale data collected through the Annual Teachers Appreciation in Indonesia to examine the different strategies used in classroom DI across the different Tiers. The central research problem understudied in this study is: What DI practices do teachers implement in their classroom teaching and how often does each practice occur?

METHODS

In this study, a descriptive qualitative approach was used which gives an opportunity to further investigate the differentiated instruction (DI) movement in the classroom. Qualitative inquiry has been particularly useful in portraying the lived experiences of teachers which helps to appreciate the interplay of factors across different school contexts on the application of DI (Creswell, 2014). Within this framework, the focus is less on students' free expression but rather on what

meanings and understandings are held regarding one's lived experiences and this makes it easy to appreciate the intricacies of the DI practice (Denzin, N. K., & Lincoln, 2008).

The sample for this study derives from the participants of the Annual Teachers' Appreciation 2024 in Indonesia. There were 112 teachers from 35 districts across school levels. These educators are at different levels of education such as primary, secondary and vocational schools, and so they make a broad scope for DI practices. Special attention was given to those who participated in the appreciation event as they showed readiness towards improving skills/ competence.

The tools used in data collection in this case are diverse and allow to perceive DI practices in their totality:

1. Self-Reported Essays: Participants are asked to write essays with respect to their experiences with DI strategies, what works for them, and what challenges they are faced with. This engage-a-learner tool allows an educator to put down his/her thoughts and experiences in plain language in a written form thus providing a qualitative response (Baker, 2011).
2. Video-Taped DI Practices: Certain participants are allowed to post video clips of their live classroom instruction incorporating DI during their teaching. Video recording and analysis provides a useful complement to data collection and analysis of teaching practices (Cocca et al., 2019).
3. Interviews After the educators submitted their videos of their teaching, several substantive interviews were carried out with them to investigate further their pedagogical practices, reasons behind those practices and views on DI. Interviews provide means through which insights can be gathered as well as provide a platform for clarifications on the responses given by participants (Kvale & Brinkmann, 2009). These interviews are conducted to gather more information about their experience, specifically the practice they used, and any obstacles experienced while implementing DI. This step is essential in evaluating the quality of data, hence improving its trustworthiness and dependability (Flick, 2018).

The data collection procedure/ process begin with a self-reported essay to collect data about teachers' experience in implementing DI in classroom situation. Essay was written in STAR (situation/task, action, result) format. Situation/task described background or reason why they perform DI (see figure 1). Action described activities they have done in facilitating students' diversity. They do not need to be an ideal teacher in DI, they just share what they usually do to differentiate their classes. Finally, result, described output or impact from the activities. This format was rooted on the theory of planned behaviour (TPB). TPB has effectively proven in elucidating and predict future behaviour across a diverse range of behavioural domains (Hagger et al., 2002). The TPB here is used to assess participants' attitudes, subjective norms, perceived behavioural control, and intentions toward coaching experience of the participants (Ajzen, 2020).

Observation is one of tools to elicit the knowledge. In this current study, indirect classroom observation is used through video recording. This technique is chosen to mitigate teachers' unnatural behaviour when being directly observed. By the video recordings, researchers have an authentic picture of DI in classroom situation without immediate presence.

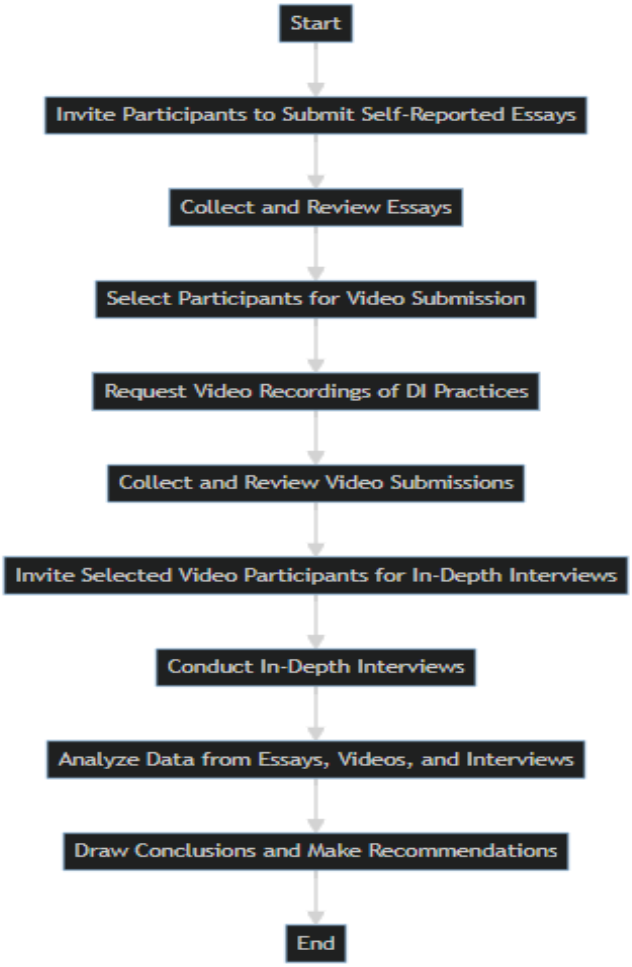

Figure 1. Research procedures

By using these methods and instruments, the study explores strategies on how DI implemented di classroom situation that gives valuable insights for educators and policymakers.

RESULTS & DISCUSSION

Based on the data collection, the DI skills that emerge during the preparation and implementation stages of learning are as follows (see table 1). In preparing the lessons, there are at least four DI skills carried out by teachers; 1) determining the learning objectives to be achieved, 2) determining student grouping techniques, 3) identifying student learning needs, and 4) selecting teaching materials. Meanwhile, in enacting the lessons, there are many DI strategies that have been implemented by teachers. In preliminary activities, the teacher conveys the learning objectives and links the material to students' prior knowledge. In the core learning activities, the teacher has provided options for forming groups, adjusting instructions/commands for those who are fast or slow learners, providing explanations according to needs (classical, group, individual), providing level questions according to student understanding, providing varied learning media, and

provide flexible time for studying. Finally, in evaluating the lessons, the teacher provides a choice of assessment instruments according to student preferences.

Table 1. DI Skills Emerged in Lesson Stages

Phase	DI Skills
Preparation	Conduct pre-assessment
	Determine learning objectives based on pre-assessment
	Determine grouping
	Select materials
Implementation	Introducing goal
	Activate prior knowledge
	Providing adapted instruction
	Grouping options
	Providing varied materials
	Variation in giving explanation
	Providing tiered questions
	Providing additional support
	Providing class time flexibility
Evaluation	Allow students to prove their understandings in different ways
	Provide varied assessment options

Although many DI practices have emerged, what is interesting are the similarities at each educational level. In terms of setting goals, communicating those goals, and connecting the material with students' prior knowledge, all teachers at the three levels have implemented these aspects optimally. However, there were several DI skills that only performed by few of them (see Figure 2).

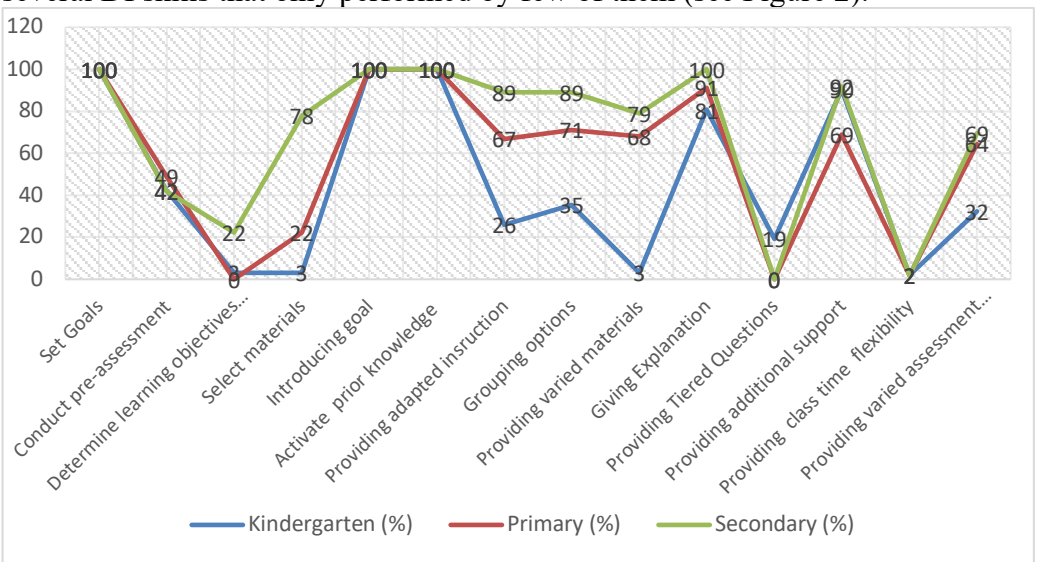

Figure 2. The Percentage of DI Skills Trend in Kindergarten, Primary, And Secondary School Levels

In the stage of preparing the lesson, 100% of teachers had set goals, but only 43% of them conducted initial assessments to map their students' needs. Furthermore, only a small number of them provided varied teaching materials according to that needs mapping. This aligns with Tomlinson's findings, which state that teachers only apply DI responsively, rather than actively (C. A. Tomlinson, 2015). As a result, they respond to what students need during the lesson but do not prepare for those needs before the lesson begins. This is attributed to teachers' unpreparedness in implementing DI, with only a small fraction of them capable of effectively preparing DI lessons (Frerejean et al., 2021).

This perspective resonates with the research conducted by Parsons et al., (2018), who discovered that adaptive teaching is present at every stage of the instructional process. This means that effective educators engage in adaptive teaching not just during the planning phase, but also while they are actively teaching and when they take time to reflect on their methods afterward. The performance indicators assert that even in such cases, effective differentiation is quite complicated. Such a complication arises not just because of the nature of interdependencies in these different stages, but also because effective differentiation depends on the right decision making. such decisions motivate centers and ought to be able to support with appropriate or various coherent strategies. Teachers are not only required to diagnose the instructional needs of their students but are also required to evaluate the effectiveness of such hypothesized instruction over time. That way, they can implement necessary changes in their plans as they teach to make sure that every child gets enough encouragement to succeed. At the end of the day, it is attempting and seeking to meet demands of students in a classroom in a bid to make learning more efficient for the rest of the learners too.

Two polar extremes were also detected at the enacting lesson stage which is providing tiered questions and providing attributes that allow class time flexibility. Only 6% of teachers attempted to use tiered questioning for fast, slow and advanced learners of the content as well as slow learners. This constitutes a glaring absence of differentiation in instruction in practice in the classroom. The low percentage shows that most practitioners are not employing this productive strategy, which should be orienting most of them to be able to address the wide needs of their learners effectively.

Analysis of the data parameter only indicates that only two percent of the teachers who participated in the study provided time flexibility in learning activities. This strikingly low percentage suggests that most educators may be sticking to time allocation which is not helpful for students willing to learn at their own pace. Regarding time flexibility, this is a core principle of differentiation that enables students to comprehend and digest content or even develop skills within their boundaries according to Eysink et al., (2017) and Tomlinson, (2001). There is, therefore, the need to support teachers in finding ways of diversifying some of their classroom activities to accommodate students who learn at different rates.

The essay report in kindergarten schools indicates that the top ten teachers integrating DI were selected from kindergarten expert teachers. They were also documenting what they did while practicing DI in real classes. They did not consider that kindergarten expert teachers lacked adequate preparations for lessons.

While some of them sought feedback before instruction, they did not use the findings to set the learning outcomes, how students would be grouped, or the materials that would be used. Such fragmentation of practice indicates a failure to take advantage of a 'low hanging fruit' in this instance, instructional differentiation.

The fact that kindergarten subject matter expert teachers applied preassessment without any use of that data towards setting objectives, decision on how learners would be grouped and what learning resources would be needed raises critical issues concerning lesson preparation. Pre-assessments can prove to be useful methods as they can help in knowing certain aspects of students. People that view things differently as well, it has been found that assessment data is disconnected from the instructional design (Wiliam, 2011). One possible explanation for this gap could be insufficient training or coaching in the analysis and application of pre-assessment results. With these factors in mind, teachers may appreciate the value of conducting student assessment prior to the introduction of lessons but may be unable to formulate strategies on how to do that. This particular gap poses the necessity of capacity building which in this case provides understanding on the assessment of student's performance and how that data is used in improving instruction (Decristan et al., 2015).

Moreover, the absence of pre-assessment data in informing the grouping of learners or selection of learning materials may cause teaching to follow a single effective strategy for all learners. In addition, the employment of materials that suit learners to their respective titles can affect their motivation thus enhancing comprehension. In conclusion, while the presence of pre-assessments indicates a commitment to understanding student needs, the lack of effective application underscores a critical area for improvement.

The three additional strategies which were considered positive include learning goal setting, prior knowledge activation, and providing different explanatory approaches continuously present the best practices used by kindergarten teachers in lessons delivery. It is important to do this since every activity creates a high level of participation and a safe twice. The introduction of learning goals particularly, the teachers clearly stating the instructional aim at the onset of the learning takes the students on a focused excursion. This not only directs the students to what the lesson seeks to address but also assists them in channeling their efforts towards what is anticipated. There is evidence that if learners know the reasons of the lesson, they will take initiative and engage in learning activities thus learning (Decristan et al., 2015). In addition, this also brings in motivation as students are now aware of the steps undertaken attaining the requirements of the goals. To activate prior knowledge, the teachers got the students on board by relating the unfamiliar concepts to what they already know, and this is critical in preschool pupils.

It is not only helpful in understanding a new concept but is also helpful in remembering the new information. While considering and respecting students' past experiences, teachers break down the barriers and foster an equitable classroom for all students. When teachers acknowledge and appreciate students' previous learning, all learners can inhabit and contribute to the classroom in a more equitable manner. Evidence supports that accessing prior knowledge improves mental performance in the processing of information and assisting learners understand new

information better (Whitley et al., 2019). At the same time, it develops speculation because children begin to connect the known material to the studied subject.

Different methods used in the presentation of concepts cater to the different abilities and expectations inherent in every classroom. Just as a teacher uses pictures, actual objects, and speech to convey a set of ideas, so would the learners be able to do more than one way these intermediary methods and capture more students. Such flexibility is very critical in kindergarten where the children will be at different readiness and understanding levels. It is on this note that research confirms that different methods of instruction promote different facets of student engagement with the subject due to the diverse needs of the students (C. A. Tomlinson, 2001). Last of all, the proper application of these three DI measures confirms the degree of professionalism kindergarten expert teachers possess towards accommodation of various needs in learning environment.

The findings show some differences between primary expert teachers and kindergarten expert teachers in their preparation processes. Many primary teachers, during the preparation stage, effectively conducted pre-assessments which were used to formulate learning objectives and establish groups. However, while they prepared a variety of instructional materials, these materials were not adequately tailored to serve specific needs of their students. They just provide students with the same materials. This suggests that, although its approach is structured and data-driven, there is still some room for improvement in ensuring that provided materials are aligned with the different learning requirements of the students.

The inclusion of providing adapted instruction and provision of additional support as other indicators of differentiated instruction among primary teachers emphasizes their commitment to more effectively address diverse needs of their learners. By adapting instruction, teachers can make sure that all students have access to the curriculum irrespective of individual strengths and weaknesses. For example, a teacher may opt for using visual aids when teaching visual learners, hands-on activities when dealing with kinesthetic learners or simplified texts for those who face challenges in comprehension reading skills (C. A. Tomlinson, 2001). This tailored approach not only enhances understanding but also fosters a more inclusive classroom environment where every student succeeds.

Through one-on-one help, small group instruction, or additional resources this indicator emphasizes the relevance of extra support for students. Additional support can take different forms like tutoring sessions, modified assignments or use of technology to reinforce learning (Hasanah et al., 2023). This practice is essential in preventing students from falling behind by ensuring they get the necessary guidance to understand critical concepts. Teachers, thus, should address learning gaps proactively to foster a growth mindset and resilience in their learners (C. A. Tomlinson et al., n.d.).

Findings suggest that secondary teachers do not show better preparation practices than primary teachers at the preparation stage. Although secondary teachers set grouping strategies beforehand, they often ignore important ingredients such as instructional material selection and learning objective definition based on prior assessment data (C. A. Tomlinson, 2001). This omission may have noticeable consequences for the effectiveness of their instruction.

A major point is that to differentiate well, one must know what students already possess (prior knowledge) and/or how they learn best; the preliminary assessment of each learner supports this premise (Suprayogi et al., 2017). Not using this data to guide their planning, secondary teachers could thus unwittingly take a more prescriptive and norm-based approach to their instruction. Failure to consider the learning needs of individual students inhibits engagement and underpins success within academic context (Moon, T. R., Tomlinson, C. A., Callahan, 1995).

There is also the fact that as vital to differentiation are grouping techniques, it represents just 1 part of what makes a differentiations instruction. If teachers don't change the instruction materials as well and schedule based upon student readiness, level of interest or learning profile in flexible groups you will marginalize students who may not fit very cleanly into preset categories (Park & Datnow, 2017). It can result in students disengaging and that they feel instructions are missing their learning style. Moreover, planning lessons without the guidance of data might also suggest more systemic problems in secondary education aimed at following standardized curricula and assessments (Pozas et al., 2020). But this focus takes away from the individualized attention students need to effectively work toward a growth mindset and cultivate resilience in their academic pursuits (Bondie et al., 2019). In short, secondary teachers are performing some practices effectively—perhaps powerful grouping strategies—but their preparation is not comprehensive or reflective. If they include pre-assessment data in their planning, it can improve the quality and support of instruction.

By contrast, secondary teachers are more strongly represented in the implement phase of teaching although predominantly for providing diverse resources and additional support. They have an advantage over their counterparts because they are more skilled in infusing Information and Communication Technology (ICT) into their teaching practices as well (Boelens et al., 2018). Technology integration empowers secondary teachers to create different forms of resources that speak to a full range of learning styles, leading both added student engagement and understanding. One example of this is the idea that utilizing multimedia presentations, interactive simulations or resources online can facilitate new teaching techniques and learning environments (Chiliban et al., 2014).

In addition, while the way of grouping students is important – grouping is just one part of differentiated instruction. To do otherwise, researchers suggest risks alienating students who may not be as easy to identify and sort into three distinct camps by readiness (C. A. Tomlinson et al., n.d.)—no matter what their ability level. This can lead to disengagement, as students may feel that the instruction does not resonate with their unique learning needs.

In summary, even though secondary teachers may engage in some promising practices for planning such as selecting grouping formats, their overall preparation practice could be more robust and intentional. Through integrating pre-assessment data in their planning process, they can improve the quality of their instruction and increase student learning. Still, the fact they are so powerful in implementing shows promise that secondary teachers can provide a rich, nurturing learning environment with appropriate materials and technology.

CONCLUSION

Results show the strengths and areas for improvement differently among kindergarten, primary- a secondary-school teachers to be managed by specific strategies. It is relevant to say that kindergarten teachers put a high focus on play-based learning and interactive hands-on activities through which young children develop. In addition, primary teachers are masterful at choosing instructional materials and crafting precise objectives for learning based on pre-assessment data that lead to instruction designed around such varied student needs. Secondary teachers, on the other hand, are skilled in working with groups and technology but neglect to use objectives or materials that differentiate by student readiness.

The results of this study have revealed useful information about practice in differentiation as it operates at each level but also point to a need for improvement. The educators have not effectively incorporated DI strategies into their practice, especially around using data from pre-assessments to inform and differentiate instruction. The space indicates a requirement for continual PD and feedback to improve teacher differentiation skills. These contributions notwithstanding, however, this study suffers from a few weaknesses. For one thing, the sample may not be generalizable to all teachers in different regions or educational contexts. Moreover, its use of teachers' self-reported data could be subject to at least two sources of bias (1) that educators may over-report their DI practices and (2) relying too heavily on such forms. However, the study did not account for external factors that may influence teaching practices, such as class size, available resources, or administrative support, which could provide a more comprehensive understanding of the challenges faced by teachers. These limitations will be solved by several recommendations: future studies should examine larger, more diverse teacher samples representing different geographical regions and educational levels to increase generalizability; classroom observation data coupled with self-reported information can offer a clearer view into how DI is being implemented in practice and what specific areas need improvement; Develop policies at schools that favor lower student-to-teacher ratios and provide resources for teachers to differentiate their instruction better.

This research enables an understanding of the combination of DI practices at different educational levels which in turn can provide a context for further study and initiatives targeting improvement in instructional practice. This would allow all educators to acknowledge and leverage those strengths, leading in turn to more effective and responsive learning environments that offer better outcomes for all students. Future research should further investigate these practices and partner with teachers to develop a best practice approach, in the interest of improving education

ACKNOWLEDGEMENT

This study was part of research group project on Differentiation Instruction (DI) supported financially by Sebelas Maret University. We would like to express our gratitude to all teachers and experts for their participation in this study. We also would like to thank all research group team for the contribution from data collection until data analysis.

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