

## Differentiation of Instruction in Public Secondary Schools: Investigating Teachers' Understanding and Implementation Strategies

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### Abstract

*Modeling differentiated instruction by secondary school teachers is crucial for meeting the diverse needs of learners. This approach enables teachers to plan their content, process, and products according to students' needs and abilities. This research aimed to investigate the understanding and implementation of differentiated instruction of teachers in public secondary schools. A mixed-method research design was adopted utilizing both quantitative and qualitative methods. Data were collected from teachers using a questionnaire on differentiated instruction and an interview protocol based on the key dimensions of differentiated instruction. Convenient sampling technique was utilized to involve 300 teachers in the quantitative survey, out of this sample 15 teachers were invited for interviews. The quantitative data were analyzed using SPSS, with descriptive statistics calculated for all questionnaire items. Content analysis was employed to analyze the qualitative data. The research found that teachers consider students' interests and abilities when planning their lessons and employ a variety of teaching methods in their classrooms. While they cannot change the given content, they make adjustments to suit students' needs and abilities. Teachers also use various assessment methods to ensure student learning and attainment of educational objectives. These results align with existing research, but they also reveal that teachers are not consistently planning their strategies with student diversity in mind. This highlights the need for better preparation of teachers in differentiated instruction to cater to the diverse interests and abilities of students.*

**Keywords:** Differentiated Instruction; Quantitative and Qualitative Research; Content Analysis; Mixed-Method Research; Secondary Schools.

### **Introduction**

Considering the global diversity found in classrooms and the critical need to provide meaningful learning experiences for all students, the “one size fits all” approach often falls short (Pozas, et al., 2020). Acknowledging the diversity of students in today’s educational settings is essential. Learners come from various backgrounds, exhibit different learning styles, motivations, abilities, and needs (Jacobse, et al., 2019). Consequently, addressing this diversity requires adapting instruction to individual interests and learning preferences, which introduces the concept of differentiated instruction (DI). DI is crucial for maximizing learners’ educational experiences (Moreno, 2015). Tomlinson (2000) defined DI as tailoring teaching methods to address students’ unique needs, rather than applying a uniform approach to all learners in a classroom. Despite the terminology differences, the core idea remains consistent: adjusting teaching and learning to meet students’ diverse needs. In Pakistani schools, differentiated instruction is an evolving practice aimed at accommodating students’ varying requirements. Given the socioeconomic disparities, linguistic diversity, and differing academic preparedness levels among students, there is a growing recognition of DI’s importance in the Pakistani educational context (Iqbal, et al., 2020). Although DI is still emerging in Pakistani schools, increased training, resources, and support have the potential to significantly enhance students’ learning experiences across Pakistan.

### **Problem Statement**

Amidst the growing diversity of student populations and the acknowledged significance of delivering meaningful and personalized learning experiences, the consistent implementation of Differentiated Instruction (DI) in public secondary schools remains a challenge. Teachers occupy a central role in the successful adoption of DI strategies; however, there exists a gap in their understanding and application of these methods. This research aims to assess teachers’ comprehension of differentiated instruction in public secondary schools and explore the extent to which they incorporate these strategies in their classrooms. Understanding these factors is essential for identifying obstacles and designing effective

professional development programs to enhance educational quality through customized instructional approaches.

### **Objectives**

- 1 To analyze the understanding of teachers on differentiated instruction in public secondary schools.
- 2 To explore the teachers' understanding and implementation of differentiated instruction in public secondary schools.

### **Literature Review**

Differentiated instruction is an instructional strategy that requires modifications in content, process and product. The effective use of differentiated instruction enhances students' motivation and achievement (Pozas, et al., 2020). Differentiated instruction is engraved in philosophical beliefs that each learner is different than others having a varied interest, abilities and learning style. This requires teachers to plan their teaching meeting the needs of all diverse learners (Hall, 2014). Differentiated instruction focuses to enhance students' growth and success to make them successful in their educational journey.

### ***Theoretical Foundation of Differentiated Instruction***

The foundational belief behind differentiation is that every student is unique and learns in diverse ways (Tomlinson, 2003). This approach is informed by Piaget's constructivist theory (Piaget, 1962), Vygotsky's zone of proximal development (Vygotsky, 1978), and Gardner's theory of multiple intelligences (1993). According to Piaget, learners engage with their physical and social environments, understanding them through processes like assimilation, accommodation, and equilibration (Piaget, 1962; Thakur, 2014). This means that learners actively construct their own understanding and use it to solve problems, emphasizing that knowledge is shaped by individual experiences. In a DI driven classroom, teachers support students' learning by employing various activities in line with their cognition, interests and abilities (Adlam, 2007). Students take interest and show motivation while the teacher is considering their individual learning styles and abilities. This enhances their intelligence, higher order thinking and motivation in learning (Pham, 2012). Consequently, differentiated

instruction provides educators with a means to ensure that all students fit within the educational framework rather than falling through the cracks, ultimately helping them become successful individuals today.

### ***Model of Differentiated Instruction***

In the literature, two models of Differentiated Instruction are commonly discussed. The first is the Differentiated Instruction Model developed and refined by Tomlinson (2014), while the second was introduced by Hall (2002). Tomlinson's model emphasizes the importance of mindset. Sousa and Tomlinson (2014) noted that a teacher's mindset can greatly influence the effective implementation of differentiated instruction. Struyven, et al. (2019). Presented two models of DI: fixed and growth. Teachers with a fixed mindset tend to believe that qualities such as talent or intelligence are innate traits that dictate student success, often overlooking the impact of effort. This mindset can lead to assumptions like, "Some students are destined to succeed, while others are not." In contrast, a growth mindset encourages the belief that learning can be achieved through hard work and dedication, suggesting that every student has the potential to succeed, with intelligence and talent serving merely as starting points. Hattie (2005) argued that teachers with a growth mindset are more inclined to embrace student diversity and view it as a valuable component of a rich learning environment.

Another frequently cited model of Differentiated Instruction is Hall's model (2002), which underscores the significance of pre-assessment to identify students' varying prior knowledge, readiness, learning preferences, and interests. This allows teachers to tailor the learning process effectively. In Hall's framework, assessment is crucial for meeting students at their current level and providing suitable support (Hall, 2002). This type of assessment, known as assessment for learning, involves meaningful social interactions between teachers and students, fostering a shared vision of learning.

Berry (2008) described this process as a systematic gathering of information from students to enhance their understanding of their knowledge, skills, strengths, and weaknesses. Hattie and Timperley (2007) emphasized the vital role of feedback in assessment and instruction,

highlighting that effective feedback can significantly improve students' learning outcomes. Hall (2002) asserted that teachers should focus on addressing student differences and offering diverse learning opportunities, which are essential for successfully integrating differentiated instruction in the classroom.

### ***Elements of Differentiated Instruction***

To incorporate differentiated instruction in their classrooms, teachers should adapt the curriculum and instructional methods by structuring content around learning objectives, choosing effective teaching approaches, and creating learning activities and assessments customized to students' interests, learning styles, and readiness levels.

### ***Differentiated Instruction at Content level***

Content includes the curriculum we teach, encompassing facts, concepts, generalizations or principles, attitudes, and skills related to the subject. It also involves materials that represent these elements (Taylor, 2015). Content differentiation occurs through two primary approaches. Firstly, we can adapt our teaching by adjusting learning outcomes based on students' prior knowledge. Teachers can organize learning experiences across various levels of Bloom's Taxonomy. For instance:

- Initially, those students who are not familiar with concepts may engage in tasks at the lower levels of Bloom's Taxonomy e.g., knowledge, comprehension, and application.
- Next, those students who have partial mastery might tackle tasks involving application, analysis, and synthesis.
- Those with high levels of mastery could focus on tasks requiring synthesis and evaluation (Tomlinson, 2006).

Secondly, differentiation involves varying the resources used to deliver learning material while ensuring consistent learning outcomes for all students. For example:

- Teachers may employ different resource materials, such as concrete objects, print materials, or interactive software, to teach topics like physical and chemical changes.

- Students might explore internet resources in assigned groups or individually.
- Regardless of their abilities, all students work toward the same instructional objectives (Pham, 2012).

#### *Differentiated Instruction at Process level*

In the context of teaching, the term “process” refers to the techniques and strategies used to engage students in learning. The goal is not only to help students understand new content but also to connect it with their existing knowledge and abilities (Taylor, 2015). To achieve this, teachers should utilize pre-assessment results - evaluations conducted before instruction - to tailor their teaching methods. This approach enables them to determine the most effective ways to deliver lessons based on students’ varying needs and readiness levels.

When implementing cooperative learning methods, flexible grouping becomes essential. Students should collaborate in different groups for various activities, enhancing their learning experience. However, it’s crucial to recognize that some students may prefer or perform better when working independently, and they should have that option. Additionally, effective classroom management plays a vital role in successfully implementing differentiated instruction (Hattie, 2012). Teachers must carefully organize the classroom and deliver instruction to ensure that all students receive the necessary support and engagement according to their individual learning needs.

#### *Differentiated Instruction at Product level*

The term “product” refers to the tangible outcome or creation that a student produces after completing a lesson, demonstrating their understanding and mastery of the subject matter (Hawkins et al. 2019). Students’ outcome shows the students’ success and mastery in the content. This based on variety of assessment strategies e.g., test, oral exam, presentations, posters, drawings, quiz etc. This aspect is crucial in differentiated instruction because how assessments are designed influences both the content taught, and the teaching methods used. Assessments can take formal forms (such as tests) or informal ones (like class discussions) and serve to measure how well students grasp the material. The “product” component provides students with opportunities to express their knowledge in various formats,

catering to different learning styles and interests (Wiggins, & McTighe, 2005). For example, in an English lesson, students might demonstrate their understanding by writing a poem, crafting an alternative ending to a story, or creating a 3D model. In social studies, they could showcase their knowledge through sketches, book reports, plays, debates, research projects, game design, or comparative analyses of different subjects. This variety of assessment methods allows students to engage with the material in ways that resonate with their individual preferences (Northey, 2005).

### **Methodology**

This research aims to explore how well teachers understand and implement differentiated instruction in public secondary schools. To achieve this, a mixed-method research design was adopted to conduct this research. The study utilized both quantitative and qualitative methods to collect data from teachers. To select the participants, a purposive sampling technique was employed. Before collecting any data, the researchers obtained informed consent from both the school principals and the teachers, ensuring that all participants were fully aware of the research purpose and their role in it. Additionally, all data was handled in a way that protected participants' identities and personal information.

### **Participants**

The population for this research study includes teachers from public secondary schools in Multan. Multan division has a total of 240 secondary and higher secondary schools. Using a convenient sampling technique, 15 schools were chosen. All the available teachers in these schools were invited to take part in this study. In total, 300 secondary school teachers participated in this research. Efforts were also made to ensure a balanced sample by including both male and female teachers. However, data were collected from only 50 male teachers. As a female researcher, it was challenging to visit male schools for data collection. The female sample was 250 teachers.

### **Research Instruments**

*Differentiated Instruction Questionnaire*

Existing research instruments were explored to choose a suitable research instrument to measure the understanding of teachers on differentiation of instruction. The Differentiation Instruction Survey was originally modified from the Teacher Self-Reflection on Differentiation for Staff Development Planning Survey developed by Tomlinson (2003). Based on this, a modified version of differentiation instruction survey developed by Whipple (2012) was utilized to collect data. The questionnaire consists of 26 items on four-point Likert type scale ranging from 1= Little or no evidence to 5=Demonstrate exemplary performance. There are the following six key dimensions of this questionnaire covering the various aspects of differentiation of instruction: (a) student interest (b) assessment (c) lesson planning (d) content (e) process (f) product.

### *Interview Protocol*

To get a deeper understanding and implementation of the differentiation instructional strategies we have thoroughly reviewed the literature and formulated some questions. In total ten questions were designed to dig out the differentiated instructional strategies at public secondary schools. Each question was linked with the six key dimensions of differentiation of instruction mentioned in the quantitative questionnaire. An introductory question was also added to know the professional background of the teachers. Initially the interview protocol was tested with a few participants and later to whole sample to check the validity of the interview questions. The following are the sample interview questions: (a) How would you define differentiation of instruction in the context of a secondary school classroom? (b) What strategies or techniques do you use to adapt your teaching to accommodate different learning styles, abilities, or interests of your students?

### *Data Collection*

After selecting the sample, researchers contacted the schools to obtain formal permission to collect data from secondary school teachers. An informed consent was obtained for both qualitative and quantitative data collection. Approximately 350 teachers were approached to complete the questionnaire, and 300 filled questionnaires were received. Many participants filled out the questionnaire during the visit, while a few

promised to return it later but did not, despite several reminders. For the interviews, 15 teachers were selected on a convenient basis from a sample of 300 teachers. These teachers expressed willingness to participate in interviews. Following the quantitative survey, researchers began collecting qualitative data by scheduling individual appointments with these teachers to conduct and record the semi-structured interviews. The teachers were briefed on the research objectives and informed about the interview questions. All interviews were recorded for analysis purposes. To encourage participation, teachers were assured of their anonymity and informed that the questions were non-evaluative, with no 'right' or 'wrong' answers.

### ***Data Analyses***

#### *Quantitative Analysis*

All the collected data were entered into SPSS version 22 for analysis. The data file was cleaned by removing any missing values and outliers to ensure accuracy. Descriptive statistics were used to analyze the data, aiming to identify trends in teachers' understanding of differentiated instruction in public secondary schools.

#### *Qualitative Analysis*

The recorded interviews were transcribed word-for-word and then prepared for further analysis. Given that the interview questions were designed based on existing literature on differentiated instruction, content analysis was employed. This process started by defining the unit of analysis, which was informed by the research objectives and the content used to draft the questions. This unit of analysis was then used for coding and creating categories according to themes and patterns. A coding matrix was developed to systematically code the data to see a larger picture of codes and trends in data. This will also facilitate in picking up relevant chunks from interviews.

## **Results**

### ***Description of Demographics***

Table 1 explains the demographic details of the research participants which consist of age and experience of their teaching. The largest age group is 23

to 30 years, comprising half of the sample. The smallest age group is 31 to 60 years, making up only 20% of the sample. In terms of experience, the majority of teachers have 11 to 15 years of experience, which is also half of the sample. The smallest group in terms of experience is those with more than 15 years, constituting only 8.3% of the sample.

<b>Variables</b>	<b>f</b>	<b>Percent</b>
<i>Gender</i>		
Male	50	16.67
Female	250	83.33
<i>Age</i>		
<23 years	90	30.0
24 to 30 years	150	50.0
31 to 60	60	20.0
<i>Experience</i>		
1-5 years	40	13.3
6-10 years	85	28.4
11-15 years	150	50.0
>15 years	25	8.3
Total	300	100.0

### ***Results from Quantitative and Qualitative Analyses***

Descriptive analysis was conducted of the quantitative data to know the understanding of teachers on differentiation of instruction at secondary schools. We will present the results together with quantitative and qualitative analysis based on six elements of the questionnaire: (a) student interest (b) assessment (c) lesson planning (d) content (e) process (f) product.

#### ***Student Interest***

The first specific question during the interview was about knowing the students' interest if teachers know and consider the students' interest during teaching and planning their classroom activities. The quantitative analysis presents the highest mean score against two of the items ( $M=3.75$ ) and ( $M=3.74$ ) which means teachers do know the students' interest and try to relate their teaching according to students' interest. The lowest mean of students' interest factor was ( $M=3.55$ ). The interview data was not very rich as teachers were reluctant to share their teaching practices or they might not be aware of differentiation of instruction. This affects the analysis as well and consequently the reporting of results as well. A teacher explained in the following way: *"I use a variety of ways to identify students' interests and needs in the classroom. I ask questions before and after my lesson to check their understanding. Their class participation also shows their interest in the learning activities."* Another teacher said: *"Asking question after the lesson help to identify the understanding of students."*

### ***Assessment***

Our second interview question addressed how teachers conduct student assessments and their effectiveness, considering differentiation of instruction in their classrooms. The questionnaire included five items related to assessment. The highest mean score was for "I assess during the unit to gauge students' understanding" ( $M=3.90$ ), and the lowest was for "I determine students' learning style" ( $M=2.91$ ). These results indicate teachers' preferences and practices in assessing students in relation to differentiated instruction. Qualitative data also revealed that *"students are assessed on certain lessons by assigning various tasks both in class and at home, including verbal and written tasks."* One teacher explained: *"Students are tested through assessments conducted after each lesson and chapter."* However, they did not link their assessment to students' diversity and differentiated instruction.

### ***Lesson Planning***

In this part of the questionnaire, we received diverse responses as reflected in the mean scores. To accommodate the diverse needs of learners, teachers employed several strategies to engage them and occasionally allowed

students to choose activities of interest (M=3.85). Additionally, a few teachers indicated that they provide a variety of materials to meet students' reading interests, as shown by the lower mean score (M=2.85). In the qualitative responses, one teacher shared, *"I plan many activities for my students to keep them engaged, and this is, in fact, part of my lesson plan. Once I plan such activities, I try applying them in my class."* However, many respondents stated that they do not formally plan their lessons and teach in a routine manner. They mentioned that lesson planning is not a requirement for teachers. As one teacher put it, *"I think, after years of experience, we do not need such preparation."* Another respondent remarked, *"Students are the same everywhere; they can only be categorized as high achievers, mediocre, and low achievers. We use certain strategies to achieve our learning goals, but we do not plan these activities in a formal way. In fact, we hardly consider students' interests and abilities. The main purpose is to complete the course."* Another teacher noted, *"Our principal and other authorities never asked us to prepare lessons; we just do some preparation before going to class."*

### **Content**

In this part of the questionnaire, we received responses like the previous section. The descriptive analysis indicated that teachers are clear about the major concepts they want their students to learn. The mean score for the item "I clearly articulate what I want my students to know, understand, and be able to do" was high (M=3.86), showing that most teachers rated this item positively. Additionally, the item "I provide a variety of support strategies to my students, such as organizers, guides, and peer assistance" also received a high mean score (M=3.81). The qualitative data revealed that teachers assign various tasks to students for both in-class and at-home work, including assignments, projects, and reading materials. One respondent shared, *"I use all available resources to achieve the lesson objectives. I use simple cards, flashcards, charts, the board, the internet, textbooks, allied materials, tests, etc."* Another teacher added, *"I usually ask my students to use multiple resources to enhance their learning. This includes charts, books, videos, YouTube, notes, and guides. This helps facilitate their learning."*

**Process**

As to this important and practical factor, teachers rated the following item higher than other items e.g., I group my students for learning activities based on readiness, interests, and/or learning preferences (M=3.65). This shows that teachers do consider their students' intellect and interests. Many teachers rated the following item second highest "generally our classroom structure is quite supportive to conduct group activities," (M=3.55). On the other hand, qualitative data showed that teachers were reporting that *"differentiated instruction is only possible when we have structured and organized classrooms. Our classrooms are not managed in this way to conduct group activities. We have too many students in class, focusing on each individual student and applying variety of teaching methods is not possible."* One more teacher highlighted, *"the differentiation of instructional activities are not possible with overcrowded classrooms, limited resources. A few teachers also explained that variety in teaching methods make class interesting though challenging, but I try my best to use different teaching methods."*

**Product**

The following items were rated higher as to product, "product can only be good if it is connected with students' interest" (M=3.00). Moreover, teachers also rated "I provide variety of assessment tasks" higher as compared to other items in this factor (M=2.95). However, after the interview analysis we could hardly link the following "how do you assess or evaluate the effectiveness of your differentiated instruction?" Teachers could not give us proper answer to this question, they again highlighted their ways of assessment i-e., formative and summative assessments. They could not link this with differentiated instruction. *"One of the teachers said, the results of the students tell you a lot about your teaching and their learning. Usually, I evaluate my result, but I never see it from a differentiated instruction point of view."* Another teacher shared: *"I think, the review of exam results could help you to know your teaching and make adjustments in your teaching strategies."* A very few teachers said, *"students feedback is in fact very important to achieve teaching and learning goals. But in our case, there is no such mechanism to take feedback from students."*

### **Discussion**

The prime purpose of this research was to measure the understanding and implementation of differentiation of instruction of the public secondary school teachers. Significant results were identified from both quantitative and qualitative data. This section will contrast and corroborate the research findings with the existing body of research. Both quantitative and qualitative results indicated that teachers do consider students' interest and learning style while they are teaching in their classes. The existing research also reached the same findings that teachers can only differentiate their instruction when they are aware of students' interests, abilities and their learning styles (Thakur, 2014). Moreover, this finding is also consistent with the study results of Tomlinson et al., (2003); Ismajli and Imami-Morina, (2018) who concluded that to meet the varied of needs of students in view of instruction it is important to know their interests and learning styles.

As to assessment, teachers both in quantitative and qualitative findings could not link the assessment to differentiated instructions and students' diversity. This means they planned a uniformed assessment for all the class. The earlier results are not different than this finding. For example, Noman and Kaur (2020) conducted a research study to map the differentiated instruction of diverse learners found the same results that teachers are still dependent on conducting uniformed assessment methods for all students regardless of their diverse learning abilities. Another study conducted by Westbroek et al., (2020) reached the same findings that assessment for learning and differentiated instruction were found to be very challenging to implement for teachers.

As to the third component, lesson planning, our research found a variety of answers in both quantitative and qualitative findings. A few teachers mentioned considering students' interests while planning their lesson, while some are not planning lessons and others depend on their experience and do not have formal preparation to go to class. These findings are in line with the study findings of Lika (2017) who study the impact of curricula and lesson planning in teaching. This research concludes that lesson plans are not flexible enough to cater the needs of varied students and this impacts the quality of instruction and students' learning as well. Another study conducted by Lestari (2023) highlighted

the need and implementation of lesson study. They concluded that through planning, implementation and reflection teachers can better prepare their lessons and meet the varied needs of students.

As to content in differentiated instruction, our findings revealed that teachers cannot alter their content, but they use certain teaching strategies to make students understand that content. However, the study result of Dawson and Guare (2018); Valiandes and Neophytou (2018) highlighted that teachers modify and adjust their teaching according to the students' needs, which is not very different to our findings because teachers adjust their teaching according to the students and they make required adjustments in the content as well. This is also linked with the process called teaching methods. Most of our respondents highlighted that they adjust their teaching methods according to the students' abilities and this is also in line with existing research findings (Magableh & Abdullah, 2021). Williams (2019) conducted their study and found that teachers must modify their teaching processes to make students successful in their learning. One-size-fit for all approaches is no longer effective with diverse learners.

As to product, again the study results of Magableh and Abdullah (2021) provide evidence of using variety of assessment strategies to align with students' needs. Our study results also reach the same conclusion. Participants highlighted the variety of assessments to measure students' learning. Similarly, Sebihi (2016) who conducted research on differentiated instruction has found the same results which are aligned with the above mentioned findings. Though these findings are aligned with the existing available research, during the data analysis, it was identified that these results were not in view of differentiated instruction rather teachers were sharing their routine practices. None of the teachers mentioned differentiated instruction and shared the strategies of differentiated instruction in their classrooms. This is opening the door for future research specifically in Pakistani context to prepare teachers to meet the diverse needs of learners. As Tomlinson (2005) stated, teachers need to understand differentiated instruction and plan their teaching accordingly. This involves creating groups of students, ranging from small to large, based on shared interests and abilities. Teachers should modify their instruction by grouping students with similar interests.

### **Limitations and Directions for Future Research**

This research aimed to explore the understanding and implementation of differentiated instruction among teachers in public secondary schools. To broaden the study's scope, several teachers from various parts of the Multan district were included. However, certain limitations need to be acknowledged. Data were collected from secondary school teachers using both qualitative and quantitative methods to gain deeper insights into their differentiated instruction practices. Despite this, the role of students in the process should not be overlooked, and future research may consider this important factor in their planning. We primarily relied on existing quantitative research instruments and designed an interview protocol to deeply explore these practices. However, incorporating classroom observations could further enhance the research results. This study can inform future research aimed at identifying real-time practices of teachers concerning differentiated instruction. Collecting more data and utilizing additional research instruments could also provide opportunities to apply advanced data analysis techniques, thereby enriching study findings and contributing to the existing literature on differentiated instructions. This will also help to generalize the study findings in a local context.

### **Conclusion**

This study aims to investigate teachers' understanding and implementation of differentiated instruction in public secondary schools. Data were collected using both qualitative and quantitative methods. The study found that teachers consider students' interests and abilities when planning their teaching and assessment. They prefer to use a variety of teaching methods to ensure every student participates in class and learns effectively. Regarding differentiated instruction related to content, teachers reported that while they cannot change the content to meet students' needs, they can adjust their teaching methods. Concerning assessments, teachers employ various strategies to ensure students understand the concepts and achieve learning objectives. Although the results are promising, the reality is that not all teachers plan with differentiated instruction in mind. While teachers

work hard to achieve their instructional goals, a more systematic approach to meeting the diverse needs of students is still needed.

### References

- Adlam, E. (2007). *Differentiated instruction in elementary school: Investigating the knowledge elementary teachers possess when implementing differentiated instruction in their classrooms*. Retrieved from <https://scholar.uwindsor.ca/cgi/viewcontent.cgi?article=5642&context=etd>
- Berry, R. (2008). *Assessment for learning* (Vol. 1). Hong Kong University Press.
- Dawson, P., & Guare, R. (2018). *Executive skills in children and adolescents. A practical guide to assessment and intervention*. Guilford Publication.
- Gardner, H. (1993). *Multiple intelligence: The theory in practice*. Basic Books/Hachette Book Group.
- Hall, T., Strangman, N., & Meyer, A. (2003). *Differentiated instruction and implications for UDL implementation*. Wakefield, MA: National Center on Accessing the General Curriculum. Retrieved July, 29, 2010.
- Hattie, J. (2005). The paradox of reducing class size and improving learning outcomes. *International Journal of Educational Research*, 43(6), 387-425. <https://doi.org/10.1016/j.ijer.2006.07.002>
- Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. New York, USA: Routledge.
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112. <https://doi.org/10.3102/003465430298487>
- Hawkins, J., Henry, G. A., Jones, S. J., Santi, K. L., & Butcher, K. A. (2019). Implementing professional learning communities: improvement required. *The educational leader's guide to improvement science: Data, design, and cases for reflection*, 295-318.
- Iqbal, J., Khan, A. M., & Nisar, M. (2020). Impact of differentiated instruction on student learning: Perception of students and teachers. *Global Regional Review*, 5(1), 364-375.
- Ismajli, H., & Imami-Morina, I. (2018). Differentiated instruction: Understanding and applying interactive strategies to meet the needs of all the students. *International Journal of Instruction*, 11(3), 207-218. Retrieved from [eric.ed.gov](http://eric.ed.gov)

Jacobse S. A. E, Meijer, A., Helms-Lorenz, M. and Maulana, R. (2019) Differentiated Instruction in Secondary Education: A Systematic Review of Research Evidence. *Frontiers in Psychology*. (10), 2366. <https://doi.org/10.3389/fpsyg.2019.02366>

Lestari, A. S. B. L., Wahyono, A., Akkuşci, Y. E., Purwanto, P., Anas, K., Nurmalasari, Y., ... & Yunus, M. (2023). PLAN–DO–SEE: Lesson study-based differentiated learning in middle schools. *Delta-Phi: Jurnal Pendidikan Matematika*, 1(1), 41-45. <https://doi.org/10.61650/dpjpgm.v1i1.76>

Lika, M. (2017). The impact of curricula and lesson planning in the teaching process. *Academic Journal of Business*, 3(1), 240-247.

Magableh, I. S. I., & Abdullah, A. (2021). The impact of differentiated instruction on students' reading comprehension attainment in mixed-ability classrooms. *Interchange*, 52(2), 255-272. <https://doi.org/10.1007/s10780-021-09427-3>

Moreno, S. (2015). Differentiated instruction: Strategies for English language learners listening comprehension development.1-65 <https://vc.bridgew.edu/theses/14>

Noman, M., & Kaur, A. (2020). Differentiated assessment a new paradigm in assessment practices for diverse learners. *International Journal of Education and Cognitive Sciences*, 1(3), <https://iase-ijeas.com>

Northey, S. S. (2005). *Handbook on differentiated instruction for middle and high schools*. Larchmont, NY: Eye on Education.

Pham, H. L. (2012). Differentiated instruction and the need to integrate teaching and practice. *Journal of College Teaching & Learning (Online)*, 9(1), 13-20. Retrieved from <https://core.ac.uk/reader/268111140>

Piaget, J. (1962). *Play, Dreams and Imitation in Childhood*. London: Routledge and Kegan Paul.

Pozas, M., Letzel, V., & Schneider, C. (2020). Teachers and differentiated instruction: exploring differentiation practices to address student diversity. *Journal of Research in Special Educational Needs*, 20(3), 217-230. <https://doi.org/10.1111/1471-3802.12481>

Sebihi, A. (2016). Strategizing teaching: Diferentiated teaching style and learning brain. *EPR*, 4(12), 115–118.

Struyven, K., Gheysens, E., & Griful-Freixenet, J. (2019). Differentiated instruction in teaching and teacher Education: the DI-Quest model. DOI: 10.1007/978-981-13-1179-6\_48-1

Taylor, B. K. (2015). Content, process, and product: Modeling differentiated instruction. *Kappa Delta Pi Record*, 51(1), 13-17. <https://doi.org/10.1080/00228958.2015.988559>

Thakur, K. (2014). Differentiated instruction in the inclusive classroom. *Research Journal of Educational Sciences*, 2(7), 10-14. Retrieved

from [https://www.isca.me/EDU\\_SCI/Archive/v2/i7/2.%20ISCA-RJeduS-2014-025.pdf](https://www.isca.me/EDU_SCI/Archive/v2/i7/2.%20ISCA-RJeduS-2014-025.pdf)

Tomlinson, C. A. (2000). Differentiation of Instruction in the Elementary Grades. ERIC Digest. Retrieved from <https://eric.ed.gov/?id=ED443572>

Tomlinson, C. A. (2004). The Möbius effect: Addressing learner variance in schools. *Journal of Learning Disabilities*, 37(6), 516-524. <https://journals.sagepub.com/doi/abs/10.1177/00222194040370060601>

Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners*. Ascd.

Tomlinson, C. A., & McTighe, J. (2006). *Integrating differentiated instruction and understanding by design: Connecting content and kids*. Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C. A., Brighton, C., Hertberg, H., Callahan, C. M., Moon, T. R., Brimijoin, K., ... & Reynolds, T. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classrooms: A review of literature. *Journal for the Education of the Gifted*, 27(2-3), 119-145. <https://doi.org/10.1177/01623532030270020>

Valiandes, S., & Neophytou, L. (2018). Teachers' professional development for differentiated instruction in mixed-ability classrooms: Investigating the impact of a development program on teachers' professional learning and on students' achievement. *Teacher Development*, 22(1), 123–138. <https://doi.org/10.1080/13664530.2017.1338196>

Vygotsky, L. S. (1978) *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.

Westbroek, H. B., van Rens, L., van den Berg, E., & Janssen, F. (2020). A practical approach to assessment for learning and differentiated instruction. *International Journal of Science Education*, 42(6), 955-976.

Wiggins, G., & McTighe, J. (2005). *Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.

Williams, S. (2019). *The influence of differentiation on student behavior and achievement* (Doctoral dissertation). Milligan College.