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Differentiated Instruction and Kindergarten through 5th Grade Teachers

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Abstract

The purpose of this article is to examine Kindergarten through 5th-grade teachers' understanding of differentiated instruction and perception of their ability to implement differentiated instruction in their classrooms. Differentiated instruction is a critical factor for children's success. Thirty-one K-5 teachers from the state of Georgia participated in this study. The teacher survey on differentiated instruction developed by Tomlinson (2001) and modified by Page (2007) was used in this study. The researchers also included two open-ended, differentiated instruction questions and seven demographic questions. Study results suggested that while teachers mostly agree that differentiation is an important instructional strategy, they are faced with multiple barriers to implementation such as a lack of differentiated instruction knowledge and practice and the need for resources and professional development.

Keywords

Differentiated instruction, teachers' understanding, teachers' perceptions, K-5 teachers

Introduction

Differentiated instruction (DI) is a way of thinking about the classroom with dual goals of honoring each student's learning needs and maximizing each student's learning capacity" (Osuafor, 2013, p. 556). With the implementation of DI, teachers can provide instruction at students' levels and implement individualized instruction to support all students. DI gives teachers the opportunity to provide choices for students, vary assessments, and monitor academic growth (Whipple, 2012). It requires teachers to identify the areas of the content that can be modified, as well as activities and processes, the setting, and the assessments used (Cooper, 2007). Teachers consider students' academic abilities, interests, and skills while they differentiate instruction (Goddard et al., 2010).

Tomlinson (2001) a leading expert in the field of DI defines DI as a learning environment with "different avenues to acquiring content, to processing or making sense of ideas, and to developing products so that each student can learn effectively". Tomlinson also states, "DI is a systematic approach to planning curriculum and instruction for academically diverse learners. DI is a well-known educational strategy that is widely used in most educational systems. To maintain high-quality education in mixed-ability classrooms, policymakers recommend and enforce the implementation of DI within educational institutions (Schleicher, 2016; Schofield, 2010; Smale-Jacobse et al., 2019). Changes in policy will inevitably bring obstacles and complications. Even though DI is widely used in education, many teachers have reservations about how DI should be implemented in the classroom and how potential problems might be handled (Van Casteren et al., 2017). If DI is successfully integrated into teaching and learning, it has the potential to provide a lot of excellent effects (Deunk et al., 2018).

Differentiated Instruction Model

DI requires teachers to use their knowledge of students' readiness, interests, and learning profile to differentiate four elements: content, process, product, and affect/learning environment (Viness et al., 2017). 'Readiness' is where the students are in relation to a particular understanding or skill. Student readiness includes not only a student's current skill level, but also a student's prior learning experiences, attitudes, and knowledge (Santangelo, 2012) 'Interest' is the students' curiosity or passion for a particular topic or skill. 'Learning profiles' is how students learn as influenced by intelligence, preferences, gender,

culture, or learning style before modifying content, process, products (Langa, 2007), and learning environment. (Figure 1).

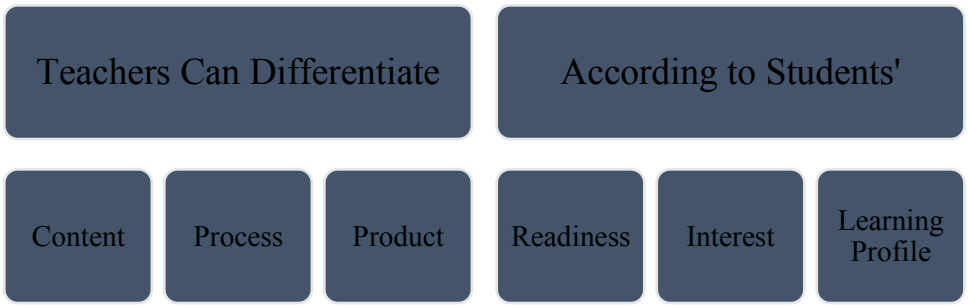

Figure 1. Differentiation of Instruction Model

Teachers who have differentiated their instruction or written about differentiation have focused on three key areas. Each area can be differentiated individually or in conjunction with one or both of the other areas. Tomlinson defines these three areas as content, process, and product (Tomlinson, 2001).

Content means the knowledge, understanding, and skills that students need to learn (Tomlinson, 2010). It's crucial to note that in a differentiated classroom, these learning goals should almost always be the same for all students. In terms of content, teachers can discriminate between "methods that students utilize to retrieve crucial content" (Hall, 2009). Students can learn new facts and concepts through reading alone or with a partner, listening to a novel on tape, conducting internet research or connecting with experts, participating in group demonstrations, or participating in small-group instruction (Tomlinson, 2010). Alternatively, the teacher can convey content in the classroom in a variety of ways, such as by giving pupils photographs of concrete items that illustrate arithmetic principles as a first step in teaching these abstract notions.

Process, according to Tomlinson (2010), is "how students come to understand and make sense of the content" (p. 15). They comprehend generating sense-making exercises that help students "own" the subject by allowing them to "see how it makes sense and grasp how it is valuable beyond the classroom" by diversifying the process (p. 15). Levy (2008) noted that activities needed to address the different abilities, learning styles and interests of all students. "A good

activity is something students will make or do in a range of modes at varied degrees of sophistication in varying time spans, with varied amounts of teacher or peer support" (Tomlinson, 2001, p. 80).

Products were referred to as the assessments or evaluation criteria used to determine what students have learned and understand (Garderen, 2006; Hall, 2009; Tomlinson, 2000). Teachers can utilize assessment to improve DI. For example, before a new unit is started, there needs to be pre-assessments and a variety of ways for students to demonstrate their understanding (Anderson, 2007; Hall, 2009). The assessment can also include a mix of informal and formal, and formative and summative assessment types.

Effectiveness of Differentiated Instruction

Studies found connections between DI -as a package- and positive student outcomes. For example, Y. L. Goddard, Goddard, and Kim (2015) found positive, statistically significant links between DI and students' mathematics and reading achievement. Further, Grimes and Stevens (2009) discovered that DI in a mathematics classroom increased scores for both poor and high achievers. They also discovered that differentiated education improved motivation and confidence in both low and high achievers by increasing engagement.

Tieso (2003), who measured DI by examining teachers' grouping practices and curricular adjustments, demonstrated a link between DI and students' mathematics achievement. Other examples include Brighton (2005) increased choice by offering students different prompts when writing in journals to increase student engagement through connecting to interests. Ernest et al. (2011) worked closely with 35 teacher education candidates who were allocated to K-12 classrooms in rural, urban, and suburban settings across a variety of subjects. The candidates prepared and amended lesson plans over the course of five weeks to include DI across those four domains in their sessions. These teachers were immersed in intensive mastery experiences, and their pupils saw academic advances on a variety of teacher-designed assessments. Miller (2002) found that high-performing teachers exploited small-group instruction, pair-working and collaborative group work more than low-performing teachers.

Hawkins (2007) conducted longitudinal research in Rhode Island to determine the reasons for the performance of particular schools. Small group instruction and manipulatives as manifestations of DI were highly beneficial in boosting education, according to the study's findings. In another study, Chen (2007) explored the learners' perspective on tiered assessment. In collecting data different techniques were employed including observation, interviews, videotaping, and artifacts. The researcher reported that tiering assessment was beneficial in enhancing the students' motivation, efforts, and English skills as well as confidence. In a longitudinal study with 1,623 elementary teachers and 4,167 students, Goddard (2018) found positive, statistically significant connections between teachers' collaboration and teachers' reports that they differentiate instruction and between DI and teacher efficacy.

Barriers in Differentiated Instruction

Although the DI idea is widely recognized as one of the most beneficial when teaching mixed-ability classes (Chien, 2015; Pettig, 2000), many teachers have difficulties in implementing it. The difficulties are lack of DI knowledge (Chien, 2015; Lunsford, 2017; Merawi, 2018; Wan, 2016), time constraints (Boston, 2017; Robinson et al., 2014; Shareefa et al., 2019), class size (Aldossari, 2018; Jager, 2017; Shareefa et al., 2019; Stollman, 2018), school administration/facilities (Merawi, 2018; Siam, 2016), lack of resources (Avgousti, 2017; Lunsford, 2017), and personal beliefs and styles (Boston, 2017; Jager, 2017; Wan, 2016).

Differentiated Instruction in Georgia, United States

The U. S. Department of Education describes DI as personalized learning instruction tailored to a student's individual learning needs, preferences, and interests (Sparks, 2015). Like many other states, the state of Georgia pays increasing attention to teacher education and improvement. For example, The Georgia General Assembly now requires that teacher education programs include mandatory coursework in DI (2021). Georgia Department of Education utilizes a common evaluation system designed for building teacher effectiveness and ensuring consistency and comparability throughout the state called "The Teacher Keys Effectiveness System (TKES)". The overarching goal of TKES is to support the continuous growth and development of each teacher. Out of ten TKES Standards, two of them emphasize directly DI in education. TKES Performance Standard 2 "Instructional Planning " includes that teacher plans using state and

local school district curricula and standards, effective strategies, resources, and data to address the differentiated needs of all students. The teacher self-assessment checklist has items such as (1) using student assessment and diagnostic data in instructional planning, (2) planning a learner-centered environment that allows for student choice, flexibility, and independence, (3) using a variety of grouping arrangements and ensuring high mobility within the classroom, (4) planning advanced learning (e.g., enrichment, curriculum compacting) for gifted learners, and (5) planning remediated learning for struggling students.

TKES Performance Standard 4 "Differentiated Instruction" means that the teacher challenges and supports each student's learning by providing appropriate content and developing skills that address individual learning differences. Standard 4 has four items: differentiating content, differentiating process, differentiating product, and learning environment. 'Differentiating Content' has items such as (1) re-teaching an idea or skill in small groups of struggling learners, and (2) extending and enriching the thinking or skills of advanced learners. 'Differentiating Process' has items such as (1) varying instructional strategies and activities for students, (2) varying types of assignments to assess student learning, (3) routinely combining instructional techniques that involve individual, small-group, and whole-class instruction, (4) monitoring and pacing instruction based on the individual needs of students.

The House Study on Professional Learning Committee recommends that the Georgia Department of Education implement revised professional learning rules that recognize that educators need time to improve their knowledge, skills, and dispositions and that such professional learning best occurs in a job-embedded context, with colleagues, and sustained over time. For professional learning to have the desired impact on student learning, it is essential that time be given to these activities. The committee suggests these rules recognize that it is the responsibility of principals, district leaders, and state leaders to ensure that teachers have the opportunity for professional learning that meets these criteria. The committee further recommends that the Department of Education rules be aligned with the new Georgia Professional Standards Commission (GaPSC) certification renewal rules, requiring the demonstration of the impact of professional learning on educator and student performance, when the latter takes effect.

The GaPSC advances excellence in educator preparation through an evidence-based peer-review approval process using the Georgia Standards for the Approval of Educator Preparation Providers and Educator Preparation Programs. These standards were adopted in May 2014, and they became effective for all approval reviews in September 2016. These standards were updated several times (Revised February 2018; Revised April 2018 to include Service/Leader Standards; Revised September, 2019 to reflect P-5 certificate title change to Elementary. While 2019 version of the standards are in effect until December 2022 for programs currently undergoing summative reviews, the most updated (2022) version of the initial teaching standards will become effective for summative reviews of EPPs and all initial preparation programs in January 2023.

When looking into the most updated version of GaPSC (2022), there are six standards that are based on evidence, continuous improvement, innovation, and clinical practice to ensure that approved providers in Georgia are preparing educators who are classroom-ready and equipped to impact student learning. The new standards demand the use of quality evidence, as well as an explanation of that evidence, in the continuous improvement of educator preparation and the GaPSC approval process. GaPSC "Standard 1 Content and Pedagogical Knowledge" Component 1.4 includes evidence of teacher candidates' ability to provide effective instruction for all students (differentiation of instruction); Evidence that candidates use approaches such as higher-level thinking skills and problem-solving, learning experiences, differentiation, collaboration, and communication skills; 1.5. Evidence demonstrates that candidates' use of technology is aligned with the goals of the lesson and that they use technology to differentiate instruction. The possible evidence in "Standard 2 Clinical Partnerships and Practice" has 'DI under category 2.3. Research evidence documents that teacher candidates have purposefully assessed the impact on student learning and development with both formative and summative assessments in more than one clinical setting. "Standard 4: Program Impact" 4.1: Teacher Assessment on Performance Standards (TAPS) data (differentiation measures improved). "Standard 6: Georgia Requirements for Educator Preparation Programs" Item 6.3. Documentation of three or more semester hours in the identification and education of children who have special educational needs, or equivalent coursework through a Georgia-approved professional learning program that indicates a candidate has a working knowledge of Georgia's framework for the identification of differentiated learning needs of students and how to implement multi-tiered structures of support addressing the range of learning needs.

Conceptual Framework

Vygotsky's socio-cultural theory's main principles are based on the relationship of social factors, between teachers and students (Whipple, 2012). Vygotsky's Zone of Proximal Development helps us understand not only why we differentiate, but how to differentiate. The basis of this theory is that instruction should be designed to reach a developmental level just above the student's current developmental level because that is where learning takes place (Vygotsky, 1978).

Using a metaphor, it would be similar to adjusting the height of each student's hurdle so that all students had to "stretch" the same amount. In other words, DI teachers need to think of what they can do to provide an appropriate degree of challenge for their students. If the challenge is either too great or too small, students will not learn as much or as well. Since students' developmental levels (readiness) change constantly, often in spurts, and since a developmental level of readiness in one subject area is likely to be different than in others, DI teachers depend on knowing a great deal about their students. If skills are too difficult for a child to master on his/her own, it can be done with guidance and encouragement from a knowledgeable person. Vygotsky stated that as long as a knowledgeable person was collaborating with a child, that child could continue to move forward in their learning (Vygotsky, 1978; Whipple, 2012). This is why ZPD theory was selected for the foundation of this study since it explains why DI is needed.

Methodology

This study was designed to examine teachers' understanding of DI and their current practices in the area of DI. The researchers focused on kindergarten through fifth-grade teachers because differentiating typically begins in the primary grades (Maddox, 2015). The following research questions guided the study.

1- What are elementary school teachers' understanding of DI in K-5 classrooms?

2- What are elementary school teachers' perceptions of their ability to implement components of DI to meet the needs of students from various backgrounds?

Participants

Thirty-one Kindergarten through 5th grade classroom teachers who are enrolled in a master's degree (Curriculum & Instruction) at a university in the state of Georgia participated in this study. The sampling in this study was convenience sampling. Convenience sampling is a type of nonprobability sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate is included for the purpose of the study (Dörnyei, 2007; Etikan et al., 2016).

For ethical consideration, the invitations for the study were distributed only after the course grades were posted at the end of spring 2020. Out of 76 invited teachers, 31 of them responded to the invitation. Students who agreed to participate in the study, first completed their consent agreement via DocuSign and then submitted their survey responses via Qualtrics. The specific researcher who collected the data was not included in the data analysis in order to avoid the bias-factor for the data collection from self-taught courses.

Participant Demographics

Graham et al. (2020) grouped teachers as 'beginning' (0-3 years of experience), 'transitioning' (4-5 years of experience), and 'experienced teachers' (more than 5 years of experience) while comparing the quality of teaching with the beginning (0-3 years of experience) and experienced (more than 3 years of experience) teachers. One of the first questions in the survey asked participants about their number of years of teaching experiences. The researchers in this study worked with the three groups of teachers as defined by Graham et al. (2020). Table 1 shows the gender and experiences of the teachers.

Table 1.

Demographics of the Participants

		Gender	
Participants	N	Male	Female
Teachers with 0-3 years of experience	11	1	10

Teachers with 4-5 years of experience	12	1	11
Teachers with 5+ years of experience	8	0	8

Survey Instrument

The survey on DI was developed by Tomlinson (2001) and modified by Page (2007) was used in this study. The survey has two parts: Part I consists of 26 Likert scale questions from 1: not important, to 4: very important on the understanding of DI. Part II asked teachers to identify their ability to implement DI. Part II has the same 26 questions as Part I with different Likert scale items as 1: hardly ever/never do this, 2: sometimes/ have used on a few occasions, 3: frequently use this, and 4: use intentionally and often. Both parts were organized by the six components of DI: Student interest, assessment, lesson planning, content, process, and product. The researchers also asked two open-ended questions on DI, and seven demographic questions such as the current subject area, grade taught years of teaching experience, and gender.

The Validity of the Survey

Carol Ann Tomlinson and Susan D. Allen are well-known educators and researchers who created the survey and published many articles and books on DI. The Teacher Survey on DI was implemented by Kiley (2011), Page (2007), Tomlinson (2000), and Whipple (2012) prior to this research. The researchers who implemented the survey also validated it prior to this research. The researchers in this study also piloted the survey to ensure validity. Eight participants were chosen from the same master's program as the pilot group. The pilot group completed the survey and inserted their comments electronically. They did not indicate any confusion or questions about the survey. They reported that the vocabulary was understandable, and directions were clear. They interpreted randomly selected five survey items successfully such as "I know individual student's life situations and how it may impact their learning", "I pre-assess students before instructing', "I adjust for diverse learner needs with scaffolding, tiering instruction and provide student choice in learning activities", "I use learner preference groups and/or learning preference centers", and "I provide a variety of assessment tasks". As a result of the pilot implementation of the survey, no changes were made.

Open-ended questions

1- Is it important to differentiate instruction in your classroom? Why or why not?
2- How do you differentiate instruction in your classroom to meet the needs of students from various backgrounds?

The purpose of the open-ended questions was to obtain detailed information about the importance, and implementation of DI to meet the needs of students from various backgrounds.

Results

Research Question 1: Understanding of Teachers about Differentiated Instruction

The data suggest that the teachers had a high level of understanding of each of the components of DI. The mean scores of the six components ranged from 3.10 to 3.93. Respondents reported the highest level of understanding of student interest which is the knowledge of individual students' interests, culture, expectations, and life situations. The lowest level of understanding was reported for the product which consists of items such as providing students with the choice to work alone, in pairs, or in small groups, and providing a variety of assessment tasks. Table 2 represents the mean, standard deviations, and ANOVA results for the six components for understanding DI. As ANOVA indicated, teachers did not have different levels of understanding based on years of teaching experience.

Table 2.

The Six Components of Differentiated Instruction: Understanding

Differentiated Instruction		0-3 years of experience	4-5 years of experience	5+ years of experience	All	ANOVA	
		n= 11	n= 12	n= 8	n= 31	F	p*
Student Interest	Mean	3.93	3.81	3.90	3.87	1.23	.307
	SD	.161	.216	.186	.192		
Lesson Planning	Mean	3.74	3.60	3.62	3.65	.452	.641
	SD	.335	.390	.433	.376		

Content	Mean	3.75	3.72	3.65	3.71	.199	.821
	SD	.295	.270	.441	.321		
Assessment	Mean	3.72	3.51	3.77	3.65	1.56	.228
	SD	.313	.430	.291	.365		
Process	Mean	3.50	3.54	3.71	3.57	.496	.614
	SD	.602	.410	.431	.483		
Product	Mean	3.56	3.10	3.50	3.37	2.66	.087
	SD	.448	.493	.626	.543		

Research Question 2: Teachers' Perceptions of Their Ability to Implement Differentiated Instruction

The content was rated the highest in the area of implementation with four items as clearly articulating what the teacher wants students to know, understand and be able to do and using a variety of materials other than the standard text. Product is the least implemented component of DI. Table 3 represents the means, standard deviations, and ANOVA results for six of the components for implementing DI. The ANOVA results showed that there is a significant difference between or among the groups on one of the components: assessment.

Table 3.

The Six Components of Differentiated Instruction: Teachers' Perceptions of Their Ability to Implement DI

Differentiated Instruction Implementation		0-3 years of experience n= 11	4-5 years of experience n= 12	5+ years of experience n= 8	All n= 31	ANOVA F	p*
Student	Mean	3.70	3.35	3.65	3.55	1.71	.199
Interest	SD	.497	.527	.399	.498		
Lesson	Mean	3.45	3.35	3.47	3.41	.189	.823
Planning	SD	.482	.526	.500	.490		
Content	Mean	3.65	3.50	3.75	3.62	.769	.473
	SD	.490	.464	.400	.455		
Assessm	Mean	3.61	3.28	3.87	3.55	6.98	.003*
ent	SD	.351	.430	.183	.418		
Process	Mean	3.31	3.35	3.78	3.45	1.91	.166
	SD	.742	.493	.247	.571		
Product	Mean	3.43	3.00	3.34	3.24	.973	.390

	SD	.581	.818	.944	.778

To determine the significant difference between or among the groups on assessment, Tukey HSD was calculated. The data shows a significant difference between the teachers with 4-5 years of experience and 5+ years of experience. Teachers with 5+ years of experience scored significantly higher (mean= 3.87) than teachers with 4-5 years of experience (mean= 3.28). There is no significant difference between teachers with 0-3 and 4-5 years of experience, and 0-3 and 5+ years of experience in terms of one of the components of DI: *assessment*.

Assessment in Differentiated Instruction

DI allows teachers to present varying learning activities and different content, as well as adopt varying modes of assessment to meet the needs of each child (Suprayogi et al., 2017; Thousand et al., 2007). According to Walker et al. (2004) assessment should consider the reader, the text, the reading and writing tasks involved, and the context in which tasks are performed. The survey in this study includes the following questions on assessment: I pre-assess students before instructing, I pre-assess readiness to adjust the lesson, I assess during the unit to gauge understanding, and I assess at the end of the lesson to determine knowledge acquisition, and I determine student's learning styles. Vygotsky's theory of Zone of Proximal Development implies that teachers are better able to assess a child's readiness levels.

To learn more about the implementation of DI in classrooms, the researchers asked two open-ended questions. In order to meet the needs of students from various backgrounds, the teachers agreed that DI is crucial. Some of the teachers stated that determining the students' learning styles allows teachers to choose the right assessment techniques for students' success. Teachers also agreed that they need to use data when differentiating their lessons and assessments for students that have different learning needs. Only one of them responded that she teaches several classes, inclusion, regular on level education, and advanced content/gifted classes, which means she cannot structure her lessons or assessments on one baseline method. Vygotsky implies that scaffolding is the support a student needs to make progress. Teachers should adjust the level of their intervention in response to students' needs (Whipple, 2012).

Some of the teachers agreed that using pre-assessment data helps the teachers see students' learning gaps in their prior knowledge of the content. They emphasized that they use pre-assessment data to align their lessons to be able to better serve students with all learning needs in their classrooms. Levy (2008) states that students come to the classrooms with a variety of abilities and experiences. Therefore, their education needs to begin with pre-assessments.

Discussion of Findings and Implications

Although the mean score of teachers with 4-5 years of experience was relatively high (mean: 3.28) on one of the components 'assessment' of teachers' perceptions of their ability to implement DI, teachers with 5+ years of experience mean score (3.87) was significantly higher. Grimes (2009) found out that assessing students' work daily helps to meet the needs of students. Tomlinson (2011) indicated that implementing pre-assessment and providing formative and summative assessments are important aspects of DI. Looking at the open-ended questions on the survey, one can conclude that the significant difference in this item comes from experienced teachers (5+ years) using pre-assessment results more effectively to DI. According to Guskey (2016) experienced teachers typically can accurately predict the results of pre-assessments. Many of the experienced teachers also start by determining students' interests. It helps them to identify which assessment techniques are appropriate for their students. By providing students with developmentally appropriate instruction and opportunities for success, teachers can effectively grow student interest in a variety of content areas (Garn et al., 2011; Viness et al., 2017).

When it comes to 'understanding' DI, all of the teachers scored the highest on 'student interest' with 3.87 average mean scores. Example survey questions on 'Student interest' are knowing individual student interests, culture, and expectations and relating them to instruction; knowing individual student life situations and its impact on their learning; being aware of student's learning disabilities and how to address them in lessons so as not to impair their learning. Effective DI involves knowing students, recognizing and reacting responsively to the students' varying background knowledge, and interests (George, 2005; Hall, 2009; Koutselini, 2006; Melesse, 2015; Tieso, 2003; Tomlinson, 2005). By providing students with developmentally appropriate instruction and opportunities for success, teachers can effectively grow student interest in a variety of content areas (Garn et al., 2011; Viness et al., 2017). They can administer short surveys,

ask questions, and engage in informal conversations with students to determine their interests (Viness et al., 2017).

Teachers' lowest mean score was on the 'product' (what the teacher wants the students to learn) when it comes to 'understanding' DI. Example survey questions on 'product' provide multiple modes of expression in the final product; provide students with the choice to work alone, in pairs, or in a small group; and provide a variety of assessment tasks. Although the mean score on 'product' is the lowest in the part 'understanding', it is still high (m=3.37) since it is between 'fairly important' and 'very important'.

The 'content' (information that students need to know and how it would be delivered) had the highest mean score (m= 3.62) when it came to the teachers' perceptions of their ability to 'implement' DI. 'Content' had four items in the survey as clearly articulating what the teacher wants students to know, understand and be able to do, and using a variety of materials other than the standard text. One of the items was about the definition of curriculum as it is based on major concepts and generalizations.

Same as 'understanding' DI, teachers' lowest mean score was on 'product' when it comes to 'implementing' DI (m= 3.24). The survey items were the same for both understanding and implementation of DI. The implementation of DI scores of teachers was between 'frequently use this' and 'use intentionally and often'. Vygotsky believed that 'process' is more important than 'product'. They looked directly at a child's series of actions and thoughts as she tries to solve a problem, and in the process, advance her own thinking (Miller, 2002).

Teachers in this study mentioned that the survey questions were helpful to enlighten their thoughts about DI. They mentioned under open-ended questions that they will talk to their colleagues about instructional strategies for differentiation, and designing lessons based on students' needs during the grade-level meetings. Therefore, they all can learn techniques on how to DI or seek professional development opportunities to implement DI in their classrooms. Teachers also stated that conversations on DI with teachers, instructional coaches, mentors, and principals would be beneficial.

Teacher professional development can clearly be linked to a DI implementation. Many authors link professional development to teacher professionalism and DI (Dixon et al., 2014; Rienties et al., 2013; Suprayogi, 2017). Many of the teachers in this study mentioned that professional development, workshops, and staff development activities with demonstrations would help teachers to DI. Walker-Dalhouse (2010), emphasize the importance of professional development for educators who implement new instructional strategies, such as DI. This research may help stakeholders if they plan professional development for teachers to enhance their knowledge and develop strategies for the effective implementation of DI. Based on the result of this research, the district may provide opportunities to help teachers increase their understanding of DI and feel more confident implementing it. Administrators may work with the teachers to differentiate instruction and help monitor students' learning. In other words, teachers may feel supported to make the necessary changes to differentiate instruction.

Conclusion

As the classroom continues to become more diverse, educators must appreciate the value of employing tactics that allow them to reach and challenge each student. DI looks to be successful at enhancing student involvement and understanding. Therefore, in ensuring effective implementation of this approach, great attention should be given to the challenges each stakeholder face. This study tried to learn about elementary school teachers' understanding of DI in K-5 classrooms and perceptions of their ability to implement components of DI to meet the needs of students from various backgrounds. The results suggested that while teachers mostly agree that differentiation is an important instructional strategy, they are faced with multiple barriers for implementation such as lack of DI knowledge and practice and need for resources and professional development.

Based on the responses from the participants of this study, it is highly suggested that policymakers and district and school officials should recognize the types of support that teachers require to improve instruction. Providing time and structure for collaboration -particularly collaboration centered on school improvement, improved instructional resources and practices, and teachers' input into professional development -is critical in assisting instructors in meeting the needs of their academically diverse pupils. In addition, our findings show that the more teachers who report collaborating, the more likely they are to differentiate instruction in their classrooms.

Increased collaboration between teachers and practicum sites should be an urgent option to meet the numerous and diverse requirements of students in classrooms. Active collaborations with practicum sites can be formed to ensure that practicum students have the chance to directly apply DI concepts learned in the courses. Teachers who have more hands-on experience may be better equipped to enter the profession. As there are limitations with all research, this study is no exception. This study is limited to 31 classroom teachers located in the state of Georgia. Increasing the number of participants can enhance the generalization of the results. Secondly, the data collection was only included an online survey due to covid. Perhaps, other means of data collection instruments such as observations, pre-post tests can also enhance the generalization.

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