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From attitudes to practice: The role of differentiated instruction in enhancing teaching effectiveness among special education teachers in inclusive classrooms

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Abstract

Differentiated instruction is widely recognized as a contemporary pedagogical approach that supports inclusive education by addressing the diverse and unique needs of students with disabilities within a single classroom environment. The present study aimed to investigate special education teachers' attitudes toward the use of differentiated instruction in inclusive classrooms, as well as to examine the relationship between the use of differentiated instruction and teaching effectiveness. A mixed-methods research design (sequential explanatory design) was employed. Quantitative data were collected through a questionnaire administered to (78) special education teachers in Saudi Arabia, followed by qualitative data gathered through semi-structured interviews with (25) teachers drawn from the same participant pool to obtain in-depth insights. The quantitative findings revealed that teachers held highly positive attitudes toward differentiated instruction, with no statistically significant differences observed according to the study variables, Except for the educational stage variable. In contrast, the qualitative findings indicated variability in the extent to which differentiated instructional strategies were practically implemented in classroom settings. Moreover, the results demonstrated a positive correlation between the use of differentiated instruction and teaching effectiveness, highlighting the importance of this pedagogical approach in enhancing the quality of instruction provided to students with disabilities.

Keywords: Differentiated instruction, Special education, Teaching effectiveness.

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Institutional Review Board Statement: This study was conducted in full compliance with the ethical standards governing educational research. Formal ethical approval was obtained from the Institutional Review Board (IRB) at King Faisal University prior to the commencement of the study, along with all required administrative permissions from the relevant authorities to facilitate data collection. The research design was carefully structured to minimize any potential risks to participants. Anonymity and confidentiality were strictly maintained, and all participants provided informed consent by reading and signing a consent form that clearly outlined the study purpose and affirmed their right to withdraw at any stage without any penalty. Participants were also assured that all collected data would be used exclusively for research purposes and handled with strict confidentiality throughout the study.
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1. Introduction

Contemporary classrooms have become increasingly diverse in terms of students' cultural and academic backgrounds, characteristics, interests, and learning styles, rendering reliance on a single instructional approach insufficient to address such diversity [1]. In response to this reality, differentiated instruction has emerged as one of the most prominent modern educational approaches capable of meeting learners' diverse needs in both general and special education classrooms [2]. It provides a pedagogical framework that allows instruction to be adapted to students' individual characteristics, ensuring that academic success is not limited to a narrow group of learners but is accessible to the widest possible range of students in achieving the intended learning outcomes [3]. Differentiated instruction also enables all learners to attain the same educational goals with varying levels of support, regardless of their abilities, interests, or learning styles [4].

Educational literature consistently indicates that the instructional strategies employed by teachers play a fundamental role in enhancing students' learning outcomes and motivation [5]. Both differentiated instruction and individualized instruction are approaches that allow teachers to adapt content, process, product, and learning environment according to students' readiness, abilities, and learning needs [6, 7]. Numerous studies have demonstrated that differentiated instruction contributes to improved student performance in reading comprehension and fluency [8] enhances achievement in mathematics [9] increases motivation, strengthens teacher–student relationships, and helps reduce achievement gaps among learners [10].

Within the context of special education and inclusive education, differentiated instruction assumes heightened importance, as it is regarded as a key approach for addressing the needs of students with disabilities in both inclusive and special classrooms, enabling them to learn alongside their peers [11, 12]. This approach aligns with global movements toward education for all, as reflected in international conventions and frameworks such as the United Nations Convention on the United Nations [13] and UNESCO's orientations toward inclusive education [13]. Article 24 of the Convention obliges States Parties to ensure an inclusive education system at all levels that upholds the rights of persons with disabilities on the basis of equal opportunity [13].

Despite the strong theoretical support for differentiated instruction, research indicates that special education teachers face tangible challenges in its implementation, including time management, behavior management, limited resources, and insufficient specialized professional training [14]. Other studies further suggest that many teachers lack the necessary skills and knowledge to design differentiated lesson plans and do not fully understand national policies related to inclusive education [3, 12].

Accordingly, there is a growing need for qualitative and interpretive studies that explore special education teachers' lived experiences in implementing differentiated and individualized instruction, and that examine their perceptions, strategies, and challenges within authentic classroom contexts [15]. Teachers who successfully integrate learning theories with differentiated and individualized instruction can offer rich practical insights that inform educational practice, enhance teacher preparation programs, and support the development of relevant educational policies [16, 17].

Based on the foregoing, the present study seeks to explore special education teachers' perceptions of implementing differentiated instruction with students with disabilities, to identify the strategies they employ in classroom practice, and to examine the relationship between differentiated instruction and teaching quality, in light of contemporary educational literature and international and national policies supporting inclusive education.

2. Statement of the Problem

Uniform, one-size-fits-all teaching approaches fail to effectively serve diverse learners; consequently, the "one teaching method fits all" model has been subject to substantial criticism [18]. The use of a single instructional approach increases the risk of dropout, loss of motivation, boredom, and low academic achievement among many students, particularly those with disabilities [19]. This reality underscores the necessity of diversifying instructional methods to meet learners' varied needs especially those of students with disabilities.

Current literature on differentiated learning has extensively examined its use and impact on teaching. While teachers often employ certain components of differentiated instruction sometimes unconsciously—to address learner diversity, existing studies lack a comprehensive exploration of how teachers effectively apply differentiated instruction to meet diverse learning needs [18]. The research gap lies in understanding how teachers implement differentiated instruction in practice, as well as the specific benefits and limitations associated with its use [20].

A study by Mengistie [21] which specifically examined teachers' knowledge of differentiated instruction, found varying levels of understanding. Although teachers were familiar with the concept, many were unable to identify specific strategies for managing mixed-ability classrooms in ways that engage all learner groups simultaneously. Similarly, Zegeye [22] reported that while teachers possessed general awareness of differentiated instruction, aspects such as content differentiation, instructional differentiation, thematic differentiation, and assessment differentiation were less well understood.

Effective implementation of differentiated instruction depends largely on teachers' conceptual understanding and attitudes toward it Njagi [23]. Teacher readiness, commitment, preparation, and institutional support are critical to the success of differentiated instruction. Developing positive attitudes toward differentiated instruction is essential for supporting student learning and addressing diverse needs [22] as positive classroom attitudes influence both instructional practices and student achievement, thereby fostering a supportive learning environment [24]. Teachers who value differentiated instruction are generally more inclined to implement it within their schools [25]. When applied appropriately, differentiated instruction can provide meaningful pathways to reach learners who struggle with understanding instructional content and help mitigate the challenges they face in classroom settings [26].

Accordingly, the significance of the present study lies in its examination of teachers' attitudes and their practical application of differentiated instructional approaches. It further highlights how differentiated instruction can be more effective in providing learning opportunities that align with students' individual learning pace. Special education teachers can develop student-centered approaches tailored to learners with disabilities, leading to constructive changes that facilitate improved learning opportunities.

This study seeks to address the identified research gap, by documenting teachers' narratives and practical experiences in contexts characterized by limited resources and organizational challenges. Specifically, it examines special education teachers' attitudes toward differentiated instruction and explores its relationship with teaching quality in inclusive classrooms. Presenting narratives from experienced special education teachers who have successfully implemented these instructional approaches and overcome implementation barriers may assist other teachers who encounter difficulties by providing concrete strategies identified in this study to enhance their instructional practices.

3. Research Questions

The present study sought to answer the following research questions:

1. What are special education teachers' attitudes toward the use of differentiated instruction in inclusive classrooms?
2. To what extent do special education teachers' attitudes toward differentiated instruction differ according to the following variables: gender, type of learners taught, academic qualification, educational stage, years of experience, and training courses?
3. What is the current level of special education teachers' practice of differentiated instruction strategies in inclusive classrooms?
4. How do special education teachers perceive the relationship between differentiated instruction and the quality or effectiveness of teaching provided to students with disabilities in classroom settings?

4.Literature Review

4.1. Concept of Differentiated Instruction and Its Components

Differentiated instruction is a teaching philosophy grounded in the premise that students learn more effectively when teachers deliberately and systematically address differences in students' readiness levels, interests, and learning profile preferences [27, 28]. It has been defined as an evidence-based instructional approach asserting that curricula and teaching strategies should vary according to the diverse needs of learners within the classroom [29]. Differentiated instruction may also be understood as the use of varied instructional strategies designed to meet students' diverse needs in order to enhance their learning outcomes [30].

Differentiated instruction is further defined as a set of strategies employed by teachers to modify content, process, product, and the learning environment in alignment with learners' needs, readiness, interests, and learning styles [7]. The core components of differentiated instruction include the following:

- Flexible grouping: Students work in various configurations (individual, pair, small-group, or whole-group), which are adjusted according to instructional goals and students' proficiency levels.
- Respectful tasks: All tasks are meaningful, appropriately challenging, and standards-based, rather than simplified in ways that diminish learning opportunities for certain students.
- Adaptation of the four instructional elements:
- Content: Organizing and presenting instructional material at varying levels and through multiple modalities to accommodate differences in readiness and ability.
- Process: Varying learning activities, instructional methods, practice pacing, and classroom interaction patterns.

- Product: Allowing students to demonstrate learning through diverse formats such as projects, presentations, written reports, or hands-on activities.
- Learning environment: Establishing a flexible classroom environment that supports individual and collaborative work, integrates technology, and allows for movement and choice [32 ,31 ,28 ,20 ,7].

4.2. Principles of Differentiated Instruction

Many educators agree that differentiated instruction represents a practical solution to educational challenges and affirms the right to quality education for all learners by placing the learner—along with their unique characteristics and needs—at the center of the teaching–learning process [33]. Differentiated instruction is guided by several key principles, including:

1. Every learner has the right to receive high-quality education and possesses the capacity to learn.
2. Differentiated instruction promotes learner growth by treating each learner as a unique individual and supporting them in reaching their fullest potential.
3. Teachers must understand, recognize, and value individual differences through thoughtful instructional planning and implementation.
4. Curriculum adaptation in terms of content, processes, and outcomes should be based on learners' readiness, interests, and learning styles.
5. Learners are provided with opportunities for choice, flexibility, and continuous assessment of learning.
6. Learners and teachers function as collaborative partners in the learning processs [34 ,31 ,7] .

4.3. Educational Foundations and Theories Supporting Differentiated Instruction

Differentiated instruction is grounded in several learning theories, most notably:

1. Vygotsky's Sociocultural Theory: Particularly the concept of the Zone of Proximal Development (ZPD), which posits that learners achieve optimal learning when provided with support appropriate to their current level, with scaffolding gradually withdrawn as independence increases—an approach closely aligned with differentiated instruction strategies [15].
2. Multiple Intelligences Theory: This theory views learners as possessing diverse forms of intelligence (linguistic, logical–mathematical, bodily–kinesthetic, musical, etc.), necessitating varied instructional methods and activities to accommodate these differences [35].
3. Universal Design for Learning (UDL): UDL advocates providing multiple means of representation, expression, and engagement to ensure accessible learning opportunities for students with disabilities and others [36].
4. Constructivist Theories and Project-Based Learning: These emphasize learners' active role in knowledge construction and the use of project-based and cooperative learning, aligning with the differentiation of content, process, and product according to learners' needs [37, 38].

Integrating these theories guides teachers in designing more effective and meaningful differentiated strategies, contributing to improved educational practice, enhanced teacher preparation programs, and strengthened educational policies—particularly within special education and inclusive settings [16, 17].

4.4. Importance of Differentiated Instruction

Differentiated instruction seeks to provide equitable learning opportunities for all learners within a single classroom, despite differences in interests, abilities, and learning preferences. It contributes to improved academic achievement for all students, addresses diverse educational needs, promotes independent and self-directed learning, and enhances learners' confidence in their abilities [39]. Additionally, differentiated instruction fosters learner satisfaction and motivation to improve academic performance, particularly among primary school students who often face learning challenges and require individualized support [7].

Differentiated instruction holds particular significance for students with disabilities, as it is considered an effective means of instruction tailored to their needs [40]. It has become a central concept in educating students with disabilities in both inclusive and special education settings, enabling them to learn alongside their peers and achieve meaningful educational outcomes [41]. Given the wide range of individual differences among students with disabilities spanning cognitive, neurological, sensory, physical, and developmental domains differentiated instruction is especially critical in addressing their diverse learning profiles [42].

Accordingly, there are numerous justifications for implementing differentiated instruction in educational contexts. One key rationale is that general education curricula are typically standardized, requiring teachers to adapt instructional content to accommodate learners' diverse needs [43]. Furthermore, variations in learners' characteristics, learning styles, educational goals, motivation, and challenges underscore the importance of differentiated instruction [33].

4.5. Elements and Domains of Differentiated Instruction

Successful implementation of differentiated instruction depends on several essential elements:

1. The Teacher: Teachers are responsible for selecting and managing instructional strategies [43, 44].
2. The Learner: Differentiation can be applied to all learners based on their readiness, interests, and learning preferences.
3. Instructional and Managerial Strategies: These include flexible grouping, multiple intelligences-based activities, and other adaptive approaches [43].

4. Learning Environment: Differentiated instruction occurs within various educational settings (classrooms, laboratories, libraries), where teachers and learners collaboratively plan and implement instructional programs [33].

4.6. Steps for Successful Implementation of Differentiated Instruction

Several key steps contribute to the successful implementation of differentiated instruction:

1. Pre-assessment: Identifying learners' differences through data collection tools such as observation, interviews, and questionnaires to determine learning preferences, abilities, and needs.
2. Defining Learning Objectives: Selecting appropriate instructional materials, activities, and learning resources aligned with these objectives.
3. Preparing and Organizing the Physical Environment: Designing instructional settings and adapting teaching strategies to accommodate learner diversity while promoting choice and active participation.
4. Diversifying Activities and Tasks: Providing varied learning tasks to support the achievement of instructional objectives.
5. Assessment**:** Evaluating learning products and outcomes to measure instructional effectivenesss [31, 45, 46].

5. Materials and Methods

5.1. Methodology

This study adopted a mixed-methods approach using a sequential explanatory design, which involves two consecutive phases. The first phase focused on quantitative methods, while the second phase employed qualitative methods to provide deeper interpretation and richer understanding of the quantitative findings [47]. This design enabled participants to articulate effective strategies for implementing differentiated instruction that better support students in special education contexts.

5.2. Population and Sample

A comprehensive survey approach was used to collect quantitative data from 78 male and female special education teachers in Saudi Arabia. The questionnaire was distributed electronically to the entire study population, resulting in 78 valid responses. From this group, a purposive sample of 25 teachers was selected for the qualitative phase due to the sensitivity of the research topic and the practical challenges associated with conducting in-depth interviews with all participants. Qualitative participants were selected based on the following inclusion criteria:

1. Employment as a special education teacher working in inclusive classrooms in Saudi Arabia.
2. Alignment of participant characteristics with the study's objectives.
3. Accessibility and willingness to participate in interviews.
4. Explicit consent to participate in the study.

Tables 1 and 2 present the demographic and personal characteristics of participants in the quantitative and qualitative phases, respectively.

Table 1.
Demographic Characteristics of Participants in the Quantitative Study.

Variable	Category	Frequency	Percent
Gender	Male	36	46.2
	Female	41	52.6
Type of Disability Taught	Intellectual disability	27	34.6
	Hearing impairment	3	3.8
	Visual impairment	2	2.6
	Learning disabilities	10	12.8
	Giftedness	15	19.2
	Other	20	25.6
Academic Qualification	Bachelor's in Special Education	33	42.3
	Bachelor's in General Education	19	24.4
	Master's degree	19	24.4
	Doctoral degree	3	3.8
	Other	3	3.8
Years of Teaching Experience	Less than 1 year	5	6.4
	1–5 years	14	17.9
	More than 5 years	58	74.4
Educational Stage	Early childhood	21	26.9
	Elementary stage	26	33.3
	Middle school	13	16.7
	Secondary school	17	21.8
Training Courses Attended	None	8	10.3
	1–5 courses	13	16.7
	More than 5 courses	56	71.8

Table 2.
Demographic Characteristics of Participants in the Qualitative Study.

ID	Gender	Type of Disability Taught	Academic Qualification	Years of Experience	Educational Stage	Training Courses
P1	Female	Giftedness	Doctoral degree	> 5 years	Secondary school	> 5 courses
P2	Male	Learning disabilities	Bachelor's in Special Education	> 5 years	Elementary (Grades 4–6)	> 5 courses
P3	Male	Learning disabilities	Bachelor's in General Education	1–5 years	Middle school	1–5 courses
P4	Female	Giftedness	Master's degree	> 5 years	Elementary (Grades 4–6)	> 5 courses
P5	Female	Giftedness	Master's degree	> 5 years	Middle school	> 5 courses
P6	Male	Giftedness	Master's degree	> 5 years	Secondary school	> 5 courses
P7	Female	Intellectual disability	Bachelor's in Special Education	> 5 years	Secondary school	> 5 courses
P8	Female	Giftedness	Master's degree	> 5 years	Elementary (Grades 4–6)	> 5 courses
P9	Female	Giftedness	Bachelor's in General Education	1–5 years	Elementary (Grades 4–6)	> 5 courses
P10	Female	Intellectual disability	Master's degree	1–5 years	Early childhood (Grades 1–3)	> 5 courses
P11	Female	Intellectual disability	Master's degree	< 1 year	—	1–5 courses
P12	Male	Intellectual disability	Bachelor's in Special Education	1–5 years	Elementary (Grades 4–6)	> 5 courses
P13	Female	Learning disabilities	Bachelor's in General Education	> 5 years	Early childhood (Grades 1–3)	> 5 courses
P14	Male	Intellectual disability	Bachelor's in Special Education	> 5 years	Middle school	1–5 courses
P15	—	Intellectual disability	Master's degree	> 5 years	Secondary school	> 5 courses
P16	Female	Giftedness	Master's degree	> 5 years	Secondary school	> 5 courses
P17	Male	Intellectual disability	Bachelor's in General Education	> 5 years	Elementary (Grades 4–6)	> 5 courses
P18	Male	Intellectual disability	Bachelor's in Special Education	> 5 years	Elementary (Grades 4–6)	> 5 courses
P19	Male	Other	Other	> 5 years	Secondary school	> 5 courses
P20	Female	Other	Bachelor's in Special Education	> 5 years	Early childhood (Grades 1–3)	> 5 courses
P21	Male	Other	Bachelor's in Special Education	> 5 years	Middle school	> 5 courses
P22	Male	Other	Bachelor's in Special Education	1–5 years	Elementary (Grades 4–6)	None
P23	Male	Intellectual disability	Bachelor's in Special Education	1–5 years	Middle school	1–5 courses
P24	Male	Other	Master's degree	> 5 years	Secondary school	> 5 courses
P25	Male	Intellectual disability	Master's degree	1–5 years	Secondary school	1–5 courses

5.3. Research Instruments

The study employed two main instruments developed in alignment with the study objectives and the characteristics of the participants, as follows:

5.3.1. Questionnaire on Special Education Teachers' Attitudes toward Differentiated Instruction (Developed by the Researcher)

The questionnaire served as the primary instrument in this study and was developed by the researcher to assess special education teachers' attitudes toward differentiated instruction. The instrument was constructed based on a review of relevant previous instruments and studies, as well as contemporary literature on differentiated instruction.

To establish content validity, the initial version of the questionnaire was reviewed by five experts in special education and psychology, who evaluated the clarity, relevance, and comprehensiveness of the items. Based on their feedback, necessary revisions were made to enhance face and content validity. Internal consistency validity was examined by calculating Pearson correlation coefficients between each item and the total score using a pilot sample of 20 male and

female teachers from the final study sample. Correlation coefficients ranged from 0.339 to 0.722, all of which were statistically significant at p = 0.01 or p = 0.05, indicating strong internal validity. Reliability was assessed using Cronbach's alpha, which yielded a value of 0.93, reflecting a high level of internal consistency.

5.3.1.1. Questionnaire Structure

In its final form, the questionnaire consisted of two sections:

- Section One: Demographic information, including gender, type of learners taught, academic qualification, years of experience, educational stage, and training courses.
- Section Two: Thirty items distributed across three domains:
- Attitudes toward differentiated instruction (Items 1–12).
- Practices of differentiated instruction in inclusive classrooms (Items 13–22).
- Teaching effectiveness of special education teachers (Items 23–30).

Responses were measured using a five-point Likert scale ranging from (1 = Strongly disagree) to (5 = Strongly agree) (see Appendix A).

5.3.2. Individual Interviews

Semi-structured interviews were used as the primary instrument for collecting qualitative data due to their ability to generate rich and flexible data that reflect participants' experiences and perceptions in depth [48]. The interviews included core and follow-up questions addressing three main areas: teachers' attitudes toward differentiated instruction, actual classroom practices, and teaching effectiveness and its relationship to differentiated instruction (see Appendix B).
Qualitative data collection and analysis followed clear stages:

1. Preparation: Reviewing interview questions and establishing their validity through consultation with qualitative research experts.
2. Data Collection: Conducting face-to-face interviews with participants until theoretical data saturation was achieved.
3. Data Analysis**:** Audio-recording interviews, taking field notes, and preparing for the coding process.

5.4. Data Analysis

5.4.1. Quantitative Analysis

Quantitative data were analyzed using SPSS (Version 20). The analysis included:

1. Calculating means and standard deviations to determine participants' responses to all questionnaire items.
2. Using one-way analysis of variance (ANOVA) to examine differences among groups across all variables except gender.
3. Employing independent samples t-tests to examine gender-based differences in questionnaire scores.

5.4.2. Qualitative Analysis

Qualitative data were analyzed using the Conceptual Analysis Method (CAM), an inductive approach that facilitates the identification of themes and patterns without imposing predetermined categories [49]. The analysis followed the steps outlined by Braun and Clarke [49] including familiarization with the data, generating initial codes, clustering codes into main themes, reviewing and validating themes, and producing the final report while linking findings to the literature.

5.5. Trustworthiness and Credibility of Qualitative Data

To ensure the quality, objectivity, and rigor of the qualitative findings, the study followed a set of credibility and trustworthiness procedures as recommended by Abu 'Allam [48] and Al-Abdulkareem [50] including:

1. Triangulation: Data sources were diversified by integrating questionnaire data with individual interviews to reduce bias and enhance credibility.
2. Expert Review: Four faculty members specializing in education reviewed the interview questions and recommended deleting, rephrasing, or adding more detailed questions. Necessary revisions were made accordingly.
3. Systematic Coding: The researcher maintained organized field notes and coding files to document emerging ideas and support systematic data interpretation.
4. Member Checking: Full interview transcripts were shared with participants to verify the accuracy of their statements and interpretations, thereby enhancing the credibility of the findings.

6. Results

6.1. Results of the First Research Question

To address this question, means and standard deviations were calculated for all questionnaire items. The results are presented in Table 3.

Table 3.
Means and Standard Deviations for All Questionnaire Items.

#	Mean	Std. Deviation
A1	4.69	0.520
A2	4.53	0.661
A3	4.45	0.753
A4	4.51	0.737
A5	4.49	0.788
A6	4.35	0.807
A7	4.56	0.639
A8	4.56	0.678
A9	4.53	0.680
A10	4.56	0.596
A11	4.08	0.900
A12	4.58	0.570
A13	4.45	0.597
A14	4.58	0.522
A15	4.40	0.654
A16	4.64	0.536
A17	4.51	0.599
A18	4.25	0.781
A19	4.31	0.693
A20	4.36	0.667
A21	4.52	0.598
A22	4.35	0.774
A23	4.32	0.751
A24	4.48	0.661
A25	4.39	0.672
A26	4.45	0.597
A27	4.44	0.618
A28	4.44	0.639
A29	4.31	0.765
A30	4.45	0.699

To ensure an objective interpretation of teachers' attitudes, attitude levels were classified according to the criteria presented in Table 4.

Table 4.
Levels of Attitudes.

Mean Score	Attitude Level
1.00 – 1.80	Very Negative
1.81 – 2.60	Negative
2.61 – 3.40	Moderate
3.41 – 4.20	Positive
4.21 – 5.00	Very Positive

As shown in Table 3 the mean scores of teachers' responses to the questionnaire ranged from 4.08 to 4.69, which fall within the positive to very positive range. This finding indicates that special education teachers hold highly positive attitudes toward differentiated instruction.

6.2. Results of the Second Research Question

To answer this question, differences in special education teachers' attitudes toward differentiated instruction were examined according to a set of variables, as follows:

6.2.1. Gender

Table 5.
Differences in Teachers' Responses to the Questionnaire According to Gender.

Levene's Test for Equality of Variances								
				Significance			Mean	Std. Error
F	Sig.	t	df	One-Sided p	Two-Sided p		Difference	Difference
Equal variances assumed	0.286	0.594	-1.041	75	0.151	0.301	-0.09490	0.09113
Equal variances not assumed			-1.050	74.996	0.149	0.297	-0.09490	0.09039

The results of Levene's test indicated homogeneity of variances ($p > 0.05$). Independent samples t-test results revealed no statistically significant differences between male and female teachers' attitudes toward differentiated instruction ($p > 0.05$).

6.2.2. Type of Learners Taught

Table 6.
Differences in Teachers' Responses According to the Type of Learners Taught.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	191.163	34	5.622	1.619	0.069
Within Groups	145.824	42	3.472		
Total	336.987	76			

One-way analysis of variance (ANOVA) showed no statistically significant differences in teachers' attitudes toward differentiated instruction based on the type of learners taught ($F = 1.619$, $p = 0.069$).

6.2.3. Academic Qualification

Table 7.
Differences in Teachers' Responses According to Academic Qualification.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	43.773	34	1.287	1.145	0.335
Within Groups	47.214	42	1.124		
Total	90.987	76			

The ANOVA results indicated no statistically significant differences in teachers' attitudes toward differentiated instruction attributable to academic qualification ($F = 1.145$, $p = 0.335$).

6.2.4. Educational Stage

Table 8.
Differences in Teachers' Responses According to Educational Stage.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	54.447	34	1.601	1.735	0.045
Within Groups	38.774	42	0.923		
Total	93.221	76			

The ANOVA results revealed statistically significant differences in teachers' attitudes toward differentiated instruction based on educational stage ($F = 1.735$, $p = 0.045$).

6.2.5. Years of Teaching Experience

Table 9.
Differences in Teachers' Responses According to Years of Experience.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.255	34	0.302	0.779	0.772
Within Groups	16.264	42	0.387		
Total	26.519	76			

The ANOVA results demonstrated no statistically significant differences in teachers' attitudes toward differentiated instruction based on years of teaching experience ($F = 0.779$, $p = 0.772$).

6.2.6. Training Courses

Table 10.
Differences in Teachers' Responses According to Training Courses.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18.387	34	0.541	1.448	0.127
Within Groups	15.690	42	0.374		
Total	34.078	76			

The findings indicated no statistically significant differences in teachers' attitudes toward differentiated instruction attributable to the number of training courses attended ($F = 1.448$, $p = 0.127$).

6.3. Results of the Third Research Question

To address the third research question, the (CAM) was employed to analyze participants' responses. Teachers' accounts regarding their actual practice of differentiated instruction were categorized into five main themes, as presented below.

6.3.1. Differentiation of Instructional Content

A large number of participants agreed that content differentiation is among the most frequently used strategies in differentiated instruction. Teachers reported modifying instructional materials to align with students' varying abilities and proficiency levels through text simplification, summarization, and the use of multiple resources such as images, videos, and concrete instructional materials. One participant stated: "I simplify the content for some students using pictures and cards, while I provide more in-depth activities for others based on their level" (P12). Another participant explained: "Diversifying content helps me achieve the same learning objective for all students without making any student feel incapable or unsuccessful" (P15).

6.3.2. Differentiation of Processes and Classroom Activities

The findings indicated that participants differentiated instructional processes by varying classroom activities and learning approaches, including cooperative learning, learning stations, game-based learning, role play, and both individual and group activities. One participant noted: "I use game-based learning and cooperative groups because students engage more and enjoy the learning process" (P13). Another participant reported: "I change my teaching methods and activities according to each group's level; some students learn better through hands-on activities, while others prefer discussion" (P11).

6.3.3. Differentiation of Learning Products and Assessment

Many participants emphasized the importance of diversifying learning products and assessment methods as a core component of differentiated instruction. Students were allowed to demonstrate their learning through various formats, such as presentations, projects, performance-based activities, or oral responses, rather than relying solely on traditional written tests. One participant stated: "I give students the freedom to choose how they present what they have learned, whether through a project, a presentation, or a practical activity" (P14). Another participant added: "Using varied assessment methods helps me measure a student's true level without putting pressure on them" (P8).

6.3.4. Flexible Grouping and Ability-Based Clustering

A substantial number of participants reported using flexible grouping as an effective differentiated instruction strategy. Students were grouped based on ability levels or interests, with group composition adjusted according to instructional objectives. One participant explained: "I group students by level and frequently change the groups so that no student feels permanently labeled" (P10). Another participant noted: "Sometimes I pair a high-performing student with a lower-performing one to provide support during the activity" (P6).

6.3.5. Integration of Technology and Diverse Instructional Media

Participants highlighted the significant role of educational technology in supporting differentiated instruction. Tools such as interactive whiteboards, digital games, instructional videos, and interactive applications were used to address diverse learning styles. One participant stated: "Using videos and digital games helps students with learning difficulties understand the material more effectively" (P3). Another added: "Technology makes differentiated instruction easier and more efficient in the classroom, especially when students' levels vary widely" (P16).

Overall, the qualitative findings indicate that participants implement differentiated instruction through a comprehensive set of strategies encompassing content, process, and product differentiation, flexible grouping, and the use of educational technology. This diversity of practices reflects a high level of pedagogical awareness regarding the importance of addressing individual differences and promoting educational equity in inclusive classrooms.

6.4. Results of the Fourth Research Question

To answer the fourth research question, the (CAM) was also used to analyze participants' responses. Teachers' perceptions regarding the impact of differentiated instruction on teaching effectiveness were classified into five main themes, as outlined below.

6.4.1. Positive Relationship between Differentiated Instruction and Teaching Effectiveness

The vast majority of participants agreed that there is a direct positive relationship between the implementation of differentiated instruction and teaching effectiveness. As the level of differentiated instruction increases, the quality and effectiveness of teaching improve. One participant clearly expressed this view: "The more effectively I apply differentiated instruction, the more I notice improvements in students' engagement and understanding, which directly enhances lesson quality" (P3).

Participants emphasized that teaching quality is not merely determined by content delivery, but by the teacher's ability to reach all students despite differences in ability levels. One participant explained: "Differentiated instruction enables teachers to accurately diagnose students' levels, recognize individual differences, plan flexible instruction, implement diverse strategies that increase participation and achievement, and evaluate progress based on clear individual goals—while making efficient use of time and resources" (P7). Another participant highlighted additional advantages: "Differentiated instruction enhances instructional quality because it relies on real data to guide in-class decisions, improves student learning—which is a key indicator of teaching quality in modern evaluations—and reduces wasted time and effort, making teaching more precise and effective" (P9). Similarly, one participant remarked: "Differentiated instruction is the key to the success of the educational process for students with disabilities" (P11).

6.4.2. Differentiated Instruction as an Indicator of Teachers' Professional Competence

Many participants viewed the ability to implement differentiated instruction as a reflection of professional competence rather than merely an additional teaching strategy. Teachers capable of differentiation were described as possessing advanced planning, implementation, and assessment skills. One participant stated: "A teacher who differentiates instruction demonstrates awareness of students' levels, flexible planning skills, and intelligent classroom management. Differentiated instruction is not limited to adapting lessons for students with disabilities; it reflects professional competence, flexibility, and the ability to manage authentic and inclusive learning" (P7).

Another participant noted: "The relationship between differentiated instruction and teaching quality is highly integrative; differentiated instruction is a core tool for enhancing teaching effectiveness because it moves beyond uniform instruction and enables competent teachers to meet individual learner needs through content, process, and product adaptation, resulting in deeper understanding" (P10). This perspective reflects a shift in the concept of teaching competence from mere knowledge transmission to data-informed learning management that accounts for individual differences.

6.4.3. Differentiated Instruction as a Mechanism for Educational Equity and Inclusion

Participants indicated that differentiated instruction contributes to narrowing educational gaps between students with disabilities and their peers, thereby promoting equity, inclusion, and fairness within inclusive classrooms. One participant stated: "Differentiated instruction ensures that all students can achieve learning objectives through approaches that match their abilities" (P5).

Teachers emphasized that instructional quality is achieved not through superficial equality, but through educational equity that responds to each student's needs—the essence of differentiated instruction. One participant explained: "Differentiated instruction does not treat students equally; it gives each student what they need, and that is true justice" (P8).

6.4.4. Differentiated Instruction as an Approach to Improving Learning Outcomes

Participants noted that the impact of differentiated instruction extends beyond teacher performance to include improved student learning outcomes—one of the most critical indicators of teaching quality. One participant stated: "When I apply differentiated instruction, I notice better understanding, reduced frustration, and increased motivation among students" (P2). Participants further emphasized that teaching quality is reflected in improved achievement, increased classroom participation, and reduced learning gaps all of which were directly associated with the implementation of differentiated instruction.

6.4.5. The Interdependent Relationship between Differentiated Instruction and Teaching Effectiveness

At a deeper analytical level, some participants described the relationship between differentiated instruction and teaching effectiveness as interdependent rather than unidirectional. One participant articulated this relationship as follows: "High-quality teaching cannot exist without differentiated instruction, and differentiated instruction cannot be implemented without a competent teacher" (P4). This perspective suggests that differentiated instruction does not occur automatically; rather, it requires professional competence. At the same time, the implementation of differentiated instruction contributes to the development of such competence.

In summary, the findings confirm that differentiated instruction constitutes a fundamental criterion of teaching quality rather than an optional instructional strategy. It enhances teachers' professional competence and improves learning outcomes for students, positioning differentiated instruction as a cornerstone of high-quality educational practice.

7. Discussion

The findings of the present study indicate that special education teachers in the Kingdom of Saudi Arabia hold very high positive attitudes toward differentiated instruction. This result is clearly consistent with several previous studies that reported positive teacher attitudes toward this instructional approach [21, 22, 51]. Accordingly, teachers' attitudes toward differentiated instruction play a decisive role in determining the success of its implementation [23]. This convergence reflects the widespread professional acceptance of differentiated instruction as an effective pedagogical response to learner diversity within classrooms, particularly in special education settings characterized by pronounced individual differences in abilities, readiness levels, and learning styles.

These findings support the theoretical assumption that teachers' attitudes constitute a critical factor shaping instructional behavior and classroom practices. For example, Mengistie [21] reported a moderate positive relationship between teachers' attitudes and their differentiated instruction practices, reinforcing the proposition that positive attitudes are a necessary—though not sufficient on their own—condition for effective implementation.

The quantitative results further revealed no statistically significant differences in special education teachers' attitudes toward differentiated instruction across the study variables, Except for the educational stage variable. This finding may be explained by the fact that differentiated instruction has become a broadly adopted pedagogical orientation and a shared professional practice among special education teachers, regardless of their demographic or professional characteristics. Consequently, teachers tend to develop convergent attitudes toward this approach. This outcome also reflects the relative effectiveness of pre-service and in-service teacher preparation programs, which are often delivered in a largely standardized manner, contributing to the alignment of teachers' knowledge and attitudes toward differentiated instruction across varying qualifications and years of experience.

With respect to gender, the nature of the teaching profession—particularly in special education—imposes similar pedagogical and professional demands on both male and female teachers, thereby minimizing the influence of gender on professional attitudes. Moreover, the principles of differentiated instruction are applicable across diverse learners categories, which further supports teachers' adoption of this approach irrespective of the type of learners taught. As for years of experience and training courses, the absence of significant differences may be attributed to the early formation of positive attitudes toward differentiated instruction, which are not substantially influenced by additional years of service or the number of training programs attended—especially when such programs are general or theoretical rather than practice-oriented. Overall, these findings suggest the presence of a shared professional awareness of the importance of differentiated instruction as a fundamental approach for addressing individual differences in inclusive classrooms, leading to convergence in teachers' attitudes across varying characteristics.

The quantitative findings of the current study are further corroborated by the qualitative results, which revealed teachers' optimism regarding their ability to meet diverse learner needs by adapting instruction to different learning styles and paces [18]. This optimism reflects an advanced level of professional awareness of the importance of aligning instruction with learner characteristics and demonstrates a mature pedagogical understanding of differentiated instruction beyond mere superficial adoption.

Furthermore, the study hypothesized a significant effect of teachers' attitudes on the implementation of differentiated instruction, a hypothesis that was confirmed through the identification of a strong positive statistically significant correlation between attitudes and practice. This finding represents an advancement over some previous studies that reported only moderate associations between these variables Mengistie [21] suggesting that teachers in the present study context not only hold positive attitudes but also translate them into tangible classroom practices.

The results also indicate that teachers recognize that each learner possesses a unique learning profile, as evidenced by their use of multiple instructional strategies, flexible grouping, and diverse learning product options [18]. Such ractices reflect a practical understanding of differentiated instruction principles as articulated by Tomlinson [52] which emphasize variation in content, process, and product in response to learner diversity. These findings are consistent with prior research demonstrating that teachers with a deeper conceptual understanding of differentiated instruction are more capable of implementing it effectively [32, 53]. Accordingly, the strong relationship identified between attitudes and practice reflects an integration of professional conviction and practical application, serving as a positive indicator of instructional quality and effectiveness within classrooms.

Regarding instructional practices, the results revealed that content differentiation was implemented at a "very high" level, with teachers modifying textbook materials, using diverse instructional resources, and adapting lessons according to students' readiness and learning pace. Qualitative data confirmed that such differentiation is actively practiced through the integration of multimedia tools and the allocation of additional time for certain learners [18].

Process differentiation practices were also classified as "very high," with teachers reporting frequent use of flexible grouping and multiple instructional delivery methods. This finding contrasts with the results of Kharka [18] which identified a gap between teachers' self-perceptions and actual classroom practices, noting that grouping was often static and did not adequately consider students' interests or preferences. This discrepancy highlights a common challenge in differentiated instruction implementation, namely the difficulty of transitioning from theoretical understanding to deep, authentic practice—particularly in classrooms with large student populations.

Although product differentiation was rated at a "high" level, it emerged as the least frequently practiced dimension of differentiated instruction. This result aligns with previous studies Kyeremeh, et al. [54] and Maeng and Bell [55] that identified product differentiation as the most challenging and least implemented component.

The findings further demonstrated that the impact of teachers' attitudes on teaching effectiveness within classrooms was rated as "high," underscoring the pivotal role of positive attitudes in enhancing teachers' commitment, persistence, and

readiness to adapt instruction to learners' needs. Qualitative data revealed that teachers who value classroom diversity are more inclined to employ differentiated instructional strategies that account for readiness, interests, cultural backgrounds, and multiple intelligences [18]. These findings are consistent with the literature indicating that positive teacher attitudes contribute to improved instructional quality and student performance, as teachers' attitudes influence both instructional delivery and student outcomes [24, 25]. Accordingly, the present study confirms that teachers' positive attitudes are not merely a psychological variable but rather a foundational pillar of effective and inclusive teaching.

8. Conclusion

The present study concludes that special education teachers possess highly positive attitudes toward differentiated instruction and demonstrate an awareness that each student has a unique learning style, preference, and learning profile. These attitudes are strongly and positively associated with teachers' instructional practices, underscoring the critical role of teachers' professional beliefs in activating differentiated instruction within inclusive classrooms.

The study also reveals that possessing a sound understanding of differentiated instruction principles does not necessarily guarantee comprehensive implementation, particularly in the presence of contextual challenges that may hinder effective practice. Nevertheless, positive attitudes were found to enhance teaching effectiveness by increasing teachers' willingness to adapt instruction to learners' diverse characteristics and needs. Accordingly, the findings emphasize that the successful implementation of differentiated instruction requires integrated institutional support, including the development of assessment systems, the improvement of learning environments, and the strengthening of continuous professional development for teachers.

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Appendix A.

Special Education Teachers' Attitudes toward the Use of Differentiated Instruction in Inclusive Classrooms and Its Relationship to Teaching Effectiveness.

Dear Teacher,

Peace be upon you,

The researcher is conducting a study on special education teachers' attitudes toward the use of differentiated instruction in inclusive classrooms for research purposes and to contribute to the development of educational practices in the field of special education. You are kindly requested to read the following statements carefully and select the response that best reflects your opinion. Please be assured that your responses will be treated with complete confidentiality and will be used solely for scientific research purposes.

Thank you for your valuable cooperation.

First: Demographic Information

Gender:

- Male
- Female

Type of Learners Taught:

- Intellectual disability
- Hearing impairment
- Visual impairment
- Learning disabilities
- Giftedness
- Other (_____)

Academic Qualification:

- Bachelor's degree in Special Education
- Bachelor's degree in General Education
- Master's degree
- Doctoral degree
- Other (_____)

Years of Experience in Teaching Students with Disabilities:

- Less than one year
- 1–5 years
- More than 5 years

Educational Stage:

- Early childhood (Grades 1–3)
- Elementary stage (Grades 4–6)
- Middle school
- Secondary school

Training Courses Attended:

- No training courses
- 1–5 training courses
- More than 5 training courses

Second: Questionnaire Statements

No. Statement Strongly Agree Agree Neutral Disagree Strongly Disagree

Axis One: Attitudes toward Differentiated Instruction

1. I believe that differentiated instruction helps address individual differences within the classroom.
2. I feel that applying differentiated instruction enhances all students' participation in classroom activities.
3. I believe that differentiated instruction increases the engagement of students with different disabilities.
4. I believe that differentiated instruction contributes to improving students' academic achievement.
5. I believe that differentiated instruction aligns with the principles of inclusive education in inclusive classrooms.
6. I feel that differentiated instruction reduces behavioral problems in the classroom.
7. I believe that differentiated instruction enables me to provide appropriate support for each student.
8. I believe that implementing differentiated instruction provides students with equitable learning opportunities.
9. I feel satisfied when using differentiated instruction strategies in teaching.
10. I believe that differentiated instruction makes the teaching process more creative.
11. I believe that differentiated instruction can be easily implemented in inclusive classrooms.
12. I believe that students genuinely benefit from diversifying instructional methods.

Axis Two: Practices of Differentiated Instruction in Inclusive Classrooms

13. I use varied strategies to teach content in ways that suit students' different abilities.

14. I adapt activities to match students' varying levels within the classroom.
15. I provide students with multiple options to demonstrate their learning (e.g., project, presentation, summary, test).
16. I use different methods to explain lessons (e.g., pictures, videos, discussion, role play).
17. I select instructional tasks with varying levels of difficulty based on students' needs.
18. I apply flexible grouping within the classroom.
19. I provide additional activities for remediation or enrichment when needed.
20. I use diverse assessment tools to measure students' learning.
21. I adjust the time allocated for tasks according to students' abilities.
22. I develop individualized educational plans that align with differentiated instruction in the classroom.

Axis Three: Teaching Effectiveness of Special Education Teachers

23. I am able to manage the classroom effectively in an inclusive learning environment.
24. I can accurately identify students' strengths and weaknesses.
25. I am able to design lessons that accommodate students' different levels.
26. I apply effective teaching strategies that suit students with varying abilities.
27. I can utilize educational technology to support differentiated instruction.
28. I possess strong skills in continuous assessment and evaluation of students.
29. I am able to address teaching challenges in inclusive classrooms effectively.
30. I am capable of making educational decisions that meet students' individual needs.

**** Responses to these statements were obtained by selecting one of the following options (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree).**

Appendix B.

Qualitative Interview Questions.

These questions aim to obtain in-depth data on teachers' attitudes and actual practices related to differentiated instruction in classroom settings.

First: Questions on Teachers' Attitudes toward Differentiated Instruction

1. How would you describe your understanding of differentiated instruction and its role in inclusive classrooms?
2. To what extent do you believe in the effectiveness of differentiated instruction for students with different types of disabilities?

Second: Questions on Actual Practices of Differentiated Instruction

3. What methods or strategies do you typically use to implement differentiated instruction?
4. How do you address differences in ability levels among students with disabilities within the classroom?
5. Do you use flexible grouping or multi-level activities? Please provide an example.
6. How do you integrate technology to support differentiated instruction?

Third: Questions on Teaching Effectiveness

7. How would you evaluate your ability to design lessons that address individual differences?
8. Which skills do you feel require further support to implement differentiated instruction more effectively?
9. How do you manage classroom challenges while teaching in an inclusive environment?
10. How do you perceive the relationship between differentiated instruction and the quality or effectiveness of teaching?