DIFFERENTIATED INSTRUCTION AND CLASSROOM QUALITY IN GIFTED AND NON-GIFTED CLASSES OF PRIVATE AND PUBLIC SCHOOLS IN SAUDI ARABIA

A dissertation submitted in partial fulfillment

of the requirements for the degree of

DOCTOR OF EDUCATION

to the faculty of the

DEPARTMENT OF ADMINISTRATIVE AND INSTRUCTIONAL LEADERSHIP

of

THE SCHOOL OF EDUCATION

at

ST. JOHN'S UNIVERSITY

New York

by

Qamrah Alsubaie

Date Submitted	_____3/10/2022_____	Date Approved	_____5/17/2022_____
	_____		_____

Qamrah Alsubaie	Dr. Seokhee Cho

© Copyright by Qamrah Alsubaie 2022

All Rights Reserved

ABSTRACT

DIFFERENTIATED INSTRUCTION AND CLASSROOM QUALITY IN GIFTED AND NON-GIFTED CLASSES OF PRIVATE AND PUBLIC SCHOOLS IN SAUDI ARABIA

Qamrah Alsubaie

This study explored students' perceptions of classroom quality in gifted and non-gifted education settings in Saudi Arabia. The researcher used the Zone of Proximal Development theory and Expectancy Value Theory to frame the study. The research was conducted across three public schools (458 students) and two private schools (353 students) that included gifted and regular education programs in grades 7-12. A total of sixteen teachers and 811 students participated in the study; 395 were in the gifted programs, while 416 were in the non-gifted. The teachers completed a Differentiated Instruction (DI) survey, while the students completed the Students' Perceptions of Classroom Quality (SPOCQ) survey. Statistical analysis revealed that students' perceptions of classroom quality differed by program, school, and classroom type. It was also found that the teacher's professional development predicts students' perceptions. Differentiated instruction did not predict students' perceptions of classroom quality. It is anticipated that the results would inform the domain and help educators and policymakers understand differentiated instruction and classroom quality.

Key Words: differentiated instruction, classroom quality, gifted students, private schools

DEDICATION

This work is dedicated to my family, parents, siblings, and people who've supported me through this journey.

ACKNOWLEDGMENT

I thank Allah for the blessings of this beautiful journey and the incredible and supportive people I've met along the way. I take this opportunity to acknowledge my mentor's excellent guidance and support, Dr. Seokhee Cho. I recognize the input from Dr. Jenny Yang. I am thankful to King Saud University for providing the scholarship that made this study possible. I am very grateful to my family, friends, and colleagues for their unbounded support and encouragement. Words are not sufficient to articulate my gratitude for my mom. Special thanks to my brothers Abdulelah and Naif, who gave their best to achieve my goal.

TABLE OF CONTENTS

DEDICATION ii

ACKNOWLEDGMENT iii

LIST OF TABLES viii

LIST OF FIGURES ix

CHAPTER 1: INTRODUCTION 1

Introduction 1

Purpose of the Study 3

Theoretical Framework 7

Significance of the Study 9

Research Questions 10

Definitions of Terms 10

Conclusion 12

CHAPTER 2: REVIEW OF RELATED RESEARCH 13

Introduction 13

Theoretical Framework 14

Conceptual Framework 17

Relation to Study 21

Review of Related Literature 21

Classroom Quality 23

Differentiated Instruction and Students Achievement 23

Professional Development on Differentiated Instruction 24

Organizational Procedures for Gifted Education Programs in the Ministry of Education 27

Procedures for Gifted Education Programs in Mawhiba Foundation 30

Contribution to Research 33

Conclusion 35

CHAPTER 3: METHOD 36

Introduction 36

Specific Research Questions and Hypotheses 36

Research Design and Data Analysis 40

Research Population and Sample 44

Research Instruments 52

Procedures for Data Collection 53

Validity and Reliability 54

Students' Perception of Classroom Quality (SPOCQ) 54

Differentiated Instruction 55

Research Ethics 56

Conclusion 57

CHAPTER 4: RESULTS 59

Introduction 59

Differences in perception of differentiated instruction between students in gifted and students in non-gifted education programs 59

Differences in perception between students in public and students in private schools. 61

Differences in students' perceptions of differentiated instruction between different classroom types 62

Predicting students' perception of classroom quality 65

Supplementary result: Ministry of Education vs. Mawhiba Gifted Programs 73

Conclusion 73

CHAPTER 5: DISCUSSION 75

Introduction 75

Summary and interpretations of Findings 75

Relationship to Prior Research 78

Limitations of the Study 80

Recommendations for Future Practice 81

Recommendations for Future Research 82

Conclusion 82

APPENDIX A: IRB APPROVAL 83

APPENDIX B: APPROVAL TO CONDUCT STUDY (ARABIC) 84

APPENDIX C: APPROVAL TO CONDUCT STUDY (ENGLISH) 85

APPENDIX D: INFORMED CONSENT LETTER (STUDENT)..... 86

APPENDIX E: INFORMED CONSENT LETTER (TEACHER)..... 87

APPENDIX F: RESEARCH QUESTIONNAIRE: STUDENT PERCEPTION OF CLASSROOM QUALITY (S-POCQ) 88

APPENDIX G: RESEARCH QUESTIONNAIRE: DIFFERENTIATED INSTRUCTION SURVEY..... 92

REFERENCES 100

Vita.....

LIST OF TABLES

Table 1 Summary of Independent and Dependent Variables 40

Table 2 Demographic Summary of Participants from Public-Schools 47

Table 3 Demographic Summary of Participants from Private-Schools 48

Table 4 Teacher participants by Public Schools by School, Gifted Program Status, School Level, and Grade 49

Table 5 Teacher Participants by Private Schools by School, Gifted Program Status, School Level, and Grade 50

Table 6 Teacher Participants by Experience, Professional Development Hours, and Level of Education 51

Table 7 ANOVA of Students' Perception of Classroom Quality by Program Type..... 60

Table 8 Means and Standard Deviations of Students' Perception of Classroom Quality by School Type 62

Table 9 Means and Standard Deviations of Students' Perception of Classroom Quality by Classroom Type 64

Table 10 Post Hoc Results for Students' Perception of Classroom Quality by Classroom Type 65

Table 11 Summary of Multiple Linear Regression Analysis for Variables Predicting Classroom Quality in Private Schools 68

Table 12 Summary of Multiple Linear Regression Analysis for Variables Predicting Classroom Quality in Gifted Private Schools 70

Table 13 Summary of Multiple Linear Regression Analysis for Variables Predicting Classroom Quality in Non-Gifted Program in Private Schools 72

LIST OF FIGURES

Figure 1 Vygotsky's Zone of Proximal Development (ZPD) (Vygotsky Learning Conference, 2020) 15

Figure 2 Expectancy Value Model (Education psychology, 2020) 16

Figure 3 Conceptual Framework 18

Figure 4 Univariate normality of students' perceptions of classroom quality for students in gifted and non-gifted education programs 60

Figure 5 Univariate normality of students' perceptions of classroom quality for students in private and public schools 61

Figure 6 Univariate normality of students' perceptions of classroom quality for students in various classroom types 63

Figure 7 P-P Plot of Regression Residuals of students' perceptions of differentiated instruction and classroom quality 66

Figure 8 Scatterplot of Distribution of Regression Residuals of students' perceptions of differentiated instruction and classroom quality 67

CHAPTER 1: INTRODUCTION

Introduction

Gifted students are unique and have abilities that are different from their peers. Gifted students require different learning environments that match their potential, and they need to be taught using various methods than those used in the regular classroom. Implementing different teaching methods for gifted students to meet their needs may not be effective if applied by unskilled and untrained teachers in gifted education. As Tomlinson (2015) puts it, 21st-century life and nature require schools to prepare students to be thinkers, problem solvers, collaborators, wise consumers of information, and confident knowledge producers. The rapid increase of diverse students' needs in today's classroom forces concerns among teachers and administrators to understand their individual needs and find techniques that assist students in being academically successful.

However, it is also crucial to note that classes are heterogeneous in nature, knowledge-centered, assessment-centered, instruction-centered, and community-centered (Tomlinson, 2015). Therefore, educators need to respond in ways that offer equity of access and empower learning experiences for that wide range of students. Because of the heterogeneous nature of the classrooms, Hall (2002) emphasized there is a need to differentially instruct students to reach the different readiness levels, learning styles, and interests in the classroom. The traditional one-size-fits-all teaching model does not meet the diverse needs of today's students (Taylor, 2015). There are too many differences among students for the teacher to instruct the whole class using one approach and one ability level (Hall, 2002). Traditional lessons are not interactive, nor are they personalized to students. Teachers should provide instruction based on students'

individual readiness levels, learning profiles, and interests. This model of teaching is referred to as Differentiated Instruction (DI).

Gifted education teachers must have the proper skills to differentiate instruction to support gifted students to reach their optimal ability. The teachers need to possess characteristics and skills that support the development of gifted students (Alamer, 2014; Aljughaiman, 2013 & Tomlinson, 2015). Teachers must have effective personal, cognitive, and instructional characteristics to run programs for gifted students; this includes skills that provide insight into the underlying structure, conceptual clarity, big ideas within the subject, and the depth of the structured knowledge. These skills and characteristics determine the success of gifted students (Tomlinson, 2015); this requires gifted students' teachers to be appropriately prepared before teaching in the classroom to save time and resources. Proper evaluation programs and training of teachers of gifted students will ensure that instruction and assessments are relevant to gifted students (Tomlinson, 2015).

The global trend of developed countries is concerned with the quality of programs and differentiation of education for gifted students (Aldalham, 2018; Aljughaiman, 2013; Alqarni, 2010; Reis et al., 2011; Tomlinson, 2015). Similarly, the Kingdom of Saudi Arabia is one of the countries that seek to pay attention to the quality of gifted programs. That is because a high-quality curriculum is the strongest pillar of student achievement (Mawhiba, 2020). In Saudi Arabia, gifted students usually receive most educational services in regular classrooms. One of the main challenges that confront gifted education is an insufficient number of teachers who can adjust their instruction to the needs of gifted students. Robinson, Maldonado, and Whaley (2014) stated that the most crucial

leaders for change in education are the teachers who have high attitudes towards differentiated instruction. Teachers can facilitate learning to meet students' individual needs. Teachers with a lack of knowledge and gifted training will not have the skills to reflect on classroom quality and differentiated instruction practice and are less likely to participate in the professional learning that best meets their demands and the requirements of their gifted students. Most teachers who teach gifted students in Saudi Arabia lack professional training in gifted education, and there are no mandatory requirements for teachers who teach gifted students (Aldalham, 2018). Due to the lack of formal teacher preparation programs, in-service teachers do not have the requisite skills to differentiate instruction for gifted students; this leads to an increase in the number of untrained instructors who are mistakenly perceived as qualified teachers for gifted students (Alamer, 2014).

Purpose of the Study

This study investigates the relationship between differentiated instruction and classroom quality from the perspectives of teachers and students of gifted and regular programs in Saudi Arabia. The examination will involve looking at curriculum or programs, types of the school setting, classroom environment, and teacher training since they have been identified in the literature as critical for classroom quality and differentiated instruction.

Curriculum or Programs: One of the primary considerations regarding gifted education in Saudi Arabia is identifying educational methods used to educate gifted students. There are many challenges related to differentiated instruction programs, which include: 1) there are no explanations for utilizing a differentiated instruction strategy in

the teacher's guide, 2) absence of having models' lessons on how to implement differentiated instruction strategy, 3) the differentiated instruction strategy is insufficient for achieving the teaching goals of some lessons, and 4) the nature of school lessons content does not correspond with differentiated instruction strategy. In addition, some lesson goals concentrate on cognitive prompting and memorization instead of connecting the subject content to the student's real-life experiences. This disconnect results in the disengagement of the students, who are less motivated to develop their research and critical thinking skills. Research has shown that cultivating interest and motivation is vital in supporting differentiated instruction in the classroom. Therefore, it is necessary to understand how differentiated instruction programs contribute to classroom quality in differentiated instruction in Saudi Arabia (Aldossari, 2018).

Types of School Setting: The challenges linked to school setting include; Some of the schools' principals do not support teachers in implementing modern teaching methods and the absence of administration interest in the importance of utilizing a differentiated instruction strategy. Additionally, the classroom environment is inappropriate for implementing a differentiated instruction strategy. The overload of administrative duties assigned to the teacher, the lack of educational resources and instruments, and the continuous evaluation system in Saudi Arabia do not create an amenable environment that supports differentiated instruction strategy. Consequently, it is essential to study the school setting to understand classroom quality in a differentiated instruction setting in Saudi Arabia (Aldossari, 2018).

Classroom Environment: The challenges connected to the classroom environment includes; Students in Saudi Arabia are accustomed to traditional teaching

strategies, which results in the absence of students' motivation for learning (Aldossari, 2018). Students in Saudi Arabia face challenges adapting to the skills and activities of a differentiated instruction strategy. Some learners believe that a differentiated instruction strategy is unsuitable for low-achievement students, and some students with poor achievement prefer traditional learning methods. In addition, some of the students have lower confidence in using the differentiated instruction strategy, individual differences among students, and the absence of students' culture of dialogue and discussion. Thus, examining how the classroom environment supports classroom quality in differentiated instruction in Saudi Arabia (Aldossari, 2018). For example, one may wish to know which of the following classroom-type implementation would meet the highest quality of differentiated instruction (1) gifted classroom in private school, (2) gifted classroom in public school, (3) regular classroom in private school, and (4) regular classroom in public school.

Teacher Qualifications and Training: In Saudi Arabia, there is little attention on teachers of gifted students and how this may affect classroom quality in a differentiated instruction setting. Teaching gifted students requires several skills to meet their needs. Numerous teachers of gifted students in Saudi Arabia are placed in a career without sufficient educational background knowledge in gifted education. As the current educational system of gifted education in Saudi Arabia is still early, there is a need to identify effective teachers for gifted students. In other words, as teachers are the key to a productive learning environment for gifted students, the educational systems ought to pay more attention to hiring instructors who have the skills and knowledge to meet the gifted students’ demands efficiently. There is the belief that teachers automatically possess

effective personal, cognitive, and instructional characteristics to perform programs for gifted students and that the achievement rate of such programs will be increased (Aldalham, 2018; Aljughaiman, 2013; Alqarni, 2010).

The skills and understanding of classroom quality and differentiated instruction by gifted education teachers may directly impact gifted students' achievement. What is also not known in literature is the perceptions of gifted education teachers on acquiring skills in gifted training. Knowing the gifted education teachers' perception is important because they influence the evaluation and success of classroom quality and differentiated instruction for gifted education (Richards-Usher, 2013). Additionally, it is also essential to know the perceptions of gifted teachers concerning which skills they think are relevant to meeting gifted students' needs through differentiated instruction.

Several educational researchers (Aldalham, 2018; Aljughaiman, 2013; Alqarni, 2010; Reis et al., 2011; Tomlinson, 2015) have stated that teachers trained in a gifted teacher preparation program are more likely to achieve success than those who are not. As the educational system in Saudi Arabia tries to identify good teachers for gifted students, what kinds of skills should be considered to hire qualified teachers? Effective gifted classroom quality and differentiation instruction skills are currently poorly investigated in Saudi Arabia. Even though there is some professional development for teachers of gifted students, there is concern that teachers in Saudi Arabia are unprepared to differentiate instructions for gifted students properly.

Many challenges related to teachers' qualifications stem from the lack of pre-service teacher preparation programs in Saudi Arabia that can educate teachers in the prerequisites of differentiated instruction. Some teachers believe using traditional

teaching methods is more accessible than differentiated instruction. Some teachers believe that differentiated instruction is a kind of chaos that requires extra time and effort for preparation (Aldossari, 2018 & Alreshidi, 2017). In improving teachers ' competencies, the absence of in-service professional development leads to a lack of awareness and knowledge of the differentiated instruction strategy and its activities. Some teachers do not believe in the value of modern teaching strategies and the importance of discipline inside the classroom, which cannot be reached through modern teaching methods. Also, the absence of teachers' experience in utilizing differentiated instruction strategies makes teachers fear the school administration's perspective of using differentiated instruction strategies, contributing to low motivation for teachers to use differentiated instruction strategies in Saudi Arabia. Accordingly, it is vital to understand how teachers' qualifications are important to reaching classroom quality in differentiated instruction in Saudi Arabia (Aldossari, 2018).

Theoretical Framework

To understand students' views, teachers, and the more prominent influences that shaped their beliefs around classroom quality and differentiated instruction on gifted and regular programs in Saudi Arabia. To help guide and frame the present research, and to help provide an outline for the study, the Zone of Proximal Development (ZPD) theory and Expectancy Value Theory (EVT) were used. Within the context of the Zone of proximal development theory, teachers of gifted students create a proactive curriculum to scaffold the gifted students' instruction based on their individual needs. Further, within the context of Expectancy Value Theory, teachers of gifted students learn how to modify their instruction to motivate gifted students throughout the appropriate activities

intrinsically. Therefore, drawing on both Vygotsky and Eccles's ZPD theory and Expectancy Value Theory allows the researcher to align these theories with Tomlinson's philosophy of differentiated instruction which is fundamental in understanding classroom quality and differentiated instruction within this study.

Zone of Proximal Development (ZPD) theory: Vygotsky (1978) conceptualized current learning as the Zone of Actual Development (ZAD), and that is where minimal learning occurs as the child is performing what he/she can already do without assistance. However, when the learner is challenged further than their current ability level and aided by more competent others to work within the ZPD, there is potential for new learning. Within the context of the ZPD theory, gifted students' teachers may implement the appropriate assessment and measure each student's ZPD level in the content and the complexity they need. The ZPD theory enabled teachers to proactively assess gifted students' performance and know-how to differentiate instruction. The assessments and the differentiated instruction helped gifted students' teachers meet with students' interest areas, provide the appropriate level of challenge, and use various instructional methods. Gifted students' interest was reflected in the content and was more meaningful for their learning and understanding of concepts and generalizing them in other circumstances.

Expectancy Value Theory: Eccles and Wigfield's (2000) study focused on the expectancy-value model. In the expectancy-value theory, the intrinsic value is students' motivation to perform. When gifted students are intrinsically interested in it, they demonstrate their willingness to become engaged in a given task. Attainment value refers to the significance of doing well on a task. Tasks are perceived as essential when they reflect the essential aspects of oneself. That is why the proponents of differentiated

instruction advocate for proactive planning that will intrinsically motivate gifted students and, in turn, result in better task performance and student achievement.

Significance of the Study

Most gifted students in Saudi Arabia receive their educational services in general education classrooms instead of additional services outside of their regular classrooms. Therefore, this investigation will help understand the quality of educating gifted students in a regular classroom. Increased knowledge of gifted students' education in regular classrooms combined with increased knowledge of gifted education teachers' skills may help better inform the individuals who make decisions about hiring teachers of the gifted. It may also be valuable for pre-service and in-service training of regular classroom teachers who want to develop their teaching skills in gifted education. Therefore, the current study may help develop and improve pre-service teacher programs in gifted education at Saudi Arabia universities.

Finally, there is a need for studies in Saudi Arabia that evaluate classroom quality and differentiated instruction for gifted education programs. This study will expand the investigation of the field of gifted education in Saudi Arabia. Moreover, numerous studies have investigated classroom quality and differentiated instruction, but few have addressed gifted education teachers' differentiated instruction and classroom quality. Therefore, this study might illuminate the outline for stakeholders and policymakers, and gifted education teachers on how to reach the classroom quality and differentiated instruction for gifted students program to contribute to the human capital development vision in Saudi Arabia that put the quality of the education in the top priority of the government vision 2030 to enhance the outputs of the education and practice system at all

grades from early education to continuous education and provide professional development to reach the international levels through education, improvement and training programs that keep level of requirements and modern times and are in line with the needs of progress as well as the global and local labor market in partnership with all relevant parties globally and locally (Vision2030, 2020)

Research Questions

This study addressed, and was guided by, the following research questions:

RQ#1: Is there a significant difference in students' perception of classroom quality between those enrolled in gifted and non-gifted programs?

RQ#2: Is there a significant difference in students' perception of classroom quality between those enrolled in private and public schools?

RQ#3: Is there a significant difference in students' perception of classroom quality between students enrolled in these classroom types: public gifted, public non-gifted, private gifted, and private non-gifted?

RQ#4: How do teachers' professional development hours and perception of differentiated instruction predict students' perception of classroom quality?

Definitions of Terms

Terms that were used with specific meanings in this study were as follows:

1. **Gifted Students**: The Saudi Arabian government's official definition of "gifted students" refers to children identified as gifted by the Saudi's National Program for Gifted Identification. Through teachers' nomination using standardized tests (Wechsler Intelligence Scale for Children, or the Torrance Test of Creative Thinking)

or academic performance. Students are selected if their performance is within the top 90th percentile (Aldalham, 2018).

2. **Teacher of Gifted Students:** It refers to those individuals who work with gifted students at any level of education in Saudi Arabia. Such a teacher should possess in-depth and advanced knowledge in specialized fields and organize, use various educational strategies, and hold special training in gifted education (Mawhiba, 2020).
3. **Differentiated Instruction:** It refers to the design that provides various learning chances for students who vary in their readiness levels (what they understand, know, and can do with the content), their interests (curiosity, affinity, or passion for a topic), as well as their learning capabilities (which may be formed by their gender, culture, intelligence preferences, or learning style). When differentiated instruction is applied, students can be challenged by
    a. providing varying levels of difficulty,
    b. varying the degree of scaffolding, and
    c. varying how students work.

    Differentiated instruction intends to increase each student's growth and individual success by reaching every learner where she or he is at the time and supporting them in the learning process (Landrum & Mcduffie, 2010). In this study, differentiated instruction is a predictor or Independent Variable (IV); it is a total derived from the 26 items for understanding and the 26 items for implementation in the Differentiated Instruction survey.

Classroom Quality: Classroom quality is the students' perceptions of the following constructs: meaningfulness, challenge, choice, self-efficacy, and appeal assessed by Student and Teachers Perceptions of Classroom Quality (SPOCQ) (Gentry, 2004).

4. **Program Type:** There are two program types: gifted and non-gifted programs. This study defines gifted programs as those that aim to develop student's abilities to the maximum possible capacity and guide them in proportion to their inclinations and abilities. Non-gifted programs are designed to suit all students in the regular class.
5. **School Type:** There are two school types, public schools, and private schools. The current study identified the public school as supported by the government while private individuals or organizations supported the private school. The Ministry of Education supervises these two-school types.
6. **Classroom Type:** There are four classroom types: gifted in private school, gifted in public school, regular in private school, and regular (non-gifted) in public school.

Conclusion

Chapter one provided an overview of the educational climate facing teachers across Saudi Arabia tasked with teaching gifted students. Therefore, the current study aimed to explore practices of differentiated instruction and classroom quality of gifted education programs, especially the two gifted education programs provided by the Ministry of Education and Mawhiba (a non-profit foundation that aims to identify and nurture talented and gifted students in scientific fields). Chapter two will highlight the theoretical framework and literature review exploring differentiated instruction and classroom quality and their relationship. It will also include summaries of empirical studies for the same domains.

CHAPTER 2: REVIEW OF RELATED RESEARCH

Introduction

This chapter provides an overview of differentiated instruction theories, previous classroom quality and differentiated instruction studies, and the extensive organizational procedures for gifted education programs in Saudi Arabia. Chapter 2 is divided into the following subsections: 1) introduction; 2) theoretical framework and conceptual framework; 3) review of related literature on classroom quality, differentiated instruction, teacher professional development within the context of gifted education; 4) organizational structure of gifted education programs by the Ministry of Education and the Mawhiba Program in Saudi Arabia; and 5) a brief conclusion.

Research and literature are abundant on who gifted students are and how they should be educated. Gifted students have unique characteristics, needs, abilities, and interests in their learning environment. Because they may comprehend complex ideas quickly and learn more rapidly and in greater depth than their age peers, it is important that educators differentiate instruction to address their uniqueness. According to Berger (1991), these students should be allowed to explore the topic in-depth, manipulate ideas and draw generalizations about seemingly unconnected concepts, and ask provocative questions. To make the learning process beneficial for gifted learners, educators should modify the type of content delivered, the assessments being conducted, the sequence of content delivery, and/or various other learner characteristics that are different from their peers.

Theoretical Framework

The current study provides a lens based on the perspective of gifted students and their teachers' view of classroom quality and differentiated instruction. It examined the variables that shape the protocols and procedures used in the gifted and standard programs in Saudi Arabia. The concept of differentiated instruction was influenced by at least two theories: Zone of Proximal Development theory and Expectancy Value Theory. These theories align with Tomlinson's philosophy of differentiated instruction and are fundamental to understanding this concept. The researcher used the Zone of Proximal Development theory and the Expectancy Value Theory to frame the study. This analytical classroom quality and differentiated instruction method answered the presented research questions.

Zone of Proximal Development Theory: Vygotsky (1978) describes how students are assisted, in learning to build cognitive challenges, by further experienced adults through structuring activities in graduated steps. ZPD theory Vygotsky argues that current learning can be conceptualized as the Zone of Actual Development (ZAD). That is where minimal learning occurs, as the learner is doing what he/she can do without assistance. However, when the learner is challenged beyond their ZPD and assisted by gifted education teachers to work within the ZPD, there is potential for increased learning. Conversely, if teaching is beyond the ZPD, the teachers will develop new strategies. ZPD theory considers the importance of finding a positive and collaborative environment of practice, focusing on positive relationships, and creating ideal conditions for scaffolding with ZPD.

Figure 1

Vygotsky's Zone of Proximal Development (ZPD) (Vygotsky Learning Conference, 2020)

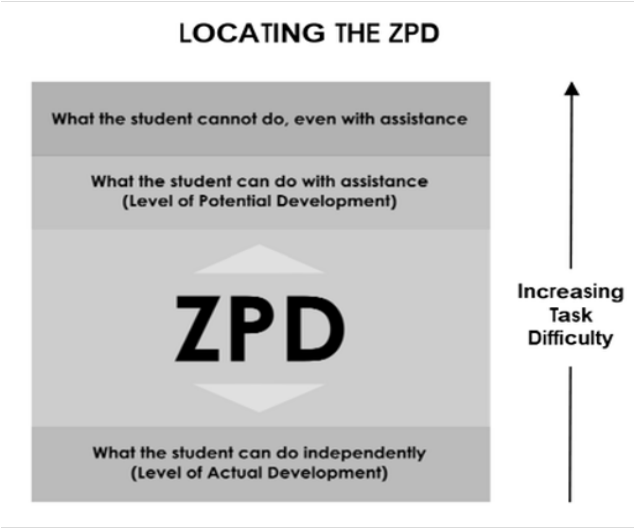


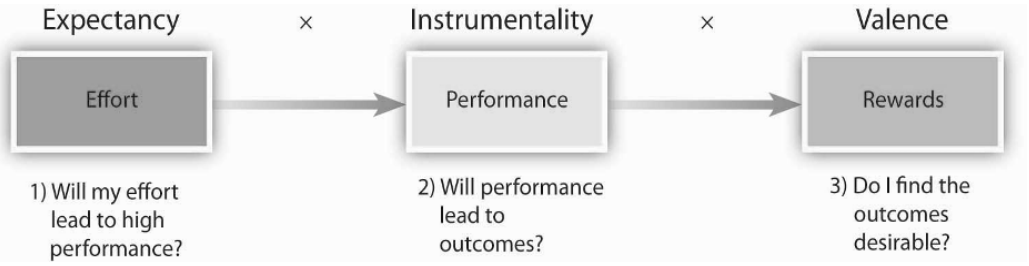
Figure 1 illustrates the location of the Zone of Proximal Development. It shows that students come to the classroom with a certain level of knowledge and skills, "entry behavior," and can learn independently; this level is called the "Level of actual development." The stage at which the students require assistance is called the "Level of potential development." ZPD is located between the level of actual potential and the actual development. Students' abilities are maximized by increasing the task difficulty, which moves a do without assistance and can do with the teacher's assistance. When teachers are trained to use this model, they can assess their learning ability and develop instructional scaffolding to enhance students' learning. The teachers can be selective in their instructional strategies.

Expectancy Value Theory (Eccles & Wigfield, 2000): Figure 2 indicates that motivation is affected by many elements, including the reinforcement of behavior, specifically learners' goals, interests, and sense of self-efficacy and self-determination. The components connect to create two general sources of motivation: learners'

expectations of success and the learner's outcome. Eccles, Wigfield, and colleagues suggest the multiplicative formula: expectancy x value = motivation to illustrate this theory. The connection between expectation and value is "multiplicative" instead of additive. In preparation for being motivated, learners need to have at least a reasonable expectation of success and a reasonable outcome. The premise is that students with high-level expectations for success do not value the tasks needed to pursue that success (mentally assign it a "0" value), then the students may not be motivated at all. On the other hand, if students value a task as highly but have no expectations of success in achieving it (assign it a "0" expectancy), then students may not feel motivated.

Figure 2

Expectancy Value Model (Education psychology, 2020)



Task value illuminates the question, "Why should I do this assignment?" There are four potential answers: intrinsic value, attainment value, utility value, and cost (Eccles & Wigfield, 2000). Intrinsic value is the enjoyment a learner feels from accomplishing a task. When gifted students are motivated in the activities, they are enthusiastically engaged. Attainment value relates to the importance of doing well on a task. Utility value relates to how their learning now impacts their future. Cost value relates to the economic impact on the students now and in the future. Tasks are seen as

valuable when gifted students feel that activities reflect the important aspects of themselves.

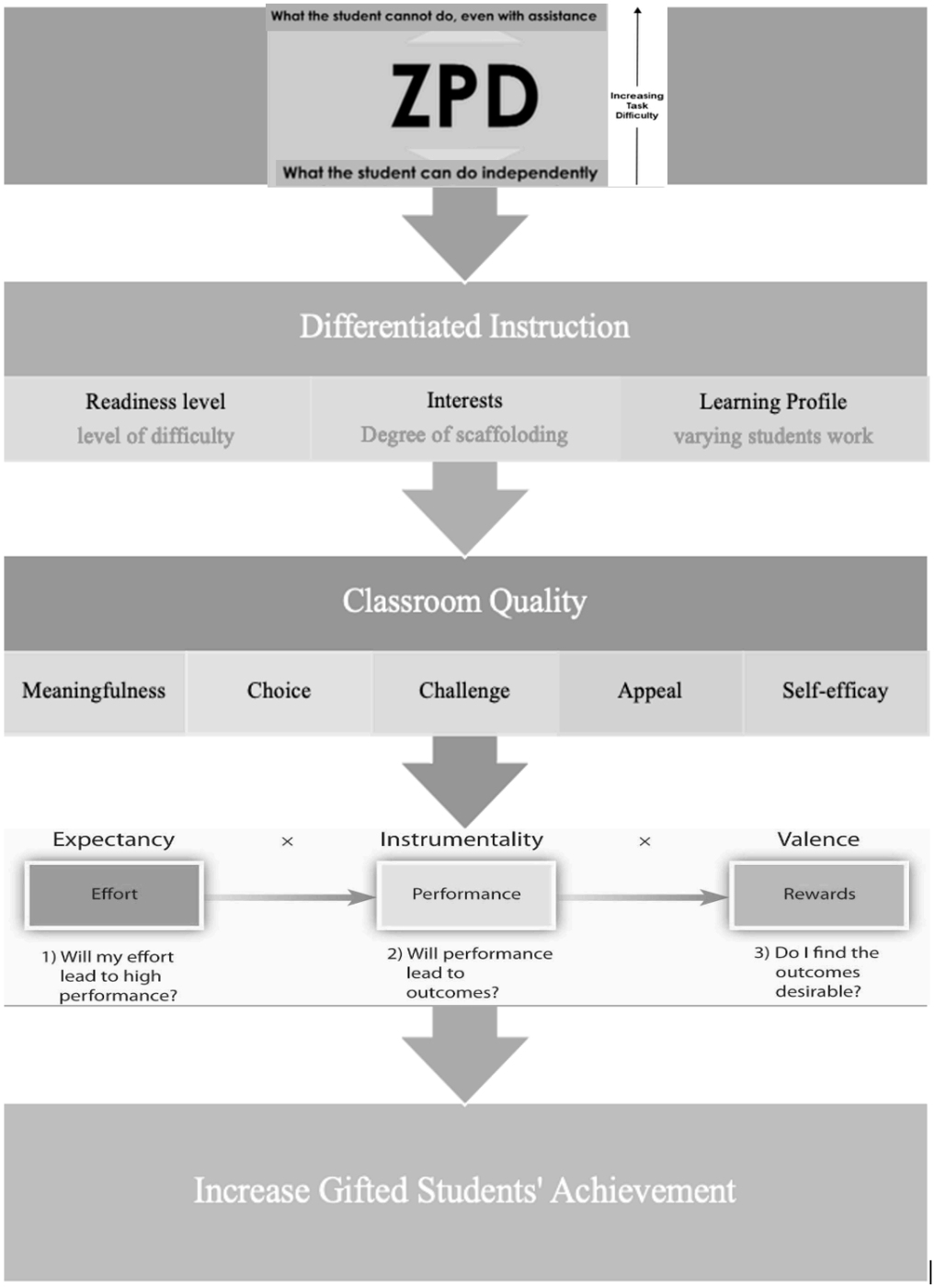
Conceptual Framework

The conceptual framework of the current study uses the Zone of Proximal Development (Vygotsky, 1978) and Expectancy Value (Eccles & Wigfield, 2000) as essential and relevant components. These theories were used together as an essential relevant component to meet the needs of the current study. For example, according to ZPD theory, Vygotsky, the current learning can be conceptualized as the Zone of Actual Development (ZAD), where minimal learning takes place because the learner is doing what he/she can do with no assistance. But when learners are challenged beyond their ZPD and assisted by skilled personnel to operate within the ZPD, there would be potential for new learning outcomes. Expectancy Value Theory emphasizes the importance of learners to have at least a reasonable expectation of success and to set a task with at least some positive value. If students have high-level expectations for success but do not value the tasks needed to pursue that success (mentally assign it a “0” value), they may not feel motivated. Tasks are seen as valuable when gifted students feel that activities reflect the important aspects of themselves. On the other hand, if students value a task as high but have no expectations of achievement (assign it a “0” expectancy), then students may not feel as motivated.

Figure 3 shows how the present study links elements of Vygotsky’s ZPD theory and Expectancy Value theory to increase gifted students' achievement in the classroom.

Figure 3

Conceptual Framework



At the top of the diagram, the Zone of Proximal Development indicates that students arrive at the classroom with a particular level of knowledge and skills, "entry

behavior," and can learn independently; this level is called the “Level of actual development.” The stage at which the students require assistance is called the “Level of potential development.” ZPD is located between the level of potential development and the actual development. Students' abilities are maximized by increasing the task difficulty, which moves a do without assistance and can do with the teacher’s assistance. When gifted education teachers understand how to implement this theory, they will learn to what degree they can increase the difficult task for gifted students. The teacher can utilize scaffolding techniques to assist the gifted student’s ability to learn independently. Using this theory, the teachers can then learn to conduct assessments as to the scaffolding strategies that best meet the needs of gifted students.

The diagram shows how Vygotsky's Zone of Proximal Development Theory and Eccles’s Expectancy Value Theory connect with Tomlinson's philosophy of differentiated instruction. Which is fundamental in understanding classroom quality and differentiated instruction (Tomlinson, 2015); gifted education teachers should pre-assess students before instructing their learning. This assessment should include assessing throughout the gifted student’s learning process. This assessment may determine knowledge acquisition and students’ learning styles. The teacher needs to be prepared to adjust the lesson plan to ensure gifted students' understanding of each lesson. In addition, gifted education teachers can develop learning strategies appropriate for instruction based on individual learner needs; the teachers can then utilize strategies such as peer groups and/or learning centers based on readiness, interests, and/or learning.

Moreover, gifted education teachers will assess individual students' interests and can relate them to their instruction. Knowing students' background and expectations, the

teacher can provide an individualized lesson plan that supports students, which may impact their learning, and they can obtain academic achievement. The third stage of the diagram illustrates how classroom quality affects intrinsic value. As the intrinsic enjoyment increases, learners feel that they are accomplishing a task. As the student learns and is mentally active, enjoying the lesson, the teacher has successfully kept the student motivated. When gifted students are intrinsically motivated in activities, they become engaged in the given task with the support of a well-trained teacher who can now provide new strategies in teaching. Accomplishment value relates to the important achievement; teachers who are trained to understand intrinsic and accomplishment values will be able to practice by incorporating in the lesson plans instructional and procedural scaffolding. The teacher learns how the skills and strategies support gifted students. Using this conceptual framework, the learner feels a sense of accomplishment; this impacts the importance of gifted students' self-esteem.

In this research, the linkage of Zone of Proximal Development to Expectancy Value Theories was critical. Gifted education teachers should be provided professional development in these theories. ZPD Theory provides teachers understanding of how to find and utilize each student's ZPD can assist teachers in planning more targeted instruction for each student. EVT Theory provides insight into motivating gifted students to reach higher levels of performance and achievement.

Relation to Study

The current study explores differentiated instruction, and classroom quality and the relationship between classroom quality and differentiation instruction from the viewpoints of teachers and gifted students enrolled in standard educational programs in Saudi Arabia. The framework acknowledges that teachers ought to have knowledge and skills to differentiate their instruction to reach the classroom quality for gifted students.

The Zone of Proximal Development and Expectancy Value Theories support two fundamental concepts, classroom quality, and differentiated instruction. Teachers will be trained to create a curriculum that includes learning instructional approaches that provide scaffolding strategies to enhance the gifted students' individual needs for academic achievement. Therefore, the importance of classroom quality and differentiated instruction further explores the relationship between classroom quality and differentiation instruction and its influence on gifted and standard programs in Saudi Arabia.

Review of Related Literature

This study utilizes various information sources and studies to attain the appropriate level of understanding of the relationship between differentiated instruction and classroom quality and the relationship between teachers and students of gifted students. This study used google scholar and the Institute of Education Sciences of the U.S Department of Education (ERIC) to review the available research resources and literature related to differentiated instruction and classroom quality in gifted education programs. This literature review focused primarily on studies related to improving classroom quality, differentiated instruction, and professional development. However, seminal research in each interest area was utilized where necessary to strengthen the

literature review. Most studies reviewed were published in the last ten years and mostly investigated the effects of classroom quality and differentiated instruction and the importance of professional development.

Several of the studies reviewed on gifted education programs were conducted in the United States, such as Bailey and Williams-Black (2008), Reis et al. (2011), Richards (2013), Tomlinson (2015), and Valiandes (2015). A few other studies were conducted in Saudi Arabia, such as Alamer (2014), Aldabas (2015), Aldalham (2018), ALgarni (2012), Algozzine and Anderson (2007), and Aljughaiman and Grigorenko (2013). Two of the studies highlighted evaluation, Alqarni (2010) and Alreshidi (2017). This study also relied on the previous readings covering classroom quality and differentiated instruction, Aljughaiman (2013); Gentry and Owen (2004); Reis et al. (2011); Tomlinson (2015); and Whipple (2012). Generally, the studies showed significant effects of differentiated instruction on students' performance and achievement. The studies reported that classroom quality and differentiated instruction significantly influence the teachers' performance and students' achievement. The previous key studies on differentiated instruction illustrated the relationship between teachers' understanding of differentiated instruction and their attitude towards implementing differentiated instruction in their classroom (Aljughaiman, 2013; Gentry & Owen, 2004; Reis et al., 2011; Tomlinson, 2015; Whipple, 2012).

Classroom Quality

Horak and Galluzzo's (2017) study investigated the influence of problem-based learning (PBL) on student achievement and students' perceptions of classroom quality. This study was performed with students taught using PBL and a comparison group of students taught using traditional instruction. This study sampled 457 students. Pre- and post-student achievement data were collected using a 25-item multiple-choice test aligned with state and local objectives. Data analysis indicated a statistically significant increase in scores in both groups, with a higher gain score in the PBL group. Data analysis also reported statistically significant differences in the total score on the Student Perceptions of Classroom Quality (SPOCQ), supporting the PBL group. This study found positive effects for well-implemented PBL instruction with these students.

Differentiated Instruction and Students Achievement

Valiandes's (2015) study shows the findings of quasi-experimental research that evaluated the impact of differentiated instruction on students' learning in mixed-ability classrooms. Participants in the research were 24 teachers and 479 grade-four elementary students. Both tests were conducted twice for all students (n = 479) who participated in the research: (a) at the school year beginning before the intervention and (b) after the intervention. Thus, comparing students' attainment between both groups (experimental and control groups) was feasible before and after differentiated instruction. The quality of differentiated teaching was assessed through an observation protocol for differentiated instruction, which was also used to report teachers' practices employed during the observations. This study proved that students with differentiated instruction reached higher success than the comparison group.

Reis et al. (2011) investigated the effects of differentiated instruction and enrichment pedagogy on reading achievement in five elementary schools. This experimental study investigated the influence of differentiated instruction using a reading enrichment program on students' oral reading and comprehension using the Schoolwide Enrichment Model–Reading (SEM-R). This study was conducted with a sample of 63 teachers and 1,192 fifth-grade students across five elementary schools, and they were randomly assigned to intervention and control groups. This study utilized multilevel modeling to analyze the data. The significant differences found in this study support the intervention group using the Schoolwide Enrichment Model–Reading (SEM-R) in reading fluency in two schools (Cohen's d effect sizes of .33 and .10) and incomprehension in the high-poverty urban school (Cohen's d = .27), with no achievement differences in the remaining school's Reis et al. (2011). These results confirm that enrichment reading programs with differentiated instruction and with less whole basal group instruction were as effective or more effective than a regular whole group basal approach.

Professional Development on Differentiated Instruction

Bailey and Williams-Black (2008) examined differentiated instruction from three teachers' perspectives; this is a non-experimental qualitative study on how regular teachers differentiate their instruction during literacy events in their classrooms. This study utilized a self-designed survey, informal interviews, and instructional documentation to investigate their teaching methods. Data were analyzed by comparing the participant responses with differentiated instruction to investigate whether the teachers' responses aligned with the literature review. This study organized the data based

on three themes that connected with Tomlinson (2000) (a) differentiating the content/topic, (b) differentiating the process/activities, and (c) differentiating the product. The finding of this study reported that only two teachers differentiated the content during their teaching. Also, the study found that all three teachers differentiated the teaching process that was utilized to assist the students in learning the content. All three teachers did not differentiate the product to allow students to show their understanding of the content they studied.

Robinson, Maldonado, and Whaley (2014) conducted a study that focused on the perceptions of the implementation of differentiated instruction. This non-experiential qualitative study reviewed a wide range of theoretical frameworks to examine how nine elementary, middle, and high school teachers successfully used differentiated instruction. Data was collected from open-ended surveys, interviews, and teachers' lesson plans encompassing their differentiated instruction strategies were examined. The findings showed a lack of professional development, time constraints, difficulties in learning how to implement differentiated instruction, and the belief that differentiated instruction is essential for student success. Richards (2013) led teachers' perception and implementation of differentiated instruction in the study of private elementary and middle schools. This non-experimental study examines 100 teachers' perceptions of the implementation of differentiated instruction. Richards examined the differences between novice and experienced teachers' perceptions of differentiating instruction and the predictive relationship between teachers' perceptions and the implementation of differentiated instruction. The study utilized a descriptive survey to collect data from the teachers. This study found that teachers who had previous training in differentiated

instruction through professional development had a positive attitude towards implementing differentiated instruction in the classroom.

Previous studies based on classroom quality and differentiated instruction provided suggestions on using and evaluating differentiated instruction to ensure the effectiveness of the classroom quality and differentiated instruction on achievement outcomes. (Bailey & Williams-Black, 2008; Horak & Galluzzo, 2017; Robinson, Maldonado, & Whaley, 2014; Reis et al, 2011; Richard, 2013; Valiandes, 2015). Some studies indicated that even though some of the teachers understood the differentiated instruction, often, they were unsuccessful in implementing the classroom quality techniques and differentiated instruction. For example, Horak and Galluzzo (2017) support that the good implementation of problem-based learning (PBL) has significantly higher results in student achievement and their perception of classroom quality. Valiandes's (2015) study reports significant differences supporting the intervention group using differentiated instruction.

Further, Bailey and Williams-Black's (2008) study found that some teachers implemented only parts of differentiated instruction components. Even though some teachers demonstrated their proficiency in differentiated instruction, they still needed to gain practical skills to reach classroom quality. Bailey and Williams-Black (2008) and Richards (2013) also reported a gap between teachers' knowledge of differentiated instruction and its implementation.

Many studies have shown the value of providing professional development for teachers. Professional development offers an opportunity to enhance their abilities and increase their knowledge and skills in implementing differentiated instruction. (Bailey &

Williams-Black, 2008; Reis et al., 2011; Richards, 2013; Valiandes, 2015; Robinson, Maldonado, & Whaley, 2014) found many reasons that prevent teachers from implementing differentiated instruction accurately. These reasons included lack of professional development, time constraints, how differentiated instruction meets the needs of all learners, difficulties in implementing differentiated instruction, and the belief that differentiated instruction is essential for students' success. Robinson, Maldonado, and Whaley (2014) and Reis et al. (2011) stated the importance of differentiated instruction is to improve students' achievement. For instance, Reis et al. (2011) and Valiandes (2015) found significant differences between the intervention and non-intervention groups. The intervention group utilized differentiated instruction, and their achievement outcomes were enhanced in the intervention groups compared to the non-differentiated instruction group.

Organizational Procedures for Gifted Education Programs in the Ministry of Education

Gifted student programs contribute to human capital development. High quality of education is a top priority of the Saudi Government Vision 2030. The government aims to enhance education outputs and develop a system at all grade levels, starting from early childhood education to university levels. To provide professional development to reach the international levels in education, improvement, and training programs. This objective will keep Saudi Arabia at the level of modern times to meet the needs and requirements and be competitive with the local and global labor market. It can also improve its partnerships with relevant parties locally and globally (Vision 2030, 2020).

From a review of the available literature on gifted education programs in Saudi Arabia, many organizational procedures are carried out by both the Ministry of Education and the Mawhiba Foundation. However, there is insufficient information addressing the evaluation of gifted programs. According to the Ministry of Education (2021), in September 2015, the Ministry requested a decree for gifted programs offered in public schools. Although gifted programs existed, the decree would legitimize their programs. The Ministry's administration formed a committee to address the requirements needed to be approved. The committee was charged with developing a scientific and practical reference guide for all gifted programs. The committee was required to develop a guide that included facilitating the process of opening classes, application of procedures, implementation, and evaluation. The guide also had procedural applications and protocols and information on professional development, which included the qualifications of teachers. The guide was divided into two sections: The theoretical and the practical.

The theoretical guide for the gifted classroom: The theoretical section was to introduce the concept of the gifted classes, clarify its vision and mission, and define its objectives. The Gifted Classroom Project is an ambitious plan for gifted students in public education. The Gifted Class Project is one of the qualitative projects and initiatives that contribute to realizing the Kingdom of Saudi Arabia’s vision to improve the educational environment that stimulates creativity and innovation. The plan is to group students in classrooms where they can be challenged on their abilities and motivate them. The Gifted Classroom Project's vision is to provide leadership and the necessary support required so that the Kingdom of Saudi Arabia may attain global status. The projects plan to adhere to its cultural values by preparing an educational environment with qualified

staff. A vibrant, knowledgeable society with long-established values can achieve prosperity and promising ambition (Ministry of Education, 2021).

The practical guide for the gifted classroom: The second section of the guide was the practical application in the classroom. The procedural section of the guide refers to the gifted classroom. The gifted classroom reflects the need to develop an educational program for gifted students that aligns with the education policy in the Kingdom of Saudi Arabia. The need for gifted students' enrichment programs commensurate with their abilities raises the educational outcomes and prepares gifted students to participate in international competitions. The classes improve the educational system and the educational environment to open special gifted schools. In addition, there are regulations for opening a gifted classroom; the schools must: be public or private; have an approved budget for one semester of classes; have availability of modern equipment; have space not less than 5m x 8m; have a maximum number of students be twenty, but not less than fifteen; and must have a gifted teacher or coordinator.

Besides regulations for the classroom, the Ministry of Education has criteria for selecting gifted teachers. The teacher's qualifications must be evaluated and have an excellent job performance for the past two years. Priority is given to a teacher who has been trained in gifted programs and meets the stated requirements. Additionally, there are incentives for gifted teachers if the teacher's performance is outstanding. Some of the incentives are reducing the number of classes, exemption from daily supervision, a vacation incentive, and an offer for professional development courses (Ministry of Education, 2021).

Education policy in the Kingdom: The gifted classes are based on the education policy in the Kingdom, which has stipulated in more than one document the concerns and care of their gifted students. The Education Policy in the Kingdom (1996) stipulates in Article 57: “Interest in discovering and caring for the gifted and providing different possibilities and opportunities for the growth of their talents within the framework of public programs, and by setting up special programs (Ministry of Education, 2021). The Kingdom's long-term national policy for science and technology and the Council of Ministry approved this document which included ten strategic plans that must be completed by all sectors (Ministry of Education, 2021).

Procedures for Gifted Education Programs in Mawhiba Foundation

According to Mawhiba's official website (2021), The Gifted Classes Program is implemented by the General Directorate of School Partnership sanctioned by Mawhiba as part of its 2030 strategic plan. This program targets public and private schools with distinct qualifications regarding their infrastructure. The implementation of this program entails cooperation with the educational administrators, teachers, and stakeholders in elementary and secondary schools. In addition to adopting the curriculum of the Ministry of Education, Mawhiba has its own Advanced Supplementary Curriculum (ASC).

Program Components: the Mawhiba Classes Program is based on five central pillars, school selection, training, professional development, curricula, assessment, and supporting parents. These pillars involve the evaluation process of schools interested in partnering with Mawhiba. Training and Professional Development includes raising awareness regarding gifted students' characteristics and how to work with them. It also seeks to provide a rich educational environment that nurtures gifted students in the

schools and the communities to which they belong. Furthermore, it aims to train teachers with strategies to implement the Mawhiba Advanced Supplementary Curriculum (ASC) and integrate the curriculum with the Ministry of Education. The third pillar aims to implement the Advanced Supplementary Curriculum (ASC) for creative and gifted students in the following subjects: Mathematics, English, Sciences, and Information Technology. The Advanced Supplementary Curriculum (ASC) consists of numerous advanced activities which align with the Ministry's curriculum but are not an alternative to them. Including skills that provide insight into the big ideas within the subject, conceptual clarity, underlying structure, and the depth of the structured knowledge developed concerning the academic topics offered in the curriculum. In addition, the curriculum seeks to develop attitudes, values, and attributes in students, including their inquiry, creativity, trust, risk-taking, mental openness, and collaboration. The fourth pillar aims to follow up, monitor, and evaluate the success of the Mawhiba Classes Program. This assessment includes assessing the culture of student-centered learning. It also intends to prepare training programs targeting the participating teachers, providing them with different assessment tools such as performance, peer review, self-assessment, assessment through projects, and building a student portfolio. Lastly, this pillar supporting parents aims to engage the parents in the student's educational and academic process; this is achieved through hosting recurrent and regular meetings that introduce Mawhiba's curriculum and stress the importance of parent involvement. Furthermore, parents learn that the activities within the curriculum are supported through communication with students (Mawhiba's official website, 2021).

School Partnership and School evaluation standards: In 2015/2016, Mawhiba started providing scholarships to identified gifted students from participating schools. Mawhiba's selection process for partnership schools is based on a globally applied standard. Mawhiba works with the schools to provide and develop the best educational environments and high-quality curricula for gifted students. The standards for student achievements are leadership, the spirit in the classroom and how it's managed by the teacher, development of the students' motivation to learn; parents' involvement; laboratories, and equipment. Students receive the same services provided to ones in the Mawhiba Classes Program in this program. Schools that have applied to join the scholarship program are thoroughly assessed according to the selection criteria. Participating schools provide funding for each student for three academic years, subject to revision based on student performance and attitude.

Comparison between Ministry of Education and Mawhiba Foundation: The previous procedures for gifted education programs in the Ministry of Education and Mawhiba illuminate theoretically and procedurally. They both have regulations to implement programs for gifted students regarding the requirements for selecting schools, selecting gifted students, hiring gifted education teachers, and professional development. However, unlike programs administered by Mawhiba, the Ministry of Education's guidebook does not follow a strategic plan through the previous review. Moreover, the gifted education programs administered by the Ministry of Education lack evidence to administer the program in theory and practice. In contrast, programs from Mawhiba follow a strategic plan applied in the beginning by choosing schools, training, professional development, advanced supplementary curriculum, assessment, supporting

parents, and evaluation of partnership schools. Both educational systems do not have evidence of an evaluation process for classroom and differentiated instruction quality. The Gifted Education Program from Mawhiba has higher standards in selecting students, and if they do not qualify for their program, the students are referred (if eligible) to the gifted education programs administered by the Ministry of Education. Nevertheless, the current study examines the relationship between differentiated instruction and classroom quality from the viewpoints of teachers and students and standards of programs by the Ministry of Education and the Mawhiba Foundation in Saudi Arabia.

Contribution to Research

Most gifted students in Saudi Arabia receive educational services in the general education classrooms instead of outside the regular classroom. The purpose of the current study is to explore the relationship between classroom quality and differentiated instruction from the perceptions of teachers and students in Saudi Arabia. Prior studies (Bailey & Williams-Black, 2008; Reis et al., 2011; Richards, 2013; Valiandes, 2015; Robinson, Maldonado, & Whaley, 2014) have indicated that teachers trained in differentiated instruction are more likely to achieve success than those who are not. The Saudi Arabia educational system tries to identify and hire competent gifted education teachers qualified in gifted education. Teachers' differentiated instruction skills and qualifications are currently not evaluated in Saudi Arabia. In this area, a lack of empirical research still exists. The current study aimed to explore differentiated instruction and classroom quality and the relationship between classroom quality and differentiation instruction from the viewpoints of teachers and students of gifted and standard programs in Saudi Arabia. The study also aimed to explore the differences between gifted and

standard programs in two gifted programs in the Ministry of Education and Mawhiba Foundation.

While numerous studies have investigated classroom quality and differentiated instruction, few addressed differentiated instruction and the classroom quality of gifted education teachers; this is a significant gap that this study has aimed to bridge. With a setting of gifted education, this study makes invaluable contributions to the understanding of the differentiated instruction and classroom quality research domain. It provides an authoritative synthesis of the theories and literature on the topic and develops a conceptual framework that researchers and educators may adopt or adapt in various applications. It provides a basis for program evaluation on classroom quality and differentiated instruction for gifted education programs. The study may strengthen and increase the capacity of researchers, stakeholders, policymakers, and gifted education teachers by offering an outline to assess, monitor, and evaluate classroom quality and differentiated instruction. The study may also contribute to research by illustrating the practical applicability of the selected research methods, including research design and data analysis techniques for similar studies.

This study will expand the field of gifted education, and more specifically, in Saudi Arabia. The two surveys in the current study explored Saudi Arabia's programs in the public school system and private educational system. The study required and received official permission to obtain the essential information related to gifted education programs from the Ministry of Education and the Mawhiba Foundation. Therefore, this investigation helps understand the quality of education gifted students receive in a standard classroom. It helps build a better understanding and implementation of services

for gifted students. It provides additional information for Saudi Arabia to consider appropriate intervention efforts for gifted students. The study demonstrates the value of professional development for teachers. It offers professional development in gifted education arms teachers with skills to improve the outcome of gifted students. Therefore, the study may also help develop academic programs in gifted education at Saudi Arabian universities.

Conclusion

The literature review was broadly organized to answer the following questions: (a) What are the existing differentiated instruction theories and possible conceptual frameworks? (b) What does existing literature reveal about the relationship between classroom quality and differentiated instruction? (c) What are the organizational procedures for gifted education programs in the Ministry of Education and the Mawhiba Foundation? Chapter two reviewed the literature that emerged from examining classroom quality, professional development, and differentiated instruction of gifted students in Saudi Arabia. The chapter evaluated theoretical frameworks and practices utilized and how they address the needs of gifted students. The Zone of proximal development theory and Expectancy Value Theory were adapted into a conceptual framework to provide a lens to review and evaluate gifted students' and their teachers' perceptions of classroom quality and differentiated instruction. This chapter's pivotal research questions were squarely positioned in the existing empirical studies. Chapter three will expound on the methodology and research design.

CHAPTER 3: METHOD

Introduction

While chapter two reflected on the literature available on classroom quality and differentiated instruction for gifted and non-gifted students, chapter three describes this study's research methodology and procedures. It documents the research design, sample characteristics, the instruments for data collection, and the data analysis techniques. The subsequent chapter will present the results.

The main objective of this non-experimental study is to examine the differences in students' perception of classroom quality between those who were enrolled in different program settings (gifted or non-gifted), school types (private or public), and four classroom types. In addition, the study also explores how teacher attributes may affect students' perception of differentiated instruction in the classroom. This study was purposed towards understanding differentiated instruction and classroom quality and their relationship from the viewpoints of teachers and students of gifted and regular programs. The study was conducted in Saudi Arabia. The four research questions which directed the study are presented in the next section.

Specific Research Questions and Hypotheses

Research Question 1 (RQ1): Is there a significant difference in students' perception of classroom quality between those enrolled in gifted and non-gifted programs?

Null Hypothesis: There is no significant difference between students in gifted and non-gifted education programs in their perception of classroom quality.

Alternative Hypothesis: There is a significant difference between students in gifted and non-gifted education programs in their perception of classroom quality.

Research Question 2 (RQ2): Is there a significant difference in students' perception of classroom quality between those enrolled in private and public schools?

Null Hypothesis: There is no significant difference between private and public schools in students' perception of classroom quality.

Alternative Hypothesis: There is a significant difference between private and public schools in students' perception of classroom quality.

Research Question 3 (RQ3): Is there a significant difference in students' perception of classroom quality between students enrolled in these classroom types: public gifted, public non-gifted, private gifted, and private non-gifted?

Null Hypothesis: There is no significant difference between gifted and non-gifted education classroom-type in students' perception of and classroom quality.

Alternative Hypothesis: There is a significant difference between gifted and non-gifted education classroom-type in students' perception of classroom quality.

Research Question 4 (RQ4): How do teachers' professional development hours and perception of differentiated instruction predict students' perception of classroom quality?

Null Hypothesis: Teachers' professional development and perception of differentiated instruction will not predict students' perception of classroom quality.

Alternative Hypothesis: At least one teacher characteristic (teachers' professional development and teachers' perception of differentiated instruction) will predict students' perception of classroom quality.

The score of students' perceptions of classroom quality (SPOCQ) served as the Dependent Variable (DV) in all four research questions. In RQ1, RQ2, and RQ3, the

identified Independent Variables (IVs) for the study's statistical analysis were program type (PT), school type (ST), and classroom type (CT), respectively. The two Predictors or Independent Variables (IVs) under consideration in RQ4 were teachers' professional development (TPD) and teachers' perception of differentiated instruction (TDI). The effective definitions of the variables used for specific statistical analysis and algorithms are provided below.

- **Students' perceptions of classroom quality (SPOCQ):** It refers to students' opinions and views of classroom quality. The score is generated from the 38 items of the Students Perception of Classroom Quality survey.
- **Program Type (PT):** A demographic variable categorizes the programs into gifted or regular (non-gifted).
- **School Type (ST):** A demographic variable that groups schools into private or public.
- **Classroom Type (CT):** Grouping classes into gifted in private school, gifted in public school, regular in private school, and regular (non-gifted in public school).
- **Teachers' Professional Development (TPD):** The number of hours a teacher has spent training in professional development programs.
- **Teachers' Perception of Differentiated Instruction score (TDI):** The Predictor or Independent Variable (IV) is a total derived from the 26 items for understanding and the 26 items for implementation in the Differentiated Instruction survey.

As Table 1 illustrates, for RQ1, the independent Variable is program type (PT) which includes gifted and non-gifted programs. Students in gifted programs refer to

students in gifted classrooms in affiliated private schools and gifted classrooms in public schools. In contrast, students in non-gifted programs refer to students in regular classrooms in affiliated private schools and regular classrooms in public schools. For RQ2, the independent Variable is school type (ST) which includes two levels, private and public. Public schools are run by the Ministry of Education, while private schools are run by the Ministry of Education and affiliated with Mawhiba. For RQ3, the independent Variable is classroom type (CT) which includes four levels: gifted classroom in affiliated private school, gifted classroom in public school, regular classroom in affiliated private school, and regular classroom in public school. For RQ4, the independent variables are hours of professional development and teachers' perception of their differentiated instruction (TDI) scores. For all four research questions, the dependent variable is SPOCQ scores.

Table 1

Summary of Independent and Dependent Variables

Research Question	Inferential Statistical Test	Independent Variable (name and levels)	Dependent Variable
RQ1	One-Way ANOVA	Program type (PT): 2 levels 1. Gifted program 2. Non-gifted program	SPOCQ
RQ2	Welch's ANOVA	School type (ST): 2 levels • Private • Public	SPOCQ
RQ3	Welch's ANOVA	Classroom type (CT): 4 levels • Gifted Classroom in Private School • Gifted Classroom in Public School • Regular Classroom in Private School • Regular Classroom in Public School	SPOCQ
RQ4	Multiple Linear Regression	Professional development (TPD) in Hours TDI scores	SPOCQ

Research Design and Data Analysis

Quantitative and survey research designs are utilized in this study because of appropriateness. The investigators conducted surveys on the sample of students and teachers to explain the populations' attitudes, opinions, behaviors, or characteristics (Creswell & Creswell, 2017). Creswell (2002) and Leedy and Ormrod (2001) summarize quantitative research tasks as collecting, analyzing, establishing, interpreting, confirming, validating relationships, writing, and developing generalizations that contribute to theory from a study. Explanations and predictions that may generalize to other situations are key results that quantitative researchers seek. Survey approaches can prevent biases because the participants choose to respond without an investigator, which helps increase confidence and reliability, and the ability to generalize the result (Creswell & Creswell,

2017). As expected, this study generalizes the findings from the sample to derive conclusions for the population. This comparative non-experimental study used data collected from intermediate school, high school students, and teachers through survey items and questionnaires. The absence of interventions and control groups makes the design non-experimental. It is non-experimental since it does not involve (a) random assignment of participants to a group nor (b) the active introduction or manipulation of an intervention by the researcher (Cook, Cook, Landrum, & Tankersley, 2008).

This study aimed to determine if students' views of differentiated instruction and classroom quality (dependent variable) had significant differences with respect to program type, school type, and classroom type (independent variables). Another objective of the study was to examine the characteristics of 7th to 12th-grade teachers. Including teachers' professional development, teaching experience, level of education, teachers' perception of differentiated instruction, and teachers' perception of classroom quality (predictor variables), to determine which could predict students' views of differentiated instruction and classroom quality (outcome variable). A supplementary analysis examined students as test groups of gifted students taught using differentiated instruction compared to student groups that did not.

After retrieval from a google survey database, several statistical operations were employed to the data into the statistical package for social scientists (SPSS) software to answer the research questions. The data was analyzed by inferential and descriptive analysis, including descriptive statistics, Welch's Analysis of Variance (ANOVA), Multiple Linear Regression (MLR) Analysis, and independent samples t-Test. An alpha level of .05 was chosen for Welch's ANOVA and multiple regression analyses.

Descriptive Analysis: This study utilized Students' Perception of Classroom Quality and Teachers' Understanding and Implementation of Differentiated Instruction surveys. The survey questionnaires gathered data on differentiated instruction and classroom quality and the relationship between classroom quality and differentiation instruction from the viewpoints of teachers and students of gifted programs in Saudi Arabia. Descriptive statistics were conducted to calculate and provide information on all relevant variables' frequencies, percentages, means, medians, and standard deviations. These statistics include the level of education, teaching experience, professional development, and grade taught.

ANOVA and Welch's Analysis of Variance (ANOVA): One-Way ANOVA worked for research question one, as none of the assumptions were violated. Welch's ANOVA was used to analyze the difference in the SPOCQ scores: students in gifted and non-gifted programs, students in public and private schools, and students in the four different classroom types. Welch's ANOVA was chosen as the inferential statistics for RQ2 and RQ3 because Levene's tests indicated the assumption of homogeneity was not met for the classic ANOVA (F (3,780) = 5.98, p=.000). Welch's ANOVA is a robust alternative to the classic ANOVA when there are unequal variances in the data (Tomarken & Serlin, 1986). Welch's ANOVA remains the procedure of choice, instead of a non-parametric test, although the Shapiro-Wilks test indicated non-normality, W (784) = .987, p=.000. The statistical literature warns against relying solely on statistical tests, like Shapiro-Wilks, to evaluate assumptions and advocates graphical tools. The central limit theorem (CLT) declares; that as the sample size gets larger, the sample distribution means estimates a normal distribution, regardless of the population's

distribution. Sample sizes greater than or equal to 30 are often considered sufficient for the CLT to hold, which would apply to this study with a sample size of over 800. Previous studies (Andersson & Mats, 2015; Hernandez, 2021; Knief & Forstmeier, 2021; Pierce & Gray, 1982; Stehlík & Thulin, 2014) indicated that, for a very large number of observations, there is no need to depend on Shapiro-Wilks's normality test. Visual inspection of Q-Q plots can decide if the distribution is normal. A visual inspection of the Q-Q plot of the dependent variable, SPOCQ scores, showed most of the values lay on a straight line. Therefore, the researcher can conclude that the distribution is relatively normal because it is evenly aligned with the standard normal variate.

Multiple Linear Regression (MLR) Analysis (Sykes 1993): Finally, a multiple linear regression analysis was conducted to examine how teachers' attributes affected intermediate and high school students' SPOCQ scores. MLR regression analysis investigates relationships between variables in statistics; the investigator seeks to ascertain the predictive effect of one variable upon another. Regression estimates the quantitative effect of the causal variables upon the variable that they influence. The investigator typically assesses the "statistical significance" of the estimated relationships. In regression analysis, the coefficients indicate the independent variable's multiplicative strength over the dependent variable, while other factors are constant. In research question four, the coefficients of the characteristics of the teachers that predict students' perceptions were computed from the regression analysis after a thorough review of the MLR assumption tests. Positive coefficients indicate the rise of the DV and IV variables together, while negative coefficients indicate inverse proportionality. The magnitude of the coefficients illustrates the strength of the relations. Therefore, the causal relationship

and the statistical significance of students' perceptions (SPOCQ), the outcome variable, and the two teacher characteristics (TPD and TDI), the predictor variables, are illustratable. MLR calculates the coefficients of determination for variables that predict SPOCQ and shows the causal relationship and the statistical significance of the variables of students' perceptions (SPOCQ) (dependent variable) and the two qualities of teachers (TPD and TDI) (independent variables).

Independent Samples t-Test: For supplementary analysis, this study employed independent sample t-Tests to compare two sample means to find whether the population means are significantly different. This study used an independent sample t-Test to compare the means and determine if there was a difference between MOE gifted and Mawhiba gifted with respect to SPOCQ.

Research Population and Sample

This study took place in Saudi Arabia, in Public and private schools with gifted education programs. The researcher received written approval from the General Administration of Gifted Education in Saudi Arabia to conduct the current study. The male students from three public and two private schools located in a large city in Saudi Arabia were contacted to participate in the study. The sampling procedure for this study was a 2-step process involving purposive sampling for choosing participating schools and stratified sampling for selecting the participating students. Purposive sampling is an approach in which specific settings, participants, or events are intentionally chosen to provide essential information that cannot be acquired from other choices. The researcher incorporates cases or participants in the sample because they consider that they warrant inclusion (Taherdoost, 2016). The researcher contacted several gifted education

departments in the Saudi Arabian Kingdom to select participating schools, such as the Department of Education in Riyadh and the Department of Gifted Education in Al-Ahsa. While the Departments of Education in Riyadh and Al-Ahsa both expressed their desire to participate, the Al-Ahsa region was ultimately chosen due to the lack of study time and the COVID-19 pandemic restrictions and the presence of a study coordinator who could cooperate in facilitating communication with the study sample. Five schools from Al-Ahsa were chosen because they are the only five schools in Al-Ahsa city that include gifted and non-gifted programs. Of these five schools, two are private schools, and three are public schools. Both the private schools and one of the public schools enroll both intermediate students (middle school) and high school students. The second and third public schools enrolled only intermediate and high school students, respectively.

The researcher conducted stratified sampling at each participating school to gather representative data for this study. Stratified sampling is used "when it makes sense to partition the population into groups based on a factor that may influence the variable that is being measured. These groups are then called strata" (Penn State, 2022). For this study, students within each school were divided into strata based on grade level and gifted or non-gifted program participation. While the total number of classrooms varies at each school, five gifted program classrooms and five non-gifted program classrooms were included in strata groupings. It was agreed with the Department of Education to draw up lists for each school to divide classes into two stages to conduct this study. First was the intermediate stage, which contained the seventh, eighth, and ninth grades. The second stage used the tenth, eleventh, and twelfth grades. A minimum of 15 student responses were collected for each grade or according to the available sample. As shown in Table

3.2 and Table 3.3, the average number of students per school in gifted classes was 128, while the average number of total students per school in non-gifted classes was 132. After receiving parental permission, 811 students and 16 teachers responded to the surveys administered online through Google Forms. The stratified sampling included 811 male students who responded to the surveys at the end of one month of data collection. The breakdown of student sample participants in the current study by school type (public/ private), program type (gifted/ no-gifted), school levels (intermediate/ high), and grades (7^{th} – 12^{th}) are captured in the two tables 2 and 3.

Table 2

Demographic Summary of Participants from Public-Schools

	School 1		*School 2*		*School 3*	
	Gifted	Nongifted	Gifted	Nongifted	Gifted	Nongifted
Number of students	200	209	64	54	17	15
Grade level						
Intermediate school	50 (25%)	49 (23.44%)	0	0	17 (100%)	15 (100%)
7th	19	17	0	0	1	1
8th	18	17	0	0	0	0
9th	13	15	0	0	16	14
High School	150 (75%)	160 (76.55%)	64 (100%)	54 (100%)	0	0
10th	30	60	32	24	0	0
11th	60	54	0	0	0	0
12th	60	46	32	30	0	0
Number of classes	6	6	0	0	2	2
Grade level						
Intermediate school	3	3	0	0	1	1
7th	1	1	0	0	0	0
8th	1	1	0	0	1	1
9th	1	1	0	0	0	0
High School	3	3	2	2	0	0
10th	1	1	1	1	0	0
11th	1	1	0	0	0	0
12th	1	1	1	1	0	0

Table 3

Demographic Summary of Participants from Private-Schools

	School 1		School 2	
	Gifted	Nongifted	Gifted	Nongifted
Number of students	127	158	101	232
Grade level				
Intermediate	48 (37.7%)	82 (51.89)	30 (29.70)	110 (47.41)
7th	16	24	5	52
8th	15	28	8	36
9th	17	30	17	22
High School	82 (64.56%)	76 (48.10)	71 (70.29)	218 (52.58)
10th	28	26	23	122
11th	29	24	23	46
12th	25	26	25	50
Number of classes	6	6	6	6
Grade level				
Intermediate	3	3	3	3
7th	1	1	1	1
8th	1	1	1	1
9th	1	1	1	1
High School	3	3	3	3
10th	1	1	1	1
11th	1	1	1	1
12th	1	1	1	1

Of the total students identified, 175 gifted students and 178 regular education students in grades 7-12 took math at the ministry of education schools. Another 220 gifted students and 238 non-gifted students in grades 7-12 took math at Mawhiba schools.

Some teacher demographics were necessary to properly situate and understand Teachers' perception of differentiated instruction (TDI) scores. This study identified 16 gifted and non-gifted students' Math teachers to answer the research questions. Teachers' number of hours that a teacher has spent on training in professional development

programs; the Teaching Experience (TE), a teacher's number of years of teaching experience; and Education Level (EL), Bachelor, Masters, Doctorate levels of qualification, were collected. The breakdown of teacher sample participants by school type (public/ private), program type (gifted/ no-gifted), school levels (intermediate/ high), and grades (7th – 12th) are captured in the three tables below. Table 4 outlines the number of teachers selected from each school, program, and grade level. Table 5 presents the demographic information for the teachers of the participating students. Table 6 presents teachers' demographic characteristics by experience, professional development hours, and level of education. Although there are only 16 teachers, the same teacher may teach the gifted and regular classes or more than one school level and more than one student.

Table 4

Teacher participants by Public Schools by School, Gifted Program Status, School Level, and Grade

	Public Schools					
	School 1		School 2		School 3	
	Gifted	Nongifted	Gifted	Nongifted	Gifted	Nongifted
Grade level						
Intermediate	**3**	**0**	**0**	**0**	**1**	**0**
7	1	0	0	0	1*	0
8	1	0	0	0	0	0
9	1	0	0	0	1*	0
High School	**1**	**2**	**0**	**2**	**0**	**0**
10	1	2	0	1	0	0
11	0	1*	0	1	0	0
12	0	1*	0	0	0	0
Total (9 Teachers)	**4**	**2**	**0**	**2**	**1**	**0**

*The same teacher teaches different grades

Table 5

Teacher Participants by Private Schools by School, Gifted Program Status, School Level, and Grade

	Private Schools					
	School 1		School 2			
	Gifted	Nongifted	Gifted	Nongifted		
Grade level						
Intermediate	**1**	**1***	**1**	**0**	**-**	**-**
7	0	1*	1*	0	-	-
8	1*	0	1*	0	-	-
9	1*	0	1*	0	-	-
High School	**2**	**1***	**1**	**1**	**-**	**-**
10	2*	1*	1*	1	-	-
11	1	0	0	0	-	-
12	1	0	1*	0	-	-
Total (7 Teachers)	**3**	**1**	**2**	**1**	**-**	**-**

*The same teacher teaches different grades

Table 6

Teacher Participants by Experience, Professional Development Hours, and Level of Education

	Teacher Grouping	No. of Teachers
Years of Experience	0	1
	1-4	2
	5-9	2
	10+	11
Professional Development Hours	0	2
	9	1
	10	2
	12	2
	16	1
	20	1
	21	1
	22	2
	30	1
	32	1
	50	1
	132	1
Level of Education	Bachelor's degree	15
	Master's degree	0
	Doctoral degree	1

From Table 6, a closer inspection of teaching experience (TE) and level of education (EL) revealed that almost all participants fell in one category of 10 years and above; and 99% of the respondents fell in bachelor's degree. These made both TE and EL were not appropriate to be used for meaningful statistical analysis.

Research Instruments

The main research instruments were surveys. The study utilized two surveys, the Students Perception of Classroom Quality (SPOCQ) survey (Gentry & Owen, 2004) and the survey on Teachers' Understanding and Implementation of Differentiated Instruction. The surveys were administered as a one-time exercise for one month and a half in group settings. Participants followed standardized instructions that informed both students and teachers that their responses would be anonymous. Translating the surveys to Arabic was necessary, and an expert in psychology and the gifted-education field was commissioned.

1. **Students Perception of Classroom Quality (SPOCQ) Survey (Gentry & Owen, 2004)**: SPOCQ assisted the researcher in examining the perceptions of students regarding the quality of appeal, challenge, choice, meaningfulness, and academic self-efficacy in their classes. SPOCQ survey is a questionnaire with seven demographic questions that gathered information about the participants' school name, type of classroom, students' names, teachers' names, years of experience, education, and grade level. Demographic questions were followed by a 5-point Likert scale survey of 38 items (with responses ranging from strongly disagree to strongly agree) designed to determine students' perception of classroom quality.
2. **Teachers' Understanding and Implementation of Differentiated Instruction (TUIDI) Survey (Tomlinson & Allen, 2000):** TUIDI was a two-part survey. It contained 26 items for understanding DI and 26 items for implementation of DI. It also had some demographic items. The general and demographic data collected included subject area taught coded as the following (1=reading, 2=writing, 3=mathematics, 4=social studies, 5=Science, 6=others); current grade taught (from

1=K, grade to 13=12th grade.); Type of teacher (1= special education teachers, 2= general education teachers); Gender (Female, Male); Teachers age in ranges (from 1= 21-25 years to 9= 60+ years); Years of teaching experiences (from 1=1-3years to 7=30+years); Differentiated instruction experience (from1= none to 3=Extensive); and Professional Development hours. The second part analyzed the understanding of differentiated instruction: (from 1=not Important to 4=very important); while the third part analyzed the understanding of implementations of differentiated instruction: (from 1=hardly ever/ never do this to 4=use intentionally and often). The teachers answered 62 of teachers' understanding and implementation of differentiated instruction items using a 4- point Likert response scale (with responses ranging from 1=not Important to 4=very important) for teachers' understanding of differentiated instruction items. And a 4- point Likert scale (with from 1=hardly ever/ never do this to 4=use intentionally and often) for teachers' implementations of differentiated instruction items.

Procedures for Data Collection

Before data collection, the researcher got approval from the IRB committee at St. John's University (Appendix A) and received written approval from the General Administration of Gifted Education in Al-Ahsa (Appendix B and C). The permission from the General Administration of Gifted Education in Al-Ahsa allowed the use of the database kept by the ministry of education to identify all gifted students and their teachers. The researcher recruited gifted students and their teachers from one region by contacting supervisors working in gifted education administration by email, phone call, and WhatsApp. The supervisors electronically posted a recruitment letter including a

description of the study to recruit participants who qualified for the study as gifted students and their teachers from Al-Ahsa. Once students and teachers qualified, the researcher sent them electronic access to the translated version of the SPOCQ survey. Responses were collected via an online survey for one and half months. Collected data were entered into Excel and converted to SPSS for statistical analysis. Data were cleaned to remove missing data and inaccuracies. The researcher kept the survey data, documents, computers, and devices safely under lock and key. Data were imported from the original Google database to excel spreadsheets for further cleaning, confirmation, and coding and exported to the Statistical Package for Social Scientists (SPSS). Statistical analysis was conducted on SPSS. Data porting, coding, cleaning, and statistical analysis took several calendar months.

Validity and Reliability

Students' Perception of Classroom Quality (SPOCQ)

The content validity of the Students Perception of Classroom Quality (SPOCQ) survey (Gentry & Owen, 2004) has been examined through a literature review and by using 22 content experts who rated items written for each construct. SPOCQ was then pilot tested with 500 high school students. Construct validity was examined using exploratory factor analysis; factors representing the expected constructs of appeal, challenge, choice, and meaningfulness were derived with internal consistency approximations ranging from .80 to .84 (Gentry & Owen, 2004).

Based on findings from the pilot study, revisions were made to the instrument. These revisions included reformatting the instrument into a scannable form, adding demographic items, adding space on the scannable form for student identification

numbers, minor rewording of 10 items, adding a scale of items to assess self-efficacy, and adding 4 attribution items. A further confirmatory study extended this work by examining the construct validity and reliability evidence for data obtained from a sample of middle and high school students (Gentry & Owen, 2004). It has been established as a sufficient tool to identify a broad spectrum of attitudes and beliefs that teachers have about classroom quality and differentiated instruction. It is a valuable tool to identify specific perspectives on classroom quality and differentiated instruction (VanTassel-Baska et al., 2020).

Differentiated Instruction

This instrument was created in Tomlinson's renowned work with differentiated instruction which supports the validity of this instrument. The current study did not need to establish criterion-related validity as the existing instrument reflected a high level of validity based on many studies conducted by Tomlinson and her team projects on DI (2000, 2001, 2003, 2006, 2010). The study used factor analysis to ensure the correlation between the instrument intentions and items (students' interest, assessment, lesson plan, content, process, and product) and the other definitions. Reliability was also a major concern for the study. Instrument reliability for the sample was examined with Cronbach's alpha. For the understanding of differentiated instruction, $\alpha = .862$; for implementation of differentiated instruction, a= .657; and for all 52 items, $\alpha = .871$.

The survey of this study was developed in English based on scientific research findings that addressed classroom quality and differentiated instruction. The researcher has translated the SPOCQ and DI from English to Arabic for the current study, as it's the official language spoken in Al-Ahsa, Saudi Arabia. However, the current study’s

population is students and teachers in Al-Ahsa, Saudi Arabia. The SPOCQ was translated into the Arabic language to serve the study goal. After translating the surveys to Arabic, the researcher contacted specialists in the gifted administration department in Al-Ahsa, Saudi Arabia, to review the survey and ensure the content validity of the translated survey items. The reviewers provided their suggestions to adjust some phrases in a way that did not affect the actual meaning of the items, and some demographic data were added that facilitated the link between the student and teacher questionnaires. It took an average of 4-5 online sessions to review and evaluate the questionnaires to come out with a final translated version. Representatives of the gifted administration department voluntarily provided the translation review service. The translation process results showed that the two versions (original survey and back-translation survey) have equivalent meanings.

Research Ethics

The study was conducted with the IRB approval from St. John's University. Participation in completing the surveys by the students and teachers was voluntary. In the introductory email, the purpose of the participation in the survey was spelled out as a doctoral research project, clearly explaining that participants and their responses would be unidentifiable. In consideration of providing ethical treatment to the participants of this research, the confidentiality of identifiers and responses was protected.

Upon linking to the online survey, page one is a consent form. Consent was required and requested with a checkbox before respondents could open the survey. Information about the researcher, the study, and the supporting advisor was also provided to participants. The informed consent also explained any foreseen risks and benefits, the

confidentiality of storage and retention of records, and the volunteer nature of the study. The survey remained locked if consent was not given to the researcher.

The study findings are beneficial to the participants and other stakeholders. The results may assist educators in significantly improving the understanding and practice of differentiated instruction and classroom quality by recognizing differences traceable to school and teacher characteristics. Since research has proven that positive perception leads to greater motivation, students are expected to benefit further in improved academic achievement.

Conclusion

Chapter three detailed all aspects of the research methodology. The current study used quantitative, non-experimental designs and methods, online surveys, and extensive SPSS statistical analysis to conclude whether there were any significant differences and relationships in the views on differentiated instruction and classroom quality between various student groups in Saudi Arabia.

Chapter three culminated with data collection to answer the research questions. The research effort sought to answer four topical research questions: (1) Is there a significant difference in students' perception of classroom quality between students in gifted and students in non-gifted education programs? (2) Is there a significant difference in students' perception of classroom quality between students in public and private schools? (3) Is there a significant difference in students' perception of classroom quality between groups of students in various classroom types? And (4) Which factors between teachers' professional development and teachers’ perception of differentiated instruction best predict students' perception of classroom quality? Subsequently, chapter 4 provided

the results of the data analysis procedures conducted on the quantitative data resulting from chapter three.

CHAPTER 4: RESULTS

Introduction

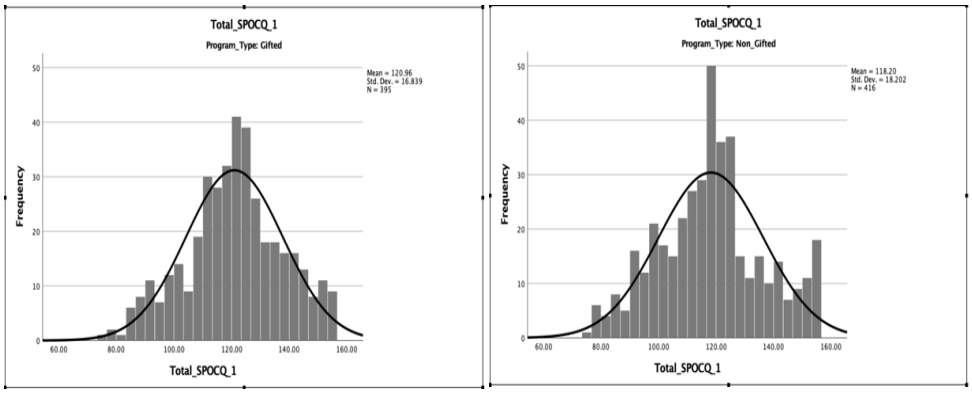
Gifted and non-gifted students in 7th-12th grades from public and private schools located in Al Ahsa City in Saudi Arabia were chosen to participate in this study that aimed to explore their perceptions regarding classroom quality. Approximately 811 male students completed the related survey. Chapter four presents the results arising from the analysis of the data collected. The chapter addresses the research questions by presenting the statistical findings on students' perceptions of classroom quality. Supplementary results are also shared. Chapter four flows from chapter three's methodology, data collection execution, and data analysis. The findings in chapter four will subsequently provide the base for discussions and recommendations in chapter five.

Differences in perception of differentiated instruction between students in gifted and students in non-gifted education programs

Research question one sought to determine whether there were significant differences in students' perceptions of classroom quality between students in gifted and non-gifted education programs. Data screening for One-Way ANOVA was conducted. Value checking provided no errors. SPOCQ presented 27 missing values that were replaced with the series mean. The Z-score calculation revealed no univariate outliers for SPOCQ, as none was greater than +2.5 or less than -2.5 (Hair et al., 2010, as cited in Meyers et al., 2013). Univariate normality was assessed, as shown in Figure 4. The data showed no signs of skewness and kurtosis; the values were within +/-1 (George & Mallery, 2003, Morgan, Griego, & Gloeckner, 2001, as cited in Meyers et al., 2013).

Figure 4

Univariate normality of students' perceptions of classroom quality for students in gifted and non-gifted education programs



The test for univariate homoscedasticity through Levine's test revealed non-significant values implying that the assumption was not violated, $F_{(1, 809)} = 1.573$, $p = .210$. The average perception score for the students in non-gifted programs ($M = 118.20$, $SD = 18.20$) shows significant difference when compared to the students in the gifted programs ($M = 120.96$, $SD = 16.84$) and a one-way analysis of variance (ANOVA) shows significant difference in the class quality, $F_{(1, 809)} = 5.017$, $p = .025$, at 95% level of confidence (see Table 7).

Table 7

ANOVA of Students' Perception of Classroom Quality by Program Type

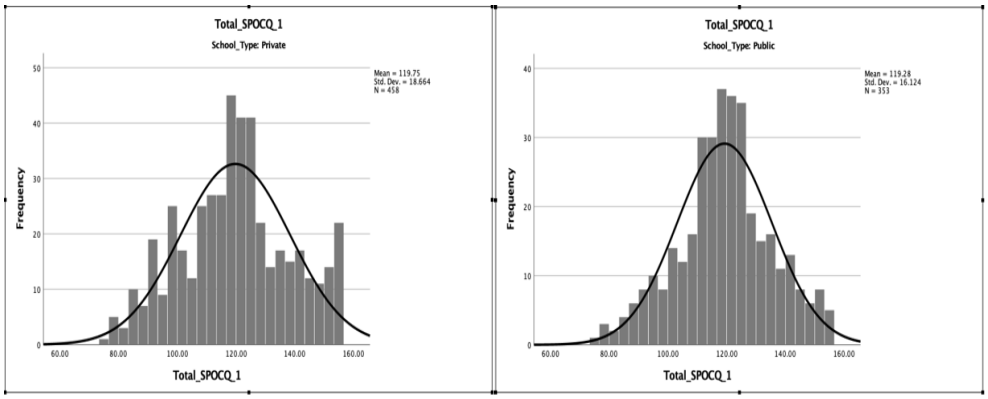
	SPOCQ score			*ANOVA*				
Program Type	*n*	*M*	*SD*	*df*	*SS*	*MS*	*F*	*P*
Gifted	390	120.9632	16.83910	1	1545.522	1545.522	5.017	.025
Non-Gifted	416	118.2014	18.20170	809	249211.06	308.048		
Total	811	119.5466	17.59477	810	250756.58			

Differences in perception between students in public and students in private schools

Research question two sought to determine whether there were significant differences in students' perceptions of classroom quality between students in public and students in private schools. Data screening for One-Way ANOVA was conducted. Value checking provided no errors. SPOCQ presented 27 missing values that were replaced with the series mean. The Z-score calculation revealed no univariate outliers for SPOCQ, as none was greater than +2.5 or less than -2.5 (Hair et al., 2010, as cited in Meyers et al., 2013). Univariate normality was assessed (Figure 5), and the data showed no signs of skewness and kurtosis. The values were within +/-1 (George & Mallery, 2003, Morgan, Griego, & Gloeckner, 2001, as cited in Meyers et al., 2013).

Figure 5

Univariate normality of students' perceptions of classroom quality for students in private and public schools



The test for univariate homoscedasticity through Levine's test revealed significant values, implying that the assumption was violated, $F_{(1, 809)} = 8.755$, $p = .003$. Welch's ANOVA was conducted to determine if there was a significant difference in students' perception of classroom quality (SPOCQ) between private (N=441) and public (N= 343)

school students. Results indicated no significant difference in SPOCQ scores between students in private and public schools, Welch's $F_{(1,774.116)} = .148$, $p = .700$.

Table 8

Means and Standard Deviations of Students' Perception of Classroom Quality by School Type

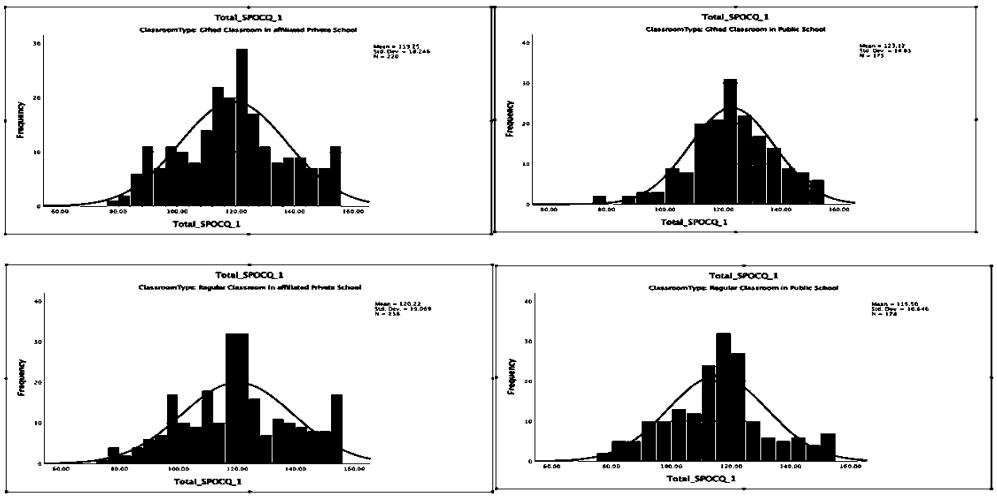
	SPOCQ score			*Welch's ANOVA*			
School Type	*n*	*M*	*SD*	*S*	*df1*	*df2*	P
Private	458	119.7596	19.02146	.148	1	774.116	.700
Public	335	119.2726	16.35783				
Total	811	119.5466	17.89556				

Differences in students' perceptions of differentiated instruction between different classroom types

Research question three pursues determining whether there were significant differences in students' perceptions of classroom quality between students in different classroom types. Data screening for One-Way ANOVA was conducted. Value checking provided no errors. SPOCQ presented 27 missing values that were replaced with the series mean. The Z-score calculation revealed no univariate outliers for SPOCQ, as none was greater than +2.5 or less than -2.5 (Hair et al., 2010, as cited in Meyers et al., 2013). Univariate normality was assessed (Figure 6), and the data showed no signs of skewness and kurtosis, the values for all the four independent variables were within +/-1 (George & Mallery, 2003, Morgan, Griego, & Gloeckner, 2001, as cited in Meyers et al., 2013). The test for univariate homoscedasticity through Levine's test revealed significant values, implying that the assumption was violated, $F_{(3, 807)} = 4.561$, $p = .004$. Welch's ANOVA was adopted to resolve the issue.

Figure 6

Univariate normality of students' perceptions of classroom quality for students in various classroom types



A Welch's ANOVA was performed to determine if there was a significant difference in students' perception of classroom quality (SPOCQ) between the four types of classrooms: 1) gifted classrooms in affiliated private schools; 2) gifted classrooms in public schools; 3) non- gifted classroom in affiliated private school; 4) non- gifted classroom in public school. Gifted classrooms in public schools scored the highest (M=123.14, SD = 14.69) followed by non-gifted classrooms in private schools (M=120.26, SD = 19.61). Table 9 is a summary of the mean scores.

Table 9

Means and Standard Deviations of Students' Perception of Classroom Quality by Classroom Type

	SPOCQ		
Classroom Type	*M*	*SD*	*n*
Gifted in Private	119.2413	18.41530	216
Gifted in Public	123.1415	14.69011	174
Non-gifted in Private	120.2572	19.61388	225
Non- gifted in Public	115.2892	17.05950	169
Total	119.5466	17.89556	784

The Welch's ANOVA indicated a significant difference in average SPOCQ scores between types of classrooms, Welch's $F_{(1, 427.311)} = 7.025$, $p < .001$. Post hoc comparisons, using the Games-Howell post hoc procedure, were conducted to determine which pairs of the four-classroom type mean differed significantly. The results are given in Table 10, and indicate that: Gifted in Public vs. Non-gifted in Public (Mean difference = 7.85232) was significant, $p < .001$; and Non- gifted in Private vs. Non-gifted in Public (Mean difference = 4.96802) was significant, $p = 0.038$; Gifted in Private vs. Gifted in Public (Mean difference = -3.9002) was not significant, $p = 0.094$; Gifted in Private vs. Non-gifted in Private (Mean difference = -1.0159) was not significant, $p = 0.944$; Gifted in Private vs. Non-gifted in Public (Mean difference = 3.95212) was not significant, $p = 0.131$; and Gifted in Public vs. Non-gifted in Private (Mean difference = 2.8843) was not significant, $p = 0.336$.

Table 10

Post Hoc Test Results for Students' Perception of Classroom Quality by Classroom Type

Variable	Area		*Mean Difference*	*SD*	*p*
Classroom type	Gifted in Private	Gifted in Public	-3.9002	1.67638	0.094
		Non-gifted in Private	-1.0159	1.81102	0.944
		Non-gifted in Public	3.95212	1.8144	0.131
	Gifted in Public	Non-gifted in Private	2.8843	1.71756	0.336
		Non-gifted in Public	7.85232*	1.72113	<.001
	Non-gifted in Private	Non-gifted in Public	4.96802*	1.85252	0.038

Note: ***$p < .001$

Since Welch's ANOVA results indicated a significant difference in average SPOCQ scores between types of classrooms, Welch's $F_{(1, 427.311)} = 7.025$, $p < .001$, the null hypothesis is thus rejected, and the alternative is adopted.

Predicting students' perception of classroom quality

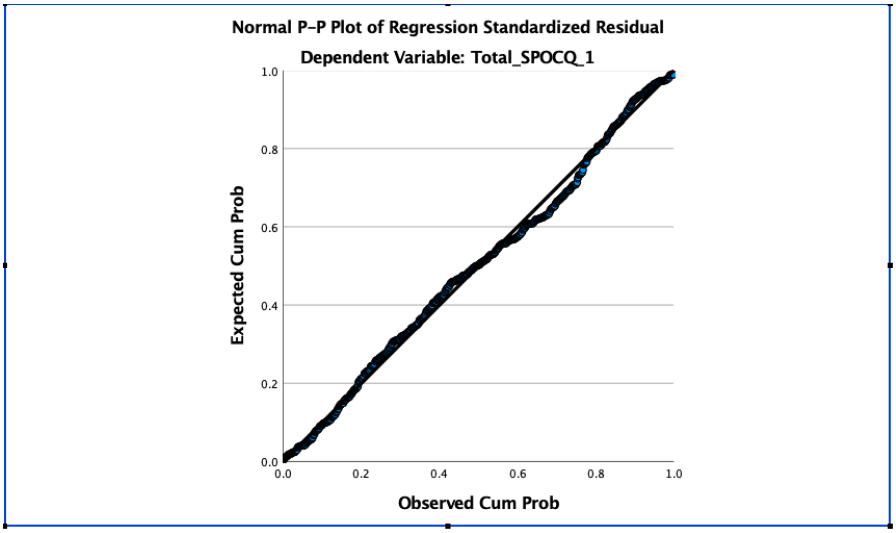
For research question four, an examination of the extent to which teachers' professional development and differentiated instruction predict students' perception of classroom quality was conducted. Multiple Linear Regression (MLR) was the appropriate analysis technique. The outcome or Dependent Variable (DV) was students' perception of classroom quality (SPOCQ) was measured on a continuous scale. The two Predictors or

Independent Variables (IVs) were teachers' professional development and differentiated instruction.

In evaluating the assumptions for MLR, at least 20 cases were recorded for each independent variable, the IVs were measured independently of each other, and each IV was linear to the DV. At least two independent variables were nominal, ordinal, or interval/ratio level variables.

Figure 7

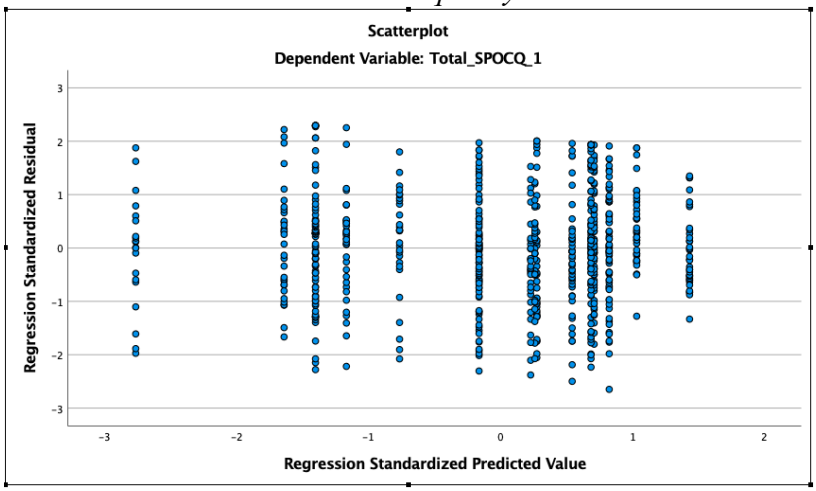
P-P Plot of Regression Residuals of students' perceptions of differentiated instruction and classroom quality



Homoscedasticity, which tested whether these residuals are equally distributed, was not violated. Normality was not violated; as illustrated in Figure 7, visual inspection of the normal P-P plot indicates normality as data points are generally along the normality line; therefore, the residuals of the regression should follow a normal distribution. Figure 8 is the scatterplot of the residuals, and the data points do not have an obvious pattern. They are also equally distributed above and below the zero on the X-axis and almost equivalent to the right and left of the zero on the Y-axis.

Figure 8

Scatterplot of Distribution of Regression Residuals of students' perceptions of differentiated instruction and classroom quality



The data were tested for multicollinearity to determine whether the predictor variables were highly correlated. The analysis of collinearity statistics showed there was no evidence of multicollinearity. This assumption was not violated as all VIF scores were less than 10; both were 1.09, while the tolerance scores were above 0.2: teachers' professional development (.910) and differentiated instruction (.910).

A closer inspection of teaching experience (TE) and level of education (EL) revealed that almost all participants fell into one category, for TE was (10 years and above); and 99% of the respondents fell in bachelor's degree. These made both TE and EL unusable for meaningful statistical analysis. Therefore, RQ4 could only adopt teachers' hours of professional development and teacher perception of differentiated instruction scores as the only potential predictor variables.

To respond to Research Question 4, MLR was necessary to determine the extent to which teachers' professional development (TPD) and differentiated instruction (TDI) predicted students' perception of classroom quality in private schools. MLR allows

researchers to determine the model's overall fit and each predictor's contribution to the total variance explained.

Table 11

Summary of Multiple Linear Regression Analysis for Variables Predicting Classroom Quality in Private Schools

	Course Quality		
Variable	*B*	*SE B*	*β*
Professional Development	.525	.164	.177*
Differentiated Instruction	-.007	.040	-.009
R^2		.030	
F		6.968*	

Note: $*p < .05$

MLR analysis was conducted to examine the predictive nature of teacher characteristics over students' perception of classroom quality in public schools. Table 11 shows that a significant regression equation was found $F_{(2,455)} = 6.968$, $p = .001$, with an R^2 of .030, implying TDI and TPD accounted for approximately 3% of students' perception of class quality variance. The independent variables statistically significantly predict the dependent variable, as illustrated by the *F*-ratio. The data provided a good fit for the regression model.

The estimated model constants and coefficients for professional development, teacher perception of differentiated instruction score, with respect to students' perception of classroom quality, are as follows: SPOCQ = 113.186 + (.525* TPD) - (.007* TDI), which is a substitution in the general equation SPOCQ = $\beta_{0+}\beta_1$ * teacher professional development + β_2 * teacher perception of differentiated instruction.

From the equation above, a 1-unit increase in professional development hours (TPD) would result in a .525 increase in the average students' perception of classroom quality (SPOCQ) score. A 1-unit improvement in teacher perception of differentiated instruction (TDI) score would result in a .007 decrease in the average students' perception of classroom quality (SPOCQ). The equation indicates that for every one unit increase or decrease in all or either TPD and TDI, there would be an increase or decrease in students' perception equal to the average of the respective coefficient.

Although, by substitution, the expected predictive regression equation would be $SPOCQ$ = 113.186 + (.525* TPD) - (.007* TDI), the t-statistics (3.209 and -.171) for TPD significant and TDI not significant (p = .001, and p = .864), respectively. Therefore, TPD predicts SPOCQ. The null hypothesis (H_0: $\beta_1 = \beta_2 = 0$) was thus rejected to indicate that at least one variable could predict students' perception of classroom quality.

To respond to Research Question 4, MLR was necessary to determine the extent to which teachers' professional development (TPD) and differentiated instruction (TDI) predicted students' perception of classroom quality in gifted private schools. MLR allows researchers to determine the model's overall fit and each predictor's contribution to the total variance explained.

Table 12

Summary of Multiple Linear Regression Analysis for Variables Predicting Classroom Quality in Gifted Private Schools

	Course Quality		
Variable	*B*	*SE B*	*β*
Professional Development	.398	.190	.155*
Differentiated Instruction	.045	.051	.065
R^2		. 037	
F		4.176*	

Note: $*p < .05$

MLR analysis was conducted to examine the predictive nature of teacher characteristics over students' perception of classroom quality in gifted private schools. Table 12 shows that a significant regression equation was found $F_{(2,217)} = 4.176$, $p = .017$, with an R^2 of .037, implying TDI and TPD accounted for approximately 3.7% of students' perception of class quality variance. The independent variables statistically significantly predict the dependent variable, as illustrated by the *F*-ratio. The data provided is a good fit for the regression model.

The estimated model constants and coefficients for professional development and teacher perception of differentiated instruction, with respect to students' perception of classroom quality, are as follows: SPOCQ = 106.785 + (.398* TPD) + (.045* TDI), which is a substitution in the general equation SPOCQ = $\beta_{0+}\beta_1$ * teacher professional development + β_2 * teacher perception of differentiated instruction.

From the equation above, a 1-unit increase in professional development hours (TPD) would result in a .398 increase in the average students' perception of classroom quality (SPOCQ) score. A 1-unit improvement in teacher perception of differentiated instruction (TDI) score would result in a .045 increase in the average students' perception of classroom quality (SPOCQ).

Although, by substitution, the expected predictive regression equation would be $SPOCQ = 106.785 + (.398* TPD) + (.045* TDI)$, the t-statistics (2.093 and .879) for TPD is significant and TDI is not significant ($p = .038$, and $p = .380$), respectively. Therefore, TPD predicts SPOCQ. The null hypothesis ($H_0: \beta_1 = \beta_2 = 0$) was thus rejected to indicate that at least one of the independent variables (professional development hours) could predict students' perception of classroom quality.

To respond to Research Question 4, MLR was necessary to determine how teachers' professional development (TPD) and differentiated instruction (TDI) predicted students' perception of classroom quality in non-gifted programs in private schools. MLR allows researchers to determine the model's overall fit and each predictor's contribution to the total variance explained.

Table 13

Summary of Multiple Linear Regression Analysis for Variables Predicting Classroom Quality in Non-Gifted Programs in Private Schools

	Course Quality		
Variable	*B*	*SE B*	*β*
Professional Development	.937	.326	.253*
Differentiated Instruction	-.104	.069	-.133
R^2		.036	
F		4.331*	

Note: $*p < .05$

MLR analysis was conducted to examine the predictive nature of teacher characteristics over students' perception of classroom quality in non-gifted programs in private schools. The data provided a good fit for the regression model. Table 13 shows that a significant regression equation was found F (2,235) = 4.331, p = .014, with an R2 of .036, which implies TDI and TPD accounted for approximately 3.6% of students' perception of class quality variance. The independent variables statistically significantly predict the dependent variable, as illustrated by the F-ratio.

The estimated model constants and coefficients for professional development and teacher perception of differentiated instruction with respect to students' perception of classroom quality, are as follows: SPOCQ = 122.812 + (.937* TPD) - (.104 * TDI), which is a substitution in the general equation SPOCQ = $\beta_{0 +} \beta_1$ * teacher professional development + β_2 * teacher perception of differentiated instruction.

From the equation above, a 1-unit increase in professional development hours (TPD) would result in a .937 increase in the average students' perception of classroom

quality (SPOCQ) score. A 1-unit improvement in teacher perception of differentiated instruction (TDI) score would result in a .104 decrease in the average students' perception of classroom quality (SPOCQ).

Although, by substitution, the expected predictive regression equation would be *SPOCQ* = 122.812 + (.937* TPD) - (.104 * TDI), the t-statistics (2.877 and -1.516) for TPD is significant and TDI is not significant (p =.004, and p =.131), respectively. Therefore, TPD predicts SPOCQ. The null hypothesis (H_0: $\beta_1 = \beta_2 = 0$) was thus rejected to indicate that at least one of the independent variables (professional development hours) could predict students' perception of classroom quality.

Supplementary result: Ministry of Education vs. Mawhiba Gifted Programs

The researcher wished to investigate whether students' perceptions of classroom quality differed between the Ministry of Education and Mawhiba Gifted Programs. The independent t-test was chosen as an appropriate statistical technique to determine the difference. Levene's test did not violate the homoscedasticity assumption (p =.92). There was a significant effect for gifted programs, t (393) = 2.368, p =.009, with Mawhiba receiving higher SPOCQ scores than the Ministry of Education. The students taking Mawhiba Gifted Programs reported higher SPOCQ scores (M= 161.54, SD=26.66) than those taking the Ministry of Education gifted programs (M= 155.44 *SD*=23.76).

Conclusion

The study's sample consisted of 811 male students from Saudi Arabia. In summary: program type, school type, classroom-type, and a teacher's professional perception of differentiated instruction and perception of classroom quality had significant effects on students' perception of classroom quality. There were significant

differences in the students' perception of classroom quality between students in gifted and students in regular programs. There were significant differences in the students' perception of classroom quality between public and private schools. There were significant differences in the students' perception of classroom quality between students in the various types of classrooms.

Moreover, a teacher's professional development significantly affects students' perception of classroom quality. In contrast, the views on differentiated instruction did not significantly affect students' perception of classroom quality. A teacher's professional development predicted students' perceptions of classroom quality, and opinion on differentiated instruction did not predict students' perceptions of classroom quality. The next chapter will discuss the implications of the findings of chapter four, review any correspondence to previous research, give some recommendations, and conclude the study.

CHAPTER 5: DISCUSSION

Introduction

The objective of this quantitative study was to identify the relationship between differentiated instruction and classroom quality of gifted students in Saudi Arabia. This chapter covers a discussion of the major finding in chapter four. It will seek to identify the similarity between this study's outcomes and prior research presented in chapter two. This chapter will also review the practical and future implications of the findings. The chapter will conclude with a discussion of the limitations of these study areas of future research possibilities and a summary.

Summary and interpretations of Findings

This study's findings from research question 1 indicated a significant difference in the student perception of classroom quality between students in gifted programs and students in non-gifted programs. The first implication is that students in gifted programs perceive their classroom has more choices, challenges, meaning, and enjoyment than the nongifted program. Therefore, teachers, educators, and professionals may consider attaching these challenging curricula along with the traditional curriculum or making these kinds of curricula accessible for all students and teachers to benefit.

Similarly, research question 2 indicated a significant difference in the student perception of classroom quality mean score between students in private schools and students in public schools. The implication is that students in private schools find more choices, challenges, meaning, and enjoyment in their classes compared with students in public schools. The students in private schools have an additional enrichment curriculum than in public schools. Private schools have fewer classrooms than public schools, and

the low ratio between students and teachers benefits students' quality of education in private schools. The requirement of qualifications and experiences of teachers varies highly between the public and private schools, benefiting the students in private schools (Ministry of Education, 2021 and Mawhiba official website, 2021). This may be because the parents pay tuition to receive better education for their kids in private schools, whereas parents of public school students do not pay. Teachers, parents, and educators must know the concept of differentiated instruction and classroom quality and classroom quality through challenging tasks and activities.

Research question 3 indicated a significant difference in the student perception of classroom quality between the four classroom types. Students in gifted classrooms perceived more choices, challenges, meaning, and enjoyment during their learning than students in non-gifted classrooms in public schools. There was a significant difference in SPOCQ between non-gifted classrooms in private schools vs. non-gifted classrooms in public schools. The students/learners from both public and private schools receive the standardized math curriculum created by the ministry of education. However, gifted students in public schools receive enrichment units in some math topics characterized by depth, challenge, and scientific research and the curriculum created by the ministry of education. Although the non-gifted students in private schools receive the same standardized curriculum from the ministry of education, the quality of education and support received by students is better when compared to public schools. The gifted in private schools receive the ministry of education and the Mawhiba curriculums. The Mawhiba curriculum has a high level of challenge and depth in addition to the resources from the private schools (Ministry of Education, 2021) Mawhiba Official website, 2021).

This result supports the importance of creating a classroom that meets students' needs in both public and private schools and creates differentiated instruction to meet students' needs in public and private schools. Additionally, teachers and parents must work toward providing more choices, appropriate challenges, more meanings, and enjoyment so that students can achieve higher.

Multiple regression analysis in research question 4 demonstrated that the professional development hours predicted SPOCQ in private schools while differentiated instruction could not predict SPOCQ. This result implies that teachers need to be provided with more and better professional development for students to perceive enough choices, challenges, meaning, and enjoyment. Differentiated instruction did not predict SPOCQ, probably because the variance in teachers' understanding and implementation of differentiated instruction was not large enough. According to Personal communication (February 16, 2022), this result could be originated from 1) Teachers in private schools have more experience than teachers in public schools as private schools' administration requires teachers to have high-level experiences and extensive knowledge to work in private schools. 2) Private schools obligate teachers to provide enrichment programs. 3) There are no models for teachers in both schools (private and public) to follow to implement gifted education programs and differentiated instructions. 4) Private schools are distinguished from public schools due to expertise among teachers, and there are experiences among some public school teachers. Still, due to the number of students in the classroom in public schools and the teaching load compared to private schools, teachers in public schools do not have the time to provide appropriate enrichment programs.

Relationship to Prior Research

The result above indicated for research questions 1, 2, and 3 that there was a significant difference in the student perception of classroom quality mean score between students in gifted programs and students in non-gifted, students in private schools, and students in public schools, programs. Research question 2 indicated a significant difference in the student perception of classroom quality mean score between students in private schools and students in public schools and four classroom types. Research question 4 demonstrated that two teachers' characteristics (teaching experience, differentiated instruction) could not predict SPOCQ.

These results are consistent with previous research on differentiated instruction and classroom quality. The current study agrees with a study on the effectiveness of using differentiated instructions in increasing students' achievement. However, Reis et al.'s (2011) study differs from the current study. It included experimental and control groups, and the differentiated instructions were used in reading, while the current study focused on mathematics. Also, the current study results agreed that there were statistically significant differences in the overall score on students' perceptions of classroom quality (SPOCQ). Horak and Galluzzo's (2017) study focused on problem-based learning (PBL) on students' achievement and their perceptions of classroom quality. On the other hand, the current study differs from Horak and Galluzzo's (2017) study in methodology and in the independent variable, where Horak and Galluzzo's (2017) study focused on the impact of problem-based learning (PBL) as an independent variable on student achievement and their perceptions of classroom quality. Also, Horak and Galluzzo's

(2017) study only dealt with students as samples, while the current study sample dealt with students and teachers.

The results of the current study also agreed with Valiandes (2015) study in the methods of sample selection and the results found that students with differentiated instruction achieved higher success than the comparison group, while the current study differed in methodology.

The current study was designed based on a quantitative research methodology. In contrast to the present study, the Bailey and Williams-Black (2008) study examined differentiated instructions from the perspectives of three teachers using a qualitative, non-experimental study on how regular teachers distinguished their education during literacy events in their classrooms. The Bailey and Williams-Black (2008) study concluded that teachers partially understand and implement differentiated instructions. This result is consistent with the outcomes of the fourth question about professional development hours as a predictor in SPOCQ; this is also consistent with Robinson, Maldonado, and Whaley's (2014) study that focused on differentiated instruction execution perceptions. The results demonstrated a lack of professional development, time constraints, difficulties in learning how to implement differentiated instructions, and a belief that differentiated education is essential to student success.

The current study agreed with Richards's (2013) study, which measures teachers' perceptions and their implementation of differentiated instruction in the study of private primary and middle schools. In measuring some variables and using the predictive relationship between teachers' perceptions and the implementation of differentiated instruction, it differed in the samples, where the current study focused on gifted students

and their teachers rather than only teachers, the current study used Measuring Teachers' Perceptions and Understanding and implementation differentiated instruction as a predictor of measuring student perceptions of classroom quality.

In addition to what was mentioned about previous studies, although the current study benefited and agreed with the results of most previous studies, it should be noted that most of the previous studies that supported the current study were applied in the United States of America. In contrast, this study was applied in the Saudi Arabian Kingdom, which leads to the possibility of some differences due to two distinct cultures and existing differences.

Limitations of the Study

The original study instruments were developed in English and had to be translated to the present study's language, Arabic, which is spoken predominantly in Saudi Arabia. Therefore, even with the best efforts, challenges in the translation of the instruments for the participants of this study may have inadvertently introduced slightly different meanings. A threat to statistical validity was the reliability of the instruments.

The study proposed and planned to use an academic achievement variable from mathematics tests. The administration and the available scores for the math exam were highly inconsistent. There are no standardized mathematics tests in Saudi Arabia to measure mathematics scores uniformly. The researcher did not find any valid and reliable tools in Saudi Arabia to measure achievement in mathematics. Therefore, the researcher had to exclude the achievement variable for use in the current study. COVID19 also presented particular challenges. This study was administered remotely by communicating with the study coordinator in the Gifted Department in the Saudi Arabian Kingdom, who

in turn communicated with the study participants. Due to the COVID19 restrictions and precautions, questionnaires were distributed to participants without explaining the survey.

One other limitation of this study was its low statistical power. Although a reasonable number of participants, 811 students and 16 teachers, the study still observed that statistical power could have significantly improved. Female schools and male schools are separate in the Kingdom of Saudi Arabia. The sample is from one country and one city in Saudi Arabia, and the fact that the researcher was only allowed to sample male schools means there is a limit to the generalization of the findings.

Recommendations for Future Practice

This study demonstrated that the relationship between differentiated instruction and classroom and student perceptions of classroom quality was affected by program type, school type, and classroom type, and student perceptions could be forecasted from teacher perceptions. Many practical recommendations were apparent. Since students seem to form their perceptions from their teachers, teachers need to have positive views and opinions about differentiated instruction, class quality, and gifted achievement. Administrators and policymakers must put more resources into teacher training on differentiated instruction. Besides skills development, perceptions can also be shaped by training. For instance, continuous teacher training programs on differentiated instruction, university degrees, and professional development could prepare teachers to deal with gifted children. Regression models, once developed, are powerful and effective in practice. The desired levels of students' perceptions can be achieved through improvements in the predictor variables.

Recommendations for Future Research

The lack of a uniform basis for academic achievement in Saudi Arabia was of great concern to the researcher. Future researchers should plan to design valid and reliable standard academic achievement tests, including uniform mathematical tests for reasonable comparative studies on gifted student performance.

The findings, the statistical analysis techniques, the research instruments applied, the design and methods, the literature summarized in the review, and the research questions' development are all potential contributions of this study to future research as they may form templates and guides. Similar studies in the future could apply experimental, qualitative, or mixed study methods instead of the non-experimental quantitative approaches used in the current study to achieve corroboration and triangulation in data sources.

Another important recommendation for future researchers is to utilize a more diverse set of demographic characteristics of the population of Saudi Arabia. Including female students, a more significant number of teachers, and varying experience and education would provide exciting results.

Conclusion

Decision-makers must avail necessary resources for teachers' professional development on gifted education and differentiated instruction to provide students with appropriate choices, challenges, meanings, and enjoyment and motivate them to learn more. This dissertation aimed to investigate the relationship of various variables with students' perceptions of classroom quality in the Kingdom of Saudi Arabia. The study indicated that students' perceptions of classroom quality would be positively impacted.

APPENDIX A: IRB APPROVAL

ST. JOHN'S UNIVERSITY

Federal Wide Assurance: FWA00009066

Mar 26, 2021 12:08:15 PM EDT

PI: Qamrah Alsubaie
CO-PI: Seokhee Cho
Ed Admin & Instruc Leadership

Re: Expedited Review - Initial - **IRB-FY2021-258** *Relationship Between Differentiated Instruction and Classroom Quality and Achievement Of Gifted Students In Saudi Arabia*

Dear Qamrah Alsubaie:

The St John's University Institutional Review Board has rendered the decision below for *Relationship Between Differentiated Instruction and Classroom Quality and Achievement Of Gifted Students In Saudi Arabia*. The approval is effective from March 26, 2021 through March 25, 2021.
Decision: Approved

PLEASE NOTE: If you have collected any data prior to this approval date, the data must be discarded.

Selected Category: 7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Sincerely,

Raymond DiGiuseppe, PhD, ABPP
Chair, Institutional Review Board
Professor of Psychology

Marie Nitopi, Ed.D.
IRB Coordinator

APPENDIX B: APPROVAL TO CONDUCT STUDY (ARABIC)

بسم الله الرحمن الرحيم

المملكة العربية السعودية
وزارة التعليم
(٢٨٠)
الإدارة العامة للتعليم بمحافظة الأحساء
إدارة التخطيط والتطوير
قسم بحوث سياسات التعليم

وزارة التعليم
Ministry of Education

رقم : ١٠٢٢٩
التاريخ : ٣/ ٨/ ١٤٤٢هـ

إلى من يهمه الأمر

السلام عليكم ورحمة الله وبركاته

نفيدكم علماً بأن الباحثة قمرة بنت حطاب فهيد السبيعي رقم السجل المدني [redacted] المبتعثة إلى جامعة سانت جونز لنيل درجة الدكتوراه في قسم القيادة الإدارية والتعليمية وتعليم الموهوبين والتي تعد دراسة بحثية بعنوان " العلاقة بين التدريس المتمايز وجودة الفصل الدراسي وإنجاز الطلاب الموهوبين في المملكة العربية السعودية"، قد تقدمت لطلب تسهيل مهمتها في تطبيق أدواتها البحثية من شهر مارس ٢٠٢١ ولمدة عام، ولا مانع لدى الإدارة العامة للتعليم بالأحساء ممثلة في إدارة التخطيط والتطوير من تسهيل مهمتها البحثية وفقاً للإجراءات التنظيمية واللوائح المعمول بها.

والله ولي التوفيق

مدير عام التعليم بالأحساء

حمد بن محمد العيسى

وحدة التخطيط والتطوير التربوي
إدارة التربية والتعليم للبنين بمحافظة الأحساء

ال / الطبيلي

APPENDIX C: APPROVAL TO CONDUCT STUDY (ENGLISH)

Letter of School Permission to Conduct Research on Site

March16,2021

To whom it concerns
Peace, mercy and blessings of God

We inform you that Qamrah Alsubaie who has a scholarship to study at St. John's University to obtain a PhD in the Department of Administrative and Educational Leadership, which is preparing a research study entitled "The Relationship Between Differentiated Instruction and Classroom Quality and Achievement of Gifted Students in Saudi Arabia.", submitted a request to facilitate her mission in the application of its research tools from March 2021 for a year, and there is no objection to the General Administration of Education in Al-Ahsa represented In the Planning and Development Department, to facilitate its research mission in accordance with applicable regulatory procedures and regulations.

God grants success

General Director of Al-Ahsa Education

APPENDIX D: INFORMED CONSENT LETTER (STUDENT)

Informed Consent Form for Participation

Dear Student,

You are invited to take part in a survey study. This study aims to understand the relationship among instruction, classroom quality and achievement of middle and high school students in Saudi Arabia. This study will be conducted by Qamrah Alsubaie, doctoral student at the Department of the Administrative and Instructional Leadership, St. John's University.

If you agree to participate in the study, you will be asked to respond to a survey on differentiated instruction and classroom quality. It will take approximately 15-20 minutes to complete two surveys: Differentiated Instruction and Classroom Quality.

Participation in this study is voluntary. You may refuse to participate or withdraw at any time without penalty. You have the right to skip or not answer any questions you prefer not to answer. If you decide to participate, please sign this form, and it will be a record of your agreement to participate. You will be given a copy of this form.

There are no known risks associated with your participation in this research and your anonymity will be strictly maintained. Although you will receive no direct benefits, this research may help the investigator understand the relationship among instruction, classroom quality and achievement of middle and high school students in Saudi Arabia.

If you have questions about the purpose of this investigation, you may contact the Principal Investigator, Qamrah Alsubaie, at1- 860-771-9114 or at qamrah.alsubaie18@stjohns.edu. You may contact my faculty advisor, Dr. Seokhee Cho, at 718-990-1303. If you have questions concerning your rights as a human participant, you may contact the University's Human Subjects Review Board at St. John's University, specifically Dr. Raymond DiGiuseppe, 718.990.1955, or digiuser@stjohns.edu.

APPENDIX E: INFORMED CONSENT LETTER (TEACHER)

Informed Consent Form for Participation

Dear Teacher,

You are invited to take part in a survey study. This study aims to understand the relationship among instruction, classroom quality and achievement of middle and high school students in Saudi Arabia. This study will be conducted by Qamrah Alsubaie, doctoral student at the Department of the Administrative and Instructional Leadership, St. John's University.

If you agree to participate in the study, you will be asked to respond to a survey on differentiated instruction and classroom quality. It will take approximately 15-20 minutes to complete two surveys: Differentiated Instruction and Classroom Quality.

Participation in this study is voluntary. You may refuse to participate or withdraw at any time without penalty. You have the right to skip or not answer any questions you prefer not to answer. If you decide to participate, please sign this form, and it will be a record of your agreement to participate. You will be given a copy of this form.

There are no known risks associated with your participation in this research and your anonymity will be strictly maintained. Although you will receive no direct benefits, this research may help the investigator understand the relationship among instruction, classroom quality and achievement of middle and high school students in Saudi Arabia.

If you have questions about the purpose of this investigation, you may contact the Principal Investigator, Qamrah Alsubaie, at1- 860-771-9114 or at qamrah.alsubaie18@stjohns.edu. You may contact my faculty advisor, Dr. Seokhee Cho, at 718-990-1303. If you have questions concerning your rights as a human participant, you may contact the University's Human Subjects Review Board at St. John's University, specifically Dr. Raymond DiGiuseppe, 718.990.1955, or digiuser@stjohns.edu.

APPENDIX F: RESEARCH QUESTIONNAIRE: STUDENT PERCEPTION OF CLASSROOM QUALITY (S-POCQ)

Dear Student,

I would like to invite you to participate in a survey to offer your input on the relationship between differentiated instruction and the classroom quality of gifted students in Saudi Arabia. I wanted to know if you were interested in participating. I am gathering information to best determine what topics and ideas should be included in gifted students' curricula. Your feedback and suggestions will benefit the high school of gifted students' programs which may help them to increase the quality of gifted students' programs in Saudi Arabia and students' achievements. You are being asked to participate because you have been identified as a gifted student in middle and high gifted schools in Al Hasa City. The survey is short and may take you 15 minutes or less for each to complete. The survey is electronic and can be completed on a digital device (e.g., smartphone, desktop, tablet) at your leisure. You will be asked some questions about Differentiated Instruction and Classroom Quality and how you can meet the needs of gifted students by enhancing the classroom quality and differentiated instruction to increase gifted students' achievement.

If you have any questions concerning your rights as a research participant, you may contact the St. John's University Institutional Review Board (IRB) at 718-990-1440 or irbstjohns@stjohns.edu. Additionally, if you're interested in participating, you may contact the co-primary Investigator, Dr. Seokhee Cho, at chos1@stjohns.edu and 718 990 1303 or the Primary Investigator Qamrah Alsubaie at qamrah.alsubaie18@my.stjohns.edu. If you have any questions or concerns, please do not hesitate to contact me.

Have a wonderful day!

Sincerely,

Qamrah Alsubaie, Ed.D. Candidate

Section A: demographic data

Affiliated school name:

Type of Classroom: Regular Classroom Gifted Classroom

Student name: Your teacher's name: Your grade level:

Survey Questions

We would like to know how you feel about your class activities. Read each statement and show how much you agree with it by choosing in the circle. There are no right or wrong answers. Your answers will be kept confidential. Remember to select an answer for each statement. Thank you for your help in this study.

(1) Strongly Disagree (2) Disagree (3) Undecided (4) Agree (5) Strongly Agree

Questionnaire Item	**Strongly Disagree**	**Disagree**	**Undecided**	**Agree**	**Strongly Agree**
I am given choices regarding how to show the teacher what I have learned.					
I am good at helping other kids understand concepts					
I find the contents of my class interesting.					
I find my class time instruction appropriately challenges my intellectual abilities.					
My teacher has let me choose the resources I use for the project.					
When there are different ways to show what I have learned, I can usually pick a good way.					
The teacher applies the lessons to practical experiences.					
I learn best when I am challenged.					
The designated reading material for my class is interesting.					
My teacher makes connections between the course material and society. My teacher makes connections between the course material and society.					
I challenge students so that they will learn the material better.					
I am given many choices in my class					

My teacher relates current issues to the material we are learning in my class.					
I am good at linking material from this class with the real world.					
This class content is an appropriate challenge for me. This class content is an appropriate challenge for me.					
I feel responsible for my learning because I can make choices in my class.					
The teacher uses multiple instructional techniques that make this class enjoyable.					
I like the challenge of the projects in this class.					
The material covered in my textbook is interesting.					
The textbook provides examples of how the material relates to society and daily living.					
I am good at answering questions in this class.					
I am encouraged to pursue subjects that interest me in my class.					
It is pretty easy for me to earn good grades.					
I explore real issues that affect the world around me in my class.					
I anticipate learning new things in this class.					
I find pleasure in reading material for my class.					
I use my critical thinking skills in my class.					
I am good at taking tests in this class.					
I can relate the discussed material in my class to my daily life.					
I can easily understand the reading assignments for this class.					
I like going to class each day.					
I can usually discover exciting things to learn about in this class.					
I like the way my teacher challenges me in this class.					
I can express my opinions clearly in this class.					
Good marks/grades are mainly the results of my hard work.					

Good marks/grades are mainly the results of my ability.					
I can improve my intelligence by working hard.					
I plan to go to college.					

APPENDIX G: RESEARCH QUESTIONNAIRE: DIFFERENTIATED INSTRUCTION SURVEY

Dear Faculty/Staff Member

I would like to invite you to participate in a survey to offer your input on the Relationship Between Differentiated Instruction and the Classroom Quality of Gifted Students in Saudi Arabia. I wanted to know if you were interested in participating. I am gathering information to best determine what topics and ideas should be included in gifted students' curricula. You will be asked some questions about Differentiated Instruction and Classroom Quality and how you can meet the needs of gifted students by enhancing the classroom quality and differentiated instruction to increase gifted students' achievement. Your feedback and suggestions will benefit the high school of gifted students' programs which may help them to increase the quality of gifted students' programs in Saudi Arabia and students' achievements. You are being asked to participate because you have been identified as a gifted students teacher in middle and high gifted schools in Al Hasa City. The survey is short and may take you 15 minutes or less for each to complete. The survey is electronic and can be completed on a digital device (e.g., smartphone, desktop, tablet) at your leisure.

If you have any questions concerning your rights as a research participant, you may contact the St. John's University Institutional Review Board (IRB) at 718-990-1440 or irbstjohns@stjohns.edu. Additionally, if you're interested in participating, you may contact the co-primary Investigator, Dr. Seokhee Cho, at chos1@stjohns.edu and 718-990 -1303 or the Primary Investigator, Qamrah Alsubaie, at qamrah.alsubaie18@my.stjohns.edu. If you have any questions or concerns, please do not hesitate to contact me.

Have a wonderful day!

Sincerely,

Qamrah Alsubaie, Ed.D. Candidate

Section A: demographic data

Affiliated school name:

Type of Classroom: Regular Classroom Gifted Classroom

Teacher name:

Experience (Yrs): 0 1-4 5-9 10 and Above

Latest degree received: No. of training hours: Grade/s taught:

Section B: Understanding of Differentiated Instruction

(1) Not Important (2) Somewhat Important (3) Fairly Important (4) Very Important

Understanding of Differentiated Instruction (Student Interest)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
I know individual student interests and can relate them to instruction.				
I know individual student culture and expectations and can relate to instruction.				
I know individual student life situations and how they may impact their learning.				
I am aware of students' learning disabilities and handicaps and how to address them in lessons so as not to impair their learning.				

Understanding of Differentiated Instruction (Assessment)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
I pre-assess students before instructing.				
I pre-assess readiness to adjust the lesson.				
I assess during the unit to gauge understanding.				
I assess at the end of the lesson to determine knowledge acquisition.				
I determine students' learning styles.				
Understanding of Differentiated Instruction (Lesson Planning)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
I teach by assuring each student works towards their highest potential.				
Materials are varied to adjust to students' reading/interest abilities.				
Students play a role in designing/selecting learning activities.				
I adjust for diverse learner needs with scaffolding, tiering instruction & provide student choice in learning activities.				

I provide assignments that require students to apply and extend their understanding.				
Understanding of Differentiated Instruction (Content)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
The curriculum is based on main concepts and generalizations				
I communicate what I want students to know, understand and be able to do clearly.				
I use a different variety of materials other than the standard text.				
I provide a variety of support strategies (organizers, study guides, study buddies).				

Understanding of Differentiated Instruction (Process)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
The pace of instruction varies based on individual learner needs.				
I use learner preference groups and/or learning preference centers.				
I set student groups for learning activities based on interests, readiness, and/or learning preferences.				

The classroom environment is structured to support various activities, including group and/or individual work.				
Understanding of Differentiated Instruction (Product)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
I provide multiple modes of expression in the final product.				
I provide students with the choice to work alone, in pairs or in small groups.				
The product connects with student interest.				
I provide a variety of assessment tasks.				
Implementation of Differentiated Instruction (Student Interest)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
I know individual student interests and can relate them to instruction.				
I know individual student culture and expectations and can relate to instruction.				
I know individual student life situations and how they may impact their learning.				
I am aware of students' learning disabilities and handicaps and				

how to address them in lessons so as not to impair their learning.				
Implementation of Differentiated Instruction (Assessment)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
I pre-assess students before instructing.				
I pre-assess readiness to adjust the lesson.				
I assess during the unit to gauge understanding.				
I assess at the end of the lesson to determine knowledge acquisition.				
I determine students' learning styles.				
Implementation of Differentiated Instruction (Lesson Planning)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
I teach by assuring each student works towards their highest potential.				
Materials are varied to adjust to students' reading/interest abilities.				
Students play a role in designing/selecting learning activities.				
I adjust for diverse learner needs with scaffolding, tiering				

instruction & provide student choice in learning activities.				
I provide assignments that require students to apply and extend their understanding.				
Implementation of Differentiated Instruction (Content)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
The curriculum is based on main concepts and generalizations				
I communicate what I want students to know, understand and be able to do clearly.				
I use a different variety of materials other than the standard text.				
I provide a variety of support strategies (organizers, study guides, study buddies).				
Implementation of Differentiated Instruction (Process)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
The pace of instruction varies based on individual learner needs.				
I use learner preference groups and/or learning preference centers.				
I set student groups for learning activities based on interests, readiness, and/or learning preferences.				

The classroom environment is structured to support various activities, including group and/or individual work.				

Implementation of Differentiated Instruction (Product)	**Not Important**	**Somewhat Important**	**Fairly Important**	**Very Important**
I provide multiple modes of expression in the final product.				
I provide students with the choice to work alone, in pairs or in small groups.				
The product connects with student interest.				
I provide a variety of assessment tasks.				

REFERENCES

Alamer, S. M. (2014). Challenges facing gifted students in Saudi Arabia. *Research on Humanities and Social Sciences*, *4*(24), 107-112.

Aldabas, R. A. (2015). Special education in Saudi Arabia: History and areas for reform. *Creative Education*, *6*(11), 1158.

Aldalham, M. S. (2018). *Characteristics for teaching gifted students: The Saudi teachers' perspective* (Doctoral dissertation, University of Massachusetts Libraries).

Aldossari, A. T. (2018). The Challenges of Using the Differentiated Instruction Strategy: A Case Study in the General Education Stages in Saudi Arabia. *International Education Studies, 11(*4), 74-83.

Algarni, A. A. (2012). *Attitudes of future special education teachers toward gifted students and their education* [Unpublished doctoral dissertation]. Queensland University of Technology.

Algozzine, B., & Anderson, K. M. (2007). Tips for teaching: Differentiating instruction to include all students. *Preventing School Failure: Alternative Education for Children and Youth*, *51*(3), 49-54.

Aljughaiman, A. M., & Grigorenko, E. L. (2013). Growing up under pressure: The Cultural and religious context of the Saudi system of gifted education. *Journal for the Education of the Gifted*, *36*(3), 307-322.

Alqarni, M. (2010). *Evaluation of provision for gifted students in Saudi Arabia* [Unpublished Doctoral Dissertation]. University of Wollongong, Australia.

Alqefari, A. (2010). *A study of programmes for gifted students in the Kingdom of Saudi Arabia* [Unpublished doctoral dissertation]. Brunel University, UK.

Alreshidi, A. M. (2017). The Effects of teaching middle school students math using the gifted supplementary curriculum "Mawhiba" on students' academic achievement and attitude toward math in public schools in Saudi Arabia [Unpublished doctoral dissertation]. Florida Institute of Technology.

Andersson, J., & Burberg, M. (2015). Testing for normality of censored data [Unpublished bachelor's thesis]. Uppsala University, Sweden. http://www.diva-portal.org/smash/get/diva2:816450/FULLTEXT01.pdf

Berger, S. L. (1991). Differentiating curriculum for gifted students. *The Council for Exceptional Children*, ERIC Clearinghouse on Handicapped and Gifted Children.

Bailey, J. P., & Williams-Black, T. H. (2008). Differentiated instruction: Three teachers' perspectives. *College Reading Association Yearbook, 29,* 133-151.

Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage.

Dixon, F. A., Yssel, N., McConnell, J. M., & Hardin, T. (2014). Differentiated instruction, professional development, and teacher efficacy. *Journal for the Education of the Gifted, 37*(2), 111-127.

Education psychology. *Expectancy-Value Theory*. Retrieved November 22, 2020, from https://courses.lumenlearning.com/edpsy/chapter/expectancy-value-theory

Fischer H. (2010). Conclusion: The Central Limit Theorem as a Link Between Classical and Modern Probability Theory. *In: A History of the Central Limit Theorem. Sources and Studies in the History of Mathematics and Physical Sciences*. Springer, New York, NY. https://doi.org/10.1007/978-0-387-87857-7_8

Gardner, H. (2011). Promoting learner engagement using multiple intelligences and choice-based instruction. *Adult Basic Education and Literacy Journal*, *5*(2), 97-101.

Garrett, S. (2017). A comparative study between teachers' self-efficacy of differentiated instruction and frequency differentiated instruction is implemented [Unpublished doctoral dissertation]. Northcentral University.

Gentry, M., & Owen, S. V. (2004). Secondary student perceptions of classroom quality: Instrumentation and differences between advanced/honors and nonhonors classes. *Journal of Secondary Gifted Education, 16*(1), 20-29.

Hall, T. (2002). *Differentiated instruction*. National Center on Accessing the General Curriculum.

Hernandez, H. (2021). Testing for normality: What is the best method. *ForsChem Research Reports, 6,* 2021-05. http://doi.org/10.13140/RG.2.2.13926.14406

Horak, A. K., & Galluzzo, G. R. (2017). Gifted middle school students' achievement and perceptions of science classroom quality during problem-based learning. *Journal of Advanced Academics*, *28*(1), 28-50.

Horsley, J. (2012). Teacher catalysts: Characteristics of teachers who facilitate high academic success. *Australasian Journal of Gifted Education*, *21*(1), 23.

Kanevsky, L. (2011). Deferential differentiation: What types of differentiation do students want? *Gifted Child Quarterly*, *55*(4), 279-299.

Kelly, D. (2008). Adaptive versus learner control in a multiple intelligence learning environment. *Journal of Educational Multimedia and Hypermedia*, *17*(3), 307-336.

Knief, U., & Forstmeier, W. (2021). Violating the normality assumption may be the lesser of two evils. *Behavior Research Methods, 53*, 2576–2590. https://doi.org/10.3758/s13428-021-01587-5

Kozulin, A., Gindis, B., Ageyev, V. S., & Miller, S. M. (Eds.). (2003). *Vygotsky's educational theory in cultural context*. Cambridge University Press.

Landrum, T. J., & Mcduffie, K. A. (2010). Learning styles in the age of differentiated instruction. *Exceptionality*, *18*(1), 6-17.

Marzano, R. J., Marzano, J. S., & Pickering, D. (2003). *Classroom management that works: Research-based strategies for every teacher*. ASCD.

Mawhiba. (2021, January 20). King Abdul-Aziz and his Foundation for the Gifted (KAFG). https://www.mawhiba.org/en/Initiatives/schools/School_Partnership/Pages/default.aspx

Miller, P. H. (2002). *Theories of developmental psychology*. Macmillan.

Ministry of Education. (2021, April). *Handbook guidebook for gifted students' classes of the Ministry of Education in the Kingdom of Saudi Arabia*. Kingdom of Saudi Arabia, Ministry of Education. https://edu.moe.gov.sa

Oaksford, L., & Jones, L. (2001). *Differentiated instruction abstract*. Leon County Schools, Tallahassee, Florida.

Penn State. (2021). *How to use stratified sampling*. Penn State Eberly College of Science. https://online.stat.psu.edu/stat506/lesson/6/6.1

Petersen, J., & Hyde, J. S. (2014). Gender-related academic and occupational interests and goals. *Advances in Child Development and Behavior , 47*, pp. 43-76. JAI.

Pierce, D. A., & Gray, R. J. (1982). Testing normality of errors in regression models. *Biometrika, 69*(1), 233-236.

Reis, S. M., McCoach, D. B., Little, C. A., Muller, L. M., & Kaniskan, R. B. (2011). The effects of differentiated instruction and enrichment pedagogy on reading achievement in five elementary schools. *American Educational Research Journal, 48*(2), 462-501.

Richards-Usher, L. (2013). *Teachers perception and implementation of differentiated instruction in the private elementary and middle schools* [Doctoral dissertation, Capella University]. ProQuest Dissertations & Theses Global.

Robinson, L., Maldonado, N., & Whaley, J. (2014). *Perceptions about implementation of differentiated instruction* [Online Submission, pp. 1-22]. The Annual Mid-South Educational Research (MSERA) Conference. Knoxville, Tennessee.

Rosemarin, S. (2009). Who is the best teacher? Do different kinds of students have different preference? *Gifted Education International*, *25*(1), 48-55.

Stehlík, M., Střelec, L., & Thulin, M. (2014). On robust testing for normality in chemometrics. *Chemometrics and Intelligent Laboratory Systems, 130*, 98-108.

Subban, P. (2006). Differentiated instruction: A research basis. *International Education Journal*, *7*(7), 935-947.

Taherdoost, H. (2016). Sampling methods in research methodology; how to choose a sampling technique for research. *International Journal of Academic Research in Management (IJARM), 5*(2), 28-36.

Taylor, B. K. (2015). Content, process, and product: Modeling differentiated instruction. *Kappa Delta Pi Record, 51*(1), 13-17.

Tomarken, A. & Serlin, R. (1986). Comparison of ANOVA alternatives under variance heterogeneity and specific noncentrality structures. *Psychological Bulletin, 99*, 90-99. http://doi.org/10.1037/0033-2909.99.1.90

Tomlinson, C. A. (1999). *The differentiated classroom: Responding to the needs of all learners*. ASCD.

Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms*. ASCD.

Tomlinson, C. A. (2015). Teaching for excellence in academically diverse classrooms. *Society, 52*(3), 203-209.

Tomlinson, C. A., & Imbeau, M. B. (2010). *Leading and managing a differentiated classroom*. ASCD.

Tomlinson, C. A., & McTighe, J. (2006). *Integrating differentiated instruction & understanding by design: Connecting content and kids*. ASCD.

Tyack, D., Anderson, J. D., Cuban, L., Kaestle, C. F., Ravitch, D., Bernard, S., ... & Streep, M. (2001). *School: The story of American public education*. Beacon Press.

Valiandes, S. (2015). Evaluating the impact of differentiated instruction on literacy and reading in mixed ability classrooms: Quality and equity dimensions of education effectiveness. *Studies in Educational Evaluation, 45,* 17-26.

VanTassel-Baska, J., Hubbard, G. F., & Robbins, J. I. (2020). Differentiation of instruction for gifted learners: collated evaluative studies of teacher classroom practices. *Roeper Review*, *42*(3), 153-164.

Vision 2030. (2020, November 15). *Human Capital Development Program*. Vision 2030, Kingdom of Saudi Arabia. https://vision2030.gov.sa/en/programs/HCDP

Vygotsky Learning Conference. (2020, November 20). *Zone of Proximal Development (ZPD).* https://vygotskyetec512.weebly.com/zone-of-proximal-development.html

Vygotsky, L. (1987). Zone of proximal development. *Mind in society: The development of higher psychological processes*, *5291*, 157.

UNESCO. (2011). *World data on education* (7th ed.). Retrieved from http://unesdoc.unesco.org/images/0021/002116/211628e.pdf

Whipple, K. A. (2012). *Differentiated instruction: A survey study of teacher understanding and implementation in a southeast Massachusetts school district* [Unpublished doctoral dissertation]. Northeastern University.

Wigfield, A., & Eccles, J. S. (2000). Expectancy–value theory of achievement motivation. *Contemporary Educational Psychology, 25*(1), 68-81

Vita

Name	Qamrah Alsubaie
Baccalaureate Degree	*Bachelor of Special Education*, *King Saud, University, Riyadh, Saudi Arabia*
	Major: Special Education
Date Graduated	*February 2008*
Other Degrees and Certificates	*Master of Special Education, King Faisal University, Al Hasa, Saudi Arabia*
	Major: Gifted Education
Date Graduated	*June 2014*