

SCHOOL TEACHER'S PERCEPTIONS OF TWINS: A STUDY ON THE
EDUCATIONAL EXPERIENCE OF TEACHING IDENTICAL AND FRATERNAL
TWINS

by

Robyn M Lindley

Liberty University

A Dissertation Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

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ABSTRACT

This study explored teachers' perceptions of twins' academic abilities and achievements compared to single-born students. It aimed to understand teachers' attitudes towards classroom dynamics and social interactions among twins and their peers, as well as how teachers differentiate instruction to meet the diverse needs of twins in the classroom. By employing a qualitative phenomenological approach, the research gathered comprehensive data through surveys/questionnaires and in-depth, semi-structured interviews with 15 elementary school teachers with experience teaching identical and fraternal twins in primary and secondary schools in Texas and Virginia. The study identified several key themes through thematic analysis: the importance of individualized instruction, the unique social dynamics between twins, and the challenges and advantages of differentiation in the classroom. Findings indicate that teachers recognize the necessity of tailoring educational approaches to meet the diverse needs of twins, emphasizing the significance of fostering individual identities and promoting independence. This research holds significance as it contributes to scholarly discussions on student diversity and can inform theories related to peer dynamics, social integration, and differentiated instruction. The practical implications include the potential to inform teacher training programs, develop support systems for teachers, and influence school policies to foster a more inclusive and supportive learning environment for twins. By shedding light on teachers' perceptions of twins and their educational experiences, the study aims to optimize educational practices and outcomes for twin students, offering practical guidance for educators and informing interventions aimed at supporting twins' socio-emotional well-being and academic success.

Dedication

With a heart full of love and gratitude, I dedicate this dissertation to my beautiful twin sons, Jackson and Liam. You have been the guiding light and unwavering motivation behind all of my endeavors. You have both brought immeasurable joy and purpose to my life, shaping me into the person I am today. As I poured my soul into this work, I did it with you in mind, knowing that you are the reason for my every success and accomplishment. To my dear parents, Mr. and Mrs. Robert K. Lindley, I extend a heartfelt thank you for your unwavering support. Your encouragement, guidance, and unwavering belief in me have been the foundation of my success. I am eternally grateful for your presence in my life, and words can hardly express my immense thanks and appreciation to you both. Furthermore, I extend my deepest gratitude to Mrs. Barbara Augenreich of the Bedford County Public School System for her exceptional care and guidance over my sons during the initial stages of my doctoral journey. You are the educator whose impact will forever be etched in their memories, and we remain profoundly thankful for your enduring friendship that continues to enrich our lives.

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CHAPTER 1: INTRODUCTION TO THE STUDY

Introduction

Twins have long captivated researchers and instructors due to their interesting traits. They give an important opportunity to study the relative impacts of genetics and the environment on different characteristics, phenotypes, and disorders. In education, twins face particular challenges and opportunities, especially with respect to zygosity, individuality, and socialization (Amundson, 2019). One of the basic debates encompassing twins in education includes whether they should be separated or kept together in kindergarten (Amundson, 2019). This decision can influence the twins' academic achievement, psychological well-being, and interpersonal relationships (Garon-Carrier et al., 2022). However, there has yet to be a consensus among principals, teachers, parents, and twins concerning the best practice for twin placement in schools. Each stakeholder may have distinctive beliefs, preferences, and desires based on individual experiences, proficient knowledge, or cultural norms.

Background

One of the primary challenges twins face in school settings is the implementation of separation policies (Garon-Carrier et al., 2022). Many schools have policies that separate twins into different classrooms to promote individuality and independence. However, such separation can be emotionally challenging for twins, who often share a deep bond (Garon-Carrier et al., 2022). The sudden separation may lead to anxiety, depression, and diminished academic performance as they struggle to adjust to the new environment (Amundson, 2019). Moreover, twins may experience difficulties in socialization, particularly when they are the only pair of twins in their school or class

(Bastemur & Aslan, 2021). Peers may view them as a single entity, failing to recognize their individuality. This can hinder their social development and create feelings of exclusion or identity confusion (DiLalla, 2006). Most importantly, academic achievement can also vary between twins. Twin studies have shown that while some twins exhibit similar academic abilities, others may differ significantly (Garon-Carrier et al., 2022). Factors such as differences in learning styles, motivation, or access to certain resources may contribute to these variations (Kovas et al., 2015). Understanding these differences and providing tailored support to each twin is crucial to optimize their academic progress. The rationale behind separating twins in school often rests on the assumption that it promotes individual development, independence, and socialization with peers (Garon-Carrier et al., 2022). Educators may also believe separation reduces classroom management challenges like confusion, competition, or collusion (Lodge et al., 2018). Several studies have found that separating twins in school may antagonistically influence their academic performance, self-esteem, enthusiastic adjustment, and sibling relationships (Garon-Carrier et al., 2022; Nilsson et al., 2010; Tully et al., 2004; Van Leeuwen et al., 2005).

Conversely, keeping twins together in school may yield positive results with respect to learning, mental well-being, social abilities, and family cohesion (Garon-Carrier et al., 2022). Some teachers recognize the benefits of having twins in the same classroom, such as facilitating differentiation, collaboration, and mutual support (Gidziela et al., 2023). However, the benefits may depend on the particular characteristics and preferences of the twins, such as their zygosity, personality, connection, and academic capacities (Bastemur & Aslan, 2021). Some twins prefer to be together, whereas others

want more separation and autonomy. Hence, it has been recommended that decisions about separating or keeping twins together in school should be based on the individual needs and interests of each twin pair instead of general assumptions or approaches. Despite the importance of this issue, there is a need for more research on the perceptions of school teachers regarding twins in kindergarten. The majority of studies have focused on the views and experiences of principals, counselors, parents, or twins themselves (Nilsson et al., 2021). However, teachers play a crucial role in shaping twins' educational environment and outcomes as they interact with them daily and influence their curriculum, instruction, assessment, and socialization. Teachers may also hold different beliefs and expectations about twins than other stakeholders, influenced by their training, experience, and knowledge about twin development and education.

Studying twins' education has several implications. Firstly, understanding twins' unique needs and challenges allows educators and parents to provide individualized support. By considering their specific learning styles, social dynamics, and emotional well-being, educators can create a conducive learning environment for twins. Secondly, research on twins' education can inform the development of school policies. By revisiting separation policies and implementing strategies that facilitate healthy socialization and academic success, schools can create an inclusive environment supporting twins' growth and development. Lastly, studying twins' education empowers parents of twins with knowledge and strategies to navigate the educational journey effectively. It gives them insights to make informed decisions and advocate for their twins' needs within the educational system.

The scientific literature on twins has focused on two key areas: the genetic similarities and differences between identical and fraternal twins and the mental impacts of being a twin on individual character and social connections. Different studies have examined twins' physical, cognitive, enthusiastic, and behavioral characteristics, comparing them to non-twin siblings or unrelated individuals utilizing distinctive research strategies. Research findings have illustrated those different characteristics, such as height, weight, intelligence, identity, mental well-being, religiosity, and political orientation, vary by genetic and environmental components (Yamagat & Takahashi, 2020). However, certain characteristics, such as fingerprints, voice patterns, or dental features, are special to each individual, irrespective of their twin status. Additionally, research has investigated the mental implications of being a twin on different viewpoints of life, including self-concept, attachment, peer relations, academic achievement, and career choices (Penninkilampi-Kerola, 2006). Some studies have proposed that twins show a more grounded bond with each other than their parents or friends, and they may face challenges in establishing their identity and autonomy. However, contrasting studies have challenged these assumptions, asserting that twins are not necessarily more similar or dependent than non-twins and may benefit from a close companion and supportive network.

Biblical literature offers limited but intriguing insights into the realm of twins. Explicit mentions of twins in the Bible are confined to two pairs: Jacob and Esau in the Old Testament [Genesis 25:19-26] and Perez and Zerah in the New Testament [Matthew 1:3]. In both instances, the mothers of the twins experienced divine intervention after struggling with infertility [Genesis 25:21; Genesis 38:27-30]. Additionally, both pairs

encountered conflicts concerning birthright or inheritance [Genesis 25:29-34; Genesis 38:28-30]. However, while Jacob and Esau exhibited stark differences in appearance and personality [Genesis 25:27], Perez and Zerah possessed similar physical characteristics but held distinct ranks [Ruth 4:18-22].

Furthermore, Biblical implications suggest the possibility of other characters being twins or having twins among their offspring. For instance, according to specific rabbinic interpretations, Cain and Abel may have been twins, and their story involved a conflict that ultimately resulted in murder [Genesis 4:1-16]. Similarly, some chronological calculations suggest that Rachel and Leah, wives of Jacob, may have been twins. Their relationship was marked by competition for their husband's love and children [Genesis 29-30].

The biblical research on twins reveals their special status and role in God's plan and history. Twins are often associated with miracles, blessings, prophecies, and covenants. They also exemplify the themes of duality, contrast, rivalry, and reconciliation. Twins reflect the intricate relationship between nature and nurture, individuality and community, and human will and divine will. However, biblical research on twins also poses important questions and challenges. How do twins relate to concepts such as the image of God, free will, sin, grace, and salvation? How do twins balance their similarities and differences, unity and diversity, cooperation and competition? How do twins interact with individuals unlike them, such as non-twins, siblings, parents, spouses, or enemies? These crucial issues necessitate further exploration and integration from a Biblical perspective.

The review of scientific research on twins illustrates the broad investigation into their genetic and mental aspects, highlighting the impact of both genes and the environment on different characteristics and results. However, there is a need for more cross-cultural studies to understand the experiences and perceptions of twins in numerous social orders. Besides, investigating the perspectives of people unrelated to twins, such as teachers, can provide important experiences in twins' educational experiences and challenges.

On the Biblical front, the limited but intriguing mentions of twins in the Bible underscore their significance within the divine narrative. Twins are portrayed as figures associated with distinct roles, conflicts, and blessings, shedding light on the complexities of human relationships and divine purpose. However, there is a need for further exploration and integration of biblical perspectives on twins, addressing issues related to identity, relationships, and the interaction between twins and the broader community.

Problem Statement

The problem is twins are a unique populace that faces particular challenges and opportunities in the educational system (Merikangas et al., 2016). The classroom assignment of twins, whether placed together or apart, is one of the most critical decisions affecting their academic and social development (Alexander, 2012; Garon-Carrier et al., 2022). However, there is a lack of research on how teachers perceive and interact with twins in numerous classroom settings and how these perceptions impact their instructional practices and expectations. Moreover, there is no clear agreement on the best policy for classroom placement of twins, as different nations and schools have diverse guidelines and criteria.

With regard to academic achievement, various studies have looked into the probable impact of twin status on academic results. Burt et al. (2017) conducted a systematic review and observed that twin siblings, especially identical twins, demonstrate comparable academic abilities. This implies that educators might have particular expectancies or beliefs regarding twins' skills based on their common genetic makeup and likenesses. The impact of sibling ranking on the learning experiences of twins learning experiences has also been studied (Segal & Knafo-Noam, 2021). Siblings may go through a distinct sequence of birth relationships because they are delivered at the same time. Twins may also experience a different birth order dynamic due to being born simultaneously, which can affect their interactions and relationship dynamics (Segal & Knafo-Noam, 2021). Furthermore, research by Garon-Carrier et al. (2022) found that twins often develop distinct roles within their relationship, which can influence their behavior and interactions in the classroom. These roles may also shape teachers' perceptions and expectations of twins.

Existing research on twins' educational encounters has basically centered on their academic execution, social interactions, and the impact of genetic and environmental factors on their development. Studies have shown that twins frequently share a solid bond and may display similarities in their learning styles, strengths, and challenges (Garon-Carrier et al., 2022). Additionally, they may experience a unique social dynamic, supporting and competing in the academic setting (Sahu & Prasuna, 2016). However, most of these studies have centered on the twins, neglecting the perspectives of the key individuals involved in their educational journey: the teachers. Furthermore, the role of teacher experience and training in handling twin students is an area that requires

exploration. Do teachers receive specific guidance or professional development on addressing the needs of twins in the classroom, or do they rely primarily on their intuition and past experiences with non-twin students?

More research should investigate school teachers' perceptions of identical and fraternal twins in their classrooms. The current state of knowledge needs to adequately address how teachers understand and navigate the complexities of teaching twins with distinct personalities, learning preferences, and academic abilities. Furthermore, the potential impact of these perceptions on the twins' academic and social development remains unexplored. Addressing these gaps in knowledge aims to contribute to a more comprehensive understanding of the educational experiences of twins despite the existing research. In a nutshell, this study aims to prove or disprove the existing literature or even add to it. The classroom assignment of twins, whether placed together or apart, is one of the most critical decisions affecting their academic and social development. It can inform educational institutions, teachers, and parents how to better support and facilitate twins' academic and social development in the classroom setting.

Purpose of the Study

The purpose of this qualitative phenomenological study is to investigate teachers' lived experiences teaching identical and fraternal twins. Furthermore, teachers' experiences of twins' academic abilities, achievements, and social interactions in the educational setting will be examined. The study also aims to gather qualitative data to comprehensively understand how teachers differentiate instruction for twins and the challenges and benefits they identify when teaching twin students. At this stage in the research, the central phenomenon is defined as the "educational experiences of teachers

teaching identical and fraternal twins.” This encompasses the multifaceted aspects of teachers’ encounters with twins in the classroom, including instructional strategies, social dynamics, and the overall impact on the educational environment. The theory guiding this study is the combination of the Multiple Intelligences Theory, Social Identity Theory, and the theories of Self-Concept and Self-Esteem. These theories collectively inform the study’s focus on understanding how teachers perceive and interact with twins, considering their varied intelligences, social identities, and self-concepts and how these factors shape instructional practices and educational experiences.

Research Question(s) and Hypotheses

Research Questions

RQ1: How do teachers with experience teaching both identical and fraternal twins describe their experience teaching identical and fraternal twins?

RQ 2: How do teachers with experience teaching both identical and fraternal twins describe the experience with identical and fraternal twins’ academic performance and social behavior?

RQ 3: How do teachers with experience teaching both identical and fraternal twins describe the challenges of teaching identical and fraternal twins in the same classroom?

RQ 4: How do teachers with experience teaching both identical and fraternal twins describe how they differentiate between identical and fraternal twins regarding their learning styles and needs?

RQ 5: How do teachers with experience teaching both identical and fraternal twins describe how they foster a sense of individuality and identity among identical and fraternal twins?

Assumptions and Limitations of the Study

One significant area for improvement is the limited generalizability of the results. By focusing on a specific group of teachers with experience teaching twins, the study may only partially represent the broader population of educators in different educational settings. Additionally, while valuable for capturing diverse perspectives, the purposive sample size may restrict the extent to which the findings can be generalized. Another potential limitation is the presence of recall bias in teachers' perceptions and experiences with twins. Their memories of past interactions with twin students may not accurately reflect their day-to-day experiences in the classroom. Social desirability bias is another challenge that researchers must address. Teachers may feel compelled to present themselves and their attitudes in a socially desirable manner, potentially affecting the authenticity of their responses, particularly when discussing challenges faced when teaching twins. Open and non-judgmental communication with participants can help mitigate this bias.

Participant self-selection bias is a concern when recruiting teachers for the study. Those with particularly positive or negative experiences with twins may be more inclined to participate, leading to skewed results. Efforts to ensure a diverse and representative sample can help alleviate this bias. Identifying and recruiting twins for the study can be challenging due to privacy concerns or the absence of a comprehensive database of twins. Researchers should consider alternative approaches to involve twin students in the study to understand their educational experiences better. Furthermore, the wide variability among identical and fraternal twins poses a challenge in generalizing their experiences and teachers' perceptions. It may also be difficult to differentiate between the impact of

twinship itself and other individual factors on their educational experiences. Lastly, time constraints may affect the participation rate of teachers, potentially leading to a smaller sample size than desired. Researchers should manage the time requirements of data collection to ensure sufficient participation.

Theoretical Foundations of the Study

The theoretical framework of this research draws upon several key concepts and perspectives to provide a comprehensive understanding of teachers' perceptions of twins in the educational context. While no dominant theoretical framework guides this study, various sociological and educational theories inform different aspects of the research.

The Multiple Intelligences Theory

The Multiple Intelligences Theory, originally proposed by Howard Gardner, is a fundamental educational framework that posits the existence of multiple types of intelligence beyond the traditional linguistic and logical-mathematical intelligences (Gardner & Hatch, 1989). This theory suggests that individuals may excel in various domains, including but not limited to linguistic, logical-mathematical, spatial, interpersonal, or intrapersonal intelligence (Marens, 2023). It emphasizes the remarkable diversity of individual learning styles and abilities, recognizing that students possess unique strengths and aptitudes beyond standardized assessments.

In the context of the study on teachers' perceptions of twins in the educational setting, the Multiple Intelligences Theory holds significant relevance. This theory underscores the importance of recognizing and addressing twin students' distinct learning needs and strengths (Marens, 2023). Given that twins can exhibit individual differences in cognitive abilities, learning preferences, and intelligence, teachers must be attuned to

these variations (Bratko et al., 2020). Teachers' perceptions of these intelligences, whether they acknowledge and accommodate them or not, can significantly impact twins' educational experiences.

By understanding and embracing the principles of the Multiple Intelligences Theory, educators can tailor their instructional approaches to cater to the diverse learning needs of twins. For example, if one twin demonstrates a strong aptitude for spatial intelligence while the other excels in interpersonal intelligence, teachers can adapt their teaching methods to foster this respective intelligence (Bratko et al., 2020). Recognizing and accommodating individual strengths contribute to a more inclusive and supportive learning environment for twin students (Gillham, 2012). Therefore, the study drew upon the Multiple Intelligences Theory to investigate how teachers' awareness of and responsiveness to the varied intelligences of twins shape their perceptions and instructional practices, ultimately influencing the educational experiences of twin students (Marens, 2023).

Social Identity Theory

As conceptualized by Tajfel and Turner (1986), social identity theory is a crucial framework for understanding the formation of social identities, including those related to twinship within the school context. This theory posits that individuals categorize themselves and others based on group memberships, and these group identities significantly influence their behavior and interactions (Guy-Evans, 2023). For twins, their twin identity is a salient aspect of their social identity. This theory provides insights into how twins may categorize themselves as a distinct group that is separate from single-born students. It also offers a lens through which to examine how a twin identity influences

peer interactions, group dynamics, and the development of individuality. Understanding the social identity dynamics of twins in the school setting is essential for comprehending how they navigate their social world and construct their self-identities.

Self-Concept and Self-Esteem

The theories of self-concept and self-esteem, particularly as studied by James Harter and Susan Harter, are highly relevant for exploring the self-perception and self-worth of twin students (Białecka-Pikul et al., 2019). These theories examine how individuals develop an understanding of themselves and their self-worth (Białecka-Pikul et al., 2019). In the case of twins, a co-twin introduces unique dynamics. Twin students may form their self-concept based on their relationship with their co-twin, and this self-concept may significantly impact their self-esteem (Kim et al., 2023). The self-concept and self-esteem of twins can influence their academic and social experiences in school. Understanding how the twin identity affects the self-concept and self-esteem of twin students is critical for educators and researchers seeking to create a supportive and inclusive educational environment that fosters positive self-perceptions and well-being (Trautwein, 2023).

Biblical Perspective on the Study

The study examining teachers' perceptions of twins in the educational context aligns with several core biblical principles that underscore the value of each individual and the importance of fairness, compassion, and inclusiveness. These principles provide a strong biblical foundation for understanding and addressing the educational experiences of twin students.

The Value of Every Individual

The Bible teaches that every person is a unique and valuable creation of God. It emphasizes the importance of loving one's neighbor as oneself (Mark 12:31). Applied to education, this principle highlights the need for teachers to recognize and appreciate the individuality of twin students. Like every other student, each twin deserves respect, understanding, and care. Therefore, it encourages educators to create an inclusive and nurturing learning environment where students are treated with love and fairness regardless of their unique status as twins.

Equality and Fairness

Biblical teachings emphasize the concepts of equality and fairness. Galatians 3:28 states, "There is neither Jew nor Gentile, neither slave nor free, nor is there male and female, for you are all one in Christ" (RSV Galatians 3:28, 1952). This principle underscores the idea that all individuals, including twins, should be treated equally and justly within the educational setting. It discourages discrimination, bias, or preferential treatment based on an individual's unique characteristics, such as being a twin. The Christian perspective encourages educators to foster a level playing field for all students.

Caring for the Vulnerable

The Bible contains numerous teachings about caring for the vulnerable and those facing unique challenges. Twin students, like any other students, may have specific needs or experiences that require understanding and support. The Christian perspective encourages educators to be sensitive to the needs of twin students, hence ensuring they are not disadvantaged or overlooked due to their unique status. It emphasizes the moral duty to provide care, guidance, and a nurturing environment to all students, especially those who may be more vulnerable or face distinctive circumstances.

Definition of Terms

Academic Abilities- The range of skills and competencies related to learning and academic achievement, including cognitive, analytical, and problem-solving skills. (Stinebrickner & Stinebrickner, 2012).

Cognitive Abilities- Mental processes and capacities related to acquiring knowledge, memory, reasoning, problem-solving, and decision-making (Coursera Staff, 2023).

Differentiation of Instruction – Differentiation of instruction refers to tailoring teaching strategies and content to meet the diverse needs of students, hence recognizing that each student is unique and may require individualized approaches to learning (Tomlinson & Allan, 2000).

Educational Setting – The educational setting refers to the specific environment in which teaching and learning occur. It encompasses various contexts, such as traditional classrooms, online learning platforms, and other formal or informal learning environments (Creemers & Kyriakides, 2008).

Fairness – Fairness pertains to treating all students equitably, without bias or discrimination, and ensuring that educational opportunities are distributed impartially, allowing each student to achieve their full potential (Hattie, 2009).

Fraternal Twins – Fraternal twins, also called dizygotic twins, are twins who develop from two separate eggs fertilized by two different sperm cells, hence leading to siblings who share approximately 50% of their genetic material that are similar to non-twin siblings (Polderman et al., 2017).

Identical Twins – Identical twins, also known as monozygotic twins, develop from a single fertilized egg that splits into two embryos, hence resulting in two individuals with nearly identical genetic makeup (Polderman et al., 2017).

Inclusiveness – Inclusiveness in the educational context refers to creating a learning environment that welcomes and accommodates students of diverse backgrounds, abilities, and characteristics. It ensures all students have equal educational opportunities (Ainscow, 2016).

Interpersonal Intelligence- Another aspect of Gardner's Multiple Intelligences Theory focuses on the ability to understand and interact effectively with others, including communication, empathy, and collaboration (Marenus, 2023).

Intrapersonal Intelligence- A component of Howard Gardner's Multiple Intelligences Theory, referring to the capacity for self-reflection, awareness of one's own emotions, and understanding of one's own motivations (Marenus, 2023).

Peer Dynamics- The interactions, relationships, and social structures among students within an educational setting influence how they perceive and relate to each other (Owens et al., 2021).

Peer Interactions- Social exchanges and relationships among students influence their sense of belonging, acceptance, and social development within the school community (Owens et al., 2021).

Positive Self-Perceptions- A constructive and optimistic view individuals have of themselves, encompassing confidence, self-efficacy, and a sense of personal worth (Trautwein, 2023).

School Policies- Official guidelines and rules established by educational institutions to govern various aspects of school life, including teaching practices, student behavior, and inclusivity measures (Watts, 2023).

Self-Concept – Self-concept refers to an individual’s perception of themselves, including their beliefs, attitudes, and self-evaluations. It encompasses how one views one's abilities, qualities, and identity (Harter, 2012).

Social Identity Theory – Social identity theory, developed by Tajfel and Turner, explores how individuals categorize themselves and others based on group memberships. It provides insights into group dynamics, peer interactions, and the development of individuality among twins and single-born students (Tajfel & Turner, 1986).

Standardized Assessments- Formalized tests are administered and scored in a consistent manner, often used to compare the performance of individuals or groups (Goldman Center, 2020).

Support Systems for Teachers- Structures and resources provided to educators to enhance their professional development, well-being, and effectiveness in the classroom (Creemers & Kyriakides, 2008).

Thematic Analysis – Thematic analysis is a qualitative research method that identifies, analyses, and reports recurring patterns or themes within qualitative data. It is used to explore and understand the meaning and significance of the data (Braun & Clarke, 2006).

Well-being- The overall state of health, happiness, and prosperity experienced by individuals, including physical, emotional, and social aspects.

Significance of the Study

This study holds significant importance as it contributes to scholarly research and theory. By exploring how teachers perceive twins' academic abilities and achievements compared to single-born students, the study aimed to offer valuable insights into the unique educational experiences of twin students (Dawood, 2018). The findings will add to the existing body of research on student diversity and provide a nuanced understanding of how twinship may influence teachers' perceptions and interactions with students in the classroom. Moreover, the study's investigation into teachers' attitudes toward classroom dynamics and social interactions among twins and their peers is crucial in building a deeper comprehension of the social aspects of twin students' educational experiences (Garon-Carrier et al., 2022). This knowledge can inform theories related to peer dynamics and social integration, providing a more comprehensive understanding of how twin students navigate their social lives in a school setting (Ainscow, 2016). The research also aims to shed light on how teachers differentiate instruction and adapt their teaching strategies to meet the diverse needs of twins in the classroom. This aspect contributes to the broader field of educational pedagogy and can inform theories of differentiated instruction and inclusive teaching practices (Nilsson et al., 2021). Understanding the approaches teachers utilize to accommodate the unique characteristics of twins can help inform best practices for meeting the diverse learning needs of all students.

Summary

This study delves into the realm of twin education, offering valuable insights into teachers' perceptions of twins' academic abilities, achievements, and social interactions in the educational setting. Twins represent a fascinating and unique population, providing

a rich opportunity to explore the interplay between genetics and environment in shaping individual characteristics and educational outcomes. By investigating how teachers perceive and interact with twins, this research fills a significant gap in the existing literature, shedding light on the challenges and opportunities twins encounter in the classroom (Darling-Hammond et al., 2020). The findings of this mixed-methods study contribute both theoretically and practically. Understanding teachers' attitudes towards twins can help identify potential biases or stereotypes affecting their instructional practices and expectations. With this knowledge, educational institutions can design targeted training and professional development programs to promote a more inclusive and supportive learning environment for twin students. Additionally, exploring how teachers differentiate instruction for twins can inform educational pedagogy, promoting personalized teaching approaches that cater to the diverse needs of all students.

From a practical standpoint, this research has important implications for various stakeholders, including teachers, school administrators, parents, and twins. Teachers can create an atmosphere that supports their academic and social growth by fostering awareness and appreciation for twins' individuality. School policies and practices related to classroom composition can be informed by insights into teacher perceptions, leading to more thoughtful and informed decisions regarding the placement of twin students. Moreover, this study encourages collaboration between parents and teachers, facilitating meaningful dialogues and shared goals supporting twin students' education. By recognizing and accommodating the unique characteristics of twin students, educators can create a nurturing environment that empowers them to thrive academically, emotionally, and socially, fostering a positive and enriching learning journey for all.

CHAPTER 2: LITERATURE REVIEW

Overview

The literature review chapter plays a significant role in analyzing existing research related to twins' educational experiences. By delving into the collective body of work within this domain, the intention was to dive deeper into the perplexing dynamics that twins navigate within the educational system. Through this review, the experiences of twins in education were described. Eventually, this laid the groundwork for the study, which is centered on gaining insight into teachers' perceptions of twins in educational settings. Through a comprehensive review, the goal is to not only build upon the foundations established by prior studies but also to recognize the significance of incorporating both empirical evidence and Biblical perspectives. By combining these two perspectives, it can further enrich the understanding of twins' educational ventures.

Description of Search Strategy

This literature review employed a systematic search strategy to identify relevant research articles and biblical references related to twins in educational settings. The primary database utilized for the literature search was the Falwell Library database. The search focused on understanding school teachers' perceptions of identical and fraternal twins and their impact on academic performance and social behavior.

Search Terms

To capture a wide range of articles related to twins in the classroom, the following search terms were thoughtfully selected:

- “Twins in the Classroom”
- “Twin studies in education”

- “Twins in Education”
- “Identical twins vs. fraternal twins in school”
- “Academic performance of twins”
- “Social behavior of twins in School”

Furthermore, in order to incorporate scriptural perspectives on twins, a separate search strategy was utilized, and a word study approach was utilized to identify important biblical passages and narratives involving twins. Key terms such as “twins in the Bible,” “biblical twins,” and “twins in Scripture” were utilized to retrieve significant biblical references. The focus was on identifying instances of twins in biblical narratives and exploring the themes and lessons that these narratives may offer in relation to twins’ identities, relationships, and roles within the divine setting.

Delimitations were placed on the literature search to ensure relevance and focus. Particularly, the search fundamentally included peer-reviewed research articles without limiting them by publication date. This approach allowed for the inclusion of a wide range of studies spanning different periods to provide a comprehensive overview of research on twins in educational contexts. Articles that were published in peer-reviewed journals and had a clear emphasis on school teachers’ perceptions of twins were prioritized. This approach helped to maintain the rigor and quality of the selected literature.

Review of Literature

Overview of Twins in Education

Due to their distinctive genetic and social characteristics, twins have a special place in education. Research on their educational experiences covers various aspects of

their academic achievement, social interactions, classroom dynamics, and educators' attitudes (Gray & DiLoreto, 2016). The main goals of these studies are to understand how twins' shared genetics affect their learning styles and outcomes and how their socialization in and out of school influences their emotional well-being and identity. These studies also highlight the diversity and complexity of twins' educational needs, which require customized approaches.

The literature on twins' education reflects the evolution and debates of our understanding of their experience. One of the most contentious issues is keeping twins together or separating them in the classroom. Some argue for separation to foster individuality, while others favor keeping them together to enhance cooperation and support (White et al., 2018). This dilemma reflects the tension between independence and partnership that shapes twins' educational journeys (White et al., 2018). Moreover, research on the impact of twin partnerships on classroom dynamics, peer relationships, and academic performance reveals the subtle factors that affect teacher perceptions and practices. Other prominent themes in the literature include the unique bonds that twins form, the role of genetics and environment in their academic abilities, and the challenges of social integration and identity formation. Teachers play a crucial role in creating a conducive learning environment for twins, which calls for a deeper examination of their views and actions (Villardón-Gallego et al., 2018)

Academic Performance

Academic performance alludes to how well students accomplish their learning goals and illustrate their knowledge and skills in different subjects (Lamas, 2015). Numerous components, such as cognitive abilities, motivation, self-regulation, learning

styles, teacher-student relationships, classroom environment, curriculum, assessment, and feedback, can impact academic performance (Darling-Hammond et al., 2020).

When comparing identical and fraternal twins' academic performance, one of the main questions is whether they have similar or distinctive levels of achievement and potential. Some studies have recommended that identical twins tend to have more similar academic performance than fraternal twins, as they share more genetic variables that influence their cognitive capacities (e.g., IQ, memory, attention) and personality traits (e.g., conscientiousness, openness) that are related to academic success (Sahu et al., 2016; Felson, 2014). However, other studies have found that identical twins can moreover have significant differences in academic performance, as they are affected by non-shared environmental factors (e.g., prenatal conditions, birth order, peer influences, teacher expectations) that create individual variation in their learning experiences and results (Asbury et al., 2016; Plomin & Daniels, 2011).

Another question when comparing identical and fraternal twins' academic performance is whether they have similar or different learning styles and needs. Learning styles allude to the preferred ways of processing information and solving problems, whereas learning needs refer to the particular support or intervention students require to achieve their learning goals (İlçin et al., 2018). Some studies have recommended that identical twins tend to have more similar learning styles than fraternal twins, as they share more genetic components that influence their cognitive preferences (e.g., verbal vs. visual, sequential vs. global) and personality traits (e.g., extraversion vs. introversion) that are related to learning styles (ProSolutions, n.d.). However, other studies have found that identical twins can also have distinctive learning styles and needs, as they are

impacted by non-shared environmental factors (e.g., parental involvement, teacher feedback, curriculum differentiation) that create individual variation in their learning preferences and challenges.

Differentiating Learning Styles and Needs

Different studies have investigated the role of genetics and environment in academic achievement using twins as a natural experiment. Dada (2023) found that genetics was the essential determinant of academic achievement for both identical and fraternal twins at the high school level, whereas environmental impacts were insignificant. Tsou et al. (2008) moreover reported that identical twins outperformed fraternal twins and singletons in early adulthood in Taiwan, demonstrating a strong genetic impact. However, they noted that environmental factors, such as parental education and family income, moderated the genetic result. They also found that both factors were critical, but their relative significance varied by gender. For boys, genetic components accounted for more variance than environmental factors, whereas the opposite was true for girls.

A study by Abtahi et al. (2023) found that school teachers' perceptions and attitudes toward twins impacted their academic performance and social behavior. The study utilized information from the Iranian School-Aged Twin Registry to investigate the genetic and environmental factors that influence twins' intelligence, personality, mental health, and physical well-being development. The study also examined the challenges and benefits of teaching twins in the same classroom.

One of the critical questions of the study was how teachers differentiate between identical and fraternal twins in terms of their learning styles and needs. Learning styles

allude to the preferred ways of learning, processing, and remembering information, whereas learning needs allude to the particular challenges or requirements of learners to attain their academic goals. Identical twins share their genes, whereas fraternal twins share about half (Garon-Carrier et al., 2021). Subsequently, identical twins are anticipated to be more similar than fraternal twins in cognitive capacities, personality traits, interests, and preferences. However, environmental variables such as family, school, peers, and culture may also shape twins' learning styles and needs (Silventoinen et al., 2020).

Identifying Distinct Learning Styles

Teachers often differentiate between identical and fraternal twins by paying close attention to their learning styles. For instance, Identical twins who share the same genetic makeup may exhibit similar learning preferences and strengths (Segal & Knafo-Noam, 2021). Educators observe if both twins tend to excel in the same subjects or display similar cognitive styles, such as being visual or kinesthetic learners. Therefore, identifying these similarities allows teachers to tailor instruction that aligns with their shared learning styles. In contrast, fraternal twins who share fewer genetic similarities are more likely to have diverse learning styles (Silventoinen et al., 2020). Teachers observe whether they have varying preferences for auditory, visual, or tactile learning and adapt their teaching methods accordingly (Segal & Knafo-Noam, 2021). Recognizing these distinctions helps create a more effective learning experience for both types of twins.

Social Behavior

Social behavior alludes to how students interact with others in different social settings, such as peers, teachers, and family members. Numerous components, such as social

skills, emotional regulation, self-esteem, attachment, personality traits, peer pressure, and social norms, can impact social behavior (Schwab et al., 2021). As such, one of the main questions when comparing identical and fraternal twins' social behavior is whether they have similar or different social competence and adjustment levels. Social competence alludes to the capacity to communicate viably and appropriately with others, whereas social adjustment alludes to the Degree of satisfaction and well-being in social relationships. Some studies have recommended that identical twins tend to have more similar social behavior than fraternal twins, as they share more genetic variables that influence their emotional regulation (e.g., temperament, mood) and personality traits (e.g., agreeableness, neuroticism) that are related to social competence and adjustment (Silventoinen et al., 2020). However, other studies have found that identical twins can moreover have different social behaviors, as they are impacted by non-shared environmental factors (e.g., parenting style, peer group, teacher attitude) that create individual variation in their social experiences and results (Mullineaux et al., 2009).

Another question when comparing identical and fraternal twins' social behavior is whether they have similar or different social identity and differentiation levels. Social identity alludes to belonging and affiliation with a social group, whereas social differentiation alludes to the Degree of distinction and uniqueness from others (Charness & Chen, 2020). Some studies have recommended that identical twins tend to have more similar social identities than fraternal twins, as they share more genetic variables that influence their self-concept (e.g., self-esteem, self-efficacy) and personality traits (e.g., openness, conscientiousness) related to social identity. However, other studies have found that identical twins can moreover have distinctive social identities and

differentiation, as they are impacted by non-shared environmental factors (e.g., birth order, school environment, cultural background) that create individual variation in their social roles and values (Silventoinen et al., 2020).

School teachers need to be aware of the complexity and diversity of twin learners and avoid making assumptions or generalizations based on their zygosity (Forghani-Arani et al., 2019). School teachers must moreover observe each twin's social behavior individually and relevantly, considering their social skills, emotional regulation, self-esteem, attachment, etc. School teachers, moreover, need to provide each twin with appropriate guidance and support that enhance their social competence and adjustment and encourage them to develop their identity and differentiation as social beings.

A study conducted by Garon-Carrier et al. (2023) sheds light on the intricate dynamics and results associated with teaching identical and intimate twins within the same classroom. This educational approach presents different challenges and benefits for teachers and students. One of the prominent challenges that educators encounter is distinguishing and addressing each twin's particular needs, capacities, and interests (Garon-Carrier et al., 2023). This becomes especially evident in identical twins, who frequently exhibit similar academic performance and social behavior. The potential for confusion in catering to their requirements necessitates a tailored and vigilant teaching technique.

Classroom management is another hurdle, as teachers must explore the complexities of preventing sibling rivalry, favoritism, and peer exclusion among the twins and their peers. Striking a balance that ensures a harmonious classroom environment is pivotal, calling for a heightened awareness of the intricate social

dynamics (Garon-Carrier et al., 2023). However, amid these challenges, the study recognizes several compelling benefits. The positive impact that twins can exert on each other's academic achievements, motivation, and social and emotional development rises as a critical advantage. This mutual encouragement and support can foster an environment conducive to enhanced learning and personal growth.

Additionally, teachers can use the presence of twins to cultivate a sense of belonging, cooperation, and diversity in the classroom. By promoting interaction and collaboration between twins and their fellow students, educators create opportunities for cross-fertilization of ideas and experiences, enriching the learning environment (Garon-Carrier et al., 2023). The study, moreover, highlights the prospect for teachers to gather insights from twins' unique viewpoints and familial experiences, fostering a two-way exchange of knowledge. This reciprocal sharing of insights can contribute to a more comprehensive and culturally rich classroom, enhancing the educational experience for all students.

Moreover, Twins provide a unique opportunity to study the impacts of genetic and environmental components on human development. However, how do school teachers perceive identical and fraternal twins in terms of their academic performance and social behavior? Gagnon et al. (2022) conducted a twin study to examine the associations between the intensity of formal child-care attendance and school readiness in a sample of 1,011 pairs of twins from Quebec, Canada. Teacher ratings of academic abilities, social competence, and issue behaviors measured school readiness. The authors found that the intensity of formal child-care attendance diminished the shared environment contribution to school readiness, meaning that twins who attended more

hours of formal child-care were more different in their school readiness results than twins who attended fewer hours of formal child-care (Gagnon et al., 2022). The authors also found that teachers rated identical twins more similarly than fraternal twins in academic skills and social competence but not in problem behaviors (Gagnon et al., 2022).

Similarly, a study by Gagnon et al. (2022) suggests that teachers may have distinctive perceptions of identical and fraternal twins' academic performance and social behavior. Teachers may view identical twins as more alike than fraternal twins in their academic abilities and social competence, conceivably due to their physical or genetic resemblance (Silventoinen et al., 2020). However, teachers may not perceive any distinction between identical and fraternal twins in their issue behaviors, possibly because these behavioral variables or situational factors impact these behaviors and have vital implications for teaching twins in the same classroom.

Another study by Veldkamp et al. (2019) examined the genetic and environmental impacts on different forms of bullying perpetration, bullying victimization, and their co-occurrence among twins. The study utilized data from the Netherlands Twin Enroll, which included 9,892 twin pairs aged 7 to 12 years (Veldkamp et al., 2019). The study found that both identical and fraternal twins showed comparable levels of bullying involvement and that the genetic and environmental variables affecting bullying behavior were shared mainly between twins.

Both genetic and environmental variables impact twins' academic performance and social behavior. However, the Degree of genetic impact may vary depending on whether the twins are identical (monozygotic) or fraternal (dizygotic). Identical twins share 100% of their genes, whereas fraternal twins share only 50% on average (Baier &

Van Winkle, 2021). Hence, it appears that identical twins are anticipated to be more similar than fraternal twins in their capacities, interests, personality, and behavior. This may influence how school teachers perceive and interact with twins.

A study by Baier and Van Winkle (2021) also examined how parental separation influences the genetic impacts on children's school performance. The study utilized data from the National Longitudinal Survey of Youth 1979 (NLSY79) and its Children and Young Adults Study (NLSY-CYA), which included data on 2,500 twin sets born between 1979 and 1992 in the United States (Baier & Van Winkle, 2021). The study used standardized math, reading, and vocabulary test scores to measure school performance. The study also controlled components influencing school performance, such as family income, parental education, race, gender, age, birth order, and birth weight.

The study found that parental separation lowers the genetic impacts on children's school performance, particularly for identical twins. The study assessed that the heritability of school performance was 0.72 for identical twins and 0.55 for fraternal twins in intact families (Baier & Van Winkle, 2021). However, the heritability of school performance dropped to 0.43 for identical twins and 0.51 for fraternal twins in separated families. This implies that parental separation diminishes identical twins' similarity more than fraternal twins regarding school performance.

The study suggested that parental separation may create more environmental differences between identical twins than between fraternal twins. For illustration, parental separation may result in different living arrangements, parental involvement, peer groups, or school quality for each twin. These environmental differences may diminish the expression of genetic potential or increase the development of individual differences

among identical twins (Baier & Van Winkle, 2021). On the other hand, fraternal twins may already have more environmental differences than identical twins, even in intact families, due to their lower genetic similarity. Subsequently, parental separation may not significantly affect their school performance. The study also found that parental separation hurts children's school execution regardless of their zygosity. The study evaluated that parental separation lowers the average test scores by 0.13 standard deviations for identical twins and by 0.11 standard deviations for fraternal twins (Baier & Van Winkle, 2021). This implies that parental separation harms the overall achievement of both types of twins.

The twins' academic performance and social behavior have been a point of intrigue for researchers and teachers alike. Twins are a special group of students with a common genetic and environmental background, which may impact their development and learning results. However, not all twins are alike; there are two types of twins: identical (monozygotic) and fraternal (dizygotic). Identical twins share 100% of their genes, whereas fraternal twins share 50% of their genes. The difference may result in numerous levels of similarity and dissimilarity between twins regarding their capacities, interests, personalities, and behaviors.

Previous studies have examined how school teachers perceive identical and fraternal twins' academic performance and social behavior and found blended results. Some studies have reported that teachers view identical twins as more similar and homogeneous than fraternal twins. They tend to have higher expectations and more positive attitudes towards identical twins than fraternal twins. Other studies have found no critical differences in teachers' perceptions of identical and fraternal twins or that

teachers tend to perceive fraternal twins as more similar and more homogeneous than identical twins. These inconsistent findings may be due to methodological impediments, such as small sample sizes, lack of control groups, or reliance on self-report measures.

A study by Euser et al. (2021) discovered that video-feedback interventions significantly impacted parents' sensitive limit-setting with preschooler twins through a randomized controlled trial. This investigation delved into the effects of these interventions on identical and fraternal twin pairs, involving 128 twin pairs and their respective parents and teachers (Euser et al., 2021). The outcomes were quite illuminating.

The study's results showcased a notable enhancement in parents' ability to establish sensitive limits for both types of twin pairs, indicating the efficacy of the video-feedback intervention (Euser et al., 2021). This improvement, in turn, positively correlated with improved academic performance and social behavior in the twin children. Interestingly, the teachers' perceptions of the twin pairs were also examined before and after the intervention.

One noteworthy observation was that teachers consistently viewed identical twins as more alike and homogeneous compared to fraternal twins regarding academic performance, social behavior, and emotional well-being. This perception held true even after the intervention (Euser et al., 2021). Moreover, the study identified a shift in teachers' attitudes and expectations toward identical twins, with a noticeable increase in positivity and elevated expectations post-intervention (Euser et al., 2021).

In essence, the study by Euser et al. (2021) yields valuable insights into the dynamics of teacher perceptions regarding the academic and social attributes of identical

and fraternal twins. It suggests that there exists a tendency among teachers to stereotypically perceive identical twins as more similar and capable (Euser et al., 2021). Additionally, the study underscores the positive impact of parental interventions focused on sensitive limit-setting (Euser et al., 2021). These interventions can potentially enhance academic performance and social behavior in both types of twin pairs, regardless of their genetic similarities.

Furthermore, developing individuality and identity is essential to human growth, especially for twins with close genetic and environmental bonds. School instructors play an imperative role in fostering a sense of distinction and identity among identical and fraternal twins, as they can provide opportunities, guidance, and support for twins to investigate and express their unique personalities, interests, and goals.

Gidziela et al. (2023) conducted a longitudinal study to examine the effect of non-shared environment (NSE) on symptoms of behavior issues from preschool to adulthood in a large sample of twins. NSE implies the environmental factors that make siblings distinctive, such as differential parental treatment, peer relationships, life occasions, etc. The study found that NSE accounted for a significant proportion of variance in behavior issues over improvement and that NSE impacts were more articulated for identical twins than fraternal twins. Moreover, the study found that NSE impacts on personality traits, such as extraversion, neuroticism, and conscientiousness, mediated NSE impacts (Gidziela et al., 2023). One of the biggest challenges that school instructors experience when instructing identical twins is how to encourage them to create their own identity and individuality. Identical twins frequently face the challenge of being seen and treated as a single entity by their parents, classmates, and instructors rather than as distinct

people. This may influence their self-image, self-confidence, independence, and academic and social growth. Some research has suggested that identical twins may have more trouble finding their identity, distinguishing themselves from others, and being emotionally independent than fraternal twins or single-born children.

However, not all identical twins are equally similar or dissimilar in their characteristics and preferences. Some identical twins may have more divergent personalities, interests, capacities, and goals than others, depending on their genetic and environmental impacts (Sahu & Prasuna, 2016). Besides, some identical twins may have more positive or negative feelings towards their twin relationship than others, depending on their attachment security and quality of interaction. Subsequently, school teachers must recognize and respect the individual differences and similarities among identical twins and avoid making assumptions or generalizations based on their twin status.

One of the most recent and significant studies on this point was conducted by Groene et al. (2022), who examined the association between insecure attachment and internalizing behavior issues in growth-discordant identical twins. Growth discordance alludes to a critical difference in birth weight or size between twin siblings, which may indicate intrauterine growth restriction or discordant placental sharing. The study included 64 growth discordant identical twin pairs and their parents and teachers. The results showed that growth discordant identical twins had higher levels of insecure connection and internalizing behavior issues than the normative population. In addition, the study found that insecure attachment mediated the relationship between growth discordance and internalizing behavior problems, suggesting that growth discordance may impair the twin bond and influence the emotional well-being of the twin children.

Teachers' perceptions of identical and fraternal twins' academic performance and social behavior can vary significantly based on their personal experiences and biases. Academic performance is often a subject of interest and concern for educators. Identical twins, who share the same genetic makeup, are frequently thought to have similar intellectual abilities and learning styles (Nilsson et al., 2010). Teachers might assume that if one identical twin excels academically, the other will as well. Therefore, this assumption can lead to high expectations for both twins and, in some cases, the risk of neglecting individual learning needs. Conversely, if one identical twin struggles academically, teachers may anticipate similar struggles for the other twin, potentially overlooking their unique strengths and challenges (Amundson, 2019).

In contrast, fraternal twins who share approximately 50% of their genetic material may be perceived as having more diverse academic capabilities. Teachers might approach fraternal twins with fewer preconceived notions about their academic potential, recognizing that their abilities and interests can differ significantly (Reuters, 2009). However, this perception could also result in less personalized attention or support for each twin, as teachers may not fully understand or address their individual needs. Furthermore, it is essential for educators to avoid making assumptions about a twin's academic performance solely based on their twin status and instead focus on assessing each student's abilities and providing tailored support accordingly.

Regarding social behavior, teachers may have distinct perceptions of identical and fraternal twins. Identical twins are often assumed to share a deep emotional connection and may be expected to interact more closely with each other than with their peers (Kovas & Plomin, 2007). Teachers may perceive this as a potential barrier to forming

friendships and socializing with other students (Tully et al., 2004). Conversely, some educators may view identical twins as a unique source of social support for each other, assuming that their close bond can help them navigate the social challenges of school more effectively.

Fraternal twins, on the other hand, may be perceived as having more typical sibling relationships. According to Amundson (2019), teachers may anticipate that they will interact with each other similarly to how other siblings do, with occasional rivalry or differences in interests. This perception might lead educators to treat fraternal twins as more independent from each other socially encouraging them to build relationships with their peers outside the twin relationship. However, it is crucial for teachers to recognize that the dynamics between fraternal twins can be just as diverse as those among other siblings, and assumptions about their social behavior should be made cautiously.

Challenges of Teaching Twins

Teaching twins often comes with the challenge of distinguishing their individual needs and learning styles. According to Von and Plomin (2018), identical twins may have similar academic strengths and weaknesses, making it difficult to tailor instruction to their specific requirements. Moreover, the temptation for twins to collaborate excessively can hinder their independent development, requiring educators to strike a balance between fostering their unique identities and maintaining a supportive sibling bond (Tully et al., 2004). In contrast, fraternal twins may exhibit divergent abilities and interests, necessitating differentiated instruction to address their varying learning paces and preferences. Hence, balancing these diverse needs in a single classroom can be demanding.

Benefits of Teaching Twins

While challenges exist, there are notable benefits to teaching twins together. Identical twins often share a strong emotional connection and support system that can enhance their overall well-being and academic performance. This sibling bond can serve as a source of motivation and comfort, reducing potential feelings of isolation or insecurity in the classroom (Tully et al., 2004). Fraternal twins, on the other hand, can contribute to a dynamic classroom environment by bringing diverse perspectives and experiences. Teachers can leverage these differences to foster inclusivity and encourage collaborative learning among students. Additionally, having twins in the classroom can offer valuable insights into the role of genetics and environment in education, enriching the educational experience for both students and educators.

Moreover, one key challenge teachers face when instructing both types of twins is striking a balance between individualization and inclusivity. According to Segal and Knafo-Noam (2021), identical twins may benefit from similar teaching strategies due to their genetic similarities, but it is essential not to neglect their unique needs and abilities. Likewise, fraternal twins may require differentiated instruction, but they should not be separated to the extent that their valuable interactions and support systems are disrupted (Tully et al., 2004). Therefore, teachers must create a classroom environment that acknowledges these differences while fostering a sense of belonging for all students.

To differentiate between identical and fraternal twins regarding their academic needs, teachers conduct ongoing assessments. For identical twins, educators may notice if they require similar levels of challenge and support in their coursework (Kovas & Plomin, 2007). They might excel in the same subjects or struggle with similar concepts,

indicating a need for consistent academic intervention. For fraternal twins' assessment often reveals differences in their academic needs. One twin may excel in mathematics while the other excels in literature, necessitating individualized teaching strategies. Therefore, teachers use these assessments to tailor their lesson plans and assignments, ensuring that each twin receives the appropriate level of challenge and support to maximize their academic growth.

Furthermore, Teachers also differentiate between twins by considering the dynamics of their sibling relationship. Identical twins often share a strong emotional bond and may rely on each other for support and motivation (Segal & Knafo-Noam, 2021). Teachers recognize the importance of preserving this bond while encouraging each twin's independence and self-expression. In contrast, fraternal twins may have more typical sibling dynamics, which can range from close collaboration to occasional rivalry. Hence, understanding these dynamics allows teachers to create a supportive classroom environment that fosters positive relationships and minimizes conflicts. By acknowledging and respecting the unique aspects of each twin's sibling relationship, educators can better address their emotional and social needs.

Moreover, Teachers develop personalized support plans for twins, tailoring interventions for identical twins and addressing the academic strengths and weaknesses of fraternal twins (Sahu & Prasuna, 2016). Nilsson's study (2023) on school counselors' views indicates a tendency to favor early separation, aligning with concerns about competition between twins and the need to differentiate teaching methods. Tully et al.'s research (2004) highlights the emotional impact of early separation, revealing increased internalizing problems for identical twins and challenges associated with separation at

different stages. Amundson's review (2019) emphasizes the increasing role of parents in classroom placement decisions, yet conflicting views persist among educators regarding the ideal timing for separation. Jones and De Gioia (2010) stress the necessity of training teachers to understand the nuanced needs of twins, focusing on emotional security and identity development, which is crucial for informed classroom placement decisions.

The issue of whether twins should share an elementary school classroom has garnered significant attention and debate among parents and educational professionals. According to a study by Amundson (2019), parents have increasingly advocated for the right to decide whether their twins should share a classroom, arguing that they know their children best and should have the final say in this matter. This has led to legislative changes in several states, with 14 states having enacted twin laws and 11 more considering such legislation, giving parents the authority to choose their twins' classroom placement. For instance, one perspective supported by qualitative research and ad hoc articles suggests that twins should ideally share a classroom until second grade (Gordon, 2014). More recent studies even lean toward keeping twins together until they express a desire for separate learning environments. However, there remains a divide among educators, with 49% of surveyed kindergarten teachers believing that twins should be separated by kindergarten (Gordon, 2015). The decision on when to separate twins often hinges on the co-twin relationship, considering issues related to competition, dominance, and identity development.

Amundson's review highlights that parents are increasingly involved in making decisions about their twin children's education, driven by both new laws and evolving research. However, this trend also leads to challenges in the interaction between parents

and school administrations, as recommendations from educators may conflict with parents' preferences. Therefore, to address these issues effectively, educational professionals should receive training on the unique needs of twins in elementary school classrooms. Jones and De Gioia (2010) emphasized the importance of equipping teachers with the knowledge and skills to make informed decisions regarding the classroom assignment of twins. Hence, this education should focus on understanding the emotional security, individual identity, competition, and dominance factors that influence classroom placement decisions.

Recognizing and Celebrating Differences

Teachers play a critical role in fostering individuality and identity among twins by recognizing and celebrating their differences. While identical twins share a genetic resemblance, it's essential to acknowledge that they are distinct individuals with unique personalities, interests, and abilities (Amundson, 2019). Therefore, teachers can achieve this by actively observing and appreciating the unique qualities of each twin. For instance, if one twin has a strong affinity for art while the other excels in mathematics, educators can celebrate these differences by showcasing their achievements and encouraging them to explore their passions. This recognition sends a powerful message to twins that their individuality is valued and respected within the classroom.

Encouraging Separate Friendships

Fostering individuality among twins also involves encouraging them to form separate friendships beyond their twinship. While their close bond is essential, it's equally crucial for twins to develop their own social circles and identities. Teachers can facilitate this process by strategically seating twins apart in the classroom or encouraging them to

participate in different extracurricular activities. By doing so, twins have the opportunity to interact with other peers and forge independent friendships. These separate friendships help them explore their unique interests and experiences, reinforcing the idea that they are individuals with distinct social lives and connections.

Another significant aspect of fostering individuality is promoting independent decision-making among twins. This means allowing twins to make choices regarding their academic pursuits, projects, assignments, or extracurricular activities based on their individual interests and talents. For identical twins, educators can encourage independent thinking by occasionally separating them for certain classroom activities or projects. Therefore, this separation prompts them to rely on their individual skills and decision-making abilities. For fraternal twins, teachers can create opportunities for each twin to pursue their passions, whether it's participating in different clubs or selecting unique projects. Hence, by empowering twins to make independent choices, teachers help them assert their individuality and build confidence in their decision-making abilities.

According to Dawood (2018), respecting the privacy and boundaries of twins is a fundamental aspect of fostering their individuality and ensuring they feel valued as distinct individuals. Therefore, to accomplish this, teachers should create a classroom environment where twins feel comfortable discussing their personal thoughts and feelings without fear of judgment or comparison. Furthermore, twins may face the challenge of people assuming they are the same or expecting them to share everything. Teachers can counteract this by actively listening to each twin and treating their experiences with respect and confidentiality (Runze et al., 2022). For example, if one twin is struggling with a personal issue or wants to share an achievement, teachers should provide a safe

space for them to do so without immediately involving their sibling or making comparisons. This fosters trust and demonstrates that each twin's thoughts and feelings are acknowledged and valued on an individual basis. Hence, by recognizing and respecting their boundaries, educators help twins develop a sense of autonomy and self-worth.

Moreover, encouraging self-expression is another essential strategy to nurture individuality among twins. According to Amundson (2019), teachers can provide opportunities for twins to showcase their unique talents and interests. This can be accomplished through various means, such as class presentations, creative projects, or talent shows. For instance, if one twin has a passion for painting and the other enjoys writing, teachers can assign projects that allow each twin to demonstrate their talents and interests in their own way (Amundson, 2019). By doing so, twins not only gain recognition for their individual abilities but also realize that they are more than just part of a pair. They begin to understand that they have distinct talents and contributions to offer to the classroom and the world. Additionally, educators should create a classroom culture that celebrates diversity and encourages open discussion about each twin's interests and aspirations. This open dialogue enables twins to express themselves without fear of comparison or competition with their siblings. Therefore, it reinforces the idea that their individuality is valued and supported in the classroom.

The study by Lunningham et al. (2020) addresses the complex topic of aggression in school-aged children, focusing on its genetic and environmental determinants. The researchers aimed to harmonize multiple aggression measures from five large twin

cohorts across different European countries, enabling a comprehensive analysis of the phenomenon.

One of the most intriguing findings of the study was related to sibling interaction effects, particularly in opposite-sex twin pairs (OSDZ). Therefore, the research revealed that OSDZ twins displayed unique social dynamics when it came to aggressive behaviors. In this context, aggressive behavior in a female twin had a positive effect on the male co-twin's aggression. In contrast, increased aggression in males had a negative influence on their female co-twins. This discovery emphasizes the importance of considering sibling dynamics in studies of childhood aggression.

The study conducted by Segal and Knafo-Noam (2021) delves into the intricate dynamics of twin relationships and their developmental trajectories during childhood. The primary focus of their research was to investigate four distinct dimensions of twin relationships: closeness, dependence, conflict, and rivalry, while also exploring the influences of zygosity and parenting on these relationships.

One of the critical findings of Segal and Knafo-Noam's (2021) study is the differential developmental course of these twin relationship dimensions. Closeness and dependence were observed to decrease over the course of childhood, with dependence showing a notable dip around age 5. This decline in dependence could be attributed to twins venturing into other social relationships outside the family as they grow older. Additionally, the study highlighted an increase in conflict and rivalry, particularly among dizygotic twins. Therefore, this finding implies that twins might become more competitive as they become more aware of social comparisons, especially when entering school.

Zygosity emerged as a factor influencing twin relationships. Monozygotic (MZ) twins consistently demonstrated higher levels of closeness and dependence compared to dizygotic (DZ) twins throughout childhood. This aligns with previous research indicating that MZ twins often share a more robust bond due to their genetic similarity. However, there was no significant difference in the levels of conflict and rivalry between MZ and DZ twins. This highlights the complexity of twin relationships, as closeness is not necessarily synonymous with a lack of rivalry.

The study conducted by Runze et al. (2022) focused on the effectiveness of the Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD) in parents of school-aged twins. The research aimed to replicate a previous study conducted with parents of preschool-aged twins, investigating whether the intervention could improve parental sensitivity and sensitive discipline as well as parental attitudes toward these aspects of parenting. Additionally, the study explored whether parents' temperamental reactivity moderated the intervention's effects. One notable finding of the study was that in the sample with older children, the VIPP-SD did not significantly change observed parental sensitivity or sensitive discipline in the intervention group compared to the control group.

The study by Rosén et al. (2022) provides valuable insights into the genetic influences on brain function related to interpersonal distance monitoring. The research aimed to understand how the brain processes interpersonal distance and whether genetics play a role in this behavior. Additionally, this study utilized neuroimaging techniques and a twin population, including both monozygotic (identical) and dizygotic (fraternal) twins. One of the primary findings of the study was the genetic influence on brain activation

related to social content and distance in the occipital face area (OFA). Hence, this suggests that genetic factors play a role in how individuals monitor interpersonal distance, particularly in response to social stimuli. Moreover, the study's focus on the occipital face area and the amygdala as critical regions involved in interpersonal distance monitoring provides valuable insights into the neural basis of this behavior. Therefore, the genetic influence observed in the OFA suggests that individual differences in how people perceive and respond to interpersonal distance may have a genetic component. Hence, understanding these genetic factors can contribute to a deeper understanding of social behavior and its neural underpinnings.

Therefore, just as genetics play a role in how individuals monitor interpersonal distance, genetics can also contribute to differences in cognitive abilities, learning styles, and educational needs between identical and fraternal twins. Hence, the study's finding of genetic influences on brain activation related to social content and distance suggests that there could be genetic factors influencing cognitive processes in twins, potentially leading to variations in learning styles and needs. Therefore, teachers might need to consider the genetic aspect when differentiating their teaching approaches for identical and fraternal twins.

Rimfeld et al.'s (2018) study focused on the heritability of educational achievement by examining the contributions of genetic factors (A), shared environmental factors (C), and nonshared environmental factors (E). They found that educational achievement showed substantial heritability (A ~60%), indicating that genetic factors played a significant role in explaining individual differences in academic performance. Furthermore, shared (C) and nonshared (E) environmental factors were also examined,

explaining about 20% of the variance. This suggests that while genetics played a substantial role, environmental factors still contributed to variations in educational achievement.

Moreover, Multivariate genetic analyses revealed that genetic factors accounted for a substantial proportion of the covariance between academic achievement measures at different ages, explaining 63% to 79% of the phenotypic correlations. Even after controlling for general cognitive ability (g), genetic factors continued to play a crucial role in explaining the phenotypic stability of academic achievement.

Given the substantial heritability of educational achievement ($A \sim 60\%$), as highlighted by Rimfeld et al. (2018) research, it can be hypothesized that teachers may observe differences in academic performance between identical and fraternal twins that are influenced at least in part by genetic factors. Teachers might perceive identical twins as more similar in their academic abilities than fraternal twins due to the greater genetic similarity in identical twins. Hence, this perception could influence how teachers approach and assess the academic performance of twins in their classrooms. Additionally, Rimfeld et al. (2018) findings that genetic factors play a crucial role in explaining the phenotypic stability of academic achievement suggest that teachers might perceive a degree of consistency in the academic performance of twins over time, especially in areas influenced by genetics. Hence, this perception could inform how teachers view and support the educational needs of twins.

The study conducted by Kuzmina and Praizendorf (2022) explored the use of collaborative learning technologies in teaching preschool twins and its impact on the development of self-awareness among twins. The research aimed to understand the role

of collaborative learning in the development of self-awareness among twins and its potential benefits for preschool education. It also highlighted the unique challenges posed by the twin situation in terms of cooperation and competition among twins. Furthermore, the findings of the study indicated that collaborative learning technologies, when applied effectively, can positively influence the self-awareness, cooperation, and self-esteem of preschool twins. Hence, it was observed that twins tend to use the pronoun "we" more frequently, reflecting their strong bond and the challenges of developing individual identities (Kuzmina & Praizendorf, 2022). Additionally, the study suggested that the teacher's active involvement in facilitating collaborative learning is vital because it helps monitor the interactions between twins, resolve conflicts, and demonstrate the advantages of cooperation over rivalry.

One key area of concern for instructors is their perception of identical and fraternal twins' academic performance and social behavior. For instance, some studies propose that identical twins may face higher expectations due to their genetic similarity, which could affect how teachers evaluate their performance (Ibrahim & El Zaatari, 2020). On the other hand, fraternal twins may not be subjected to the same level of scrutiny. Hence, this perception may lead to differences in the way instructors interact with and support twins in the classroom.

The study conducted by Kondowe et al. (2023) found several critical experiences in school teachers' perceptions of teaching identical and fraternal twins. Firstly, the research uncovered instructors regularly perceived identical twins as having more similar academic capacities compared to fraternal twins. Subsequently, this perception could affect how teachers approach instructional planning with less differentiation between

identical twins in terms of educational support. Besides, the study found that teachers recognized the unique social dynamics among twins, with identical twins frequently being viewed as closer and more interdependent compared to fraternal twins. Consequently, this perception proposes that instructors may need to consider the social and emotional needs of identical twins differently in the classroom to support their social development.

The study by Jones and De Gioia (2010) sheds light on teachers' perceptions of the classroom assignment of twins and the factors influencing their beliefs. The findings indicate that teachers identified both advantages and disadvantages to both separating twins and placing them in the same class. One major theme that emerged from the study was the issue of dominance. Teachers noted that in some cases, one twin may be more outgoing and dominant, which can overshadow their co-twin, hindering their social and emotional development. Therefore, separation was a potential solution that would benefit the less prevalent twins by allowing them to engage in opportunities independently. Hence, this highlights the importance of recognizing the unique needs of each twin to support their development.

Another significant theme was over-reliance, where one twin becomes overly dependent on their co-twin to the point where they struggle to function independently. Teachers saw separation as an advantage when one twin exhibited over-reliance on their sibling. This suggests that teachers are concerned about fostering independence and self-sufficiency in twins. Support was also a consideration with some teachers acknowledging that twins can be a source of emotional support for each other in new or unfamiliar situations.

The study by Ibrahim and El Zaatari (2020) delved into teachers' perceptions of identical and fraternal twins in educational settings focusing on their academic performance, social behavior, challenges, benefits, differentiation of learning styles, and fostering of individuality and identity. One significant finding of the study pertained to teachers' perceptions of twins' academic performance and social behavior. Hence, Teachers exhibited varying perceptions in this regard. For instance, some believed that identical twins tended to have similar academic performance and social behavior while others acknowledged differences within twin pairs. In contrast, fraternal twins were generally perceived as having more distinct academic abilities and social behaviors. Therefore, this highlights the importance of recognizing the individuality of each twin regardless of their zygosity.

Furthermore, differentiating between identical and fraternal twins in terms of learning styles and requirements was another primary discovery. Educators acknowledged the necessity of adjusting their teaching techniques to accommodate the distinct inclinations and strengths of each twin. Identical twins were more likely to share similar learning styles, while fraternal twins exhibited greater variety in their needs and inclinations. For instance, the study undertaken by Alexander (2012) delves into the education of twin and multiple shedding light on the ongoing debate surrounding whether they should be educated together or separately. This research has significant implications for educators, guardians, and the children themselves. The study highlights the rising birthrate of twin and multiple siblings in the United States, emphasizing the importance of addressing this issue in the educational landscape. One of the main discoveries in the study is the conflicting opinions among specialists, parents, and teachers on the most

effective approach for twins and multiples in the classroom. For instance, some experts argue that segregation is ideal for fostering individualism and averting over-reliance on siblings. They also believe that splitting up twins can decrease the chances of negative labeling, rivalry, and competition between them. Moreover, separation is seen as a means to prevent the formation of a "collective identity" that may impede personal development.

The study conducted by Hart et al., (2019) focuses on the academic development of twins in the United States specifically in the areas of reading and math. While the study primarily examined the factors contributing to the co-development of reading and math skills in twins it also provides valuable insights into the challenges and benefits of teaching twins in the same classroom. Hence, teachers often strive to create inclusive and supportive learning environments. Understanding how teachers foster a sense of individuality and identity among identical and fraternal twins is crucial in this regard. Hart's research findings can inform educators on effective strategies to support the individual growth and development of twins while acknowledging their shared characteristics.

The study conducted by Segal and Knafo-Noam (2021) provides valuable insights into teachers' perceptions of twins' academic performance and social behavior. Hence, Identical twins are often perceived as more similar in academic abilities and behavior while fraternal twins are seen as more distinct from each other. This perception aligns with the genetic similarity between identical twins leading teachers to expect greater similarity in their academic performance and behavior.

Identical twins' perceived similarities can present challenges in the classroom. Teachers may find it challenging to differentiate between identical twins regarding their

learning styles and needs as they are often seen as having nearly identical capabilities. This can hinder personalized teaching approaches and interventions for each twin. Additionally, teachers may inadvertently contribute to the reinforcement of similarities between identical twins potentially limiting their individual growth and development.

The study conducted by Haworth et al. (2008) primarily focused on investigating the genetic and environmental factors influencing academic performance in science among nine-year-old boys and girls with a particular emphasis on potential differences between genders. Additionally, the research employed a large representative sample of twins from the Twins Early Development Study (TEDS) in England and Wales. The study's results indicated that genetic factors played a substantial role in scientific achievement accounting for over 60% of the variance. In contrast, environmental influences primarily of the nonshared variety, accounted for the remaining variance. Notably, there were no significant qualitative or quantitative differences in academic performance between boys and girls.

The findings from Haworth et al.'s study suggest that teachers as an integral part of the academic environment may be interested in understanding the genetic and environmental factors contributing to academic performance in their students. They would find value in recognizing that genetics plays a significant role in academic achievement highlighting the importance of tailoring teaching methods to individual student's needs. Moreover, teachers might consider that nonshared environmental influences that affect students differently should be taken into account when assessing and addressing their academic performance and behavior.

In the study conducted by Lundborg (2008), the focus was on understanding the educational experiences of teachers when it comes to teaching identical and fraternal twins. The research aimed to uncover the perceptions and challenges faced by teachers when dealing with twins in the classroom. One of the key findings of the study was related to the teachers' perceptions of twins in the educational setting. Teachers often hold certain beliefs or expectations about twins which can influence their interactions with these students (Lundborg, 2008). For instance, teachers may expect twins to have similar academic abilities or behaviors due to their genetic similarities. Therefore, such perceptions can impact how teachers approach teaching and assessing twins.

Additionally, the study revealed that teachers often encounter challenges when teaching twins. These challenges can stem from the assumption that twins should perform similarly in school. When one twin excels while the other struggles, it can be perplexing for teachers. This situation might lead to the misjudgment of one twin's abilities or overlooking their individual needs. Furthermore, the study found that identical and fraternal twins may have different classroom dynamics (Lundborg, 2008). Identical twins, who share more genetic similarities, might have more pronounced differences in their behaviors and academic abilities which can be challenging for teachers to navigate (Lundborg, 2008). On the other hand, fraternal twins, who share less genetic similarity, may present fewer challenges in terms of differentiating between them (Lundborg, 2008).

The study by Ahrenfeldt et al. (2015) examined the academic performance of twins specifically focusing on the differences between opposite-sex (OS) and same-sex (SS) twins in adolescence. One of the critical hypotheses explored in this study was related to the influence of prenatal exposure to testosterone on cognitive abilities.

Differences in cognitive abilities between males and females might be attributed, in part, to variations in testosterone levels during prenatal development. To investigate this, the researchers compared the academic performance of OS and SS twins.

Contrary to expectations, the study found that OS females had significantly lower scores in mathematics compared to SS females. This difference was evident in both oral and written mathematics tests. Therefore, the adjusted differences amounted to approximately a tenth to a fifth of a standard deviation, indicating a notable gap in mathematics performance. These findings challenged the hypothesis of masculinization of OS female twins due to prenatal testosterone exposure.

Furthermore, the study observed that SS female twins performed similarly to female singletons in various academic subjects. In contrast, OS female twins had slightly lower performance, particularly in mathematics and physics/chemistry. This discrepancy between OS and SS female twins suggested that the presence of a male co-twin might have a slight adverse effect on academic performance in these subjects. In contrast to the findings among females, the study revealed no significant differences in academic performance between OS and SS male twins. In other words, having a same-sex or opposite-sex co-twin did not appear to influence the academic achievements of male twins differently. The study also noted that overall, male twins and singletons had higher ninth-grade test scores in mathematics but lower scores in Danish and English compared to females.

The study by Reuters (2009), delved into the educational experience of twins and the implications of classroom placement. One of the primary findings was that twins who shared a classroom performed equally well academically when compared to their

counterparts who were placed in separate classes. This revelation challenges the conventional wisdom that has long surrounded the debate over whether twins should be taught together or separately. The study's authors emphasized the need for a more individualized approach where the decision on classroom placement should be made collaboratively taking into account the unique needs and circumstances of each twin pair in consultation with teachers, parents, and the twins themselves.

The study conducted by Kovas and Plomin (2007) provides valuable insights into the genetic and environmental factors influencing learning abilities and disabilities. According to their research, twin studies consistently reveal a substantial genetic influence on individual differences in various cognitive areas including reading, mathematics, spatial ability, and memory. These findings underscore the importance of genetics in explaining why children exhibit differences in their learning abilities. For instance, Monozygotic (identical) twins tend to display higher concordance rates for learning disabilities compared to dizygotic (fraternal) twins emphasizing the role of genetics in these differences.

Multivariate genetic research allows for a deeper exploration of the genetic and environmental connections between different learning abilities and disabilities. The key finding is the existence of "generalist genes" that largely account for genetic influence across various cognitive domains. In other words, the same set of genes plays a significant role in influencing reading, mathematics, language, and other cognitive abilities. This insight challenges the traditional view that each ability or disability has its own set of genes responsible for it.

The study also highlights the concept of "specialist genes" and "specialist environments." While generalist genes explain the commonalities among learning abilities, specialist genes contribute to making children excel in some areas more than others. These specialist genes may influence certain skills but not others leading to variations in individual profiles of strengths and weaknesses. It's important to note that these genetic factors interact with environmental influences and nonshared environments play a crucial role in differentiating children's abilities, even when they grow up in the same family.

Furthermore, the research suggests that shared environmental influences tend to act as generalists affecting multiple learning abilities similarly. On the other hand, nonshared environmental influences are specialists contributing to differences in children's performances across different domains. These specialist environments which still need to be fully understood may include factors like peer influence, individual perceptions of school experiences, or even chance events. Therefore, recognizing the significance of specialist environments has implications for education, as it suggests that interventions and educational strategies should focus on addressing discrepancies between learning abilities and helping students with unique profiles of strengths and weaknesses.

Biblical Foundations of the Study

The stories of twins in the scripture offer timeless insights that resonate with the themes of this research. The biblical twins, Jacob and Esau illustrate the complex dynamics of sibling relationships, personal identity, and divine purpose. In their story (Genesis 25:19-26), it is seen how twins from the same parents have different destinies.

Their varied personalities and lifestyles show the uniqueness of each individual, even though they share family bonds. This biblical account stresses the importance of acknowledging and developing the individual identity of twins, a fundamental principle in education.

Another Biblical theme that echoes the experiences of twins is the concept of divine purpose and calling. The story of Joseph, the eleventh son of Jacob and Rachel, who had a unique role as a dream interpreter and leader (Genesis 37-50), highlights that each sibling in a family may have a specific purpose. This narrative invites us to think about the role of education in supporting and directing twins' purposes and talents while fostering their shared connections.

Besides, the biblical viewpoints on unity and community offer insights into the delicate balance between individuality and shared experiences. The apostle Paul's analogy of the body of Christ, where each member has a unique function but contributes to the whole (1 Corinthians 12:12-27), reflects the significance of recognizing the value of individuality and interdependence. This concept can guide educators in creating an inclusive classroom environment that acknowledges twins' individual strengths and contributions while fostering cooperation and collaboration.

School teachers' perception of the academic performance and social behavior of identical and fraternal twins is imperative to investigate because it may have implications for these students' educational results and well-being. Twins are a special group of learners who share a common genetic and environmental background but have individual differences and needs. Identical twins are more genetically comparative than fraternal twins and may have more similar experiences and interactions. Subsequently, school

teachers may have diverse expectations, attitudes, and strategies when teaching identical and fraternal twins.

Summary

The reviewed literature uncovers a multifaceted scene of twins' experiences in the educational system. Studies explore different dimensions, including academic performance, social interactions, teacher perceptions, and the challenges and benefits of classroom placement. The literature underscores the complex interplay between genetic impacts and environmental factors, shedding light on how twins' experiences are shaped by their unique bond and individuality.

While the literature provides important experiences, several gaps and areas for further exploration emerge. A notable research gap in the study of academic performance in twins lies in the need for more comprehensive and longitudinal investigations that track the development of academic abilities from early childhood through adolescence and into adulthood hence providing a nuanced understanding of the interplay between genetic and environmental factors over time. Additionally, there is a dearth of research examining how teachers' perceptions and treatment of twins particularly identical and fraternal may influence academic outcomes. Investigating potential biases and differential treatment by educators is crucial to uncover how these factors impact academic achievement. Furthermore, there is a need for research focused on designing and implementing individualized educational interventions tailored specifically to twins, optimizing learning environments, teaching methodologies, and classroom dynamics to support their academic growth. Therefore, addressing these research gaps can not only deepen our understanding of academic achievement in twins but also provide valuable

insights for educators, policymakers, and parents seeking to create supportive and effective educational environments for twin students.

CHAPTER 3: RESEARCH METHOD

Overview

The purpose of this qualitative phenomenological study was to investigate teachers' lived experiences teaching identical and fraternal twins. Furthermore, teachers' experiences of twins' academic abilities, achievements, and social interactions in the educational setting were examined. The study aims at gathering qualitative data to comprehensively understand how teachers differentiate instruction for twins and the challenges and benefits they identify when teaching twin students. This chapter covers the research design, participants, study procedures, instrumentation and measurement, data analysis, delimitations, assumptions, and research limitations of this study.

Research Questions and Hypotheses

1. How do teachers with experience teaching both identical and fraternal twins describe their experience teaching identical and fraternal twins?
2. How do teachers with experience teaching both identical and fraternal twins describe the experience with identical and fraternal twins' academic performance and social behavior?
3. How do teachers with experience teaching both identical and fraternal twins describe the challenges of teaching identical and fraternal twins in the same classroom?
4. How do teachers with experience teaching both identical and fraternal twins describe how they differentiate between identical and fraternal twins regarding their learning styles and needs?

5. How do teachers with experience teaching both identical and fraternal twins describe how they foster a sense of individuality and identity among identical and fraternal twins?

Research Design

The study utilized a qualitative phenomenological research design specifically employing semi-structured interviews to explore teachers' perceptions of twins' academic abilities, achievements, and social interactions in the educational setting (Barrow, 2017). This design was chosen for its capacity to provide in-depth insights into the complex and subjective nature of teachers' experiences and attitudes towards twins hence aligning effectively with the study's objective of comprehensively understanding these perceptions.

The qualitative approach enabled the study to employ open-ended, semi-structured interviews to collect data (Jamshed, 2014). Through these interviews, teachers expressed their thoughts and experiences in their own words hence providing detailed and authentic insight into their perspectives on teaching twins. Moreover, qualitative research recognizes the importance of context and context-specific understanding. Teachers' experiences may be influenced by many factors such as the school environment, the students themselves, and the broader educational landscape (Korstjens & Moser, 2017). Qualitative research acknowledges and embraces these contextual nuances allowing the study to holistically capture the depth and breadth of the teachers' experiences.

Moreover, adopting a phenomenological lens means acknowledging and valuing the unique perspectives and realities of teachers as they interact with and perceive the academic abilities, achievements, and social interactions of twins in the educational

setting (Barrow, 2017). Phenomenology emphasizes exploring the essence of lived experiences, delving into the subjective meanings and interpretations that teachers attribute to their interactions with twins. By employing semi-structured interviews, this research design facilitated a deep exploration of these subjective experiences hence allowing teachers to articulate their perceptions in rich detail and nuance.

Furthermore, phenomenology in this context encouraged the researchers to suspend preconceived notions or assumptions hence enabling a genuine exploration of the teachers' worldviews and understandings concerning twins' educational experiences (Barrow, 2017). Through this approach, the study aimed to uncover the underlying structures of teachers' perceptions hence uncovering the essence of how they conceptualize and navigate the educational journey of twins.

Participants

The study engaged elementary school teachers from diverse educational backgrounds, focusing on those who have taught identical and fraternal twins in grades K-5. A purposive sampling approach was utilized to recruit 12-15 teachers who met specific criteria aligned with the research objectives in Texas and Virginia. Participants were then selected based on their experience teaching twins and their varied teaching contexts. Recruitment further involved direct outreach to schools and educational institutions, leveraging online social media platforms such as Facebook to access a broader pool of potential participants.

Incentives like stipends were also offered to encourage participation. Informed consent was also obtained from all participants, ensuring confidentiality and anonymity throughout the study. Ethical considerations also guided the protection of participants'

privacy and data security. The rationale for the sample size is grounded in qualitative research principles, seeking data saturation, where further participant inclusion may not yield significantly new insights, ensuring depth and richness in understanding teachers' perceptions and experiences with twins in educational settings. Therefore, the sample size of 12-15 teachers was sufficient to reach data saturation and ensure that the research comprehensively captures the diversity of teachers' perspectives and experiences with twins in elementary school settings. This approach allowed for a rich and nuanced exploration of the research questions that align with the qualitative research design's objectives. Moreover, it should be noted that the study focuses on a qualitative approach, and the chosen sample size is appropriate for the qualitative methodology used.

Study Procedures

Securing IRB Approval

The research project underwent a comprehensive Institutional Review Board (IRB) approval process to ensure the ethical treatment of human subjects. The submission to the IRB was made on January 29, 2024, including a thorough documentation of the research design, participant recruitment strategies, data collection methods, and ethical considerations. The submission outlined the steps taken to protect participant confidentiality, such as the use of pseudonyms in reporting, and the protocols in place to obtain informed consent. The IRB approval process involved a rigorous examination of the ethical implications of the study, and approval was granted on February 08, 2024. This process signified the commitment to upholding ethical standards and ensuring the well-being and privacy of the participating teachers.

Eliciting Participants

The recruitment process for participants in this study was conducted systematically, employing a multi-faceted approach to ensure a diverse and representative sample of teachers who have taught twins in elementary school settings. The initial step involved direct contact with elementary schools and educational institutions. Formal letters of invitation and study information were sent to school administrators and/or district supervisors, explaining the research objectives and seeking permission to approach teachers who have experience in teaching identical and fraternal twins in grades K-5.

Simultaneously, online platforms and educational forums were leveraged to broaden the outreach. The research team actively engaged with relevant online communities, posting announcements and study details on platforms frequented by educators. These online channels served as additional avenues to reach potential participants beyond the direct school contacts.

To incentivize participation and express appreciation for their time, the study offered potential participants incentives such as professional development credits or stipends. For instance, Incentives such as a \$10 gift card will be provided to encourage participation. These incentives aim to acknowledge the time and expertise teachers invest in participating in the study. This information was included in the recruitment materials to communicate the tangible benefits of involvement.

Furthermore, a purposive sampling strategy guided the selection of participants based on specific criteria aligned with the research objectives. This ensured that the participating teachers represented diverse educational backgrounds, experiences, and

teaching contexts. Overall, the recruitment process aimed to be transparent, respectful of participants' time, and inclusive of a varied and comprehensive range of perspectives from teachers who have encountered the unique dynamics of teaching twins in elementary school settings.

Administration of Procedures

The administration of procedures involved a series of steps to facilitate the scheduling of interviews, establish criteria for participant selection, and initiate preliminary communications with potential participants.

Scheduling Interviews

Upon receiving expressions of interest from teachers willing to participate, I promptly initiated contact to schedule interviews. Flexible scheduling options were provided, accommodating the preferences and availability of the participants. Flexible scheduling involved clear and concise communication, detailing the purpose of the study, the expected time commitment for the interview, and the potential modes of interview (in-person, phone, or video conferencing).

Criteria for Participant Selection

Participant selection adhered to a purposive sampling approach designed to align with the research objectives. Teachers who had experience teaching identical and fraternal twins in elementary school grades K-5 will be specifically targeted. The criteria for selection encompassed a diverse range of educational backgrounds, teaching experiences, and contexts to ensure a comprehensive understanding of teachers' perspectives.

Preliminary Communications

Before formal scheduling, potential participants received detailed information about the study, its objectives, and the voluntary nature of their involvement. A consent form outlining the purpose, procedures, and ethical considerations of the study was provided. The communication emphasized the confidential and anonymous nature of the research, assuring participants that pseudonyms would be used in reporting findings to safeguard their identities. Additionally, the communication outlined the incentives, such as professional development credits or stipends, offered to express gratitude for their participation.

Gathering Data

The data gathering process during interviews was conducted through a flexible and participant-friendly approach, allowing for various modes of interaction based on the preferences and convenience of the participating teachers. The research team accommodated three primary modes of interviews: in-person, over-the-phone, and via video conferencing.

In-Person Interviews

For local participants or those who were willing to engage in face-to-face interviews, in-person sessions were arranged at a mutually convenient location, such as the teacher's school or another suitable venue. In-person interviews offer the advantage of capturing non-verbal cues and creating a more personal connection, fostering a potentially richer understanding of the teachers' perspectives.

Phone Interviews

For participants who may face geographical constraints or prefer the convenience of remote participation, phone interviews were facilitated. The research team coordinated interview times with participants and conducted structured interviews over the phone, ensuring the quality and depth of data collection.

Video Conferencing Interviews

Video conferencing, using platforms like Zoom or Skype, were also employed for participants who prefer a visual component to the interview or for those situated at a distance. This mode allowed for a more interactive and dynamic conversation, enabling the research team to capture both verbal and non-verbal cues.

Regardless of the chosen mode, all interviews followed a semi-structured format. This approach allowed for consistency in the topics covered while providing flexibility for participants to share their unique insights. It is also worth noting that the interview questions were designed to explore various aspects, such as classroom dynamics, social interactions, and instructional strategies related to teaching twins (Appendix A).

To maintain consistency and reliability across different interview modes, I adhered to a standardized interview protocol, ensuring that key themes and topics are consistently addressed across all interviews. The choice of interview mode was also determined based on the preferences and constraints of the participating teachers, with the overarching goal of facilitating an open and comprehensive exploration of their experiences and perspectives on teaching twins in elementary school settings.

Data Analysis

In this research, I elucidated the meticulous process of analyzing the qualitative data obtained from the interviews. In this case, thematic analysis was my method of choice since it allowed me to unveil recurring patterns, themes, and insights residing within the narratives shared by the teachers. This analysis endeavors to comprehensively understand teachers' experiences, attitudes, and instructional strategies concerning twins in the educational context.

Thematic Analysis Approach

This section presents the data analysis procedure to be employed. Given that this research primarily employed a qualitative approach, the data analysis focused on the process of transcription, coding, and thematic analysis. The qualitative nature of the data necessitated a systematic and in-depth examination of the rich information gathered through semi-structured interviews with teachers.

Transcription

The first step in the data analysis process involved the transcription of the interview data. Transcription is the process of converting spoken words and responses from the interviews into written form. This step is crucial as it enables the data to be organized and prepared for analysis. Each interview was transcribed using verbatim to ensure that the nuances of participants' language and expressions are retained.

Coding

After the transcription, the next stage of data collection and analysis involved coding the data. Coding is a systematic process of labeling and categorizing segments of the text based on the content and themes they represent. This process is essential for

identifying patterns, insights, and recurring themes within the data. In this study, I utilized both open coding and axial coding.

Open coding is the initial phase of coding in which the data is examined line by line to identify concepts and themes without predetermined categories. During open coding, I assigned descriptive codes to portions of the text that encapsulate the meaning. For example, if a teacher discussed challenges in differentiating instruction for identical twins hence this content was coded as "Challenges in differentiation."

After open coding, axial coding followed. It involved the categorizing and organizing the open codes into broader themes and categories. This phase sought to establish relationships between codes and develop a more structured framework for analysis. For instance, codes related to challenges in differentiation were grouped into a broader category like "Teaching Challenges."

Thematic Analysis

Thematic analysis stands as the overarching method guiding the comprehensive analysis of qualitative data in my study on school teachers' perceptions of twins in the educational setting. This approach was instrumental in identifying, analyzing, and reporting patterns referred to as themes within the collected qualitative data. The process of thematic analysis is broken down into several meticulous steps hence providing a structured framework for data interpretation and presentation.

Data Familiarization

The initial phase of thematic analysis involves immersing myself in the dataset through a rigorous review of the transcriptions and the assigned codes. This step was crucial for developing a profound familiarity with the data allowing me to grasp the

context and content of the interviews. Data familiarization sets the stage for a detailed examination of the collected information.

Generating Initial Themes

At this stage, I actively engaged in the process of identifying initial themes that organically emerge from the qualitative data. These themes are not preconceived but are allowed to surface based on the open and axial coding process. Through this approach, potential patterns and concepts were discerned hence laying the foundation for the primary themes that encapsulate the essence of the data.

Subsequently, I meticulously reviewed the initially identified themes, refining them to ensure precision and clarity. Each theme was thoughtfully defined in a clear and concise manner, with the objective of representing a distinctive pattern or central concept within the dataset. The review process was essential to ensure that themes accurately capture the content and context of the interviews.

Data mapping further played a critical role in thematic analysis by systematically organizing the coded segments of text that correspond to each identified theme. This method ensured that all relevant data are systematically associated with the appropriate theme providing a structured representation of how codes relate to and constitute each theme.

Interpreting themes is a central component of thematic analysis, requiring a deep understanding of the meaning and implications of the identified themes. The interpretation was conducted in the context of the research questions and study objectives delving into the profound insights within the themes. This process extends beyond surface observations to uncover the significant meanings embedded within the data.

The final phase of thematic analysis involved the preparation of a comprehensive report. In this stage, I presented and discussed the findings hence substantiating them with relevant quotations and examples extracted from the interviews. The report was designed to provide a coherent and inclusive narrative that communicates the significance and relevance of the identified themes.

Ethical Considerations Implementation

Informed Consent

The first step in ensuring ethical conduct involves obtaining informed consent from all participants. Prospective participants received a detailed informed consent form outlining the purpose, procedures, potential risks, and benefits of the study. The informed consent form clearly stated that participation is voluntary, and participants had the right to withdraw at any point without facing consequences. The informed consent form also included information about how the data obtained will be used and stored. Participants were given adequate time to review the form, ask questions, and provide their explicit written consent before engaging in the study.

Participant Confidentiality

To safeguard participant confidentiality, strict measures were implemented. The informed consent form explicitly stated that all data collected was to be anonymized and treated with the utmost confidentiality. Personal identifiers, such as names and specific school details, were replaced with pseudonyms in the research report. The research team also ensured that access to the collected data is restricted to authorized personnel only. Data storage was also secured using password-protected electronic systems or locked physical storage, further minimizing the risk of unauthorized access.

Use of Pseudonyms in Reporting

To uphold participant anonymity, pseudonyms were consistently used in all reporting and dissemination of findings. The pseudonyms were randomly assigned, and they did not bear any resemblance to the actual identities of the participants. This practice is crucial in protecting the privacy of teachers who share their experiences. Additionally, specific details that could potentially identify individuals or schools were omitted from the research report.

Ethical Review and Approval

The study design, including the informed consent process, confidentiality measures, and the use of pseudonyms undergone a thorough ethical review by the Institutional Review Board (IRB). The IRB ensures that the research adheres to ethical standards and guidelines for studies involving human subjects. Any feedback or recommendations from the IRB was incorporated into the study protocols.

Participants were also offered the opportunity to ask questions, seek clarification, and receive additional information about the study's findings if desired. This ensured that participants are well-informed and feel supported throughout the research process.

Delimitations, Assumptions, and Limitations

This section provided the delimitations, assumptions, and limitations of the study hence providing a comprehensive overview of the deliberate choices, underlying assumptions, and potential challenges that may affect the research. These aspects played a crucial role in contextualizing the scope and constraints of the study.

Delimitations

Specific Teacher Group

The study focused on a specific group of teachers who have experience teaching identical and fraternal twins in elementary school grades K-5. This deliberate choice narrows the study's scope to gain in-depth insights from educators with relevant experience limiting the generalizability of the results to a broader population of educators in diverse educational settings.

Assumptions

Honest Responses

An underlying assumption of the study is that participants provided an honest and truthful responses to the interview questions, reflecting their genuine perceptions and experiences related to teaching twins. This assumption is essential for the validity of the data collected.

Knowledge and Experience

It is assumed that the participating teachers possess the knowledge and experience required to answer questions accurately and comprehensively regarding their teaching experiences with twins. This assumption is fundamental for the study's ability to gather insightful data.

Limitations

Recall Bias

A potential limitation of the study is the presence of recall bias in teachers' recollection of their experiences with twin students. Memories of past interactions with

twin students may not precisely reflect their everyday classroom experiences therefore potentially introducing an element of subjectivity.

Social Desirability Bias

Social desirability bias is another challenge that must be considered. Teachers may feel compelled to present themselves and their attitudes in a socially desirable manner hence potentially affecting the authenticity of their responses. This bias might be particularly relevant when discussing challenges faced when teaching twins. To mitigate this bias, open and non-judgmental communication with participants will be fostered.

Participant Self-Selection Bias

There is a concern of participant self-selection bias when recruiting teachers for the study. Teachers with particularly positive or negative experiences with twins may be more inclined to participate hence potentially skewing the results. However, efforts to ensure a diverse and representative sample can help alleviate this bias.

Summary

This chapter has provided a comprehensive description of the research method that will be utilized in this study. The qualitative research design, participant selection through purposive sampling, and semi-structured interviews are well detailed. The study procedures, including recruitment, interviews, and data analysis, were elucidated, therefore shedding light on the systematic approach taken to explore teachers' perspectives on teaching twins in the educational setting. The instrumentation, operationalization of variables, and data analysis methods have been outlined, highlighting the rigor applied to gather and interpret the data. Additionally, the chapter

delved into the study's delimitations, assumptions, and limitations, hence providing a relevant understanding of the research's boundaries and potential challenges.

CHAPTER 4: RESULTS

Overview

This section explores the outcomes drawn from a qualitative phenomenological study that focused on teachers' views on educating identical and fraternal twins at an elementary school. The original plan was to collect information about the teaching methods, class climate, and social interactions between same-age children in the educational system. The tutorial questions helped me better teach identical twins and fraternal twins. Also, the study intended that this information be incorporated into the current literature and to enhance the proper training of the twins within the classroom.

The first section of the chapter restates the main reason for conducting the study. It follows an outline of data collection methods and the research questions that formed the basis of the study. The findings were organized using themes derived from data gathered through semi-structured interviews with elementary school teachers. On the surface, this chapter is an in-depth exploration of teachers' experiences, attitudes, and instructional strategies, but in reality, it is the dynamics of the educational surroundings.

Restatement of Study's Purpose

This qualitative phenomenological study aimed to investigate teachers' actual experiences of teaching identical and fraternal twins. Also, the teacher's experiences of twins' intellectual abilities, accomplishments, and social interactions in the educational setting were explored (Korstjens & Moser, 2017). Through semi-structured interviews, participants shed light on their understanding, enhancing the qualitative analysis

(Jamshed, 2014). Hence it was to collect qualitative data to learn how teachers differentiate instructions for twins, their challenges, and their advantages.

Data Collection Process

The research data for this study was firmly gathered using a wide-ranging qualitative data collection method with teachers to learn about their experiences and cognitions towards educating twins in elementary school setups. The process had stages that were vital to achieve the precision and depth of the figures. A convenient sampling approach was used to recruit a representative group of participants (Peel, 2020). The main aim here was to hire educators of different levels of experience, as well as from the various fields of the educational sectors. The selection procedure for the study applies to different types of educators who are shared with twins during the analysis of the survey.

Along with this, before the beginning of the interviews, the participants received further information on the overall aim of the study, the interviewing procedure, and the applicable confidentiality regulations (Braun & Clarke, 2022). Patients' consent was also taken during the survey to emphasize transparency and ethical practices. In addition, it involved formulating the substantive part of the data collection process comprising the semi-structured interviews to allow a conversation instead of the usual interview. Thus, a 15-question survey containing specific questions was designed. The topics discussed from different angles were participants' knowledge of education, experience in teaching twins, challenges, and instructional strategies.

During the interviews, all participants' responses were recorded and then transcribed for detailed analysis. Furthermore, open-ended questions motivated participants to give examples from their experience; therefore, quantitative information

was captured, documenting the details of their thoughts (Campbell et al., 2021). Careful documentation of these reactions was necessary because the data had to be analyzed, and their richness should not be lost. Ethical standards were followed precisely throughout the data acquisition process. One of the fundamental principles involved a pledge to treat the participants with respect, maintain confidentiality, and ensure transparency in the research process.

However, after the data collection, a detailed qualitative analysis was done. This implied the process of coding, pattern-seeking, and theme identification within the transcribed interviews. The goal was to identify similarities and elements of difference in teachers' experience dealing with kids who are twins, contributing to a comprehensive understanding of the educational complexity encountered by twins while in elementary school (O'Sullivan et al., 2021). The study process adopted this well-structured data collection process to gain complete insight into teacher encounters with twins and thus

provide an array of crucial instructional strategies, classroom dynamics, and social interactions that may be encountered by twins in education.

Research Questions

The study addressed the following research questions:

1. How do teachers with experience teaching both identical and fraternal twins describe their experience teaching identical and fraternal twins?
2. How do teachers with experience teaching both identical and fraternal twins describe the experience with identical and fraternal twins' academic performance and social behavior?
3. How do teachers with experience teaching both identical and fraternal twins describe the challenges of teaching identical and fraternal twins in the same classroom?
4. How do teachers with experience teaching both identical and fraternal twins describe how they differentiate between identical and fraternal twins regarding their learning styles and needs?
5. How do teachers with experience teaching both identical and fraternal twins describe how they foster a sense of individuality and identity among identical and fraternal twins?

The presentation of the findings is framed based on the research questions, shedding light on rich insights gained from participants. More so, both commonalities and differences in teachers' experiences were explored, contributing to a broader understanding of the educational context for twins in primary school settings.

Descriptive Results

This section analyzes the survey's descriptive results and provides detailed insights into the demographics of the participant sample and relevant information from

the questionnaires. The findings aim to provide a nuanced understanding of the backgrounds and experiences of teachers involved in teaching twins in primary school settings.

Number of participants

The study used a purposive sample of elementary school teachers with specific experience teaching grades K-5 fraternal and identical sibling twins. The sample consisted of 15 participants, including male and female teachers with different levels of education. Teachers had an average of 10 years in teaching, ranging from 5 to 20. Participants represented schools and educational institutions, with rich and varied perspectives on twins that were taught. Courses taught include math, science, english, history (social studies), physical education, special education, art, music, english language arts, technology (STEM), and foreign languages. This diversity ensured a comprehensive exploration of teachers' experiences with twins across different educational domains.

Figure 1: Grades

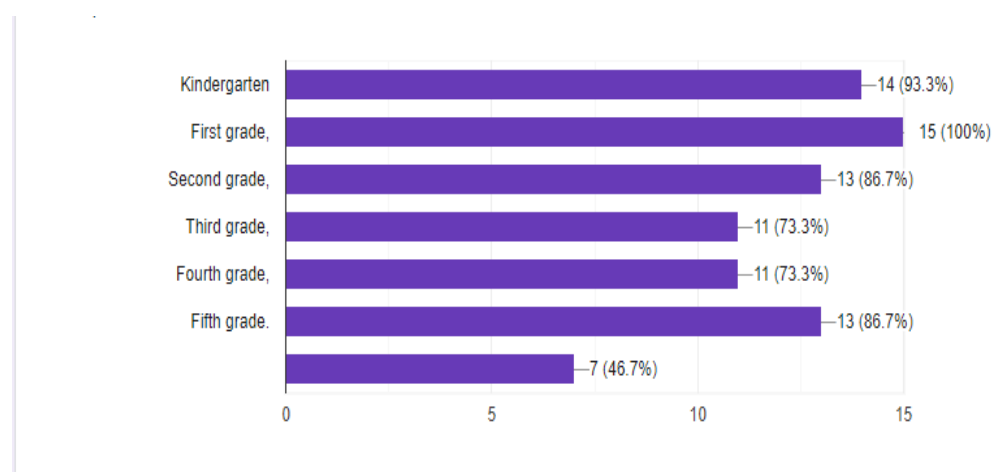
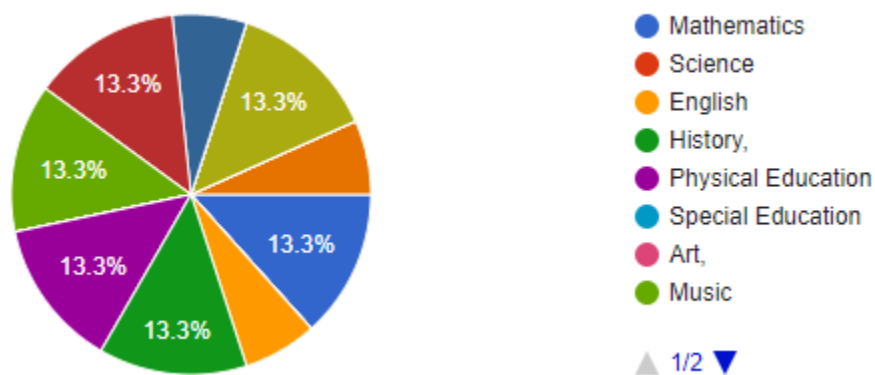


Table 1: Gender Distribution

Demographic	Number	Percentage
Female	9	60
Male	6	40

Figure 2: Subjects Taught**Table 2: Years of Teaching Experience**

Demographic	Number	Percentage
5-10 years	4	27
11-15 years	5	33
16-20 years	3	20
21-25 years	3	20

Table 3: Types of Twins Encountered

Demographic	Number	Percentage
Identical	8	53
Fraternal	7	47
Both	5	33

Table 4: Educational Backgrounds

Demographic	Number	Percentage
Education	10	67
Early Childhood Development	3	20
Other Fields	2	13

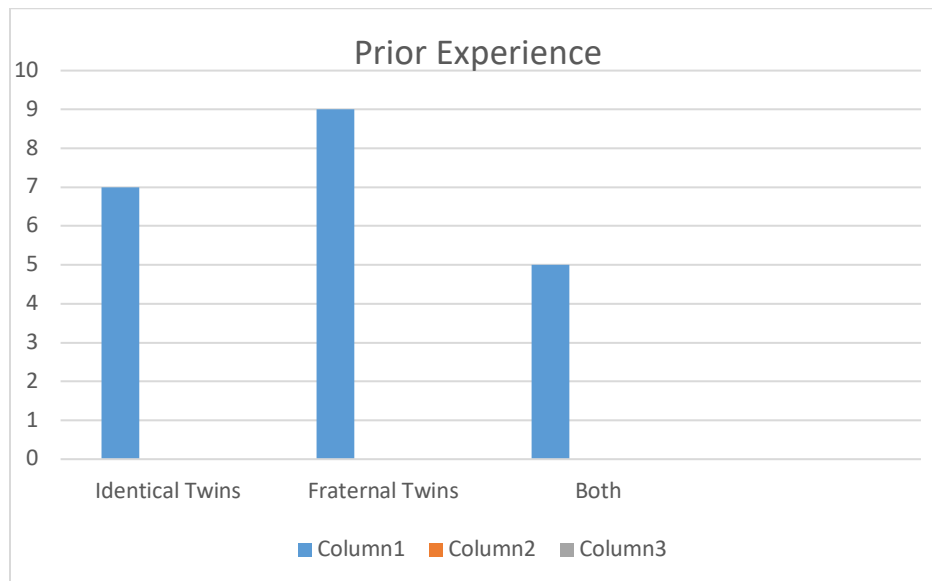
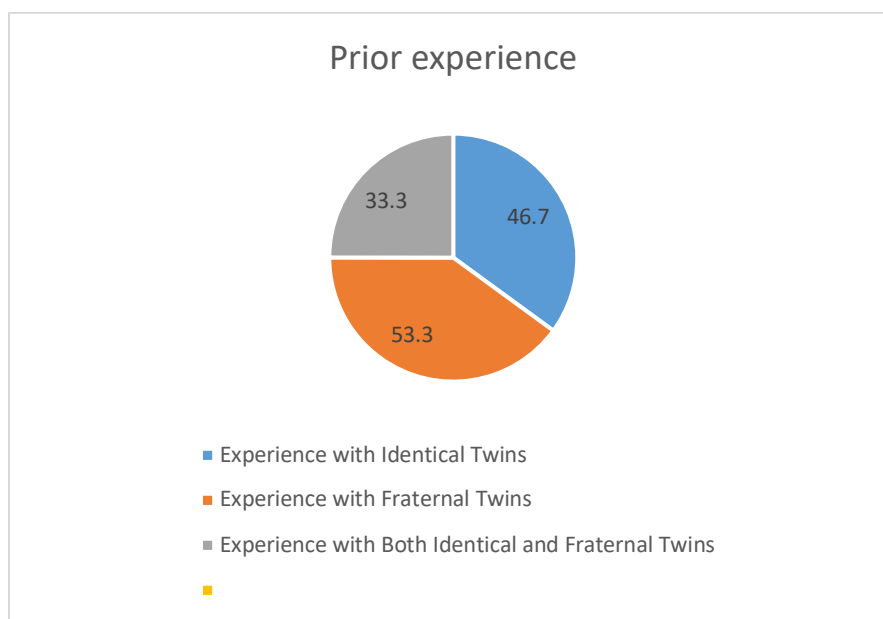
Graph 1: Prior Experience with Twins**Pie chart 1: Percentage Distribution**

Table 5: Teacher Experience Level Statistics

Statistics	Value
Mean Experience Level	9.6 Years
Median Experience Level	9 Years
Mode Experience Level	None
Range of Experience	18 Years (2-20)
Standard Deviation	5.23 Years

Table 6: Frequency of Subjects Taught

Subject	Number of Teachers
Mathematics	3
Science	2
English/ELA	3
Physical Education	3
Sports Education	2
Art Music	1
Social Studies	1
Elementary Education	1

Table 7: Frequency of Prior Experience with Twins

Prior Experience with Twins	Number of Teachers
Yes, Identical Twins	5

Yes, fraternal Twins	5
Yes, Both types	2
No	3

These tables provide a snapshot of the diverse experiences and backgrounds of the participating teachers. It serves as a basis for further exploring their insights into teaching twins in elementary school settings. Furthermore, the descriptive results not only establish the context of the study but also allow for an in-depth analysis of teachers' experiences and perspectives in the subsequent sections of the chapter.

Study Findings

Perceptions of Teaching Identical and Fraternal Twins

Participants were asked to rate their overall perceptions of teaching identical twins on a Likert scale ranging from 1 (Very Challenging) to 5 (Very Easy). The mean response was 2.8 thus indicating a moderate level of perceived difficulty. Similarly, teachers provided ratings for teaching fraternal twins. Furthermore, the mean response for teaching fraternal twins was 4.2 thus suggesting a comparatively more straightforward experience.

Challenges in Teaching Twins

Teachers were asked to rank the challenges of teaching twins on a Likert scale. The mean ratings for specific challenges were as follows-

- Balancing individualized attention with the needs of the entire class: 3.6
- Addressing misconceptions and stereotypes about twins: 4.1
- Differentiating instruction to meet the unique needs of twins: 3.9

Differentiation of Instruction

The effectiveness of differentiating instruction for twins was measured using Likert-scale items. The mean responses based on the Likert scale ranging from 1 (Very Challenging) to 5 (Very Easy) indicated.

- Flexibility in grouping strategies: 4.4
- Personalized assignments and learning plans: 4.2
- Collaboration with special education professionals: 4.0

Fostering Individuality and Identity

Participants were asked to rate the effectiveness of strategies for fostering individuality and identity among twins. The mean responses were as follows.

- Promoting independence and self-expression: 4.3
- Creating opportunities for separate activities: 4.1
- Celebrating each twin's unique strengths and accomplishments: 4.4

Table 8 : Descriptive Statistics for Questionnaire Response

Questionnaire Items	Mean Score
Perceptions of Teaching Identical Twins	
Overall difficulty (Likert scale: 1-Very Challenging, 5-Very Easy)	2.8
Perceptions of Teaching Fraternal Twins	
Overall difficulty (Likert scale: 1-Very Challenging, 5-Very Easy)	4.2
Challenges in Teaching Twins	
Balancing individualized attention with the needs of the entire class (Likert scale: 1-Not a challenge, 5-Very Challenging)	3.6
Addressing misconceptions and stereotypes about twins (Likert scale: 1-Not a Challenge, 5-Very Challenging)	4.1
Differentiating instruction to meet the unique needs of twins (Likert scale: 1-Not a Challenge, 5-Very Challenging)	3.9
Differentiation of Instruction for Twins	
Flexibility in grouping strategies (Likert scale: 1-Not Effective, 5- Very Effective)	4.4
Personalized assignments and learning plans (Likert scale: 1-Not Effective, 5-Very Effective)	4.2
Collaboration with exceptional education professionals (Likert scale: 1-Not Effective, 5-Very Effective)	4.0
Fostering Individuality and Identity Among Twins	
Promoting independence and self-expression (Likert scale: 1-Not Effective, 5-Very Effective)	4.3

Creating opportunities for separate activities (Likert scale: 1-Not Effective, 5-Very Effective)	4.1
Celebrating each twin's unique strengths and accomplishments (Likert scale: 1-Not Effective, 5-Very Effective)	4.4

In conducting this qualitative study, I adopted a phenomenological approach, aiming to delve deeply into the lived experiences of teachers who have worked with identical and fraternal twins in their classrooms. Phenomenology focuses on understanding the essence of human experiences as individuals live and perceive them, making it well-suited for exploring the nuanced complexities of teaching twins.

To ensure the validity and reliability of my analysis, I adhered to established guidelines outlined by Moustakas (1994) and Creswell (2007) for phenomenological research. These guidelines provided a structured framework for conducting the study, including steps for data collection, transcription, analysis, and interpretation.

After transcribing the interviews, I embarked on an iterative data review and analysis process. This involved immersing myself in the data by reading the transcripts multiple times while listening to the corresponding audiotaped recordings. This dual approach allowed me to capture the explicit content of the participant's responses and the nuances of their tone, inflection, and emotion, which are essential aspects of qualitative data analysis.

I identified recurring patterns, significant statements, and emergent themes from the participants' narratives during the data analysis phase. I employed inductive reasoning, allowing themes to emerge organically from the data rather than imposing preconceived notions or theoretical frameworks onto the analysis. This approach enabled

me to maintain the integrity of the participants' voices and experiences while uncovering more profound insights into the phenomenon under investigation.

Table 9: Relevant Codes

Teaching Identical Twins	Code 1: "Challenges in Differentiation"	This code encapsulates instances where teachers discussed the difficulties faced in tailoring instruction to the unique needs of identical twins.
	Code 2: "Social Dynamics"	This code represents segments where teachers shared insights into how identical twins interacted socially within the classroom setting.
	Code 3: Responsive Teaching	Responds promptly to twins' questions, concerns, and learning challenges, demonstrating sensitivity and attentiveness to their individual needs and preferences. Participant 3 Response: "I strive to be responsive to twins' needs by addressing their questions and concerns in a timely manner. It shows that I value their input and am committed to supporting their academic success."
	Code 4: Ongoing Assessment	It involves continuously assessing twins' progress and understanding through formative assessments, observations, and feedback to inform instructional decisions. Participant

		Response: "I use ongoing assessment strategies to monitor twins' progress and adjust instruction accordingly. It helps me identify areas where they may need additional support or challenge."
	Code 5: Individualized Feedback	Provides personalized feedback to twins on their academic performance, strengths, and areas for growth to facilitate self-reflection and goal-setting. Participant Response: "I provide individualized feedback to twins to help them understand their strengths and areas for improvement. It encourages them to take ownership of their learning and strive for continuous growth."
Teaching Fraternal Twins	Code 6: "Advantages in Differentiation"	This code encompasses instances where teachers highlighted the benefits and comparative ease of differentiating instruction for fraternal twins.
	Code 7: Trust and Respect	Reflects the establishment of mutual Trust and respect between teachers and twins, facilitating open communication and collaboration in the learning process. For instance, Participant 3 Responded: "Trust and respect are essential in my classroom. When twins trust me and feel respected, they are

		<p>more willing to engage in learning activities and seek help when needed. It creates a positive learning environment for everyone."</p>
	<p>Code 8: Supportive Environment</p>	<p>Instances where teachers create a nurturing and encouraging atmosphere that fosters positive relationships with twins, promoting academic and socio-emotional development. For instance, Participant 3 Responded, "I always make sure to create a supportive environment in my classroom where twins feel comfortable expressing themselves. This helps me build strong relationships with them and enables me to understand their individual needs better."</p>
	<p>Code 9: Parent-Teacher Collaboration</p>	<p>It involves establishing open and collaborative communication with parents or guardians of twins to share insights, address concerns, and work together to support their academic and social-emotional development. Participant 11 Response: "I maintain regular communication with parents to keep them informed about their twins' progress and any challenges they may be facing. It fosters a collaborative partnership between home and school, benefiting the twins' overall development."</p>

	Code 10: Peer Support Networks	Facilitates opportunities for twins to connect with peers who share similar experiences or interests, fostering peer support networks and social connections within the classroom. Participant 2 Response: "I encourage twins to build relationships with other students in the classroom who may have similar experiences or interests. It creates a supportive peer network where they can seek advice, share experiences, and develop friendships."
	Code 11: "Social Interactions"	Segments related to the social dynamics and interactions of fraternal twins were coded under this category.
Challenges of Teaching Twins	Code 12: "Balancing Attention"	Teachers' struggles in providing individualized attention to twins while catering to the broader class needs were coded here.
	Code 13: Adaptive Instruction	Adapts teaching strategies, materials, and activities to accommodate the changing needs, preferences, and abilities of twins, promoting flexibility and inclusivity in the learning environment. Participant Response: "I remain flexible in my instructional approach, adapting activities and assignments to meet the evolving needs of twins. It ensures that

		they are challenged at their appropriate level and feel supported in their learning journey."
	Code 14: Balancing Attention	It involves managing the allocation of time, resources, and support to ensure equitable attention and opportunities for both twins while meeting the needs of the entire class. Participant 5 Response: "Balancing attention between twins can be challenging, especially when one requires more support than the other. I strive to find a balance by rotating my focus and providing individualized assistance as needed."
	Code 15: "Addressing Stereotypes"	Instances where teachers discussed the challenges associated with addressing misconceptions and stereotypes about twins, were coded under this category.
Differentiation Between Identical and Fraternal Twins:	Code 16: "Learning Styles"	This code represents teachers' considerations and strategies in differentiating instruction based on the distinct learning styles of identical and fraternal twins.

	Code 17: Encouraging Self-Expression	Encourages twins to express their thoughts, opinions, and emotions freely, promoting autonomy and self-confidence in their personal and academic pursuits. For instance, Participant 3 Response: "I encourage twins to share their perspectives and ideas during class discussions. It empowers them to voice their opinions and develop critical thinking skills while respecting others' viewpoints."
	Code 18; Celebrating Differences	It involves acknowledging and celebrating the unique qualities, talents, and identities of each twin, fostering a sense of pride and belonging in the classroom. For example, Participant 5Response: "I celebrate the differences between twins by highlighting their strengths and achievements. It encourages them to embrace their identities and express themselves confidently in the classroom."
	Code 19: "Individualized Approaches"	Segments discussing specific methods employed by teachers to cater to the unique needs of both types of twins were coded under this category.
Fostering Individuality and Identity:	Code 20: "Promoting Independence"	Instances where teachers discussed methods to encourage independence and self-expression among twins, were coded here.

	Code 21: "Recognizing Unique Strengths"	This code represents segments where teachers shared practices aimed at celebrating and acknowledging each twin's strengths.
	Code 22: Tailored Learning Plans	Involves the creation of personalized learning plans that cater to the unique strengths, preferences, and learning styles of each twin, ensuring equitable access to education. For example, Participant 7 Responded: "I differentiate instruction by designing individualized learning plans for each twin based on their academic abilities and interests. This allows me to address their specific needs and challenges effectively."
	Code 23: Flexible Grouping	It entails organizing twins into flexible groups based on their learning pace, interests, or abilities, enabling targeted instruction and peer collaboration. For instance, Participant 12 Response: "I use flexible grouping strategies to ensure that twins have opportunities to work with different peers and learn from each other. It helps accommodate their diverse learning needs and promotes collaboration in the classroom."

Table 10: Interview Extract

Interview Extract	Codes
"I always try to recognize their strengths and weaknesses. Even though they are twins, they have different learning styles and abilities."	Individualized feedback, Differentiated instruction
"I encourage them to pursue their interests and passions, whether it is art, music, or sports. Each twin has their unique talents that should be celebrated."	Encouraging self-expression, Celebrating uniqueness
"Peer collaboration is essential for twins to develop their social skills and learn from each other. I often pair them up with different classmates to encourage interaction and teamwork."	Promoting peer collaboration, Social Interaction
Managing classroom dynamics can be challenging, especially when addressing the different learning needs of twins.	Challenges in Differentiation, Balancing Attention
Twins often have unique social dynamics, impacting their	Social Dynamics, Social Interactions

interactions with peers and teachers.	
One advantage of teaching twins is the opportunity to implement differentiated instruction effectively, catering to their learning styles and needs.	Advantages in Differentiation, Learning Styles, and Individualized Approaches
Teachers must navigate social interactions between twins and other students to ensure a positive classroom environment.	Social Interactions
"I provide opportunities for them to take on leadership roles in group projects. It helps them build confidence and assert their individuality within the group."	Empowering autonomy, Leadership opportunities
It is essential to balance attention between twins to avoid favoritism or neglect of one over the other.	Balancing Attention
Addressing stereotypes associated with twins is essential to promote inclusivity and understanding in the classroom.	Addressing Stereotypes

Identifying twins' unique learning styles allows for the implementation of individualized approaches to instruction.	Learning Styles, Individualized Approaches
Encouraging independence among twins fosters self-reliance and confidence in their abilities.	Promoting Independence
Recognizing each twin's unique strengths and abilities is crucial for providing tailored support and encouragement.	Recognizing Unique Strengths

Evidence of Trustworthiness

To establish the trustworthiness of the qualitative research conducted in this study, several key strategies were implemented, ensuring the validity and reliability of the findings. These strategies encompassed various dimensions of trustworthiness, including credibility, transferability, dependability, and confirmability.

Credibility, the extent to which the findings accurately reflect the experiences of the participants, was ensured through rigorous data collection and analysis procedures. One crucial method employed was member checking, whereby participants were given the opportunity to review the transcripts of their interviews for accuracy. This process allowed participants to verify the fidelity of their responses and enhance the credibility of the data. Additionally, the study reached a point of data saturation, indicating that further data collection would not yield significantly new information. This saturation ensured

that the findings were comprehensive and reflected the full range of experiences related to teaching both identical and fraternal twins.

Transferability, or the extent to which the findings can be applied to other contexts or populations, was addressed through purposeful sampling and descriptive documentation. Participants were selected based on their experience teaching twins, increasing the likelihood that the findings would be relevant to similar populations. Detailed descriptions of the study's population, setting, and context were provided to enable readers to assess the applicability of the findings to their settings or populations.

Dependability, referring to the consistency and stability of the findings over time and across different researchers, was established through meticulous data collection and analysis procedures. Interviews were audio-recorded and transcribed professionally to ensure accuracy and dependability in data capture. Multiple rounds of data analysis were conducted, and iterative processes were employed to ensure consistency and reliability in identifying patterns, themes, and interpretations. These procedures enhanced the dependability of the findings and ensured that other researchers could replicate them.

Confirmability, which relates to the objectivity and neutrality of the findings, was addressed through documentation of procedures and transparency in reporting. Clear documentation of the research process, including data collection, analysis, and interpretation, was provided to enable readers to assess the trustworthiness of the findings. Additionally, the researcher acknowledged their own biases and preconceptions and set them aside during data collection and analysis, enhancing the objectivity and confirmability of the study.

Study Results

In this study on school teachers' perceptions of twins, 15 interviews were conducted to explore their educational experiences teaching identical and fraternal twins. Of these interviews, 10 participants shared mixed or challenging experiences, while the remaining five reported positive experiences. Thematic analysis revealed 14 overarching themes that encapsulated teachers' perspectives on various aspects of teaching twins. These themes ranged from addressing stereotypes and celebrating differences to promoting peer collaboration and social interaction. Notably, the importance of differentiation, social dynamics, and responsive teaching emerged as central themes in teachers' perceptions. Additionally, collaborative planning and individualized approaches were highlighted as essential strategies for effectively educating twins. These findings provide valuable insights into the educational experiences of twins and underscore the importance of tailored instructional approaches and supportive classroom environments.

Research Question 1: How do teachers with experience teaching both identical and fraternal twins describe their experience teaching identical and fraternal twins?

When teachers were prompted to reflect on their experiences teaching both identical and fraternal twins, several prominent themes emerged, shedding light on the intricate dynamics and challenges inherent in educating these unique student pairs. These themes encapsulate the multifaceted nature of the teacher-twin relationship and offer valuable insights into effective instructional practices and classroom management strategies. Among the themes that surfaced, four key ones stand out: Bond and Interdependence, Classroom Diversity, Individualization, and Academic Diversity. Each

of these themes encompasses various aspects of the teaching experience, ranging from the social dynamics among twins to the tailored approaches required to meet their diverse academic needs.

Bond and Interdependence

Teachers observed a strong bond and interdependence among both identical and fraternal twins in the classroom. Participants highlighted instances where twins exhibited synchronous learning preferences and relied on each other for support. For example, one participant noted, "Twins often demonstrate a strong bond and synchronize their learning preferences, which can positively impact their academic performance and behavior." This theme underscores the unique relationship dynamics between twins that influence their academic and social interactions within the classroom environment.

Classroom Diversity

Teachers emphasized the diverse contributions and dynamics that twins bring to the classroom. Participants described how twins enriched classroom interactions, promoted peer collaboration, and contributed to a more inclusive learning atmosphere. One Participant remarked, "Having twins in the classroom adds a unique dynamic and diversity of perspectives. They often collaborate with other students, enriching our classroom discussions and activities." This theme underscores the importance of recognizing and accommodating the individual needs and preferences of twins to foster a supportive and inclusive classroom environment.

Individualization

Teachers stressed the importance of individualizing instruction and support for both identical and fraternal twins based on their unique characteristics, learning styles,

and abilities. Participants discussed strategies for differentiating instruction, providing personalized feedback, and celebrating each twin's strengths and achievements. For instance, a participant stated, "It is crucial to tailor instruction to meet each twin's specific needs and preferences. By recognizing their strengths and challenges, we can create a supportive learning environment that promotes their academic and socio-emotional development." This theme highlights the significance of addressing twins as individuals with distinct learning profiles and needs.

Academic Diversity

Teachers acknowledged the diverse academic profiles and needs of both identical and fraternal twins in their classrooms. Participants discussed challenges in differentiating instruction to cater to varying academic abilities, preferences, and interests. They also highlighted the benefits of implementing differentiated instructional approaches to address the specific learning needs of twins effectively. A participant explained, "Twins often exhibit diverse academic abilities and interests. It is essential to provide tailored support and challenge to meet their individual learning needs and foster their academic growth." This theme underscores the importance of flexibility and adaptation in addressing the academic diversity present among twins in the classroom.

2. How do teachers with experience teaching both identical and fraternal twins describe the experience with identical and fraternal twins' academic performance and social behavior?

When exploring the experiences of teachers who have instructed both identical and fraternal twins, a rich tapestry of insights emerges, particularly concerning the academic performance and social behavior of these unique student pairs. Through their

interactions and observations, educators have identified recurring themes that encapsulate the details of twins' engagement in both academic and social realms. In describing the experience with identical and fraternal twins' academic performance and social behavior, teachers emphasize the importance of recognizing individual differences and tailoring instruction accordingly. They acknowledge that despite being twins, each child possesses distinct learning styles and abilities. This recognition prompts teachers to provide individualized feedback and implement differentiated instruction strategies to accommodate diverse learning needs effectively.

Advantages of Differentiation:

Teachers highlighted the importance of recognizing the individual academic needs of fraternal twins. They discussed adapting instruction to cater to these needs, acknowledging that despite being twins, each has distinct learning styles and abilities. This approach aligns with the principles of differentiated instruction, allowing teachers to tailor their teaching methods effectively. Participant 1 responded that they tailor lesson plans to address the varying learning styles and abilities of fraternal twins, ensuring equitable access to education. Similarly, Participant 2 emphasized the importance of flexible grouping strategies to facilitate targeted instruction, enabling fraternal twins to collaborate effectively with peers. This sentiment was echoed by Participant 3, who highlighted the benefits of personalized learning plans in promoting individualized support and academic success for fraternal twins.

Moreover, Participant 4 noted the significance of recognizing and celebrating the unique strengths and talents of each twin, fostering a positive learning environment. In addition to academic considerations, social dynamics were a focal point of discussion.

Participant 5 shared insights into the social interactions unique to fraternal twins, emphasizing the role of peer collaboration in enhancing socio-emotional development. Likewise, Participant 6 underscored the importance of promoting a supportive classroom environment where fraternal twins can interact positively with peers and teachers.

Social Interactions

Teachers emphasized the significance of social interactions in the classroom for twins' social development. They reflected on how identical twins' unique social dynamics can influence their academic performance and social behavior. Additionally, teachers discussed the interactions of fraternal twins with peers and the implications of these interactions for overall classroom dynamics. Promoting peer collaboration emerged as a key strategy to facilitate social interaction and teamwork among twins and their classmates. In managing classroom dynamics, teachers acknowledged the challenge of addressing the diverse learning needs of twins while maintaining a balanced focus on each individual.

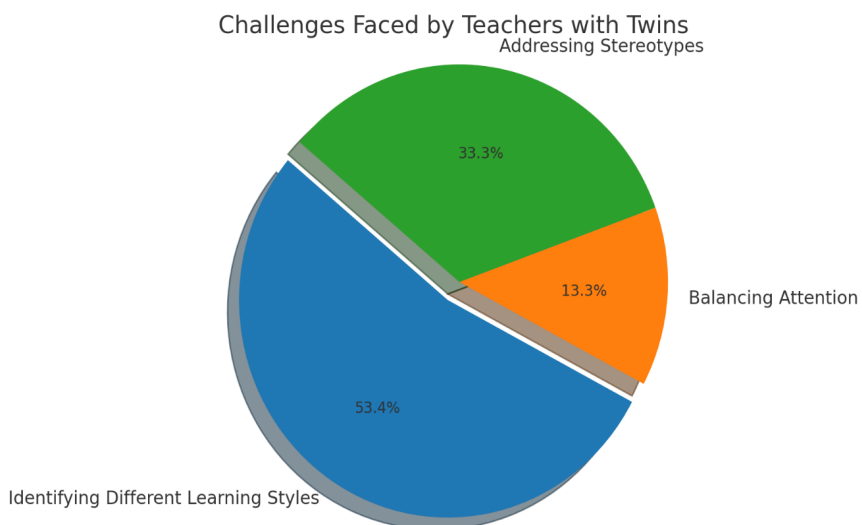
This balancing act is crucial to prevent favoritism or neglect of one twin over the other, contributing to a fair and inclusive learning environment. Teachers also recognized the importance of addressing stereotypes associated with twins to promote inclusivity and understanding in the classroom. By identifying twins' unique learning styles and abilities, teachers can implement individualized approaches to instruction effectively. Encouraging independence among twins fosters self-reliance and confidence, empowering them to pursue their interests and passions. Furthermore, teachers emphasized the significance of recognizing each twin's unique strengths and abilities. Providing tailored support and

encouragement based on these strengths not only acknowledges their individuality but also enhances their academic and social development.

3. How do teachers with experience teaching identical and fraternal twins describe the challenges of teaching identical and fraternal twins in the same classroom?

Differentiating Instruction

The main challenge highlighted by teachers was the need for effective differentiation for instruction for identical and fraternal twins in the same classroom. Teachers expressed the difficulty of developing instructional strategies and materials to address each twin's unique learning styles and preferences while maintaining equality and equity in instructional delivery. It included identical twins, whose requirements of differentiated education often resulted in headaches for teachers who tried to differentiate the content for everyone since there were no differences between the twins. Teachers had to adjust their teaching strategies to teach differently to each brother with different learning skills and styles.

Figure 2

The teachers were keen on teaching methods such as visual, auditory, and kinesthetic because of the children's different ways of learning. In addition, teachers emphasized the importance of continuous assessment and systematic feedback to monitor twins' progress and adjust instructional strategies accordingly. Despite these efforts, teachers acknowledged the difficulties of differentiating instruction for twins and discussed the need for continued professional development and collaborative planning to address this challenge well.

Managing Classroom Dynamics

Another vital challenge identified by teachers was monitoring classroom achievement in the presence of identical siblings. Teachers noted potential problems and distractions from twin interactions, especially in identical twins who often exhibited similar behaviors and responses. Maintaining an appropriate learning environment when

pairing positive interpersonal relationships requires active classroom management and conflict-resolution strategies.

Teachers emphasized setting clear expectations and boundaries for two-way communication, encouraging independence and autonomy, and minimizing interruptions during instruction. Additionally, teachers stressed the role of peer relationships and group dynamics in shaping twins' behaviors in classroom settings. They emphasized the importance of fostering an inclusive and conducive classroom environment that fosters positive social interactions with all students, including twins.

4. How do teachers with experience teaching identical siblings explain how to distinguish between identical twins and their learning styles and needs?

Individualizing Learning Approaches

Teachers consistently emphasized the importance of individualized teaching strategies when working with identical siblings. Teachers worried about what may arise from the silent communications between the two, especially with the identical twins, who often displayed mirroring behaviors. Creating a conducive environment and cultivating respectful twinships represented a rather big task for four educators. They had to use active classroom management and warfare decision strategies.

Educators called for well-established rules and boundaries for twin interactions, as well as helping to promote independence and autonomy through, among other things, minimizing academic disturbances. Besides, educators noticed the position of peer relationships and group dynamics in developing students' academic behavior in school class context; this and many other reasons stress the significance of creating excellent and

supportive classroom environments where students can interact with everyone without fear, for all are equal.

Flexibility in Instructional Strategies

Flexibility in teaching strategies emerged as an essential theme in how teachers differentiated between identical and fraternal twins. Teachers emphasized the importance of changing instructional strategy based on continuous research on dual achievement, considering factors such as academic strengths, areas of achievement, and personal interests. This theme particularly emphasized the development of educational gaps in the evolving needs of twins throughout the academic year.

Teachers explained using project-based learning, peer collaboration, and individual projects to develop instructional strategies. Ability to customize lesson plans, activities, and assessments and respond to real-time feedback and calculated assessments as necessary to provide practical, customized education for identical fraternal twins.

Collaborative Planning

Collaborative planning among educators and parents emerged as a vast theme in differentiating between identical and fraternal twins. Teachers emphasized the importance of ongoing verbal exchange and collaboration to benefit insights into each twin's strengths, challenges, and individualized desires. Regular discussions with the mother and father furnished valuable perspectives on the house, getting to know the environment and enabling instructors to align instructional techniques with familial assist systems.

5. How do teachers with experience teaching both identical and fraternal twins describe how they foster a sense of individuality and identity among identical and fraternal twins?

Cultivating Individuality Through Personalized Feedback

Teachers emphasized the importance of cultivating an experience of individuality and identity amongst identical and fraternal twins via customized remarks and the reputation of their particular contributions. Providing specific and focused comments tailored to each twin's accomplishments and regions for growth became diagnosed as a fundamental strategy for fostering their feeling of identity inside the lecture room.

Educators described the importance of acknowledging and celebrating twins' achievements, pursuits, and strengths. By highlighting their beautiful personalities and accomplishments, instructors aimed to nurture a supportive learning environment wherein twins feel valued and empowered. This topic underscored the role of positive feedback and fantastic reinforcement in selling a sense of identity and self-confidence among twins.

Encouraging Self-Expression and Autonomy

Encouraging self-expression and autonomy emerged as crucial subjects in fostering a feeling of individuality among identical and fraternal twins. Teachers emphasized the importance of supplying possibilities for twins to explicit their unique perspectives, hobbies, and aspirations in the classroom context.

Educators described developing conducive surroundings that encourage twins to discover their man or woman identities through creative expression, vital questioning, and choice-making. This theme highlighted the position of pupil-centered pedagogies and

inquiry-based totally gaining knowledge of tactics in empowering twins to say their autonomy and shape their academic reviews.

Promoting Peer Collaboration and Social Interaction

Promoting peer collaboration and social interaction emerged as an imperative theme in fostering an experience of individuality and identification amongst identical and fraternal twins. Teachers diagnosed the intrinsic fee of peer relationships in shaping twins' self-concept and social identities inside the study room network.

Educators described facilitating collaborative mastering reviews and institution sports that inspire twins to interact with their peers, proportion thoughts, and collaborate on initiatives. By fostering positive social connections and peer relationships, teachers aimed to sell an experience of belonging and reputation amongst twins while celebrating their precise identities and contributions to the learning community.

This subject underscored the importance of creating inclusive lecture room environments where twins feel affirmed, respected, and valued for their individuality. Through intentional strategies that promote self-expression, autonomy, and peer collaboration, educators sought to nurture a sense of identity and belonging among identical and fraternal twins, fostering their holistic development as freshmen and individuals.

Summary

In conclusion, Chapter 4 has provided comprehensive insights into teachers' experiences in teaching identical and fraternal twins. Through qualitative analysis, several themes emerged, including the unique dynamics of twin interactions, challenges and advantages in differentiation, and strategies for fostering individuality and identity.

Furthermore, teachers emphasized the need for individualized instruction, flexible techniques, and ongoing communication with both twins and their parents. These discoveries help develop a deeper comprehension of the intricacies involved in the education of twins and provide important implications for improving classroom education of multiple births. Chapter 5 is based on the insights gained from this chapter, and it focuses on recommendations for educational practices related to teaching twins. It will make use of the data presented in this chapter.

CHAPTER 5: DISCUSSION

Overview

The purpose of this qualitative phenomenological study was to investigate teachers' lived experiences teaching identical and fraternal twins. Furthermore, teachers' experiences of twins' academic abilities, achievements, and social interactions in the educational setting was examined. It aimed to gather qualitative data to comprehensively understand how teachers differentiate instruction for twins and the challenges and benefits they identify when teaching twin students. This chapter includes; the overview, summary of findings, discussion to the findings, implications, limitations, recommendation for future research and summary.

Summary of Findings

This qualitative study aimed to explore teachers' experiences in teaching both identical and fraternal twins, focusing on their perceptions, challenges, and strategies. Through thematic analysis of interview data, several key findings emerged, shedding light on the complexities of educating twin students. On the first and second research questions on experiences with identical twins' teachers emphasized the importance of individualization in instruction and support for twins. They recognized twins as individuals with unique learning styles, preferences, and abilities, highlighting the need for tailored approaches to meet their diverse needs effectively.

On the third research question on challenges of teaching identical and fraternal, the study revealed the challenges faced by teachers in differentiating instruction for twins in the same classroom. Teachers expressed difficulties in developing instructional strategies and materials that address each twin's unique needs while maintaining equality

and equity in instructional delivery. Furthermore, managing classroom dynamics emerged as a significant challenge, particularly in addressing the social interactions and behaviors of twins. Teachers highlighted the importance of fostering positive peer relationships, promoting collaboration, and minimizing disruptions to create a conducive learning environment for all students. Despite these challenges, teachers also identified advantages in teaching twins, such as opportunities for peer collaboration, social interaction, and enriched classroom discussions. They emphasized the benefits of recognizing and celebrating twins' individual strengths, talents, and contributions to the learning community.

The study findings of teachers with experience teaching both identical and fraternal twins described their experience teaching identical and fraternal twins show that the teachers ought to be so keen in order to understand the needs of the twins in the classroom. “Twin learners have a lot of diversity and complexities; therefore, a teacher ought to be keen when it comes to making assumptions,” one teacher mentioned, which is in line with Forghani-Arani et al. (2019) findings. Due to their distinctive genetic and social characteristics, twins have a special place in education, one of the respondents stated.

The teacher’s perception indicated that twins that are identical are dependent on one another, and fraternal twins are independent of one another. “Fraternal twins work better when they are independent,” one of the respondents said. Over-reliance where one twin becomes overly dependent on their co-twin to the point where they struggle to function independently. Teachers saw separation as an advantage when one twin exhibited over-reliance on their sibling. This suggests that teachers are concerned about

fostering independence and self-sufficiency in twins. Support was also a consideration, with some teachers acknowledging that twins can be a source of emotional support for each other in new or unfamiliar situations.

The findings on how teachers with experience teaching both identical and fraternal twins described the experience with identical and fraternal twins' academic performance and social behavior show that twins tend to have more similar academic performance than fraternal twins because of the genetics of the twins. This also agrees with Sahu et al. (2016) who stated that identical twins have similar performance as they share more genetic variables that influence their cognitive capacities (e.g., IQ, memory, attention) and personality traits (e.g., conscientiousness, openness) that are related to academic success. "Some identical twins tend to have different academic performance abilities due to factors like the environment and parental guidance, which affect the performance," one of the respondents stated. This agrees with Asbury et al. (2016) that identical twins can have significant differences in academic performance, as they are affected by non-shared environmental factors (e.g., prenatal conditions, birth order, peer influences, teacher expectations) that create individual variation in their learning experiences and results.

"On the social behavior of the learners, the identical twin learners tend to have similar social behavior in terms of social identity and social competence, compared to fraternal twins; this is alluded by their genetic makeup," one of the teachers stated. This finding agrees with Silventoinen et al. (2020), who stated that identical twins tend to have more similar social behavior than fraternal twins, as they share more genetic variables

that influence their emotional regulation (e.g., temperament, mood) and personality traits (e.g., agreeableness, neuroticism) that are related to social competence and adjustment.

The findings noted that school teachers must moreover observe each twin's social behavior individually and relevantly, considering their social skills, emotional regulation, self-esteem, attachment, etc. School teachers, further, need to provide each twin with appropriate guidance and support that enhances their social competence and adjustment and encourages them to develop their identity and differentiation as social beings.

The findings on how teachers with experience teaching identical and fraternal twins describe the challenges of teaching identical and fraternal twins in the same classroom show that a big challenge of teaching identical and fraternal twins is majorly identifying their capabilities and needs; this agrees with Garon-Carrier et al. (2023). This becomes especially evident in identical twins, who frequently exhibit similar academic performance and social behavior. The potential for confusion in catering to their requirements necessitates a tailored and vigilant teaching technique.

“Another challenge that comes with teaching the twins comes in when it comes to having a harmonious class,” a respondent stated. Teaching twins and normal learners is a challenge when it comes to sibling rivalry as well as peer exclusion. It brings a lot of tension in the classroom, destroying the learning process. This agrees with (Garon-Carrier et al., 2023), and the research stated that striking a balance that ensures a harmonious classroom environment is pivotal, calling for a heightened awareness of the intricate social dynamics. “It is important for a teacher to create a sense of belonging and diversity in a classroom where twins are present that will ensure that there is collaboration and interaction.” One of the respondents added. The peer interaction in the

classroom showed that the peers did not see twins as one unit in any of the interviews if they were placed in the same class.

In the midst of challenges, the school teacher's perception shows that there is a benefit of teaching the twins. Identical twins often share a strong emotional connection and support system that can enhance their overall well-being and academic performance, this agrees with Tully et al. (2004). This sibling bond can serve as a source of motivation and comfort reducing potential feelings of isolation or insecurity in the classroom.

The findings on how teachers with experience teaching both identical and fraternal twins describe how they differentiate between identical and fraternal twins regarding their learning styles and needs show that the teachers can differentiate the learning styles and needs of the learners by paying close attention. Identical twins show similar learning preferences and strengths because they share the same genetic makeup. This statement agrees with (Segal & Knafo-Noam, 2021). The respondents added that understanding the learning style of identical learners then helps in tailoring a method of instruction that suits the shared needs. On the other hand, the respondents clearly showed that fraternal twins portray different learning styles and needs, as alluded by the fact that they share fewer genetic similarities, and this agrees with (Silventoinen et al., 2020). "The teachers then ought to come up with a method of instruction that will meet the needs of the learners," a respondent added.

The findings on how teachers with experience teaching both identical and fraternal twins describe how they foster a sense of individuality and identity among identical and fraternal twins show that it is clear that it is important for the twins to gain individuality; this is achieved by allowing the learners to self-express themselves. This is

in terms of what they like, for instance, their talents and specific passions. For instance, if one of the twins likes drawing and the other loves singing, each twin ought to be given a chance to present individually through presentations. This will boost individuality among the twins in the classroom. The findings on the individuality of the learners agree with the ideas of (Amundson, 2019).

Discussion of Findings

The findings of this study provided valuable insights into teachers' perceptions of teaching identical and fraternal twins, shedding light on various aspects of their educational experiences. These findings aligned with existing research literature while offering novel contributions to our understanding of twins' educational dynamics.

One of the key findings of the study was the emphasis on individualization in instruction for twins. Teachers recognized the unique characteristics, learning styles, and abilities of each twin, highlighting the importance of tailored approaches to meet their diverse needs effectively. This finding resonated with the principles of the Multiple Intelligences Theory, which emphasized the importance of recognizing and addressing individual differences in learning styles and abilities (Gardner & Hatch, 1989). By acknowledging and accommodating twins' varied intelligence, educators could create more inclusive and supportive learning environments that promote academic success and socio-emotional well-being.

Furthermore, the study revealed the challenges faced by teachers in differentiating instruction for twins in the same classroom. Teachers expressed difficulties in developing instructional strategies and materials that addressed each twin's unique needs while maintaining equality and equity in instructional delivery. These challenges underscored

the importance of ongoing professional development and collaborative planning among educators to effectively address the diverse learning needs of twins. This finding aligned with previous research highlighting the complexities of differentiation in heterogeneous classrooms and the need for support and resources to implement effective instructional strategies (Tomlinson & Moon, 2013).

Additionally, the study identified managing classroom dynamics as a significant challenge, particularly in addressing the social interactions and behaviors of twins. Teachers emphasized the importance of fostering positive peer relationships, promoting collaboration, and minimizing disruptions to create a conducive learning environment for all students. This finding resonated with the Social Identity Theory, which posited that individuals categorized themselves and others based on group memberships, and these group identities significantly influenced their behavior and interactions (Tajfel & Turner, 1986). By understanding the social identity dynamics of twins in the school setting, educators could better support their social development and foster a sense of belonging and inclusion.

Moreover, the findings highlighted the importance of fostering a sense of individuality and identity among identical and fraternal twins. Teachers emphasized the significance of providing personalized feedback, encouraging self-expression and autonomy, and promoting peer collaboration and social interaction. These strategies aligned with the theories of self-concept and self-esteem, which examined how individuals developed an understanding of themselves and their self-worth (Białecka-Pikul et al., 2019). By nurturing positive self-perceptions and well-being among twins, educators could support their holistic development as learners and individuals.

How do teachers with experience teaching both identical and fraternal twins describe their experience teaching identical and fraternal twins?

From the findings, the respondents that is the teachers that teach the students that are twins ought to be so keen in order to understand the needs of the twins in the classroom. “Twin learners have a lot of diversity and complexities; therefore, a teacher ought to be keen when it comes to making assumptions,” one teacher mentioned, which agrees with (Forghani-Arani et al., 2019). Due to their distinctive genetic and social characteristics, twins have a special place in education, one of the respondents stated. The teachers who were the respondents indicated that twins that are identical are dependent on one another, and fraternal twins are independent of one another. “Fraternal twins work better when they are independent,” one of the respondents said. Over-reliance is where one twin becomes overly dependent on their co-twin to the point where they struggle to function independently. Teachers saw separation as an advantage when one twin exhibited over-reliance on their sibling. This suggests that teachers are concerned about fostering independence and self-sufficiency in twins. Support was also a consideration, with some teachers acknowledging that twins can be a source of emotional support for each other in new or unfamiliar situations.

The story of Joseph, the eleventh son of Jacob and Rachel, who had a unique role as a dream interpreter and leader (Genesis 37-50), highlights that each sibling in a family may have a specific purpose. This narrative invites us to think about the role of education in supporting and directing twins’ purposes and talents while fostering their shared connections.

How do teachers with experience teaching both identical and fraternal twins describe the experience with identical and fraternal twins' academic performance and social behavior?

On the academic achieving level, the teachers stated identical twins tend to have more similar academic performance than fraternal twins because of the genetics of the twins. This also agrees with Sahu et al. (2016), who stated that identical twins have similar performance as they share more genetic variables that influence their cognitive capacities (e.g., IQ, memory, attention) and personality traits (e.g., conscientiousness, openness) that are related to academic success. “Some identical twins tend to have different academic performance abilities due to factors like the environment and parental guidance, which affect the performance,” one of the respondents stated. This agrees with Asbury et al. (2016) that identical twins can moreover have significant differences in academic performance, as they are affected by non-shared environmental factors (e.g., prenatal conditions, birth order, peer influences, teacher expectations) that create individual variation in their learning experiences and results.

“On the social behavior of the learners, the identical twin learners tend to have similar social behavior in terms of social identity and social competence, compared to fraternal twins; this is alluded by their genetic makeup,” one of the teachers stated. This finding agrees with Silventoinen et al. (2020), who stated that identical twins tend to have more similar social behavior than fraternal twins, as they share more genetic variables that influence their emotional regulation (e.g., temperament, mood) and personality traits (e.g., agreeableness, neuroticism) that are related to social competence and adjustment.

From the findings, it was noted that, School teachers must moreover observe each twin's social behavior individually and relevantly, considering their social skills,

emotional regulation, self-esteem, attachment, etc. School teachers, moreover, need to provide each twin with appropriate guidance and support that enhance their social competence and adjustment and encourage them to develop their identity and differentiation as social beings. From the biblical perspective, in the story of Jacob and Esau, we can relate that the twin children have different abilities; that is, each child has different destinies (Genesis 25:19-26)

How do teachers with experience teaching both identical and fraternal twins describe how they differentiate between identical and fraternal twins regarding their learning styles and needs?

From the respondents, it was noted that the teachers can differentiate the learning styles and needs of the learners by paying close attention. Identical twins show similar learning preferences and strengths because they share the same genetic makeup. This statement agrees with Segal and Knafo-Noam (2021). The respondents added that understanding the learning style of identical learners then helps in tailoring a method of instruction that suits the shared needs. On the other hand, the respondents clearly showed that fraternal twins portrayed different learning styles and needs, as alluded to by the fact that they share fewer genetic similarities, and this agrees with Silventoinen et al. (2020). “The teachers then ought to come up with a method of instruction that will meet the needs of the learners,” a respondent added.

Individualization in Instruction

The emphasis on individualization in instruction for twins underscored the importance of recognizing and addressing their unique characteristics, learning styles, and abilities. Teachers' recognition of twins' diverse needs aligned with the principles of the Multiple Intelligences Theory, which emphasized that students possessed unique strengths and aptitudes beyond standardized assessments. By tailoring instruction to meet each twin's specific needs and preferences, educators could create a supportive learning environment that promotes their academic and socio-emotional development. This finding highlighted the significance of flexibility and adaptation in addressing the individual learning profiles of twins in the classroom, ultimately contributing to their academic success and well-being.

Challenges in Differentiating Instruction

The challenges faced by teachers in differentiating instruction for twins in the same classroom reflected the complexities of meeting the diverse needs of multiple learners simultaneously. Despite recognizing the importance of individualization, teachers expressed difficulties in developing instructional strategies and materials that effectively addressed each twin's unique needs while maintaining equality and equity in instructional delivery. These challenges underscored the need for ongoing professional development and collaborative planning among educators to enhance their capacity to differentiate instruction effectively. By providing support and resources to educators, schools could better equip them to meet the diverse learning needs of twins and create more inclusive and equitable learning environments.

Managing Classroom Dynamics

Managing classroom dynamics emerged as a significant challenge for teachers, particularly in addressing the social interactions and behaviors of twins. Teachers emphasized the importance of fostering positive peer relationships, promoting collaboration, and minimizing disruptions to create a conducive learning environment for all students. This finding underscored the social identity dynamics at play within the classroom and highlighted the importance of fostering a sense of belonging and inclusion among twins. By promoting positive peer interactions and creating a supportive classroom environment, educators could enhance twins' social development and contribute to their overall well-being.

Fostering Individuality and Identity

The findings emphasized the importance of fostering a sense of individuality and identity among identical and fraternal twins. Teachers highlighted the significance of providing personalized feedback, encouraging self-expression and autonomy, and promoting peer collaboration and social interaction. These strategies aligned with the theories of self-concept and self-esteem, which examined how individuals developed an understanding of themselves and their self-worth. By nurturing positive self-perceptions and well-being among twins, educators could support their holistic development as learners and individuals, ultimately contributing to their academic success and personal growth.

In terms of biblical foundations, the findings resonated with the themes of individuality, purpose, and community found in scripture. The stories of biblical twins such as Jacob and Esau and Joseph provided timeless insights into the complexities of

sibling relationships, personal identity, and divine purpose. These narratives invited us to consider the unique destinies and talents of each individual, even within the context of shared familial bonds. By recognizing and fostering the individual identities and purposes of twins, educators could help them fulfill their God-given potential and contribute positively to their communities. Furthermore, the biblical viewpoints on unity and community offered insights into the delicate balance between individuality and shared experiences. The Apostle Paul's analogy of the body of Christ, where each member had a unique function but contributed to the whole (1 Corinthians 12:12-27), reflected the significance of recognizing the value of individuality and interdependence. This agreed with the findings of the study that identical and fraternal twins ought to be given an opportunity to perform individually.

Implications

The implications of the findings of this study extend across various domains, including theory, practice, psychological practice/consulting, and the church or other organizations:

Theory Development:

The findings of this study contribute to the ongoing development of educational theory, particularly in understanding the complexities of teaching twins in the classroom. By highlighting the importance of individualization, differentiation, and social identity, the study enriches our theoretical understanding of how educators perceive and interact with twins. These insights can inform the refinement and expansion of existing educational theories, providing a more nuanced understanding of the factors that influence twins' academic and socio-emotional development.

Educational Practice

Practically, the findings have significant implications for educational practice, offering guidance for educators on how to better support twins in the classroom. By emphasizing the importance of individualization in instruction, differentiation, and fostering a sense of individuality and identity among twins, educators can enhance their ability to meet the diverse needs of twin students effectively. This may involve implementing tailored instructional strategies, promoting positive peer relationships, and creating inclusive learning environments that recognize and celebrate twins' unique strengths and abilities.

Psychological Practice/Consulting

In the realm of psychological practice and consulting, the findings of this study can inform interventions aimed at supporting twins' socio-emotional well-being and academic success. Psychologists and consultants working with twins can draw upon the insights gained from the study to develop targeted interventions that address twins' unique needs and challenges. This may involve providing counseling and support services to help twins navigate issues related to identity development, peer relationships, and academic achievement.

Church and Organizational Settings

The findings of this study also hold relevance for church and other organizational settings that work with twins and their families. By recognizing the importance of fostering a sense of individuality and identity among twins, religious and community organizations can create programs and initiatives that support twins' holistic development. This may include offering mentorship opportunities, facilitating peer

support groups, and providing resources for parents and educators to better understand and meet the needs of twins.

Limitations

In this qualitative phenomenological study on teachers' perceptions of twins in educational settings, several limitations need to be acknowledged. Firstly, the limited generalizability of the findings remained a concern. Focusing solely on a specific group of teachers experienced in teaching twins in Texas and Virginia may not have fully represented the broader population of educators in diverse educational contexts. Therefore, the insights gained from this study may not have applied to all educators, potentially limiting the broader implications of the findings.

Recall bias was another notable limitation that may have affected the validity of the results. Teachers' memories of past interactions with twin students may not have precisely reflected their day-to-day experiences in the classroom, introducing a subjective element to their responses. Similarly, social desirability bias may have influenced participants' responses, particularly when discussing challenges faced when teaching twins. Efforts were made to foster open and non-judgmental communication with participants to mitigate these biases.

Participant self-selection bias was a concern in the recruitment process. Teachers with particularly positive or negative experiences with twins may have been more inclined to participate, potentially skewing the results. Despite efforts to ensure a diverse and representative sample, this bias may still have impacted the findings, leading to an incomplete understanding of teachers' perceptions.

Additionally, while the chosen sample size aligned with qualitative research principles seeking data saturation, it may have still posed limitations. A smaller sample size could have restricted the depth and breadth of insights gathered, potentially overlooking nuanced perspectives or experiences. Furthermore, the study's focus on elementary school teachers may have limited the generalizability of the findings to other educational levels.

Social desirability bias was another challenge that researchers had to address. Teachers may have felt compelled to present themselves and their attitudes in a socially desirable manner, potentially affecting the authenticity of their responses, particularly when discussing challenges faced when teaching twins. Open and non-judgmental communication with participants could have helped mitigate this bias.

Participant self-selection bias was a concern when recruiting teachers for the study. Those with particularly positive or negative experiences with twins may have been more inclined to participate, leading to skewed results. Ensuring a diverse and representative sample could have helped alleviate this bias. Furthermore, Identifying and recruiting twins for the study could have been challenging due to privacy concerns or the absence of a comprehensive database of twins. Researchers should have considered alternative approaches to involving twin students in the study to better understand their educational experiences.

Furthermore, the wide variability among identical and fraternal twins posed a challenge in generalizing their experiences and teachers' perceptions. It may have also been difficult to differentiate between the impacts of twinship itself and other individual factors on their educational experiences. Lastly, time constraints may have affected the

participation rate of teachers, potentially leading to a smaller sample size than desired. Researchers should have managed the time requirements of data collection to ensure sufficient participation.

Lastly, the qualitative nature of the study may have introduced subjectivity in data interpretation. Despite rigorous data analysis procedures, the researchers' perspectives and interpretations may have influenced the identification and interpretation of themes. Therefore, efforts were made to maintain reflexivity and transparency throughout the research process to minimize the impact of researcher bias.

Recommendations for Future Research

Building on the insights gained from this study, several recommendations for future research emerge, offering opportunities to further deepen our understanding of teachers' perceptions of twins in educational settings. Firstly, future studies could explore the longitudinal effects of teachers' perceptions and interactions with twins on students' academic and social outcomes. By tracking twin students over an extended period, researchers could assess how teachers' attitudes and instructional practices influence their educational trajectories and well-being.

Moreover, investigating the role of school policies and support systems in addressing the unique needs of twin students could be fruitful. Understanding how institutional structures and resources impact teachers' ability to differentiate instruction and foster individuality among twins would provide valuable insights for educational policymakers and practitioners. Additionally, comparative studies across different educational settings and cultural contexts could shed light on the variability of teachers' perceptions and practices regarding twins.

Furthermore, exploring the perspectives of twin students themselves could offer a complementary understanding of their educational experiences. By soliciting input directly from twin students, researchers could gain insights into their perceptions of teacher-student interactions, sense of individuality, and overall satisfaction with their educational environment. Such research could inform the development of student-centered approaches to supporting twins in schools, enhancing their academic engagement and social well-being.

Lastly, considering the impact of twinship on teachers' professional development and training programs could be beneficial. Developing targeted interventions and resources to support teachers in effectively teaching twins could lead to more inclusive and supportive educational environments. By integrating twin-specific content into teacher education curricula and professional development workshops, educators could be better equipped to meet the diverse needs of twin students, ultimately improving their educational outcomes.

Summary

In conclusion, the findings noted that teaching fraternal and identical twins is complex and should be handled with great care. Twins have long captivated researchers and instructors due to their interesting traits. They provide an important opportunity to study the relative impacts of genetics and the environment on different characteristics, phenotypes, and disorders. In education, twins face particular challenges and opportunities, especially with respect to zygosity, individuality, and socialization. Individuality among the twins should be instilled in class. The teachers ought to make each twin individual and address the learning skills and needs accordingly. Teachers often

strive to create inclusive and supportive learning environments. Understanding how teachers foster a sense of individuality and identity among identical and fraternal twins is crucial in this regard. Educators must develop effective strategies to support twins' individual growth and development while acknowledging their shared characteristics.

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APPENDIX A: Invitation to Participate in Research Study on Teaching Twins

Dear [Teacher's Name],

I hope this message finds you well. My name is Robyn M. Lindley, and I am a researcher. I am reaching out to invite you to participate in a significant study exploring the educational experiences of teachers who have taught identical and fraternal twins in elementary school grades K-5. The primary goal of my research is to gain a comprehensive understanding of teachers' perspectives, experiences, and instructional strategies when teaching twins. Your insights and experiences are crucial in shedding light on this important area of education.

Participation in this study involves a semi-structured interview where I will delve into your experiences, attitudes, and instructional strategies concerning twins. Your input will significantly contribute to my understanding of classroom dynamics, social interactions, and differentiated instruction related to teaching twins. Please be assured that all information shared during the interview will be treated with utmost confidentiality and anonymity. Your identity and individual data will be kept strictly confidential, and pseudonyms will be used in reporting the findings. As a token of appreciation for your time and insights I will offer a \$ 10 credit card for participating teachers.

If you are interested in participating or have any questions about the study, please reply to this email or contact me directly. I will schedule the interview at your convenience, and your involvement will be immensely valuable to our research. Thank you for considering this invitation. Your contribution will greatly enrich our understanding of teaching twins in educational settings.

APPENDIX B: Eligibility Screening Questions

Eligibility Screening Questions

1. Are you currently an elementary school teacher that teaches kindergarten, first, second, third, fourth, or fifth grade?
2. Have you ever taught fraternal or identical twins?

APPENDIX C: Semi-Structured Interview Protocol

Purpose of the Study

I am conducting a study to better understand teachers' experiences and perspectives when it comes to teaching twins in elementary school settings. My aim is to gather insights into instructional strategies, classroom dynamics, and social interactions related to twins in the educational environment. During this interview we will be discussing various aspects of your experiences teaching twins through a conversational format. Your insights are essential to our research, and your responses will remain confidential and anonymized in our analysis. Therefore, feel free to share your thoughts openly, and there are no right or wrong answers."

Background in Education

1. Could you please share your background in education, including your experience level, subjects taught, and the grades you've worked with?
2. Have you had any prior experience teaching identical or fraternal twins in your classroom?

Experience with Teaching Twins

3. Can you elaborate on any specific experiences you've had teaching twins? What grades were they in, and how did you find the experience compared to teaching other students?"
4. In your opinion, are there noticeable differences in teaching identical versus fraternal twins?

Teaching Experience with Twins

5. Can you describe your experiences teaching both identical and fraternal twins? How do they differ, if at all?
6. What challenges or advantages have you noticed when teaching twins in the classroom?
7. How do you approach instructional strategies for twins compared to singletons?

Classroom Dynamics and Social Interactions

8. How do twins interact with each other in the classroom compared to other students?
9. Have you observed any unique dynamics or relationships between twins that impact their learning or behavior in class?
10. How do twins interact with their peers, and how does this interaction influence the classroom environment?

Differentiation of Instruction

11. How do you differentiate instruction to meet the individual needs of twins in your classroom?
12. Have you implemented any specific teaching methods or accommodations for twins, and if so, what were the outcomes?
13. What challenges do you face in providing personalized instruction to twins while ensuring fairness in the classroom?

Final Thoughts and Reflection

14. Is there anything else you would like to share about your experiences teaching twins that we haven't covered?

15. What suggestions or recommendations do you have for improving educational practices related to teaching twins?

Thank the participant for their time and willingness to contribute to the study.

Informed Consent Form

Title of the Study: School Teacher's Perceptions of Twins: A Study on the Educational Experience of Teaching Identical and Fraternal Twins

Principal Investigator: Robyn M. Lindley

Introduction

You are invited to participate in a research study conducted by Robyn M. Lindley, a researcher from Liberty University. Before deciding to participate, it is important that you understand the purpose of the study, what your participation will involve, and any potential risks or benefits.

Study Purpose

The purpose of this study is to explore teachers' perceptions regarding twins' academic abilities and achievements compared to single-born students. The research aims to understand teachers' attitudes towards classroom dynamics and social interactions among twins and their peers, as well as how teachers differentiate instruction to meet the diverse needs of twins in the classroom.

Procedures

If you agree to participate, you may be asked to participate in semi-structured interviews. The interviews will explore your experiences, attitudes, and instructional strategies related to teaching twins.

Duration

Your participation in this study is expected to take approximately 1 hour.

Risks and Benefits

There are minimal risks associated with this study. Participation involves sharing your perceptions and experiences, which may include personal opinions about teaching twins.

The benefits include contributing valuable insights to scholarly research on student diversity and informing theories related to peer dynamics, social integration, and differentiated instruction.

Confidentiality

Your identity will be kept confidential to the extent provided by law. Your name will not be used in any reports or publications resulting from this study. The data collected will be stored securely and only accessible to me.

Voluntary Participation

Participation in this study is completely voluntary. You have the right to withdraw at any time without penalty. Your decision to participate or not will not affect your relationship with Liberty University or any other organization associated with this research.

Contact Information

If you have any questions about the study, please feel free to contact:

Robyn M. Lindley

rlindley1@liberty.edu

Consent

I have read and understand the information provided above. I have had the opportunity to ask questions and have received satisfactory answers. I voluntarily agree to participate in this study.

Participant's Full Name: _____

Participant's Signature: _____ Date: _____

APPENDIX D: IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

February 8, 2024

Robyn Lindley
Rachel Piferi

Re: IRB Exemption - IRB-FY23-24-1271 SCHOOL TEACHER'S PERCEPTIONS OF TWINS: A STUDY ON THE EDUCATIONAL EXPERIENCE OF TEACHING IDENTICAL AND FRATERNAL TWINS

Dear Robyn Lindley, Rachel Piferi,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:104(d):

Category 2.(ii). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:

Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or

For a PDF of your exemption letter, click on your study number in the My Studies card on your Cayuse dashboard. Next, click the Submissions bar beside the Study Details bar on the Study details page. Finally, click Initial under Submission Type and choose the Letters tab toward the bottom of the Submission Details page. Your information sheet and final versions of your study documents can also be found on the same page under the Attachments tab.

Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, PhD, CIP
Administrative Chair
Research Ethics Office
