K-12 Teachers’ Perceptions and Experiences in their Teaching Practices of Utilizing Multimedia integrating with online Classroom Technology

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This dissertation explores how teachers perceive and engage with multimedia integration in their online teaching practices to effectively involve students. The study specifically focused on teachers in grades three through seven at an international school in Saudi Arabia. The research questions delved into teachers’ descriptions of their perceptions and experiences when using online technology and utilizing appropriate multimedia to engage students. The literature review highlighted the existing gap between theoretical knowledge and practical application when it comes to integrating technology and multimedia in the learning environment.

The research presented the TPACK framework and multimedia cognitive theory as guiding principles for effective integration. The methodology employed qualitative data collection methods, including interviews and focus groups, ensuring validation checks and ethical procedures were in place. The findings shed light on the adaptation of teaching in online classrooms using technology tools, the challenges faced by teachers, practical approaches to multimedia usage, and the correlation between multimedia utilization and student engagement. Teachers expressed the importance of support systems such as training programs, colleagues, and ICT departments in the school, which helped them navigate the features of online platforms and efficiently incorporate them into their teaching.
Despite the challenges faced in integrating multimedia into distance learning, teachers mentioned several multimedia applications that effectively engaged their students in online classrooms. They also shared practical teaching instructions for leveraging multimedia to deliver learning content effectively. The conclusion emphasizes the significance of teachers’ technological proficiency and the careful selection of multimedia content to enhance student engagement.
K-12 TEACHERS’ PERCEPTIONS AND EXPERIENCES IN THEIR TEACHING PRACTICES OF UTILIZING MULTIMEDIA INTEGRATING WITH ONLINE CLASSROOM TECHNOLOGY

BY
RATEEBA ALGOUIFI
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A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF EDUCATION

DEPARTMENT OF CURRICULUM AND INSTRUCTION

Doctoral Director:
Jodi P. Lampi
ACKNOWLEDGEMENTS

I want to take this opportunity to express my heartfelt gratitude to Dr. Jodi Lampi, my dissertation chair, for her unwavering guidance, expertise, and invaluable insights that have accompanied me throughout this process. Dr. Lampi’s encouragement and meticulous attention to detail have played a pivotal role in shaping my dissertation and broadening my intellectual horizons. I am genuinely grateful for her steadfast commitment to my academic growth. I would also like to sincerely thank Dr. Xie Ying and Dr. Peet Smith for their valuable feedback, constructive criticism, and contributions to my research. Your expertise in the field and thoughtful guidance have been crucial in refining my ideas and methodologies.
DEDICATION

I dedicate this dissertation to my loving and supportive husband, Abdulmohesn: You have been my rock unwavering. To my beloved children, Faisal, Shihana, Talal, and Mawya: you have been an unceasing source of inspiration, and your boundless love has given me the strength to persevere. Your unwavering support holds immeasurable value to me, and I deeply appreciate it.
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INTRODUCTION

The technological revolution of the late 20th century arguably transformed the concept of education (Langub & Lokey-Vega, 2017). Rapidly evolving technologies continue to significantly influence schooling and learning procedures, revealing many significant challenges facing the educational process in its traditional form (Garzón et al., 2017). In particular, the education system has discovered uses and applications that are highly effective in various learning environments (Garrison & Kanuka, 2004), such as learning management systems (LMS). Whether the classroom is blended learning or entirely remote, LMS platforms and tools allow educators to communicate with their students and to deliver learning materials in an environment consistent with students’ learning patterns (Lai & Savage, 2013).

Multimedia is among the technological concepts generated from the technology boom, and it has had a definite impact on the restructuring of the pillars of the learning process. Modern multimedia tools have opened doors and created opportunities for multimedia applications in the field of education (Garrison & Kanuka, 2004). Educational videos, websites, and video games are examples of commonly used multimedia tools for improving the learning process and achieving more interaction between the learners and the material (Komalasari & Saripudin, 2017). Whether it be in the form of text, pictures, or animations, multimedia can be designed and delivered to a variety of learning environments (Mayer, 2014). These multimedia content forms must then be integrated into the teaching instructions in a manner that is commensurate with the
patterns and needs of learners to build valuable learning experiences. Mayer (2014) posited that meaningful learning with multimedia is achieved by understanding content through the active processing of text and picture information that is easy to transfer and preserve and is engaging to learners.

The relationship between student engagement and the quality of instructional practices related to LMS is an essential aspect of online education. LMS can provide opportunities for enhanced student engagement through various features such as interactive multimedia content, discussion forums, quizzes, and collaborative tools. Teachers who know the LMS features can further increase student engagement. Quality of the instructional multimedia design and delivery methods is, therefore, a critical factor for improving the learning environment and determining the extent of the immersion and interaction of learners within the learning activity (Moreno & Valdez, 2005). Studying teachers’ recent perceptions and experiences with integrating multimedia into their teaching will give researchers critical insights into the usefulness of multimedia in their teaching instruction. Skinner et al. (1990) mentioned that students’ engagement appears through enthusiasm in facing learning tasks and the desire to learn, students’ effort on a task, and their ambient emotional states during learning activities. Engaging students with learning activities depends on the teachers’ skillful selection and delivery of multimedia content that facilitates learning and suits their needs to engage them in the learning process (Mayer, 2014).

Some studies indicated the importance of teaching instructions to transfer multimedia content in learners’ interaction in learning activities and achieving the learning goal. Zhou and Yadav’s (2017) study is an example in which using a digital multimedia story resulted in
increased vocabulary acquisition and reading skills, which were indicators the learners were more cognitively and behaviorally engaged. Richter et al. (2016) conducted a similar study using a digital chemistry book; the multimedia content helped learners by highlighting information that helped them link it to prior knowledge and build a new learning experience. These studies highlight the usefulness of multimedia in engaging students in a physical learning environment.

Undoubtedly, the technology boom has contributed to the diversity of multimedia and even the diversity of learning classrooms, which are no longer limited to traditional classes (Sangrà et al., 2012). Teachers’ perceptions of multimedia applications appropriate to learning content and engaging K-12 learners come from their practice teaching with multimedia technology in traditional learning environments (Mollaei & Riasati, 2013). Current studies at the college level (Al Abed, 2020; Alsadoon & Alhussain, 2019; Al Meajel & Sharadgah, 2018; Oelfke et al., 2021) have investigated teachers’ perceptions of adapting multimedia in their teaching to engage learners in the online learning environment. However, multimedia studies in the K-12 stage focused mainly on learners’ achievement based on integrating multimedia content learning (Martin & Carr, 2015; Park & Braud, 2017; Richter et al., 2016), while only a few of the K-12 studies (Almekhlafi & Almeqdadi, 2010; Gallini & Barron, 2001; Gebremedhin & Fenta, 2015) have studied teachers’ perceptions based on their application of appropriate multimedia, contributing to understanding the use of multimedia to enhance students’ engagement in traditional learning environments.

Online learning for grades K-12 has been found to be a suitable alternative to the classroom during emergencies such as the COVID-19 pandemic (Oraif & Elyas, 2021). Some studies on the K-12 teachers’ perceptions regarding their experience in distance learning during
COVID-19 (Boonmoh et al., 2021; Rahayu & Wirza, 2020) indicated that despite teachers’ solutions to dealing with online class obstacles such as classroom management or keeping learners’ attention, there were still challenges in integrating technology tools that arose because teachers were not trained in how to use the latest developments in technology. As such, I explored K-12 teachers’ perceptions of multimedia applications and how they incorporate them into instructional practices instructions to engage students in distance learning environments.

Teachers Keep Pace with the Development of Teaching Aids

The cornerstone of all education systems is student engagement in the learning process, which is the interaction between the students and the teacher in a particular learning environment (Fredricks et al., 2004). Therefore, teachers are focused on making learning more effective and efficient by actively engaging students in the learning process. Before the advent of the computer, teachers relied on traditional audio and visual methods to clarify content and create an active learning environment, such as playing sound recordings and drawing pictures and graphs on the blackboard (Reiser & Dempsey, 2012).

Due to the technological revolution and the acceleration of access to information we are witnessing in the current era, the prevalence of computers in education has led to the development of multimedia learning tools. However, the use of multimedia in the learning environment is not limited to serving as an attractive element; it should be a catalyst for achieving the learning goals. The skill of integrating multimedia into teaching instructions is a critical factor in engaging learners in both traditional and online learning environments (Reiser & Dempsey 2012). Topacio (2018) and Herring et al. (2016) emphasized that the effective utilization of multimedia in teaching instruction relies on two critical factors: a deep
understanding of the learning environment and the necessary technological expertise to seamlessly integrate multimedia into the learning process.

Nature of Teaching in Distance Learning

E-learning highlights society’s move toward modernization of the learning process (Messina & Tabone, 2012). Online learning environments have become more widely used in various educational universities and training institutions in recent years (Krogstie & Bygstad, 2005), while in the K-12 stage, blended or distance learning was limited. However, due to the public health emergency posed by COVID-19, teachers around the globe were forced to transition the way they taught from traditional learning to online learning. The teacher plays a pivotal role in adapting their teaching instruction for delivering learning content in the online learning classroom; through their practice teaching in the online classroom, teachers can describe the factors that affect their teaching experience.

Challenges of Shifting to Online Classrooms

Instructors face challenges as they move from the traditional classroom to online learning, including the need to become expert moderators of communication and interaction among students (Levitch & Milheim, 2003). Francom et al. (2021) and Zhang (2021) conducted studies which revealed that teachers’ primary obstacles involved facing challenges in establishing effective communication and maintaining contact with students, as well as encouraging their active participation.

Furthermore, teachers struggled to apply suitable teaching strategies and learning activities to stimulate students’ engagement in the online classroom to reach all students and get
them to participate and complete assignments. The study by Tawfik et al. (2021) highlights an additional challenge in online teaching, namely the absence of adequate technical support from the administration, resulting in ineffective online learning experiences.

Barriers to Integrating Online Technology

Teachers face challenges when transitioning to online classrooms due to difficulties in integrating online technology into their teaching instructions, resulting in obstacles in delivering learning content effectively and efficiently (Hannafin et al., 2003).

Understanding how to integrate online technology in teaching instruction helps create a coherent and helpful perspective that helps educators integrate learning content into their teaching and provide practical approaches to engage learners in the learning process (Mayer, 2014).

There are two main barriers that stand in the way of teachers understanding how to practically integrate online technology tools into their teaching. The first is that they lack knowledge and experience with online technology tools, which causes the fear of making mistakes while trying to use them (Leeder & Lonn, 2014). The second is that their professional development programs are not in line with modern technological developments that serve the purpose of active learning (Moses et al., 2014; Yuen et al., 2009) due to a lack of full communication between teachers and students in online learning environments (Hannafin et al., 2003). Online learning has strategies that arguably differ from traditional learning (Reiser & Dempsey, 2012). Therefore, online teachers must use teaching instruction to ensure interaction and communication between students while also considering their modes of learning (Posey et al., 2010). Altunoglu (2017) points out how the quality of teaching instructions with diverse
activities plays a crucial role in influencing participation and learning in e-learning environments. Therefore, a teacher’s goal in an online classroom does not differ from a traditional classroom: providing practical and authentic education to address learners’ engagement (Al Alhareth, 2013).

Teachers’ Perceptions and Experiences in Multimedia Applications

The extent to which teachers have practiced using multimedia applications plays a significant role in shaping their perceptions of its usefulness for engaging their students in a learning environment. Various studies have been able to positively shape teachers’ views on the effectiveness of multimedia in teaching instructions in the learning environment; some of these teachers noted that smooth and effective multimedia integration in their teaching significantly contributed to improving learning (Edmunds & Hartnett, 2014; Ferreira et al., 2013; Scheuerell, 2015). On the other hand, studies by Susomrith and Coetzer (2015), Leeder and Lonn (2014), and Zuvic-Butorac et al. (2011) all found that teachers perceived the complexity of multimedia integration technology as creating an additional burden in the teaching process.

The Impact of Multimedia Content on the Learning Process

Understanding how the human mind processes new information is essential to choosing multimedia content that is appropriate for the learning environment (Mayer, 2014). Rogers and Scaife (1998) mentioned that choosing the appropriate multimedia content helps learners in active learning processes of selecting, organizing, and integrating information without overloading their working memory, making them more engaged in the learning environment. The appropriate multimedia learning content has an important impact in helping learners interact
with learning tasks and be more engaged in the learning process. Therefore, teachers’ knowledge of the effective multimedia content makes them aware when selecting and delivering multimedia properly to achieve learning objectives that cater to the learners’ needs (Babiker & Elmagzoub, 2015; Hutchison & Reinking, 2011). Arguably, the successful application of multimedia principles will reduce the learner’s cognitive load through the effective processing of visual and audio content in a coherent manner that is in line with the human brain’s mechanisms (Moreno, & Mayer, 1999).

Quality of Multimedia Content

The classification of the multimedia content and employing multimedia principles in a manner commensurate with the educational situation to meet the learners’ needs and achieve the goal of learning. Findings of studies by Bond (2020), Çetinkaya and Sutcu (2019), Mayer et al. (2018), and Schrader et al. (2018) indicated that learners’ interaction in the learning activity when choosing and applying appropriate effects of multimedia principles. On the other hand, the studies conducted by Dousay (2016) and Yuen et al. (2018) provide evidence suggesting that multimedia can negatively influence the learning process if they are not appropriately applied in a manner that aligns with the learning content and objectives.

Arguably, teachers’ practical experience of multimedia applications and their incorporation into teaching practices in the traditional learning environment have been the focus of many studies and have revealed varying results. In contrast, teachers’ perceptions of the effectiveness of multimedia in distance learning for the K-12 stage need further research and depth. Thus, my qualitative study conducted individual interviews and focus groups with teachers from Grades 3-7 to explore their perceptions of online learning and integrating
multimedia into their teaching practices. These interviews also allowed teachers to explain their experiences of teaching online classrooms and using multimedia applications to engage students in K-12 distance learning environments. This outcome contributed to expanding the image of multimedia teaching practices regarding the involvement of learners within different environments.

Problem Statement

Using multimedia learning in the classroom holds the potential for effectively engaging students. According to Shernoff et al. (2014), the central aspect of fostering learner engagement lies in establishing a dynamic and interactive learning setting; this highlights the importance of learner engagement in education and the expansion of multimedia learning through technology, which goes beyond traditional physical classrooms to include online and blended learning. Indeed, an online classroom has a different condition and atmosphere in attraction between teacher and student than a traditional classroom (Reiser & Dempsey, 2012).

Due to the COVID-19 pandemic, educational systems worldwide, including Saudi Arabia, shifted to online learning for K-12 teachers (Ministry of Education, 2020). Consequently, delivering multimedia content effectively through online technology tools becomes crucial for engaging students in instructional practices. While technology education has been established in Saudi Arabian universities since 2010 (Alqarni, 2015), with a narrow focus on the K-12 stage, the transition to e-learning has presented challenges in embracing engaging online learning technology and teaching online due to teachers’ limited technology experience and inadequate technical support (Alshammari et al., 2016). According to Ferreira et al. (2013), academic knowledge of standards for using multimedia tools helps teachers not only avoid practicing
misconceptions that affect students’ learning but also positively changes teachers’ perceptions about multimedia tools. While recognizing that teachers’ perceptions and understanding of multimedia applications in online teaching play a significant role in successfully integrating multimedia into one’s online instructional practices (Means et al., 2013), it is essential to note that existing studies on teachers’ perceptions of multimedia in online and blended learning environments are limited, primarily concentrating on higher education levels.

Furthermore, existing studies conducted in K-12 settings, including those in Saudi Arabia, have primarily focused on teaching in online classrooms instead of using multimedia or utilizing online tools; studies by Aladsani et al. (2022), Alahmari and Kyei-Blankson (2016), Daraghmeh et al. (2021), as well as studies from outside Saudi Arabia such as Martin and Carr (2015) and Sadaghiani (2011), have explored the use of multimedia for K-12 education within traditional classroom settings, but there appears to be a lack of research on how K-12 teachers perceive and effectively utilize multimedia tools within online technology platforms. This study therefore sought to shed light on teachers’ perceptions of utilizing and integrating multimedia tools in their teaching to engage their third through seventh-grade students in using online technology platforms. It also explored teachers’ experiences appropriately using multimedia tools and their challenges when teaching in online learning environments.

Online Technology Learning in the Saudi Education System

Like many other developing nations, the Kingdom of Saudi Arabia is witnessing a persistent surge in the importance of technology and the need for its integration into the field of education. The Ministry of Education (MOE) demonstrated this by introducing the Ministry of Education’s
ten-year strategic plan for technology in 2004. So, in 2007, they established the National Center for E-learning and Distance Education. The plan delineated enhancing information and communication technology (ICT) infrastructure and harnessing its potential for educational purposes (Alqarni, 2015). Consequently, educators in higher education in Saudi Arabia are incorporating educational technology tools into the conventional curriculum to improve teaching and learning methods which include the adoption of various systems such as LMS, student information systems (SIS), as well as other distance learning and e-learning platforms that offer a multitude of features Al-Asmari, & Rabb Khan. (2014). Higher education in Saudi Arabia has witnessed consistent improvement in online technology systems. However, the same level of progress has not been observed in the K-12 education stage.

As an illustration, the MOE in Saudi Arabia introduced a learning management system called Classera as a pilot program in 12 public and private schools during the 2014-2015 academic year. According to Alahmari and Kyei-Blankson (2016), evaluating teachers’ perceptions of Classera is crucial, as they are at the forefront of this implementation. Despite the system being implemented for a while, there has been a shortage of assessments to determine whether the implementation objectives have been achieved.

Despite several prior efforts by the MOE to facilitate digital transformation in Saudi Arabia, technology in K-12 education was predominantly viewed as a supplementary tool. Daraghmeh et al. (2021) indicated the onset of the pandemic brought about a rapid transformation where technology became the backbone of the entire educational process. As a result, teachers faced the challenge of swiftly enhancing their technological knowledge to effectively support their
students, enabling them to improve their abilities and adapt seamlessly to a fully online learning environment.

Within the distance education framework in Saudi society, particular challenges go beyond the essential technical skills required for remote learning technology. These challenges are intricately linked to cultural factors, especially in a conservative society where gender-segregated schooling is the norm. Consequently, female teachers often experience a sense of unease while conducting remote teaching, as they harbor concerns about their voices being audible in the presence of male family members within their students’ homes.

Purpose Statement

My research explored how teachers at an international school in Saudi Arabia perceive and engage students in online classrooms by integrating multimedia using technology platforms. Specifically, the study examined the teachers’ experiences and perceptions of utilizing multimedia. The participants consisted of third to seventh-grade teachers.

Research Questions

The following research questions guided this study of teachers’ perceptions and experiences integrating multimedia technology into their teaching in online environments:

1. How do teachers describe their perceptions and experiences with incorporating online platform technology into their instructional practices to effectively engage students in grades three through seven?
2. How do teachers describe their perceptions of and experience with utilizing appropriate multimedia in engaging students in grades three through seven in online learning?

Significance of Study

While distance learning environments are well known in the higher education system (Alahmari, 2019), until recently they were optional and/or used sparingly in K-12 schools (Schill, 2020). However, emergencies such as the COVID-19 pandemic of 2020 made distance learning environments the only option for learning. This study highlighted the successes and challenges of adapting online classrooms to deliver multimedia content, while helping teachers explore the practical teaching instructions for utilizing multimedia in the online classroom to engage K-12 students. Furthermore, the study encouraged teachers to develop their skills in collaboration and share ideas that improve their teaching and enrich student learning. The study’s findings shed light on the challenges of teaching instructions in delivering multimedia content in the online classroom to engage students and find ways to address them.

The qualitative study provided a deeper insight into teachers’ perceptions and experiences that allowed them to share their ideas about integrating online classroom technology in delivering multimedia content, therefore opening the door for curriculum and instructional designers to improve multimedia content and online classroom technology to enhance learning. It is hoped the findings of this study will persuade the education system in my country of Saudi Arabia to recognize the importance of activating technology, especially online learning for public schools in general and home schools in particular, to generate interactive simplicity for teachers and students. Finally, the study serves as a future reference for researchers on teachers’
perceptions and experiences about their teaching instruction in delivering multimedia content in the online classroom to engage K-12 students in developing countries.

The Researcher’s Identity

Recognizing and addressing my research identity and potential biases is crucial for upholding the rigor and validity of this qualitative case study. In this qualitative study, I served as the designer of a qualitative case study, as well as a data collector and analyst, to explore K-12 teachers’ perspectives on the utilization of online technology tools for delivering multimedia content. It is essential for the researcher to transparently disclose any personal affiliation with the research topic and participants at the outset. By doing so, readers can gain a comprehensive understanding of the research’s context and the manner in which the findings are presented (Sutton & Austin, 2015).

Researcher Background

I have previous experience working in the Education Administration of the western region of Saudi Arabia as a trainer at an education training center. In this capacity, I conducted courses aimed at improving teachers’ professional development and collected their feedback on the implementation of new technology tools in their schools. Additionally, as a chemistry supervisor, I developed a keen interest in utilizing multimedia to effectively deliver educational content. This interest was sparked in 2006 when I conducted a survey among teachers to assess their perspectives on the effectiveness of smart boards in teaching and engaging students, considering their technological background and familiarity with multimedia applications.
Moreover, my passion in this research topic emerged during my time as a master’s student when I enrolled in an online classroom for the first time. I experienced the challenges firsthand, both as a student and as an online instructor, while utilizing multimedia to deliver learning content. These personal experiences have deepened my curiosity and motivation to explore the perceptions and experiences of teachers in delivering multimedia content in online classrooms.

**Positionality and Bias**

As the researcher, I recognize that my positionality can introduce biases that may impact the study’s outcomes. My background in the Saudi Arabian education system, along with my experience as a teacher and trainer, could shape my perspectives and interpretations of the participants’ experiences. Additionally, my existing knowledge and preconceived notions about the research topic may unintentionally influence the data collection process, analysis, and interpretation. To mitigate these biases, I am committed to remaining aware of them throughout the research process and implementing strategies to minimize their influence. During the study, my role as a trainer did not entail any administrative responsibilities that would grant me power or control over the participants, nor did it involve evaluation duties. I maintained a close working relationship with many of the participating teachers and had a relatively close working relationship with the remaining teachers within the school. It is important to note that participation in the study was voluntary, with no offers of incentives. To address ethical concerns regarding participant privacy and data security, all participants signed informed consent documents that outlined these issues.
To ensure a comprehensive and well-rounded approach, I utilized both individual and focus group interviews as part of my research methodology. These interviews provided opportunities for seeking input from peers and engaging in discussions with a diverse group of colleagues. By incorporating multiple perspectives, I aimed to minimize the potential for bias. This approach significantly bolstered the study’s reliability and validity, facilitating a more robust and inclusive analysis of the data.

Definition of Terms

Asynchronous Classroom: “an indirect learning type that does not require learners to be educated simultaneously. Learners can access available tools such as websites via e-learning tools” (Clark & Kwinn, 2007, p. 12).

E-learning: an educational model that includes processes, content, and methods for communicating valuable learning (Aldrich, 2005). There are two types of e-learning: synchronous and asynchronous.

Learning management systems (LMS): “a means to design, deliver and build online learning environments for a course, though features of each LMS vary slightly depending on the vendor” (Lai & Savage, 2013, p. 4). Gautreau (2011) defined LMS as “a web-based software consisting of courses that contain electronic tools including a discussion board, files, grade book, electronic mail, announcements, assessments, and multimedia elements” (p. 4).

Multimedia: Mayer (2014) defined multimedia as the potential of the world’s technology, with its variety of tools, to effectively influence human learning. Multimedia learning is, in essence, the building of representative knowledge links between the verbal and visual models, as this process relies on more than one sense of learning (Mayer & Moreno, 1998a).
Multimedia principles: the different techniques such as signaling, spatial, temporal, segmented, and preview for directing learners’ attention to the essential elements in subject learning (Mayer, 2014).

Student engagement: Fredricks et al. (2004) defined student engagement as multidimensional, consisting of observational, behavioral, and internal factors that motivate both cognitive and emotional interest. Student engagement gives learners a sense of achievement (Cothran & Ennis, 2000) by providing abundant opportunities for practicing useful activities that build stimulating learning experiences.

Synchronous classroom: “the confluence of the teacher and students simultaneously on the internet through video conferences and voice” (Clark & Kwinn, 2007, p. 10).

TPACK framework: the set of synergistic knowledge teachers need to integrate technology into their teaching. TPACK is based on three essential components of knowledge: content knowledge (CK) describes teachers’ knowledge of the content subjects’ teachers should teach. Pedagogical knowledge (PK) is defined as the teachers’ knowledge of practices and methods regarding their teaching and learning. Technological knowledge (TK) describes teachers’ knowledge and ability to use various technologies, tools, and associated resources to deliver learning content (Koehler & Mishra, 2009).

Delimitations

The study examined K-12 teachers’ perceptions and experiences integrating multimedia in teaching instruction in an online learning classroom at a private international school in Yanbu, Saudi Arabia. Saudi Arabia was chosen because it is a developing country that is achieving qualitative leaps in development in all fields, especially in education. Therefore, it needs more
research that supports and directs the use of technology and its advantages to improve its education system. Furthermore, Yanbu is one of the most famous cities in Saudi Arabia and is characterized by its rapid cultural growth and the quality of its educational facilities.

The sample included third through seventh grade teachers from the core subjects of math, science, and English, because the standards for these core subjects require that teachers to have at least five years of teaching experience in three stages of learning (elementary, middle, and high school) as well as extensive professional development. The sample for this study was six teachers, including men and women from traditional. The study was conducted at Yanbu Elite International School (YEIS), one of seven private international schools in Yanbu City in Saudi Arabia, because the international schools teach primarily English, making the study process more accessible.

Conclusion

A critical focus for educators is to create a productive and active environment in which learners engage deeply in the learning process. Integrating multimedia content into teaching provides opportunities to engage learners in the content by incorporating the materials in a coherent mental representation that aid in building a meaningful learning experience (Mayer, 2014). The research problem was summarized in teachers’ perceptions and teaching experience when forced to use the online classroom in the K-12 stage. The study explored teachers’ feedback in their teaching instructions of integrating multimedia to engage learners effectively in a way that is different from that in the traditional classroom. The research framework includes Cognitive Theory of Multimedia Learning and its principles integrating multimedia in teaching instruction according to the TPACK theory criteria. The study adopts a qualitative approach to
interpretation through an interview and focus groups to interpret the teachers’ perceptions of the usefulness of multimedia integration in teaching instruction in online learning.
CHAPTER 2
LITERATURE REVIEW

In light of the rapid development of technology and its application in various fields, educational institutions have become very interested in selecting appropriate technological tools. These tools must then be integrated into the content in a manner commensurate with the patterns and needs of learners to build valuable learning experiences (Almekhlafi & Almeqdadi, 2010). Educators seek to use multimedia to engage students in the learning content, whether traditional or online; therefore, they look at the methodologies to achieve active learning participation (Rogers & Scaife, 1998). However, Reiser and Dempsey (2012) showed that designing instructional multimedia is not just a matter of selecting a package of materials and including them in the different technology tools. Teachers’ knowledge plays an essential role in effectively conveying content in different learning environments as well as in achieving learning goals (Eisner, 2002). This literature review served as a foundation for my study on teachers’ perceptions of and experiences with using multimedia in their teaching to engage students in an online classroom. The literature is organized into three sections. The first section examines the role of teachers’ experiences in integrating technology tools in a classroom while also discussing the factors that have an impact on integrating technology in the classroom. The second section reviews different multimedia applications for engaging students in learning as well as teachers’ perspectives of multimedia principles for engaging students. The last section presents the foundations of the two frameworks: TPACK and the cognitive theory of multimedia learning.
Technology Integration in the Classroom

Technology has infiltrated nearly every aspect of individuals’ lives, and its many tools have become essential to the various science fields. Raja and Nagasubramani (2018) indicated that education systems are racing to embrace technology-centered learning in their educational institutions, not only for the advancement of their societies but to keep pace with the technological age (Lei, 2009). In the 21st century, integrating technology in the classroom is an essential building block in enhancing the learning process (Boonmoh et al., 2021). The teacher’s technological knowledge is a critical prerequisite that contributes effectively to achieving the integration of technology in a way that serves the learning process (Liao et al., 2021). Arguably, most teachers agree on the benefits of technology for improving teaching methods in the classroom (Nawzad et al., 2018). However, Efriana (2021) as well as Park & Ertmer (2008) found teachers often applying technology tools with ineffective teaching strategies that are not consistent with the content, which leads to technology becoming an additional burden that does not serve the learning process. Boonmoh et al. (2021) and Moses et al. (2014) agreed that teachers have faced challenges in their long struggle to integrate technology tools into their teaching instruction and to create active learning environments that reflect their perceptions and teaching experiences. Some studies overall present numerous and diverse challenges in the use and integration of technology. For instance, Hakim (2020), Khanlari (2016), Laho (2019), and Todd (2020) mentioned the academic challenges related to curriculum designers and teachers in the delivering learning content, which should be based on the needs of learners and consider their different learning patterns when providing appropriate content for different learning environments. Other studies such as Alshammari et al. (2016), Francom et al. (2021), Rahayu et
al. (2020), and Yuen et al. (2009) pointed out that technical challenges also constitute a significant obstacle in the expansion of the use of tools platform, such as the lack of technical support because of the increased financial burden, which the budgets of most schools cannot support. Obtaining more knowledge about the technology tools and practical experience integrating them will contribute to overcoming these challenges (Nasser et al., 2011).

Previous research has focused on the challenges of integrating technology into the learning process, specifically in designing content compatible with technology tools and meeting learners’ needs. However, a gap exists in providing strategies to effectively design such content, which seamlessly incorporates technology tools and adequately addresses the diverse requirements of learners.

Teachers’ Experience and Perceptions in LMS Integration

LMS is one of the technology tools through which learning materials can be delivered (Oliveira et al., 2016). The ultimate goal of using LMS in education is to benefit learners and encourage a dynamic learning environment. According to Kadir et al. (2016), the features of LMS are varied to contribute to building a basis for linking learners and teachers with learning materials; providing suitable opportunities for positive interaction in the learning environment relies on knowledge in using tools effectively and being aware of their integration into learning content materials to create an active learning environment.

Teachers’ practical experiences in technology applications can positively shape their opinions of LMS technology usage. For instance, studies by Almekhlafi and Almeqdadi (2010), Wang and Woo (2007), and Zamora-Antuñano et al. (2021) probed teachers’ perceptions of integrating technology into their classrooms. The researchers pointed out the role of teachers’
decisions in determining the required technology and integrating it into the learning process in a meaningful way. In particular, the researchers required teachers to design a learning experience for high school students by considering both the desired behavior and the condition for its occurrence. Therefore, teachers must determine appropriate media techniques for the learning situation. The results demonstrated how teachers’ positive experiences led to cognitive competence in integrating technology into learning.

Although some studies hinted at the role of effective teaching practices for applications of LMS technology in shaping positive experiences for teachers integrating technology into teaching instructions, other studies discovered a defeatist attitude among teachers regarding implementing technology into their teaching. Studies by Leeder and Lonn (2014) as well as Susomrith & Coetzer (2015) indicated a decrease in the utilization of LMS tools due to the teachers’ perceptions about integrating technology tools. Because some experienced teachers saw the integration as an extra workload and useless within the learning process, they resisted the technology integration. Besides, other teachers’ perceptions showed a deficiency in understanding LMS’s features to support teachers in transferring learning content and engaging learners effectively. This disparity in teaching practices forms educators’ experiences employing LMS tools, which shapes their level of technological knowledge and its impact on the effectiveness of technology applications in their classrooms (Herring et al., 2016).

Previous studies examined how teachers’ practical experiences with LMS technology influence their perceptions and opinions of using LMS technology in their teaching. However, other studies highlighted a lack of understanding among teachers regarding the features of LMS platforms, which are crucial for effectively transferring learning content and engaging learners.
Both studies have a gap in exploring the impact of teaching experiences with LMS features on negative perceptions and attitudes toward using LMS. Conversely, there is a need for research that investigates teaching practices promoting teachers’ effective utilization of technology tools in teaching instructions based on a deeper understanding of LMS features in a different kind of learning classroom.

Teachers’ Technology Knowledge

The Technology boom in the 21st century has generated a diversity of learning environments, which means learning is no longer confined to the traditional classroom (Sangrà et al., 2012); it has also produced a diversity of multimedia materials available (Emmanuel & Ekpo, 2016). Technology variation impacted teachers’ teaching practices in integrating technology tools to serve the learning process. At the same time, multimedia requires teachers to put more effort into identifying and transmitting multimedia content that achieves the learning goal (Mayer, 2014).

Edmunds and Hartnett (2014), Komalasari and Saripudin (2017), and Tempelman-Kluit (2006) all found that the effectiveness of interactive multimedia was heavily dependent on the primary teachers’ experiences selecting and delivering multimedia learning content, because choosing appropriate multimedia supports personal learning by reducing the effort needed for mental processing of audio and visual information (Mayer, 2014).

Some studies identified teachers’ technology knowledge levels as one of the reasons behind effectively integrating multimedia into learning content; they found that the more teachers were aware of integrating technology, the more efficient they adapted it to the lesson instructions (Hutchinson & Reinking, 2011; Ramanair & Sagat, 2007). Cochrane (2010) pointed
out that teachers’ attitudes and level of knowledge have a pivotal role in integrating technology into the learning process because teachers’ awareness reduces obstacles to technology integration. Hutchison and Reinking (2011) confirm that 38% of teachers had a high level of knowledge about utilizing multimedia and, therefore, had high positive attitudes toward its use in the learning process. In contrast, 14% of teachers had a low level of knowledge, which negatively affected their opinion because they did not have sufficient knowledge to overcome their fear of using it in learning processes.

Previous research has emphasized the significance of teachers’ experiences when selecting suitable multimedia materials and minimizing the cognitive burden for learners. It has also shed light on the connection between teachers’ attitudes, knowledge levels, and technology integration. However, it is a necessity close these gaps and gains a more comprehensive comprehension of the elements that impact teachers’ experiences in effectively choosing and delivering multimedia learning content, including considering their levels of technological knowledge, attitudes, and the obstacles they encounter.

**Role of Training on Teachers’ Technology Knowledge**

The quality of training provided to teachers should keep pace with the development of technology and its application in the classroom and decreases the barriers to integrating technology (Lei, 2009). The previously described studies sought to gauge the effect of technology knowledge level on integrating technology tools, while other studies (Ifinedo et al., 2020; Oluwadara et al., 2020; Toquero & Talidong, 2020) focused on professional development’s role in improving teachers’ technological knowledge. According to Omar et al.
(2020), training programs impact teachers’ perceptions who initially viewed the use of technology as a distraction from the learning process; furthermore, after teachers received training, they recognized its potential for improving learning outcomes and increasing their daily practice productivity.

Training becomes an urgent necessity when new developments appear in the educational system that requires teachers’ awareness to adapt (Martin, 2021). Zamora-Anguiano et al. (2021) pointed out that improving teachers’ knowledge has a significant impact on several aspects of the learning environment, such as new teaching strategies where teachers have not been able to practice effectively with their students; it can also help to retain skills in the long term and realize the goals and importance of applying strategies in theory, which enhances their knowledge. Improving teachers’ technology knowledge is a key to preparing teachers to face new technology challenges and guiding them to use technology effectively in the classroom (Martin, 2021). Studies by Arneson et al. (2019) and Knowles et al. (2018) showed an increase in the participants’ functional awareness after the development program to varying degrees based on the teachers’ experience and specialization.

While the above studies identified the positive role of training for improving teachers’ technology knowledge, other studies (Alshammari et al., 2016; Gebremedhin & Fenta, 2015; Lai & Savage, 2013; Leeder & Lonn, 2014) focused on the negative consequences of inadequate professional development. A lack of training not only affected the level of teachers’ technology knowledge but also generated barriers in using technology, such as a fear of making mistakes and an unwillingness to try innovative technology; this resulted in limitations on the educators’ employment of technology in the desired form in their teaching instructions.
While certain studies emphasize the positive influence of training and professional development on teachers’ technology knowledge, others underscore the adverse outcomes of insufficient training, leading to barriers to effectively utilizing technology in instruction. Nonetheless, it is essential to explore the effects of different forms of support that can contribute to improving teachers’ technological awareness.

The first part of the literature explored the teachers’ experiences integrating technology tools and the factors that impacted that integration. Although the studies focused on traditional K-12 classrooms and blended learning in higher education, K-12 teachers’ experiences in employing technology tools in online classrooms still need more investigation.

The initial part of the literature examined teachers’ integration of technology tools and the factors influencing this integration, primarily focusing on traditional K-12 classrooms and blended learning in higher education. However, there remains a gap in research regarding K-12 teachers’ experiences utilizing technology tools, specifically in online classrooms. Further investigation is required to understand better how teachers navigate and employ technology tools within online K-12 classrooms.

The second part of the literature reviews studies on the impact of multimedia principles and the results of their incorporation into the learning content and its impact on learning outcomes.

Multimedia Applications in the Classroom

The positive engagement of learners in the learning environment is the goal that teachers seek to achieve in their teaching practices (Fredricks et al., 2004). Since multimedia learning is, in essence, the building of representative knowledge links between the verbal and visual, it relies
on more than one sense (Mayer & Moreno, 1998a). Therefore, multimedia technology provides
learners with opportunities that contribute to engaging learners effectively in the learning
process.

Our increasingly technologically and culturally diverse world presents educators with
incredible opportunities and significant challenges in designing learning content and choosing
methods and tools for delivering it (Yuan et al., 2008). Therefore, creating an interactive learning
environment in different learning classrooms is a focal point for engaging learners in the learning
process (Shernoff, et al., 2014). Sianjina (2000) mentioned that effective formatting of delivering
learning content is one of the strategic keys to creating an effective learning environment, so the
multimedia’s diversity applications guide a variety of teaching adaptations to achieve learning
goals.

Multimedia’s Role in Engaging Students

Engagement is crucial in learning. Students get positive learning experiences and
improved outcomes when they are actively engaged. Conversely, a lack of engagement can result
in significant learning difficulties. Therefore, educators and researchers need to understand how
students engage or disengage with multimedia resources (Marks, 2000).

According to Finn & Schrodt (2016), creating an engaging and supportive discussion
environment motivates students to actively participate. Skillful facilitation techniques and a
positive classroom climate enhance the quality of classroom discussions and foster a conducive
learning environment. Neo (2007) discusses how multimedia helps students establish meaningful
connections; he found that when students engage with multimedia, they are required to process
information from multiple modalities, such as visual and auditory stimuli. This processing
stimulates cognitive functions, leading to more profound learning experiences and increased comprehension. Mayer et al. (2018) likewise emphasized that the extent of students’ engagement depends on the quality of the multimedia content and employing multimedia principles commensurate with the educational situation to meet the learners’ needs and achieve the goal. Indeed, a study by (Halverson & Graham 2019) confirmed that integrating technology and its various applications in the learning environment provides a concrete perception of how learners immerse themselves and interact with educational activities. Therefore, the interactive features and multimedia elements enhance engagement and comprehension.

Some studies (Emmanuel & Ekpo, 2016; Pan et al., 2006) studied the effect of using video on their student’s engagement. Their findings showed that student engagement and achievement increase when utilizing videos and forum posts. A study by Guthrie et al. (2004) found that incorporating technology-based resources, such as e-books and online reading platforms, can motivate students, especially those who are digitally inclined. Other studies on the impact of multimedia principles on the learning process, such as Mayer et al. (2018), found that breaking content into smaller parts facilitates learners’ processing and understanding, and employing multimedia principles helps get learners’ attention, enabling them to complete tasks and achieve learning goals. Mayer and Moreno (2003) also indicated that incorporating signals or cues helps identify important content and improves the cognitive processing of information by reducing extraneous material. Clark & Kwinn (2007) thus emphasized that engaging with multimedia stimulates cognitive processing and leads to more profound learning experiences and increased comprehension.
The quality of multimedia content and the application of multimedia principles aligned with educational contexts plays a vital role in students’ engagement. Thus, integrating technology into learning materials helps to cater to diverse learning styles and stimulate learner involvement (Clark & Kwinn, 2007). Halverson and Graham (2019) emphasized the crucial role of teachers in incorporating different media formats and evaluating multimedia resources, because multimedia can expose students to diverse perspectives, cultural experiences, and authentic scenarios, fostering the growth of critical thinking, problem-solving, and decision-making skills.

Using Multimedia Principles Effectively

Many studies have indicated the positive effects of multimedia principles on effectively engaging learners in the learning process. For instance, De Koning et al. (2009) found that added cues help people learn in a profound and faster way. The signaling principle employs three types of signaling cues. First, text-based cues can be used to highlight information. The second type is pictures-based cues such as arrows. The third type is cueing corresponding elements, i.e., using the same color to correspond to the text and pictures’ elements.

Richter et al. (2016) conducted a study on a digital chemistry book, which delivered multimedia content that helped learners present chemistry concepts by highlighting information to help them link it to prior knowledge and build a new learning experience. Draus et al.’s (2014) study noted the effectiveness of the applied personalization principle when an instructor led the educational videos. Recording the video in the classroom and using the instructor’s informal language increased students’ attention because it felt like a more natural learning environment.
Mayer et al. (2018) applied the segmenting principle through an online slideshow on geographic information systems. The study designed the material in two versions: segmented vs. non-segmented. Each version included 12 slides with graphics and text. The non-segmented version showed graphics on the left side with the corresponding text on the right side. In contrast, the segmented version consisted of both graphics and text presented on the same slides. Based on the transfer test, the findings showed that students who received a segmented lesson scored significantly higher than those who received a non-segmented lesson. Segmenting, or breaking down the lesson content into smaller pieces, is better for learning because it motivates the learner to more fully engage in the learning process due to the reduced burden on the working memory (Mayer, 2014).

**Negative Effects of Using Multimedia Principles Incorrectly**

There are studies that shed light on the inappropriate employment of multimedia principles in learning content that negatively affect learners’ interactions and engagement in the learning process. Applying multimedia principles should be compatible with the learning content and with the needs of the learners. Çetinkaya et al.’s (2019) study clearly demonstrated the modality principle, which refers to the learning benefits of using audio narration to present words rather than on-screen text (Moreno & Mayer, 1999). The study did not always prove the usefulness of that principle when applied in one of four forms to help Turkish students learn English vocabulary through the WhatsApp app. They found that text and audio were less effective in acquiring vocabulary than other forms: text and picture as well as text, picture, and audio. The content presented to the learners was not in their native language, and that was one of the conditions that Mayer (2014) mentioned of the inventiveness of the modality principle.
Therefore, the modality principle was not very helpful for fostering mastery of English vocabulary. Likewise, Dousay’s (2016) study sheds light on the effectiveness of redundancy on the study subjects who were students in an emergency services program. Thus, the materials were presented in three forms. Group 1’s lesson only used animation and text (AT), Group 2’s lesson incorporated animation and narration (AN), while Group 3’s lesson incorporated animation, narration, and text (ANT) to ensure the redundancy principle was followed. The results showed that Group 3’s lesson did not show a higher SI-maintained affective reaction among learners than the other groups. Perhaps Group 3 (ANT) was overwhelmed with reading and seeing the text on a screen, which affected their situational interest. In summary, the effectiveness of the redundancy principle depends on the educational situation and, in the case of Dousay’s (2016) study, applying the principle was an additional burden and did not improve learning.

The existing studies on integrating multimedia to engage students have provided insights into the importance of quality multimedia content and its impact on student engagement and learning experiences. However, these studies have primarily focused on traditional classroom settings, leaving a gap in the research for exploring teachers’ perceptions and experiences with appropriate multimedia to engage students in online classrooms. With the increasing use of online technology for instruction, it is crucial to understand how educators adapt multimedia integration strategies in this context. Teachers may face unique challenges when selecting and utilizing multimedia content for online teaching, and their perspectives and experiences can provide valuable insights.
The third section is in two parts: the first presents the multimedia cognitive theory with highlights of its principles. The second part presents the foundations of TPACK in integrating technology tools.

Cognitive Theory of Multimedia Learning

Understanding how the human mind processes new information is essential to choosing multimedia content appropriate for the learning environment (Mayer, 2014). Mayer described multimedia as the potential for using various learning materials (text, pictures, narration animation) to help individuals learn effectively. Human learning is dependent on a necessary mental process designed to decrease the cognitive load in working memory, and the focal point of multimedia learning theory is understanding the mental architecture behind this learning process (Mayer & Moreno, 2003). According to the evolution of their emergence in the learning environments, teachers have long been keen on creating learning environments with multimedia tools (Mishra & Koehler, 2008; Ramanair & Sagat, 2007).

Sorden (2005) suggested merging multimedia technology by activating the advantages of learning technology to grasp the information. Indeed, Moreno and Mayer (1999) claimed that multimedia content, if delivered based on multimedia principles, will reduce cognitive load on a learner’s memory by effective processing of audiovisual content in a coherent manner in line with the human brain’s mechanisms. According to Mayer (2014), choosing the appropriate multimedia content helps learners in the active learning processes of selecting, organizing, and integrating information without overloading their working memory, making them more engaged in the learning environment.
Cognitive Multimedia Learning Theory

Multimedia designs are based on the mechanism of the human mind processing information to achieve meaningful learning (Mayer, 2014). When a learner gets the information (input) and the material is being presented to the learner through eyes or ears, Paivio’s dual-coding theory of cognition states that the mind receives the information in the sensory memory through two separate channels (Phan, 2011). Visual information—graphics or images—is stored in the visual channel, whereas text information, if it is spoken or audible, is instead stored in the audio channel. Both types of stored information then move to the working memory where they are processed in separate visual and audio channels (Mayer & Moreno, 1998b). Moving information from the working memory into the long-term memory requires linking the information between the two channels to build a useful learning experience. For example, when learners read the word farm in a textbook and see a picture of a farm, this helps them combine text with the image and builds the concept of farm in the long-term memory, making it easier to absorb and remember than if visual or audio was presented separately.

The working memory has a limited capacity for each of the two channels (Mayer & Moreno, 1998b). Thus, if the information is rearranged and organized in a meaningful manner, it reduces the cognitive load and makes a smoother transition from the working memory to long-term. This is important not only because working memory has limited capacity but also because long-term memory has unlimited capacity that builds schemas based on active prior knowledge (Arslan, 2012). The cognitive theory of multimedia learning (CTML) has adopted a set of fundamental principles for designing multimedia content compatible with how the human mind processes textual and visual information (Sweller et al., 1998).
Principles of Multimedia

The principles of multimedia learning are based on a design that includes the relevance of the materials to learning strategies and the mechanism of the learner’s interaction with those materials to achieve the desired learning outcomes (Mayer & Moreno, 1998b). Mayer and Moreno (2003) describe these multimedia principles as foundations for integrating visual and verbal information to influence learning outcomes positively. Mayer (2014) sought to employ the principles of multimedia, both basic and advanced, in designing learning content to provide an optimal learning experience. His approach encourages learning strategies consistent with the design of learning materials to serve the educational process. Mayer’s cognitive theory of multimedia learning adopted a set of fundamental principles for designing multimedia content that is compatible with the human mind’s processing of textual and visual information.

In particular, the effectiveness of multimedia principles is based on reducing three distinct types of cognitive load: extraneous, intrinsic, and germane (Sweller et al., 1998). Extraneous cognitive load occurs when unnecessary instructions are produced and determined by the instructional design. Intrinsic cognitive load refers to the nature of the task or the subject matter of the learning material, which consists of numerous related elements; thus, Mayer and Moreno (2003) suggest that instructional design should not change the intrinsic cognitive load. The germane cognitive load is the mental processing effort that supports developing schemas in long-term memory and creating connections with existing knowledge.

Because reducing cognitive load is a primary factor for helping the learner engage and integrate information (Mayer, 2014), multimedia content designed to reduce cognitive load will help learners mentally organize information to form a meaningful learning experience better. The
adoption of multimedia learning principles (Mayer, 2014) helps create a coherent and useful perspective that guides researchers and developers to understand learner characteristics better and to provide pedagogical and practical approaches optimally aligned with the learners’ characteristics.

Briefly, the triangle of cognitive multimedia is based first on processing information through auditory and visual channels. Second is navigating the confines of limited memory. Third is the active process that integrates the most useful information into the human mind. Therefore, multimedia design in the instructional environment is not just a matter of selecting a package of materials and including it in different technology tools (Mayer, 2014). Instructional design techniques should include motivational and cognitive factors to create an active learning environment that guides learners to get a meaningful learning experience.

The multimedia environment is based on multiple sources of information (images, texts, and stimuli) to interact with learners in the learning process. The different techniques of multimedia principles guide educators in creating an active learning environment that motivates learners to engage in the learning process and get a meaningful learning experience (Moreno & Valdez, 2005). The literature in the teachers’ multimedia applications, such as Çetinkaya & Sutcu (2019), Dousay (2016), Kumi-Yeboah (2018), Mayer et al. (2018), and Park and Braud (2017) focused on specifying practical criteria of the quality of the multimedia content that guide educators in selecting or delivering appropriate content for their students and encouraging them to engage more in the learning process and achieve a valuable learning experience. This study’s theoretical foundation was obtained from previous studies on the teachers’ multimedia applications in their teaching to engage students. My study investigated teachers’ perceptions of the usefulness of
teaching instructions in selecting and delivering multimedia using online technology classroom to engage K-12 students in particular; the study explored teachers’ understanding of the nature of multimedia used in terms of standards and principles that help teachers select appropriate multimedia content for the learning content to deliver the message constructively.

TPACK Framework

Integrating technology into teaching requires more than just technical skills. Educators need to have a systematic understanding of how technology tools fit into the learning environment (Akturk & Ozturk, 2019). TPACK is a dynamic framework to describe teachers’ knowledge related to designing, implementing, and/or conveying the educational message using multimedia tools. Thus, the TPACK framework emphasizes the role of teachers’ awareness of the nature of multimedia tools used in terms of standards and principles that help them understand the pedagogical and technological knowledge of integrating multimedia into the learning content to deliver the message constructively (Akturk & Ozturk, 2019). Therefore, TPACK is essential when designing effective teaching with technology because the framework clarifies the mechanisms and meaning behind integrating technology into the lesson based on the expertise, experiences, and skills necessary for the learning process (Baran & Uygun, 2016).

The TPACK framework is a foundational element in integrating technology into the learning environment. It relies on knowledge in the three aspects—content, pedagogy, and technology—for teachers to integrate technology into their teaching instructions. The cognitive framework of TPACK focuses on a theoretical description of the link between PCK, which is the pedagogical knowledge essential to the teaching process, with TCK, which Akturk and Ozturk (2019) define as the integration of technology tools into subjects. Schulman’s (1987) framework
(PCK) focused on the two main aspects of successfully delivering learning subjects: knowledge of content and knowledge of teaching. Linking these two aspects smoothly and interactively guides teachers in effectively engaging learners.

Schulman (1987) argues that the (PCK) framework fundamentally lies in teachers’ awareness of the difference between knowledge of the subject of learning (KC) and how to teach it (KP). Thus, many scholars have used Schulman’s model as a base when building new technological knowledge models that support teaching and learning. Mishra and Koehler (2008) derived the TPACK framework from Schulman’s knowledge methodology by adding technology knowledge. TPACK guides teachers’ awareness of technology use as well as establishes how to integrate technology tools with a subject’s content and then deliver it to learners (Pierson, 2001). The TPACK Framework is based on three essential components of knowledge: content (CK), pedagogy (PK), and technology (TK). The three components do not work in isolation; they intersect and create four knowledge aspects that contribute to defining a practical framework for technology integration in learning (Messina & Tabone, 2012). The seven aspects of knowledge defined as the TPACK framework domains are illustrated in Figure 1.

A rich understanding of TPACK design combines knowledge in a cross-section to illustrate what effect the application of technological tools will have on the learning environment (Koehler & Mishra, 2009). TPACK defines teachers’ knowledge requirements to integrate technology into their teaching process (Baran & Uygun, 2016). These seven components each describe a type of knowledge required by teachers in each aspect of teaching processes, leading to a smooth integration of technology into the classroom environment (Koehler & Mishra, 2009).
Figure 1: Seven domains of TPACK framework (Koehler & Mishra, 2009, p. 63).

- Content knowledge (CK) varies according to each lesson, so the teacher must thoroughly understand the nature of the content to be taught.
- Pedagogical knowledge (PK) refers to teaching methods and practices, including dealing with learners in managing the classroom and assessment.
- Technology knowledge (TK) refers to understanding information technology, applying it productively in the learning process, and adapting to information technology changes.
- Pedagogical content knowledge (PCK) is choosing to design content, teaching methods, and evaluation in a way that suits the needs of learners and fits the learning environment.
• Technological content knowledge (TCK) refers to deep and conscious knowledge in identifying technology-appropriate tools for content and achieving learning objectives.

• Technological pedagogical knowledge (TPK) focuses on understanding the advantages and limitations of technological tools related to educational design that enable them to be applied in the learning process.

• Technological pedagogical content knowledge (TPACK) is based on the pedagogical content and technological knowledge of teachers required to integrate technology into the learning content in a smooth manner, which not only creates an attractive environment for learning but also addresses learning problems and facilitates the learning process.

TPACK refers to the teachers’ flexibility and fluency in adapting to broad developments in technological applications and using them productively in the classroom environment. These can be applied in the context of cognitive theory multimedia learning (CTML) to better identify strengths and weaknesses in teaching instructions using multimedia in online classrooms. TPACK is based on the extent of teachers’ understanding of technology affordance and its mechanism in the learning process in a tangible way (Koehler & Mishra. 2009). Therefore, teachers’ knowledge of the limitations and privileges of technological tools and their relationship to teaching strategies positively affect the learning process (Akturk & Ozturk, 2019). TPACK requires a deep awareness of choosing the most appropriate technology tools for the subject (Koehler & Mishra. 2009). To conclude, TPACK’s in-depth knowledge of the content, skill in
teaching professionally, and familiarization with the selection and use of assistive technology techniques lead to creating active learning environments (Baran & Uygun, 2016).

TPACK combines elements determining the teachers’ ability to use their technological pedagogical knowledge to integrate multimedia content of the learning environment in a streamlined manner in the learning environment (Koehler & Mishra, 2009). The online learning environment requires different technology tools than the traditional environment (Contrado, 2016). According to Levitch and Milheim (2003), instructors are facing challenges as they move from the traditional classroom to online learning, including the need to become expert moderators of communication and interaction among students. Posey et al. (2010) claim that to become proficient in using technology, online teachers must use teaching strategies to ensure interaction and communication between students while also considering their modes of learning. Hence, my study was guided by the four components of TPACK related to integrating online technology, along with the type of criteria in using multimedia content in teaching instructions, to investigate the extent to which K-12 teachers found multimedia useful in their teaching instructions for an online environment.

Because the TPACK framework consists of seven components that effectively integrate technology into the learning process, the TPACK framework in the previous works of the literature pertains to teachers’ awareness of technology integration tools in their teaching (e.g., Alharbi, 2020; Hill & Uribe-Florez, 2020; Lavidas et al., 2021; Lin et al., 2013; Miguel-Revilla et al., 2020; Redmond & Lock, 2019). The TPACK framework guided my study on how teacher perceptions and experiences in integrating technology into the online classroom engage K-12 students, and how their technology knowledge impacts their teaching instruction to adapt to
shifting from a traditional classroom to an online classroom. This study focused on both the successes and difficulties of integrating LMS features as a platform used in an online classroom to interact and deliver learning content.

While studies such as Hutchison and Reinking (2011) and Sancar-Tokmak et al. (2014) focused on traditional physical classrooms, Al-Abed (2020) and Salas & Moller (2015) explored teachers’ perspectives in distance learning environments at the university level. Hence, employing the TAPACK framework and Multimedia Theory as a lens for my study can bridge the existing gap in previous studies by examining K-12 teachers’ perceptions and experiences in multimedia content using technology tools in online classrooms.

In short, multimedia cognitive theory aims to optimize cognitive processing, reduce cognitive load, and facilitate effective learning. This theory guides the selection and presentation of multimedia elements in instructional design, enhancing learning experiences. Additionally, the TAPACK framework promotes thoughtful consideration of instructional context, learner characteristics, and desired outcomes, resulting in more engaging and practical instruction.

Combining the TAPACK framework with multimedia cognitive theory allows the researcher to gain valuable insights into teachers’ perceptions of using multimedia in online technology. This comprehensive approach provides a structured framework to examine how teachers perceive and navigate various aspects of multimedia integration in online instruction. The findings can inform the development of professional development programs, instructional design guidelines, and support systems to enhance teachers’ use of multimedia in online teaching, fostering student engagement.
Summary

This chapter reviewed studies on teachers’ perceptions of adopting technology tools in their classrooms while also shedding light on the aspects that play an essential role in integrating technology effectively and smoothly. This literature review outlined the gap between theory and practice in applying multimedia tools to engage students in a learning environment and revealed the obstacles teachers face that require an understanding of multimedia usage and multimedia principles’ effects. In addition, the review presents the TPACK framework and its seven-domain knowledge framework as a map to define the requirements for integrating technology into the learning environment.
CHAPTER 3

METHODOLOGY

This study investigated third through seventh grade teachers’ perceptions of and experiences with utilizing multimedia content in an online classroom at an international school in Saudi Arabia. In particular, the study explored how teachers use multimedia in their teaching instruction to deliver content to engage students in an online classroom. The study also examined how the teachers describe selecting multimedia tools appropriate for their teaching instruction when the K-12 class shifts from a traditional in-person classroom to online. The chapter includes several sections: the research questions that guided the study, the research design, a description of the setting and participants, the data collection procedures, and the data analysis processes.

Research Questions

The study was guided by the following research questions:

1. How do teachers describe their perceptions and experiences with incorporating online platform technology into their instructional practices to effectively engage students in grades three through seven?

2. How do teachers describe their perceptions of and experience with utilizing appropriate multimedia in engaging third through seventh grade students in online learning?
Qualitative Research Design

A qualitative design is an appropriate approach for my study based on Merriam and Tisdell’s (2015) description that “qualitative research consists of a set of interpretive, material practices that make the world visible” (p. 14). Indeed, the characteristics of qualitative research focus on the meaning based on inductively analyzing the participants’ data (Merriam, 1998). This helps me describe and interpret the participants’ experiences and perceptions as a lived experience in education. That is because the role of qualitative researcher does not require future prediction; instead, the qualitative researcher seeks to deliver the nature of a participant’s experience and what it looks like in a specific situation with honesty (Creswell, 2009; Maxwell, 2004, 2012). Using a qualitative approach in my study contributed to transferring teachers’ firsthand experiences with adapting their teaching by integrating multimedia for distance class engagement. A qualitative approach benefits the researcher by enabling them to understand and explore the particular points of the teachers’ perceptions and experiences, which improves insight (Barnham, 2015). Arguably, qualitative research is concerned with understanding processes and interpreting their meaning based on words rather than numbers (Creswell, 2009; Merriam, 1998). Thus, the findings of my study provide a descriptive outcome about third through seventh grade teachers’ perceptions and experiences of integrating multimedia in their teaching instructions in an online classroom.

Based on Maxwell (2012) and Yin (2009), the ‘how’ questions that characterize the qualitative research method open the way for open-ended responses, so the qualitative approach of my study fit with my research questions about teachers’ perceptions of and experiences with using multimedia to engage learners in the online classroom. A qualitative study in the context of
teachers’ perceptions and experiences in the distance learning environment is helpful, as data collection through interviews provides a comprehensive explanation of the subject of the study (Creswell & Poth, 2016; Daher et al., 2017; Merriam, 1998; Stake, 1995). In my study, I explored the perceptions and experiences of K-12 teachers in one private international school. Furthermore, collecting and analyzing data to create common categories and ideas to understand teachers’ perceptions (Kalu & Bwalya, 2017), which teachers have not previously shared in other schools, added a different dimension to the interpretation of the subject of the study.

My study did not aim to infer evidence or test theories; therefore, the quantitative approach based on numbers does not serve my study (Creswell, 2009). Since my study aims to inspire further investigations into teachers’ perceptions and experiences of using multimedia in online classrooms to engage students, the qualitative approach is appropriate. The qualitative approach allows researchers to conclude and analyze interpretations to derive meanings (Yazan, 2015). Thus, this approach is suitable for investigating teachers’ perceptions and experiences in their teaching instruction of using multimedia in the online classroom. Semi-structured interview questions and focus groups require delineating teachers’ perceptions about their usage of multimedia in online classes to engage students, in addition to exploring their experiences in the distance teaching experience for the K-12 stage.

Rationale for Case Study

Case studies are an inquiry method focusing on recent real-life events (Merriam & Tisdell, 2015; Yin, 2009). In particular, Merriam (1998) defined a qualitative case study as “an intensive, holistic description and analysis of a single instance, phenomenon, or social unit” (p. 21); therefore, case study methods are widely used in qualitative research of various disciplines.
Yin (2009) pointed out that a case study is an appropriate approach for investigating how and why inquiries; hence, researchers interested in qualitative studies at the academic level tend to apply the case study method in their studies. Merriam (1998) mentioned the three characteristics of case study, which are specificity, descriptive, and heuristic. These characteristics lead to a deep understanding of the single phenomenon. Therefore, case study research is valuable in the educational field because it explains the phenomenon under the situation and circumstances of the study issue (Merriam, 1998; Stake, 1995; Thomas, 2010).

The case study method seeks to reveal the complexity of the subject of the study through verification of an individual or a group case (Stake, 1995). Furthermore, case studies rely on verifying the experiences of a person or group of individuals as a single case by exploring individuals’ experiences within the context of the case (Baskarada, 2014). I used a case study in exploratory design using six participants to profoundly illustrate teachers’ perceptions and experiences in multimedia instruction to engage learners using online classroom technology (Hesse-Biber, 2017; Stake, 2006; Yin, 2014). These exploratory case studies helped to understand the use of teaching instructions in integrating multimedia to engage students in the online classroom better than the previously researched connections between teachers’ perceptions and practical usage of multimedia instruction (Hashweh, 1996; Kang & Wallace, 2005).

In my study, which Merriam (2009) characterized as a singular focal point, I employed a bounded case study methodology, commonly used when researchers aim to explore a specific phenomenon, as Yin (2014) outlined. The objective of my case study was to examine how teachers perceive and experience instructional practices when incorporating multimedia content.
in the online technology classroom to engage their students. My case study is bounded by veteran teachers who taught science, math, and English to third through seventh grade students in online classrooms at one Saudi Arabian international school. In particular, my study was with six teachers, a case study consisting of six teachers is suitable for the research topic because the case included different teachers with varying opinions and experiences, and that allowed me to synthesize a rich description of the phenomenon of understanding teachers’ perceptions of distance teaching for the K-12 stage and describing their experiences in their teaching instructions of using multimedia to engage students in in online learning (Gustafsson, 2017). Applying a case study allowed me to discover the similarities and differences in previous studies and provides a more comprehensive insight into exploring the phenomenon’s existence (Yin, 2003).

I applied multiple ways to collect data, such as individual interviews and focus group forums, which allow participants to expound upon their personal experiences and reflections. The study’s outcome provided a deep understanding of teachers’ perceptions and experiences of teaching instruction in the online classroom. In alignment with Merriam’s (2009) description of the case study and Stake’s (2005) concept of the case study that specifies the activity patterns: descriptions of teachers’ selecting and delivering multimedia content using technology online classrooms. This narrow focus helped me shed light on the usefulness of particular instruction procedures in k-12 online classrooms.

Setting

This study be conducted at one of the schools in Yanbu, on the Red Sea Coast of Western Saudi Arabia. YEIS is one of seven private international schools in Yanbu City. It is officially
operated with a license from the MOE. The school was established in 2010 offering a Filipino curriculum with only 85 students: 55 of them are Filipino and 30 students from other nationality, while the nine teachers are mostly Filipino.

The population of the school continues to grow, not only with Filipino students but with other nationalities. In 2019, the school transitioned from a Filipino to an American curriculum and passed the accreditation of the AdvancEd (Cognia) in the same year. At present, it has approximately 600 students and 53 teaching faculty who are Saudi and Non-Saudi. Most of the non-Saudi teachers are Filipino and are highly professional licensed teachers.

YEIS was selected because it meets the requirement for a case study. According to Merriam and Tisdell (2015), a high level of access and convenience sample availability help researchers comfortably conduct their study. Working as a trainer in the Professional Development Education Department that provides development courses to teachers in the different schools’ districts allows me to gain a suitable sample. Beyond the convenience sampling (Creswell & Poth, 2016; Merriam, 1998), the school is also highly accredited. The administration focuses on raising the students’ achievement by providing a quality learning environment. Jokinen and Mikkonen (2013) pointed out that scaffolding teachers’ engagement in the development of technology knowledge in learning environments is a significant opportunity to support students’ learning and motivate teachers to build different teaching experiences according to their teaching practices. The school strives to improve its educational system by integrating technology in the learning and teaching practices. The YEIS schools were among the first schools in the country to adopt platforms such as Google Classroom and ClassDojo to
achieve more support for the learning process and ease of communication among teachers, students, and parents.

The school is working to create an appropriate learning environment with academic and technological developments while supporting and encouraging its teachers to refine and enhance their practices in high-quality teaching performance. YEIS prepares teachers with additional professional development in the academic aspect and in a technological field in line with the changes of contemporary life. Based on Villegas-Reimers’s (2003) findings, effective professional development programs are related to a school culture that professionally empowers teachers in curriculum development. Therefore, schools provide professional programs conducted inside and outside the schools with different local and international resource speakers.

The school is characterized by the exceptional quality of its material, its technological capabilities, and its cadre of proficient teachers. The school received a distinction from the MOE as one of the best schools in Yanbu because of the excellent standard of its learning facilities and teaching as well as its high performance in maintaining effective operation teaching practices as reflected in students’ achievements.

I have built trusting relationships among the teachers because of my previous work as a trainer in the Professional Development Education Department where we focused on teachers’ development courses. Familiarity is arguably considered helpful in conducting a study (Walsh, 2014); therefore, my knowledge of the school’s culture and my relationship with the administration helped me to obtain the data (Creswell & Poth, 2016). For instance, honesty and respect are the elements of building a deep level of trust in the relationship between the researcher and the participants. Therefore, formalizing trust through documenting consent,
clarifying the study procedures for the participants, and stressing the confidentiality of participant information ensured quality continuity in the study. Moreover, the formal consent I sent to the teachers granted them more comfort and confidence in participating in the study.

Participant Selection

When choosing participants at YEIS, I sought out the teachers who came from traditional science, math, and English classes for grades three through seven. The sample of six teachers included men and women selected based on several criteria. All six teachers had a bachelor’s degree in a specific discipline (e.g., science, mathematics, and English), and each had at least five years of teaching experience. The six teachers had similar circumstances; all of them were from the same school. Furthermore, the teachers are veterans, meaning they have over three years in the classroom. The study aims to gain insights from experienced teachers with extensive knowledge and experience in traditional classroom settings. By including veteran teachers, the study investigated how their perceptions and practices adapt to the use of multimedia in the online learning environment, considering their established teaching approaches and pedagogical expertise. The sample of participants for study is convenient (Creswell & Clark, 2017; Maxwell 2008, 2012), which means they are easily accessible. It is also a purposeful sample based on a set of characteristics related to the subject of the research study (Ishak et al., 2014; Merriam & Tisdell, 2015; Patton, 2002). According to Patton (2002), small and purposeful sample sizes in a qualitative case study lead to higher potential involvement and are better for exploring issues in-depth. Therefore, a sample of six teachers proved to be beneficial. Data saturation was achieved after the fifth participant. However, an additional participant was included to ensure a
comprehensive exploration of the teachers’ viewpoints and experiences regarding the utilization of multimedia in the online learning environment.

Table 1

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Teaching Subject</th>
<th>Gender</th>
<th>Teaching Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sami</td>
<td>Science</td>
<td>Male</td>
<td>11 years</td>
</tr>
<tr>
<td>Amal</td>
<td>Science</td>
<td>Female</td>
<td>8 years</td>
</tr>
<tr>
<td>Noora</td>
<td>Math</td>
<td>Female</td>
<td>10 years</td>
</tr>
<tr>
<td>Ali</td>
<td>Math</td>
<td>Male</td>
<td>13 years</td>
</tr>
<tr>
<td>Rams</td>
<td>English</td>
<td>Male</td>
<td>10 years</td>
</tr>
<tr>
<td>Mona</td>
<td>English</td>
<td>Female</td>
<td>16 years</td>
</tr>
</tbody>
</table>

Recruitment Procedures

I sought permission from the school principal via email (Appendix A). Then to recruit teachers to participate in the study, I sent a brief email describing the study, its purpose, and the requirements for participation (Appendix B). After that, I explained the purpose of the study during a Zoom meeting that included the academic supervisor and third through seventh-grade teachers of English, science, and math who had agreed to participate. Upon agreeing to participate, each participant signed and returned the informed consent forms (Appendix C). Each participant received a copy of the informed consent.

Data Collection

The study utilized multiple data sources, including interviews and focus groups, to obtain rich and in-depth data on the subject. Using these methods of data collection in qualitative
research is beneficial to the researcher to combine the strengths of each method (Lambert & Loiselle, 2008; Merriam, 1998; Stake, 1995; Yin, 2009). Using more than one method to collect data for the case study also made the research results less biased (Denzin, 2012; Ghrayeb et al., 2011; Maxwell, 2012; Meijer et al., 2002; Oliver-Hoyo & Allen, 2006). The selected methods of data collection also helped answer ‘how’ questions for the study (Kalu & Bwalya, 2017; Maxwell, 2012; Yin 2009).

**Interviews**

Interviews are an essential key in people’s interpretation of information about events or the phenomena around them (Maxwell, 2012), and therefore interviewing is also essential for probing teachers about their perceptions and experiences regarding research questions, especially when the researcher is interested in past events. An interview is a valuable tool if the interview questions are focused on gaining a deeper understanding and complete responses to the study phenomenon (Yin, 2009). Interviews provide insight into the teachers’ perceptions of and experiences with teaching practices in distance learning during the pandemic (Merriam & Tisdell, 2015).

Patton (2002) explained that semi-structured interviews are a set of questions that can include both more and less structured questions about the topic researchers want to explore. In semi-structured interviews, the required information from the participants is specific (Jamshed, 2014); however, semi-structured interviews do not require a precise formulation of the questions nor a specific order in which they are asked (Creswell & Clark, 2017). Yin (2009) pointed out how the flexibility of a semi-structured interview allows the researcher to respond broadly to new ideas and expand their worldview. In the case of my study, using semi-structured interview
questions gave the participants more freedom to share their perceptions of the effectiveness of teaching using multimedia technology in learning environments to engage K-12 students. When meeting in person was not possible, the semi-structured interviews were conducted virtually with each of the six participants via Zoom. The interviews were synchronous due to the researcher not being in the same place as the participants.

To establish the validity of the data collection instrument, all the items of the interview guide were subjected to an expert panel of dissertation committee members and two professional educators with at least ten years of experience in education. The interview question protocol was related to the teachers’ perceptions of integrating technology tools into their teaching to deliver multimedia content in online learning classrooms (Appendix D). The individual time for each interview was approximately 45-60 minutes. I also conducted a follow-up interview for each participant, lasting approximately 15-20 minutes, which served as a validity check to gather any missing data or obtain clarification.

All interviews were recorded and transcribed verbatim to record with complete accuracy the participants’ answers, including interjections such as (um, ah), interrupted words, colloquial language, and even pauses. Then I used the member check technique because it helps the researcher improve accuracy and credibility (Hesse-Biber, 2017; Kalu & Bwalya, 2017). The transcripts were shared with the participants to ensure their ideas were accurately represented. For confidentiality, all audio data and transcriptions were saved with a secure password on a computer and then deleted after the study was complete.
Focus Groups

The second approach to data collection was a focus group. According to Merriam and Tisdell (2015), a focus group is an exploratory research method for collecting data in qualitative studies. It is a directed and interactive method for a group of individuals who have been chosen for my study to generate rich details and various comments about their perceptions and experiences related to the subject of the study (Creswell & Poth, 2016; Powell & Single, 1996). Focus groups are useful as a complementary source for verifying data from other collection data tools in qualitative case study research (Levy, 2006). Thus, a focus group is a practical and effective way to discover and interpret people’s opinions and thoughts because it promotes direct discussion on a specific topic to get people’s perspectives, but it does so without placing pressure on the participants (Barbour & Kitzinger, 1998). Using focus groups is a useful way to obtain real information on the extent of teaching multimedia content in online classrooms to engage students.

The influential role in the focus group is homogeneity (Duncan & Marotz-Baden, 1999). Because the participants in the study are all from one school, they are familiar with each other. Additionally, all participants are teachers with more years of teaching experience, eliminating authority or hierarchy fear barriers in the workplace. In addition to that, all participants have experience with teaching online classes. These homogenous attributes facilitated obtaining more open responses.

Focus groups are a valuable and supportive research method (Morgan, 1993) because they allowed me to understand an expansive range of teaching experiences. Focus groups are how participants interact to produce clear perceptions of the subject of interest (Barbour &
Kitzinger, 1998; Krueger, 1988). Williams and Katz (2001) pointed out that the focus group method opens the door to discuss practical practices to integrate distance teaching technology in transmitting effective multimedia content to engage students, including successes and challenges of teaching and learning experience.

Focus group interviews feature semi-structured questions that allow the formulation of flexible and less structured questions without limiting participant responses or leading participants to a particular answer (Powell & Single, 1996). The nature of semi-structured questions also means that the questions depend on the participant’s responses (Creswell & Poth, 2016). Asking the interviewees more probing questions adds a deeper meaning to their idea and has a greater chance to clarify that idea (Savenye & Robinson, 2005). There is no specific definition of formulation or order of questions to be discussed in the focus group (Merriam & Tisdell, 2015).

To allow everyone the opportunity to elicit effective responses on the subject of the study, the ideal number of focus group participants ranges from 5-10 people (Creswell & Poth, 2016). I conducted two focus groups with the same third through seventh-grade teachers in YEIS, who were in an individual interview; each group consisted of three teachers. The discussion group, guided by inquiries that revolve around teachers’ perspectives and instructional methods, investigates the usage of multimedia in online learning settings to actively involve students in grades three to seven.

The focus group protocol (Appendix E) was structured with open-ended questions that asked teachers to convey their perceptions of changing their teaching using online technology to integrate and deliver multimedia content in the K-12 stage. The questions let them describe their
teaching experiences with practical applications of multimedia to engage students in the online learning classroom. The two focus group sessions were conducted virtually using the Zoom application for approximately 45-60 minutes each; participants were audio-recorded to ensure the most accurate understanding of the dialogues.

I employed two methods for collecting data: individual interviews and focus groups (Patton, 1999, 2002; Yin, 2009). Both were virtually conducted through Zoom, and during all interviews, I used an iPad to host and record the interviews and focus groups via Zoom. During the sessions, I took notes of salient comments, themes, and general notes.

Data Analysis

Once the data were collected, I initialed and created the transcripts using Scribie, but then I converted all transcripts into a PDF file to allow coding on an iPad. After reading the transcripts carefully and multiple times to get a comprehensive view of the general meaning of the information, I started the coding process. The individual and focus group interviews were both analyzed using Strauss and Corbin’s (1998) three-step coding process (Appendix F).

Open Coding

Open coding serves as a focal point for providing the researcher with evidence to analyze the data (Strauss & Corbin, 1998). I identified the repeated words or phrases in the teachers’ responses to the interviews and focus groups. Then I started labeling using color-coding in Word document and Excel sheets to represent patterns that answer each research question to find similarities and differences in the teachers’ responses and perceptions. I then began grouping the codes to create categories. According to Hesse-Biber (2017), coding the words related to the
study subject allows the researcher to highlight words for generating patterns based on comparable categories.

**Axial Coding**

According to Strauss and Corbin (1998), “Axial coding is the act of relating categories to subcategories along the lines of their properties and dimensions” (p. 124). The axial coding helped the researcher find common relationships to classify words or phrases into categories from the initial coding step (Merriam & Tisdell, 2015). The data were divided into subcategories and labeled to answer the research questions. These subcategories were again coded based on teachers’ perceptions of several aspects: technology knowledge in the distance learning tools and teachers’ experiences in integrating multimedia into their teaching instructions, in addition to the teachers’ perceptions of appropriate multimedia use in their online classroom teaching and their experience in multimedia applications that effectively engage learners.

**Selective Coding**

The last step in data analysis was to use selective coding to compare the data; selective coding reveals the relevant relationships among categories in data to describe the idea (Bazeley, 2009). The selective coding step helped the researcher link the categories to create integrative relationships for describing the idea and showed the researcher if data had reached theoretical saturation.

The previous section explained the coding processes for analyzing the interview and focus group transcripts. After that, the coding categories were organized to interpret the usefulness of selecting specific multimedia effects in teaching instruction to engage students in
an online classroom. Then I identified and classified the categories from three collection data resources to report the findings.

Trustworthiness of Data

The criteria for judging qualitative research are essential for ensuring the data have been collected and analyzed accurately (Creswell & Miller, 2000; Yin, 2009). Therefore, data validation included credibility, transferability, and dependability (Korstjens & Moser, 2018).

Credibility was addressed through member checks. According to Creswell et al. (2007) and Hesse-Biber (2017), member checks help researchers confirm that the transcript data are accurate. I provided each participant with a copy of his or her transcripts in each data collection method. The participants were asked to check their transcripts to ensure that I understood what they said and interpreted them correctly. Member checks are an interactive process between the researcher and participants to achieve a high level of accuracy for the validity of the data level (Candela, 2019).

To ensure credible data analysis, I used the previously mentioned collection methods, allowing consistent evidence across data sources (Creswell, 2009; Trotter, 2012). Furthermore, peer debriefing added validity to the account because it interprets a different explanation of the data than the researcher’s (Creswell, 2009). I asked my colleague, who is familiar with qualitative analysis through his own doctoral research study, to offer feedback and input about the findings.

Peer debriefing feedback is valuable for confirming the validity of the coding process and emergent categories, which provides additional validity to findings (Creswell, 2009). Data transferability was achieved based on the researcher’s deep description (Korstjens & Moser,
2018; Merriam, 1998). My study offered additional insight into integrating multimedia technology in the online classroom.

The dependability of the data was processed through case study protocol, which accurately lists the practical steps of the study, allowing others to see the researcher’s decisions and the rationales for them (Merriam, 1998).

Coding Procedures

Data were collected from participants using interviews and a focus group with six teachers, based on how teachers deal with teaching online learning and integrated multimedia in their teaching instructions to engage students in an online classroom. The semi-structured interview was used to investigate the teachers’ perceptions and experiences in integrating multimedia in their instruction in online learning classrooms from grades 3-7.

All recordings were transcribed from the individual and focus group interviews and then sent to the teachers involved in the study for a member-checking procedure. The transcribed subjects were reviewed by participants for accuracy and ensured that the study subjects were not misinterpreted or misunderstood. Member-checking improved credibility by allowing participants to confirm what they said and what they meant (Korstjens & Moser, 2018).

After transcribing and member checking the data, I went through multiple rounds of coding the data. First, I came up with initial codes based on identifying keywords and phrases that indicated the participant’s perceptions and experiences about a given subject during the interview. These phrases were grouped with similar phrases by other teachers and were compared to identify commonalities among teacher responses to the interview questions. These
commonalities were further refined and condensed for clarity and grouping to become the codes. Then, the second round of coding included axial coding. I organized and arranged the codes into categories and subcategories, allowing me to identify how codes or categories were related (Merriam & Tisdell, 2015). These expanded codes were then categorized into final codes or subthemes. As themes emerged, I returned to my data to look for any disconfirming data that did not fit into the themes. Finally, the themes were developed from these subthemes to identify relationships between teacher responses and the research questions (Appendix G). The potential of themes and subthemes across the participants by noting the number of data points related to each research question. These patterns were fluid and revisited with each ensuing period of data analysis (Appendix H).

During the coding, I engaged in memo-writing (Hesse-Biber, 2017), “a technique that lets out the researcher’s thought process and, through review, helps to form new ideas or relationships in the codes. The memos served as a step between the coding and the interpretation” (p. 324) of the data. The memos were reviewed frequently during the data analysis stage to provide a point of reflection for the researcher.

Data Integrity Procedures

The criteria for judging in qualitative research are essential, because these criteria ensure the data quality of research and the data collection and analysis are as accurate as possible (Creswell et al., 2007; Hesse-Biber, 2017; Yin, 2014). Several procedures were applied to validate the data using the criteria of credibility, transferability, dependability, and confirmability (Mertens, 2014).
Credibility

Credibility was addressed by comparing, finding, and analyzing tools. First, I looked at analyzing cross-member checks to confirm the credibility of the information I collected. Second, I received advice at a peer debriefing with my colleague, who is an instructional coach and has been trained in data analysis and qualitative design through courses at the doctoral level. The peer checks helped the researcher develop ideas and maintain progressive subjectivity to ensure the analysis data was supported. For triangulation, different data methods were used; multiple data collections from both individual interviews and focus groups allowed for evidence consistency (Hesse-Biber, 2017; Mertens, 2014). Thus, I used two approaches to gather data: individual and focus group interviews. The results of both methods revealed comparable findings among the participants, providing a degree of consistency. However, there was a certain level of triangulation achieved, meaning that the convergence of data from multiple sources enhanced the reliability and validity of the findings.

Transferability

As Creswell and Miller (2000) indicated, it is important to give “a rich, thick, detailed description so anyone interested in transferability will have a solid framework for comparison” (p. 59). Thus, the transferability of the data was achieved according to the researcher’s detailed description of the context, known as thick description.
Dependability

For data dependability criteria, the interview protocol addressed every step (Creswell et al., 2007; Hesse-Biber, 2017; Yin, 2014). Therefore, the protocol guided the researcher in the data collection and allowed others to see the researcher’s decisions and the rationale behind the decisions. Furthermore, in the transparency process, the data were organized by participant name and type of data before being saved on an external hard drive.

Confirmability

The findings were based on multiple analyses of the data at different times, such as researcher memos throughout the process, which helped to “practice reflexivity” (Hesse-Biber, 2017, p. 327). Thus, the researcher’s self-awareness of biases, inferences, and objectivity is key to reaching conformability and ensuring data is accurately represented via the participants’ ideas and not created by the researcher (Elo et al., 2014).

Summary

Chapter 3 presents the methodology of the study that qualitatively explores the perceptions and experiences of teachers in grades three through seven regarding integrating multimedia into their teaching to engage learners using online technology classroom. The chapter also covers the setting specifications of the study and a description of the participants, who were from YEIS. The study relied on collecting data through multiple methods, including individual interviews and focus groups. The chapter concludes with a description of validation checks. After collecting the data, the researcher analyzed the data using a three-step coding
process, in addition to memos, to ensure careful data procedures. The data were reviewed across member checking and peer examination. Finally, validation checks and ethical procedure was required to ensure that participants understood how the information was used in the study, as well as to determine the degree to which the information they shared would remain confidential.
CHAPTER 4

FINDINGS

This qualitative exploratory case study investigated how science, math, and English teachers from grades 3-7 explained their perceptions and teaching experiences in adapting to the online classroom. The teachers also described integrating multimedia in their teaching instructions to engage students in the online classroom. This chapter contains the qualitative case study results to answer the research questions. It is organized first by directly answering each research question and exploring relevant themes.

I arranged the participants’ responses from both individual interviews and focus groups into categories exploring relevant themes to answer the two research questions. The first was focused on the teachers’ perceptions about technology platforms based on their online teaching experiences. The second question explained teaching instructions for integrating multimedia to engage students online.

The merged themes that answer research questions rely on four themes: adapting teaching methods in online platforms in the classrooms based on the teacher’s technology background; difficulties in teaching online; the practical usage of multimedia in online teaching instructions; and the relationship between multimedia usage and students’ engagement in the online classroom.
Table 2
Research Questions Aligned to Themes

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Theme</th>
<th>Subtheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How do teachers describe their perceptions and experiences with incorporating online platform technology into their instructional practices to effectively engage students in grades three through seven?</td>
<td>Adapting teaching online classroom based on teacher’s technology practices.</td>
<td>• Teachers’ descriptions of the online classroom transition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support aspects for online classroom.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Procedures and teaching practices in dealing with teaching online classroom.</td>
</tr>
<tr>
<td></td>
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<td>2. How do teachers describe their perceptions of and experiences with utilizing appropriate multimedia in engaging students in grades three through seven in online learning?</td>
<td>The Practical usage of multimedia in online teaching instructions.</td>
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Major Themes Related to Research Question 1

The first research question asked how teachers describe their perceptions and experiences using online classroom technology features in their teaching instructions to deliver multimedia content to engage students in grades three through seven. Across the teachers’ responses to the interviews and focus group questions, two themes emerged.

Theme 1: Adapting Teaching in Online Classrooms Based on Teacher’s Technology Practices

The first theme explored how to adapt teaching methods in online classrooms based on the teacher’s previous technology background. When there has been a sudden shift to an online classroom, reactions among teachers vary according to their own perceptions, the presence or absence of support factors to facilitate the online teaching process, and the teaching procedures used to cope with this new situation. The second theme addressed the difficulties of teaching in online classrooms and asked for teachers to share their practical experiences in dealing with those difficulties. This theme has three related subthemes which are: teachers’ describing how the online classroom transitioned, support aspects of the online classroom, and teaching practices and procedures for online classroom challenges.

Teachers’ Descriptions of the Transition to Online Classrooms

All teachers described their experience transitioning to online teaching as a difficult challenge for them, because shifting to the online classroom happened quickly and without prior preparation for teachers. In her remarks about shifting to the online classroom, participant Sami
The time and the transition itself from face to face to distant learning was too soon and too fast; we didn’t have enough time to be ready or fully equipped with everything that we need to be and to be having in order for us to deliver our lessons perfectly.

Participant Mona added to her description that “The difficulty of switching to online classes did not stop at teachers only; even parents and students were facing a hard time in that shifting.”

Indeed, all participants had the same perceptions of how challenging the online transition situation was. However, they identified the support keys that helped them in their teaching online classroom, as described below.

**Support is Key to Effective Teaching in Online Classrooms**

All six participants shared the same view relative to the support they received during online classroom situations. Participants mentioned three kinds of support that significantly impacted their online teaching. Each participant responded positively about school efforts in explaining seminars that showed the fundamental steps in teaching online classrooms. Mona valued and described the school’s seminar content. She said, “We attended seminars; thank goodness the school provided seminars for teachers on how to adapt to online teaching, as well as the strategies we need to do for online teaching.” Participant Ali spoke on the type of aid materials provided by the school to help the teachers. “The school provides teachers with websites, software, multimedia; they call this educational material for us to more easily deliver the lessons.” While Rams explained the impact of these seminars on his teaching knowledge,

I do not have any idea about Zoom, so later on, after some seminars with the ICT department in our school, they gave a seminar, and they taught us how to use Zoom. They gave us videos like tutorial videos. So later on, I already adapted how to use Zoom as a platform for teaching while online.
In addition, teachers indicated the important role of technical support in providing a helping hand for them whenever they had questions. Noora said, “Good thing that we have a very good Computer teacher here in the school who can help. He actually helps me a lot, whenever I have questions about technology.” Ali also explained how technical support in solving the technical issue in delivering the learning content:

I had a problem with Zoom, there is a button in the Zoom to share: For my reading audio like that I usually shared my audio to them and I can share my screen to them and that is different because before from the speaker, from the audio, from the overhead projector, I need to have this class online, the audio shared audio, shared screen the and I was also I was happy, I was entertained also using this kind of Zoom. During the first online classes, because I didn’t know how to share the screen, I didn’t know how to write on the whiteboard, we had the ICT coordinator here.

Mona alluded to a technical person’s help because of her old age in showing the ways of searching learning resources. “He taught me how to research the different technologies … that has affected me using technology with my students because I am no longer young.”

Sharing ideas with colleagues in smoothly delivering learning content makes students more engaged in learning. Amal summed it up by stating, “We shared ideas; it’s like collaborative teaching. We asked each other how to explore this kind of technology, this kind of application.”

Besides the impact of the support provided, the teachers clarified the procedure and the strategies that guided them smoothly in their teaching online classroom, as illustrated below.

**Procedures and Teaching Practices for Teaching in Online Classrooms**

According to teachers’ perceptions, the transition to distance teaching was challenging. All teachers emphasized that the recording class lesson was a practical procedure for conveying
the lesson and helping their students understand the learning content. For example, participant Amal explained,

I can just simply record it through the screen. And whenever the student wants to, once the students want to review about a certain topic, I just simply send them the video, and it is really worth it for them to return to the video now and then. And everything was there, and they can understand all the lessons.

Furthermore, participant Sami added that he was sending the content in advance to the learners,

I prerecorded an advanced lesson in online teaching and then sent it to the students, but I recorded myself teaching the lesson, that advanced lesson, and sent it to the students so they can watch it, analyze everything, and then already formulate their questions or possible questions before we go into our discussion. So, before we go to our discussion, they already have a general idea of the topic.

Besides the teachers’ agreement on recording the lesson as a standard procedure to convey the learning content, the teachers also indicated the various strategies for applying the appropriate technology for distance learning to achieve the learning goal using several platforms. Since the teachers used several platforms to transfer the learning content during the distance learning period, each teacher had preferences in using one platform over the other based on the features they saw as appropriate for their subject and students, as well as what was most helpful in the process of distance teaching. For example, Participant Rams said, “I think the best one is Microsoft Teams; because it has many features, Microsoft Teams can access videos easily. I will always use technology in my teachings, starting with this online class.” Participant Mona also saw that the Microsoft Teams platform was the best for her because it enabled her to build her class. “Then when we shifted to Microsoft Teams, I liked it way better than Zoom because Microsoft Teams has different features. Say, for example, you can create your own teams and channels, and in each channel, you can have an assignment.” While some participants chose Microsoft Teams as
the best platform for them, others found that Zoom as a teaching platform was the most appropriate. Amal said:

But as a teacher in lower grade, we were told before to use Teams. However, then we just found out that the Teams platform is not that friendly user when it comes to lower-grade students. So, we shifted, listened to the parents’ voices, and shifted to Zoom again. Zoom has offered us a really convenient and very helpful application. We can let the students engage in our discussion by giving some pictures wherein the students can engage with us, like having to message. I can say that Zoom features are appropriate and helpful for little kids.

Participant Amal’s point of view was that the Zoom platform was the most appropriate for her students. Also, Participant Ali indicated that the advantages of the Zoom platform were the most convenient for math subjects, as he said, “I am used to using Zoom because of the annotation because, in math, it is very useful; annotation is very useful in discussing math because students are following what you are writing on the screen.” However, participants Sami and Noora were more biased towards the Google Meet features in their teaching online. Sami said,

With all those … wonderful teaching options in Google, the resources for the teachers in the platform, the digital discussion is one of the best ways for the students to answer. In Google Meet we can have a good conversation and … a good resource.

Mona also emphasized that, “In the Google Meet platform, we called the digital conversion that can be in the platform that we are using right now, which is very effective on my part as a science teacher.”

Although there is diversity in the types of platforms used by the participants in transferring the learning content to their students in online teaching, they extolled that the ClassDojo platform was the best in its advantages in alerts regarding assignments and tests, as well as the link between parents and teachers regarding the behavior of their children in the classroom. Mona identified some of ClassDojo’s advantages:
ClassDojo, that is the platform I used for posting. It helps me because I will not always remind them of their tasks. They just need to check in ClassDojo what their homework and assignment should be to finish by the due date. You do not have to remind them always.

Amal also mentioned ClassDojo as a link between the school and parents.

In ClassDojo, we have direct contact with the parents … Parents are also part of it; they are engaged in ClassDojo, so they can see everything we post there. They can see the activities of their students, and they can easily interact with them by sending direct messages, private messages. [There is] good communication between the parents, the students, and the content.

Other than teachers’ preferences in platform advantages, there were applications that teachers assert were effective with their students during online classroom situations. Indeed, the teachers spoke with confidence and assurance in using some applications that facilitate their teaching online classroom and effectively impact their students’ engagement. For instance, five of the six teachers used the Kahoot application in evaluating students during the learning process, and they saw it was a practical application for evaluating their students’ learning. Ali summed it up by stating,

I used Kahoot during … the evaluation part of my class, and at first, the students were really happy with the Kahoot and how the application works with the points, and they will see in the quiz who is ranked first, second, and third.

While Participant Rams replaced the Kahoot application because his students felt bored with it, so the Quizizz application was the alternative.

My students repeated ‘Kahoot again?! I used to play!’ They had me, and that message should be that I needed to find another application, not Kahoot, because they got bored already using Kahoot. So, I explored and I found out that there was a better one. And I found out that Quizizz is better than Kahoot, and there are many apps like Quizizz.
Teachers’ perceptions of online classroom circumstances led them to find alternative tools that assist them in teaching practices that can influence online teaching quality and student learning. Participant Mona explained,

[When] I’m teaching poetry, it’s very difficult for a teacher to just read the poem. In the classroom, … you’re using your book, you’re reading the poem in front of the students. So, what did I do? I use technology. I could present, I could download from an audiobook some poems, and I could make them listen to the poem. It’s better for them; it is effective.

Teacher Mona discovered readtheory.org to be a valuable website for providing learning content smoothly to her students. As she described,

Starting…with this online class, the [readtheory.org], I think this one really helps me in terms of finding the reading comprehension of my students….They can create their own account, I can access it easily using my laptop, I could see the lessons or the reading materials that they understand, because there are questions that they need to answer and I can see their score.

All teachers recognized that over time, the game applications they applied in online teaching had the best impact in motivating their students and making them interact more in the lesson. Participant Sami explained his way of using the games:

They want to have the groupings, the breakout classes, and each in the instruction part, because usually they will listen during the discussion part of the lesson … with this online application, I can group them … using breakout classes and, in that group, I can give the video games in each group.

Participant Rams confirmed,

They can play like an airplane in the World War: If they like that, they are flying in the air and what we called the snake and ladder, what we call the bomb; when they touch that place, they love this game…. It gives them free will to choose what game they want,… but at the same time they are also learning.
Theme 2: Teaching Difficulties in Online Classrooms

Teachers’ perceptions reflected the obstacles of the practical experiences of teaching online. The three kinds of difficulties encountered were: lack of technology knowledge, technical issues, and a lack of classroom management.

Lack of Technology Knowledge

Participants showed a lack of technology knowledge by explaining their challenges while teaching online classrooms. For example, participant Rams said:

One is limited to my teacher’s knowledge and how to insert audio and video in each question that I have to include in Quizizz. That was my obstacle, so I needed to know more about how to use the Quizizz, but because the application is really limited, I could not message the [creators of] Quizizz directly.

Participant Ali also described his challenge:

I handled grade 10 students, so the topics there are more complex, and it needs to have … a graph, or … a longer space to write the problem-solving. So, since we only use Zoom, the screen we have is limited, so I need to erase and do it again, but some students are having problems with that. So, I need to … put all solutions on one screen and then shift to another problem. So that is the challenge that I encountered during online classes.

While some participants showed the impact of their technology knowledge on their teaching online, others evaluated themselves in their technology knowledge, such as participant Sami in his statement. “I can still say that I am not that literate regarding technology.” Mona similarly described, “I have limited technology; we will be using multimedia alone as my model instruction will be limited. We also need to be more effective, and multimedia is effective itself.” Indeed, the teachers showed that their technological knowledge was an influencing factor in teaching online. As Amal summed up, “Number one is the knowledge itself; the teacher needs to
be knowledgeable enough regarding … using the application and the devices, because without this knowledge he or she will not be able to deliver the lessons smoothly.”

**Technical Issues with Internet Speed**

An inadequate internet connection was among the most prominent technical problems repeatedly mentioned in the participants’ responses. All teachers suffered from slow internet speed because it affected smooth interaction during the class period. Mona expressed the teachers’ internet suffering:

> The internet was a … consistent problem for everybody during the online classroom. The internet connection is terrible; it is bad when all of us use the internet at the same time; we face troubles, and that affects the students; they keep saying we are having a bad internet connection.

Participant Rams mentioned that the Internet was a barrier when presenting group activities. As he described,

> Internet is a big hindrance in online teaching. For instance, in Zoom there is an option that you have to … break the group into two or into three? But I did not use that one because other teachers said it will cause you trouble in your system. It hangs, or we call this. It is lagging. So, I did not try that one.

Amal similarly indicated that internet speed affects her delivering learning content to her students. According to her statement, “Internet speed, no matter how you prepare for your lesson, kind of video clips, materials, the internet connection gives us a hard time presenting those things. The internet itself is awful.”

**Lack of Classroom Management**

Based on all participants’ responses, the lack of online classroom management was considered a significant obstacle for teachers, so all participants affirmed four common
denominators: delayed feedback, learners’ disengagement, hindering support from parents, and
time class management.

All participants asserted that it was not easy to get immediate feedback in the online
classroom, as Rams summed up:

Based on my experience when it comes to instruction. There is a big difference. In face-
to-face classes, we can usually give feedback; I can easily tell you are doing great. I read feedback on what they are doing. However, this online I need to wait until they submit it. When they would submit their homework, that is the time I give feedback, so when I shift to the online classroom, that immediate feedback, does it happen?

In addition to feedback delay, all teachers feel that students engage in an online class
because they do not want their faces to be seen. They do not know whether they are listening or focusing. According to Mona’s explanation, she said,

My experience when I was using Zoom, during the online lesson: when I call someone to answer the question, the student did not turn on his camera…. If the student does not want to open his mic or camera, then I cannot do anything anymore.

Hindering support is when parents try to help their kids succeed academically by taking the primary task of doing certain school-related work. For example, a student may need help with one part of their school assignment; however, the parent would attempt to do the whole assignment to support their child to succeed in the class when in fact, the parent is hindering their child’s academic growth substantially. Therefore, hindering support, as teachers indicated, was a critical problem when evaluating their students in the exam precisely. Rams described the situation.

The problem is how genuine [is] the result of the assessment that we will record?… The problem is many parents always compete for their child’s score. So, there are also some parents who do the exam. Parents want to take advantage of the situation of the online classroom like, I’m beside my son, I cannot open the camera, so … the results of the exam become already questionable on my part.
In addition, time management in the online classroom impeded delivering learning content during the class period. Sami clarified,

We only have 40 minutes, 40 minutes of delivering that one, but I cannot start my lesson in the first minute because I need to wait for my students to come in, right? So, I think I can only discuss the lesson for 20 minutes because: for 5 minutes, I have to wait for the students, then another 5 minutes to set the students’ moods, and then 20 minutes for the actual discussion. When the students are already pre-entered in the online classroom, then the possibility that I need to repeat everything for students, the time management that we can do compared to when it is physical when it is online.

Amal also emphasized that the lesson time was extended online teaching when he said, “I need three days … because of time in the online classroom, it will lead me to three days, which is too long for one lesson.”

In summary, research question 1 explored teachers’ perceptions of their teaching experiences in the online classroom. The teachers perceived the shift to distance teaching based on the impact of the support factors provided to them in applying appropriate procedures and strategies to handle online classrooms. It also indicated the most barriers they faced during their online classroom teaching.

Major Themes Related to Research Question 2

The second research question was: How do teachers describe their perceptions of and experience with utilizing appropriate multimedia in engaging students in grades three through seven in online learning? The major theme was the practical usage of multimedia in online teaching instructions. This theme and related subthemes are: teachers’ perceptions of multimedia technology’s role in teaching, describing the practical ways of utilizing multimedia in online
classrooms, and criteria of multimedia chosen for online classrooms. These themes were
gathered through in-depth interviews and focus groups.

Theme 3: The Practical Usage of Multimedia in Online Teaching Instructions

The teachers described their teaching instructions in integrating multimedia in online
classrooms. They shared their opinions toward the role of technology in teaching; the practical
methods of multimedia teaching in online classrooms; and the multimedia criteria that were
chosen for the online classroom.

Teachers’ Perceptions of Multimedia’s Role in Teaching

Although all teachers agreed with the importance of multimedia in their teaching, each
teacher expressed based on her/his purpose of utilizing multimedia in their classroom. For
example, Ali, Rams, and Mona see multimedia technology as essential in their teaching because
it helps them transfer content and facilitate students’ learning processes. As Mona explained,

I cannot start teaching without multimedia; I think it is part of my routine as a classroom
teacher. So, I always use multimedia in my classes because I can see the (outcome)
benefit to the students. Also, on the part of the teacher, we are really benefiting from
multimedia.

In addition, participant Amal adds that multimedia technology has a vital role because it had her
get positive feelings about their teaching as she intended.

I can see that as long as I can utilize the multimedia technology, as long as I can see that
my students can learn, I can teach the lessons with the help of technology. So, I am
always happy when utilizing the multimedia technology effectively.

While Sami and Noora described why they see multimedia technology as a necessary tool
because it keeps pace with technological developments that meet generation needs. As Sami
illustrated: “Because generation Z are more inclined to technology than the past generation. So, their use of technology is the key to having a faster connection. They are spending less than the teacher can raise to the student.”

Describing the Practical Ways of Utilizing Multimedia in Online Classrooms

All the teachers had explained their way of integrating more types of multimedia to facilitate delivering content and engaging their students in the online classroom. One subtheme emerged from the practical teaching methods with multimedia in online classrooms.

All participants expressed that teaching online classrooms for the first time was incredibly challenging. Sami described,

The online classroom is very different regarding getting students’ attention or delivering a complex learning content. In the physical classroom, you can get students’ attention more quickly. Because you are already communicating with them physically, you can deliver the content clearly, but communicating with them online is a little bit of a struggle.

Even in difficult online situations reported by teachers, teachers applied many teaching instructions for integrating multimedia in the online classroom. Some teachers described their integration of multimedia by narrating their steps in detail for delivering the lesson in an online classroom. For example, Noora showed her teaching instructions in using multimedia for delivering math lessons as she explained,

I put a song that tells about addition to motivate students, and then use that video to talk about addition, which engages them and gives focus on the topic. After that, I have a PowerPoint presentation in which I can put a lot of pictures that my students can count while adding like that, and I can also give them online quizzes so that I will know also if they really understand my lesson in online class.

Rams paralleled C in elucidating his teaching process by saying, ‘I use PowerPoint presentations because … animated pictures catch students’ attention. Then, the students have to know what the lesson is. After that, we discuss the math problems in steps on the screen to find
solutions and finally sum up why they are important to the lesson and how we will answer the previous problem. I have a link for them to click to watch a specific process or principle to give the pictures. That is the use of multimedia for me.

He added, “I let them use the web or Google to give specific questions for them to answer using Google to search on something, which is in addition to the topic that we have.”

Mona started her description by saying, “I use multimedia technology more than a physical classroom.” Then she talked in detail about her method in delivering English learning content.

I started by doing it in a motivational game to get the students’ attention. That is the best thing I can do for them because that is one thing to set the atmosphere of the class. Then let the students engage in our discussion by giving some pictures story wherein the students can engage with the topic, like having to message us or giving us some backgrounds or reactions regarding our lesson. Also, downloading videos with different pronunciations and native speakers is the best. That is the advantage of using online classes.

Some participants reviewed the mechanism of their lessons in detail about how they used multimedia in conveying their lesson, while others presented the purpose of integrating multimedia during their transfer of learning content. For example, Amal’s statement showed that she used multimedia for a specific purpose: simulation. She indicated,

I can remember that presenting my lesson in science, I was able to have some activities about my lessons wherein they were engaged even though we were doing the online teaching and learning process; they were able to participate in virtual experiments because in that time we cannot do it face to face. Moreover, with the help of technology and multimedia applications, I could show them how we can have regular learning participants and activities even though we are doing online classes.

Besides the simulation, Rams and Sami stated that integrating multimedia served them in students’ evaluation; for instance, Rams mentioned his way of using multimedia was “formative assessment, I can also give them online questions like Kahoot or Quizizz for them to add as an activity to evaluate their learning.”
Sami’s statement revealed his own way of utilizing multimedia. “We need to know if the students understood our lesson. And I asked them to…record themselves using their camera and send it to me, using video.” Amal also elucidated in her comments her preferences regarding employing multimedia in homework.

I tell them to prepare a PowerPoint presentation. I want them to learn how to know and use computer technology to their advantage. So, in the presentation proper, I let them share space and do their part using technology. Students like preparing PowerPoint presentations in online classes.

**Criteria of Multimedia Chosen for Online Classroom**

As explained above, teachers indicated the changes to their teaching practices in the online classroom. The subtheme is related to teachers’ clarification of multimedia criteria. All teachers had the same considerations in the norms of multimedia tools that teachers selected for delivering learning content and, at the same time, helping engage students in the online classroom. Indeed, the most recurrent choosing video criteria, according to participants’ responses, were the video length, content clarification, and child safety.

All teachers referred to short videos because the length of a video is important in grabbing students’ attention without making them feel bored, as well as suitable with class time in distance learning, which is only 40 minutes. As Mona indicated, “I choose a video presentation on what I want to teach the students. Usually, the short video effect grabs my students’ attention quickly and saves time in online classes.” Amal confirmed in her statement, “I consider choosing the videos and other multimedia that explain the topic during the 40-minute class period.”
According to the norm of content clarification, four out of six participants were focused on the instruction video that showed the steps. As Rams explained, “Using a tutorial video that already can show the processes by of those videos to be able to analyze and synthesize whatever the process is that happens in a given lesson. Moreover, that will support them in any activity.” Furthermore, Mona asserts the process and the smooth technique in the multiplication or addition videos. As she described,

In math subject, besides the process, I also consider the technique that is used in the video; for example, there are many techniques available in YouTube as a math teacher, but I care more about the most effortless technique in conveying the learning subject.

Participant Rams also recognized the animated technique helped students understand the lesson. As he said, “Animation videos show the process in an interesting and simple way, which positively affects the student’s learning.”

Other participants were more interested in selecting videos and pictures based on color and effects when delivering information to their students. According to participant Sami’s statement, “I prefer the video that gives the information with the colorful pictures and effects.” Participant Amal likewise preferred multimedia content and the simplicity aspect as she said, “In addition to appearance, the chosen video should be a more profound explanation in a simple way and most like the lesson I delivered.”

For the child-safe multimedia norm, all teachers emphasized selecting multimedia content in an appropriate language and suitable for kids’ society culture. As Mona clarified,

It is important that I consider [what is] child friendly. My criteria for choosing multimedia, number 1, like teacher Rams said, is child friendly. Of course, we have to consider the children before choosing videos or pictures; we have to know if it suits their age. Because you know that will violate culture; definitely, you will get so many complaints from the parents, so that is the first thing I need to consider.
Theme 4: The Relationship Between Multimedia Usage and Student Engagement in Online Classrooms

Teachers’ perceptions and experiences in utilizing multimedia to engage their students were based on teachers self-rating their teaching performance in an online classroom; teachers also explained to what extent they observed students engaging in learning activities.

Self-Rated Teaching Performance

Teachers rated their teaching online between 6-8 on a scale of 1-10, because all participants were cognizant of the impact of their technology knowledge in integrating multimedia into their teaching online classes. Therefore, teachers admitted it was not an easy task. As Rams asserted,

I had a hard time finding an appropriate multimedia, specifically the videos presented to my students. An online teacher must be equipped and influential in using multimedia in different applications. Therefore, online teachers need more time and pre-preparation to expand their knowledge.

Participant Ali stated that his limited technological knowledge made him stick to using a type of multimedia, as he said, “I am not that expert in using those applications or techniques. Because I do have limited resources, I only used Zoom and the videos … again and again, I need to know more educational instructions.” However, all teachers admitted that over time, they developed online teaching strategies for delivering learning content in online classrooms, as B clarified: “Honestly before the pandemic happened, I was not that literate enough in technology. However, when online teaching is happening nowadays, we, as teachers, can be flexible enough on how to use the technology.”
Even though teachers emphasize their need to improve their technological knowledge, as Mona indicated, teachers still need to learn more to improve their teaching and cope with students’ needs. Also, Sami agreed with that when he said, “It should be monthly seminars for all the teachers to be the best in utilizing multimedia and teaching about helpful technology.”

Teachers’ Descriptions of Student Engagement

Teachers had different indicators of their students’ engagement while observing their students’ learning in online classes. Thus, teachers differed in students’ engagement explanations during their teaching online. For example, teachers Ali and Rams see the students’ engagement based on students’ interactions when they ask questions in discussion activities. As Rams mentioned,

I think that … for me, students’ engagement is how they interact, how they ask questions, that is students’ engagement for me. So, my students, one, can engage, but during the class discussion, they are asking and answering your questions.

Rams indicated that “as long as the students can answer the questions, can justify and explain their answers, then we can also say that they understand the lesson.”

While Mona sees students’ engagement according to the degree of attention and curiosity in learning, as she described, “I understand students’ engagement refers to the degree of attention, curiosity, interest, optimism, and passion of the students, optimism, that students show when they have a class with their teachers.” Therefore, she found that her students were more engaged online when she used multiple kinds of multimedia. She explained, “When playing videos, songs, there is … maximum attention, interest. Then students start to express their ideas.” She also added that “when they are playing a game, they are answering certain questions in the game, so while they are having fun, they are learning.” Teacher Amal emphasized that students’
engagement is when teachers motivate students to express their ideas, which will be effectively achieved using multimedia. According to her belief in student engagement, “When using multimedia, to deliver it accurately to the students through the video games, then get their answers and sharing their ideas, shows their reaction, and express their thoughts.”

On the other hand, teachers Noora and A thought of students’ engagement as more related to a student’s performance in the exam, as Noora asserted,

I can measure my students’ engagement through assessment of the quizzes when giving a task or assessment at the end of the lesson. Moreover, when students apply the knowledge, they fully understand the lesson, not just by memorizing it.

Briefly, the research question explores English, math, and science teachers’ perceptions and experience in utilizing appropriate multimedia to engage students in online learning in grades three through seven. Teachers emphasized the role of technology and multimedia in their teaching by describing their integration of multimedia for delivering content based on their standards of chosen kinds of multimedia suitable for online classroom learning. In addition, teachers explain the extent of their satisfaction with their teaching performance to engage students in an online classroom.

Summary

The findings from this case study of six teachers investigated their perceptions and experiences of teaching instruction in the online classroom. Also, teachers were integrating multimedia in their teaching practice to deliver learning content to engage students in online learning. The two questions produced evidence to create four significant assertions regarding adapting teaching in online classrooms based on teacher’s technology practices, difficulties in
teaching online, the practical usage of multimedia in online teaching instructions, and the relationship between multimedia usage and students’ engagement in the online classroom.
CHAPTER 5
ANALYSIS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This descriptive case study investigated the experiences and perceptions of teachers in grades 3-7 in Saudi Arabia regarding their using technology in an online classroom and how integrating multimedia into their instruction influenced their ability to deliver the learning content and engage their students. The participants were six teachers from an international school in Saudi Arabia who have five or more years of teaching experience as well as previous experience teaching in online classrooms. Through a lens of conceptual multimedia theory and TPACK framework, the data consisted of semi-structured individual interviews and focus groups from these six teachers to explore experiences and perceptions of delivering multimedia in an online classroom to teach grades 3-7 during the COVID-19 pandemic.

The data collected, based on the two guiding research questions, produced evidence to create significant assertions regarding teachers adapting online teaching classrooms and utilizing multimedia to engage their students. The first question asked was: “How do teachers describe their perceptions and experiences with incorporating online platform technology into their instructional practices to effectively engage students in grades three through seven?” The second question asked was: “How do teachers describe their perceptions of and experiences with utilizing appropriate multimedia in engaging students in grades three through seven in online learning?” During the analysis phase, the responses from individual interviews and focus groups
were coded and organized into four themes that aligned with the research questions; I used these themes to demonstrate my findings.

Chapter 5 summarizes the main themes that confirmed answering two research questions. The findings of this study uncovered the teachers’ perceptions and experiences in grades 3-7 regarding their teaching instructions and experiences delivering learning content for students’ engagement in online classrooms, as well as a discussion of findings relative to the literature. Finally, implications of practice and recommendations for future research are provided.

Summary of the Findings

The themes in Chapter 4 provided information based on data collection from Grade 3-7 teachers in Saudi Arabia according to their perceptions and experiences of utilizing multimedia using online technology classroom teachers to engage their students.

The themes were aligned with the two research questions. So, the study outcome presented considerable insight into the perceptions and experiences of 3-7 grade teachers in math, science, and English regarding their teaching instructions in terms of how they coped with the transition in using online technology teaching and integration multimedia to engage their students in the online classroom.

The results disclosed teachers’ perceptions and experiences by clarifying the aspects that contributed to helping them deal with the shift to distance teaching, and demonstrated how they applied different teaching methods that contributed to teaching their students in distance teaching. At the same time, the results indicated the challenges of distance teaching, which involved the lack of technological knowledge and weak technological support, in addition to the
difficulties of classroom management in distance learning. Four themes were revealed during the analysis and coding data to answer research questions:

- Adapting teaching online classroom based on teacher’s technology practices
- Difficulties in teaching online
- The practical usage of multimedia in online teaching instructions
- The relationship of multimedia usage and students’ engagement in the online classroom

The first and second themes are about adapting teaching methods using technology online classrooms based on the teacher’s technology background and difficulties in teaching online. The other two themes were related to practical teaching instructions in integrating multimedia to deliver learning content, as well as teachers’ impressions regarding their online teaching experience on using multimedia to engage students in an online classroom.

Discussion of Findings

This study sought to answer two research questions regarding teachers’ perceptions and experiences delivering multimedia using online platforms technology classroom based on four themes and subthemes that aligned with the research questions. The first research question and its related themes and subthemes are shown on Table 3.
Table 3
Themes and Subthemes of Research Question 1

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Theme</th>
<th>Subtheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- How do teachers describe their perceptions and experiences with incorporating online platform technology into their instructional practices to effectively engage students in grades three through seven?</td>
<td>Adapting teaching online classroom based on teacher’s technology practices.</td>
<td>• Teachers’ descriptions of the online classroom transition&lt;br&gt;• Support aspects for online classroom&lt;br&gt;• Procedures and teaching practices in dealing with online technology classrooms online classroom</td>
</tr>
<tr>
<td></td>
<td>Difficulties in teaching online</td>
<td>• Lack of knowledge&lt;br&gt;• Technical Issues&lt;br&gt;• Lack of classroom management</td>
</tr>
</tbody>
</table>

Theme 1: Adapting Online Teaching Based on Teachers’ Technology Practices

Teachers were willing to describe the transition to online teaching and to give their opinions and explanations of support aspects that helped them apply teaching procedures; they also described the challenges they faced during online classroom teaching in using platform features. Three subthemes were revealed.

Teachers’ Descriptions of the Online Classroom Transition

I found that the teachers reflected on their opinions that shifting to distance teaching was a complicated situation initially. All teachers expressed that because it happened quakily without preparation, especially for teachers who first dealt with online technology, the teachers’ descriptions were based on their limited background in online technology tools. The discussion discovered the diversity of learning environments and requirements is one of the challenges that teachers face with different experiences and teaching skills. This finding was consistent with
studies by Leeder and Lonn (2014), and Susomrith & Coetzer (2015) indicated a decrease in the utilization of LMS tools due to the teachers’ perceptions about integrating technology tools. Because some experienced teachers saw the integration as an extra workload and useless within the learning process, some teachers’ perceptions showed a deficiency in understanding LMS’s features to support teachers in transferring learning content and engaging learners effectively. This disparity in teaching practices forms educators’ experiences employing LMS tools, which shapes their level of technological knowledge and its impact on the effectiveness of technology applications in their classrooms (Herring et al., 2016).

Support Aspects for the Online Classroom

Participants emphasized three kinds of support that helped them and significantly impacted their online teaching. Teachers’ responses indicated that the school’s seminars on fundamental steps in teaching online classrooms guided them during an online situation. The ICT support in the school was beneficial in solving technical issues. At the same time, all teachers indicated that the most vital support was the role of colleagues in discovering new methods and technology tools that facilitated their online teaching. Discussion disclosed the variety of developing teachers’ skills and providing resources facilitating their teaching in the different learning environments is the central pillar in facing new challenges in the education field. The training aspect support that I found based on teachers’ responses was corroborated in the literature. Lei (2009) concluded that the quality of training provided to teachers should keep pace with the development of technology and its application in the classroom and decrease the barriers to integrating technology; also, Martin (2021) affirmed that training becomes an urgent necessity when new developments appear in the educational system that requires teachers’ awareness to
adapt. My findings about the role of the technical support aspect were emphasized in the result of studies by Alshammari et al. (2016), Francom et al. (2021), Rahayu and Wirza (2020), and Yuen et al. (2009) who pointed out that the absence of technical support constitutes a significant obstacle in the expansion of the use of tools platform, because of the increased financial burden. Whereas the importance of supporting colleagues in learning experiences to facilitate distance teaching processes, which I did not find in the literature related to distance teaching for the K-12 stage.

**Procedures and Teaching Practices in Dealing with Online Technology Classrooms**

I found that procedures and teaching practices in teaching online classrooms relied heavily on teachers’ awareness about the nature of the online technology classroom; participants explained in their responses that teaching online requires different strategies and a variety of techniques to deliver learning content. Discussion revealed that teaching procedures differ according to different learning environments. Distance learning classes require teaching procedures that ensure the transfer of learning content following the nature of that environment and achieve the learning goal based on applying a specific teaching process to engage students in learning content effectively. This finding was consistent with the literature from Altunoglu (2017) and Reiser & Dempsey (2012), who indicated how the quality of teaching instructions with diverse activities plays a crucial role in influencing participation and learning in e-learning environments. Contrado (2016) also mentioned that the online learning environment requires different technology tools than the traditional environment. Indeed, participants highlighted the importance of awareness of platforms and features that facilitate their teaching online, which was affirmed by Kadir et al. (2016). The features of LMS are varied to contribute to building a basis
for linking learners and teachers with learning materials (Al Alhareth, 2013). Being able to provide suitable opportunities for interaction in the learning environment relies upon knowledge in using tools effectively and being aware of their integration into learning content materials to create an active learning environment. Responses given by participants showed they were aware of the importance of applying the appropriate techniques that fit with online classrooms, such as recording the lesson and sending the lesson in advance to the students. Furthermore, games and activities helped engage their students.

**Theme 2: Difficulties in Teaching Online**

Teachers expressed the significant difficulties experienced when teaching their online classrooms. The teachers’ responses merge into three subthemes: lack of knowledge, technical issues, and lack of classroom management.

**Lack of Technology Knowledge**

I found that participants expressed their lack of technology knowledge by explaining their technology knowledge barrier in online platforms. Teachers faced an obstacle in understanding the platform’s features when delivering learning content, as evidenced by participants’ explanations about the effect their level of technology knowledge had on their teaching practices. The discussion showed that technology knowledge is essential for teachers in guiding their understanding and practice with employing technology tools, and that conformed with the TPACK framework that teachers must combine elements of pedagogical content and technological knowledge to integrate technology into the learning content smoothly (Koehler & Mishra, 2009). The lack of technology knowledge that participants explained hindered their
ability to easily use platform features; this was confirmed by the study result of Hutchison and Reinking (2011), who confirmed that 38% of teachers had a high level of knowledge about utilizing technology tools and, therefore, had high positive attitudes toward its use in the learning process. In contrast, 14% of teachers had a low level of knowledge, which negatively affected their opinion because they did not have sufficient knowledge to overcome their fear of using it in the learning process.

**Technical Issues Related to Internet Speed**

An inadequate internet connection was among the most prominent technical problems repeatedly mentioned in the participants’ responses. All teachers suffered from slow internet speed because it affected smooth interaction during class. The internet speed was a significant obstacle in distance teaching that negatively affected the smoothness of the learning process and communication between teachers and students. This outcome was found mainly in studies conducted in a developing country, as in the study by Alshammari et al. (2016).

**Lack of Classroom Management**

According to teachers’ responses, all participants affirmed that there was a lack of online classroom management. I found four common factors that were negatively affecting their online teaching: delayed feedback, learners’ disengagement, hindering parental support, and poor time management. Based on the discussion in the online classes, the quality of interaction between the teacher and the learners depends on managing the classroom effectively, which ensures an active learning process between the teacher and the learners. The discussion showed that low internet speed and teachers’ limited familiarity with platform features in online classrooms contribute to
communication barriers, such as audio delays, muted microphones, and limited opportunities for spontaneous interaction. These obstacles disrupt the class flow, impede effective classroom management, and make it more challenging for teachers to engage their students, provide instructions, and manage student interactions in real-time. Moreover, students utilizing online platforms may encounter distractions from their immediate surroundings. Some of the factors in lack of classroom management corresponded with studies by Francom et al. (2021) and Zhang (2021), who pointed out that teachers’ most critical challenges were difficulty contacting and communicating effectively with students and getting them to participate; this corresponded with participants’ responses concerning the difficulties in grabbing students’ attention and getting them to participate in the online classroom. However, regarding the hindering parental support and class time management, I did not find these elements in the literature studies, perhaps because most online studies are conducted at a higher education level.

Table 4
Themes and Subthemes of Research Question 2

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Theme</th>
<th>Subtheme</th>
</tr>
</thead>
</table>
| 2. How do teachers describe their perceptions of and experiences with utilizing appropriate multimedia in engaging students in grades three through seven in online learning? | The practical usage of multimedia in online teaching instructions | - Teachers’ perceptions of multimedia role in teaching  
- Describing the practical ways of utilizing multimedia in online classrooms  
- Criteria of multimedia chosen for online classroom |
| | The relationship between multimedia usage and student engagement in the online classroom | - self-rated teaching performance  
- Teachers’ description of students’ engagement |
Theme 3: The Practical Usage of Multimedia in Online Teaching Instructions

This theme and related subthemes are: teachers’ perceptions of multimedia technology’s role in teaching, describing the practical ways of utilizing multimedia in online classrooms, and criteria of multimedia chosen for online classrooms.

Teachers’ Perceptions of Multimedia Role in Teaching

I found that in teachers’ perceptions of the multimedia role in teaching, all teachers’ responses agreed on the vital role of multimedia. Participant Mona asserted, “I cannot start teaching without multimedia; I think it is part of my routine as a classroom teacher. So, I always use multimedia in my classes because I can see the [outcome] benefit to the students.” The discussion revealed Teachers’ keenness to employ multimedia in distance teaching is based on their belief in its vital role in facilitating learning. This aligns with the existing literature (Efriana, 2021; Nawzad et al., 2018; Park & Ertmer, 2008) that most teachers agree on the benefits of technology for improving teaching methods in the classroom.

Describing the Practical Ways of Utilizing Multimedia in Online Classrooms

Each teacher explained their aim of using multimedia and described the integration types of multimedia in teaching instructions to facilitate delivering content and engaging their students in the online classroom. I found that the effectiveness of interactive multimedia was heavily dependent on the primary teachers’ experiences selecting and delivering multimedia learning. From the discussion, it became clear that online teaching instructions for using multimedia require more effort and time from teachers in searching for multimedia applications that align
with the nature of distance learning, which is consistent with the literature by Edmunds and Hartnett (2014), Komalasari and Saripudin (2017), and Tempelman-Kluit (2006); the experiences and awareness of teachers had impacts on the integration of multimedia in their teaching.

**Criteria for Choosing Multimedia in Online Classrooms**

I found that in the teachers’ clarification of multimedia criteria, all teachers had the same considerations in the norms of multimedia tools that teachers selected for delivering learning content and helping engage students in the online classroom. The most recurrent criteria for choosing video content, according to participants’ responses, were the video length, content clarification, and whether the video was age appropriate. The discussion revealed that teachers are eager to find multimedia learning content that fits with online learning classrooms and helps to engage their students, which is supported by Richter et al. (2016) and their findings that the quality of the multimedia content will guide educators in selecting or designing appropriate content for their students and encouraging them to engage more in the learning process and achieve valuable learning experiences. Participants shared the criteria for their selection of multimedia, some of which incorporated the principles of multimedia theory. For example, some teachers found the practical criteria for choosing video is segmenting content into shorter sections to keep learners’ attention in the short classroom period, which was described by the studies of both Emmanuel and Ekpo (2016) and Mayer et al. (2018). Furthermore, this result supports Mayer’s (2014) claim that breaking down the lesson content into smaller pieces is better for learning because it motivates the learner to engage more fully in the learning process due to the reduced burden on the working memory. Indeed, all participants emphasized “child-safe”
multimedia. The criteria, according to the participants explained, is an appropriate multimedia material that fits with the culture society in Saudi Arabia, which is a conservative society.

**Theme 4: The Relationship Between Multimedia Usage and Student Engagement in Online Classrooms**

The teachers’ descriptions of multimedia usage and the impact on their students’ engagement contained two subthemes: self-rated teaching performance and teachers’ description of students’ engagement.

**Self-rated Teaching Performance**

I found in the teachers’ explanations that they tend to rate their usage of multimedia in delivering learning content between 6-8 out of 10, because all participants struggled to apply the suitable teaching instruction of integrated multimedia in an online classroom to engage their students and achieve the learning goal. Teachers expressed that their teaching experiences in physical classrooms in integrating multimedia into their instructions reflected on their performance of multimedia integration to engage their students in the online classroom. The discussion conveys that the use of multimedia depends on understanding the mechanics of multimedia in the learning process and how to integrate them into the lesson instructions to deliver the learning content in distance learning. The findings aligned with the literature of Mayer et al. (2018) and Pan et al. (2006), who indicated that learning materials should be integrated with technology to suit various visual, auditory, and tactile learning styles and encourage learners to engage in learning the content.
Teachers’ Descriptions of Student Engagement

I found variations in teachers’ explanations about their students’ engagement in an online classroom related to teaching instructions when delivering multimedia learning content. The teachers shared their perceptions of the student’s engagement according to their observations of their students’ learning in online classes. Some teachers noted that the learners were more engaged in the learning tasks when they used multiple kinds of multimedia and participating in the learning activities. At the same time, some saw that students were more engaged when they felt the pleasure of learning through competitions or games. The discussion revealed teachers’ awareness of the online learning requirements regarding how to grab students’ attention as an essential step in the learning process. Also, teachers’ descriptions of students’ engagement in the online classroom disclosed the diversity of using multimedia applications in teaching instructions to deliver learning content and how students interact with it. The findings were consistent with Moreno & Valdez (2005) who specifically emphasized that the quality of the instructional multimedia design and delivery methods is a critical factor not only for improving the learning environment, but also for determining the extent of the immersion and interaction of learners within the learning activity. Also, the finding aligned with the claims of Shernoff et al. (2014) that creating an interactive learning environment in different learning classrooms is a focal point for engaging learners in the learning process. In addition, the finding is supported by the existing literature of Skinner et al. (1990), who mentioned that students’ engagement appears through enthusiasm in facing learning tasks and the desire to learn, students’ effort on a task, and their ambient emotional states during learning activities.
In summary, I found that one of the difficulties of teaching online classrooms in the k-12 stage was the lack of classroom control remotely because of students’ unwillingness to have the camera open, as well as the intervention of the parents during the class period. These difficulties added to existing literature regarding distance learning obstacles in k-12. Also, I found the colleagues’ support in sharing their experiences with multimedia applications and discovering platform features added to the support aspects of teaching in distance classes in the existing literature.

Implications for Practice

This study provided an opportunity to understand teachers’ perceptions of their teaching experience utilizing multimedia in an online classroom. Toward teachers’ perceptions and experiences in integrating multimedia content and delivering effectively to engage students in the online classroom, the following practical recommendations are suggested.

All the participants described the transition to online class as difficult, because it was sudden and the teachers had no experience in distance teaching, but the set of seminars provided by the school administration and ICT department regarding the mechanism of distance teaching in terms of understanding different learning platform features, in addition to online simulation workshops, helped teachers significantly to adapt to the online teaching situation in a significant way. Therefore, ongoing training should be provided to help teachers cope with new technology applications in their field.

Participants also explained the positive impact of sharing different learning resources and discussing teaching methods with multimedia applications that fit online classrooms. The
collaborative teaching reflected effectively on teachers’ online teaching perceptions. Thus, peer support was also a helping hand for teachers regarding online teaching experience.

Briefly, the available literature on K-12 teachers’ perceptions of using multimedia focused on traditional classroom settings. However, my study addressed this gap by providing valuable insights specific to online learning environments. The finding offered essential information for identifying best practices, guidelines, and strategies to effectively select and utilize multimedia content that engages students in online learning. Moreover, the study emphasized the significance of comprehending the unique requirements and challenges of online instruction, enabling the development of customized and effective techniques for integrating multimedia within the online classroom environment.

Recommendations for Future Research

This study investigated English, math, and science teachers’ perceptions and experiences integrating multimedia in online technology classrooms in an international school in Saudi Arabia. The benefit of the data gathered was rich and detailed. However, the less reporting output from certain participants in the findings can be attributed to various factors, such as their tendency to be quieter or less participatory during the study. As a result, there was a limited amount of data available for analysis from these individuals, possibly due to their reluctance to openly share their perspectives and experiences. This aspect should be recognized as a potential limitation of the study, as the findings may not fully represent the diverse range of viewpoints and experiences among all participants.

The reduced input from these individuals may have hindered a comprehensive understanding of the phenomenon under investigation. Acknowledging this limitation in the
write-up would demonstrate an awareness of potential bias and ensure transparency regarding the study’s scope. It also highlights the need for future research to explore strategies that foster increased participant participation and mitigate potential limitations. Therefore, adding participants from different schools can expand generalizability because this one school might have unique policies and facilities for teacher training programs that other schools do not.

My study was located in conservative Saudi Arabia, and teachers in the country consider various factors when determining the criteria for multimedia tools. These factors include religious considerations, cultural norms, and the educational value of the content. By aligning with these criteria, educators strive to integrate multimedia tools in a manner that respects local values while enhancing the learning experience for students. Duplicating this study with more teachers in other countries would give a more comprehensive view of teachers’ perceptions of using multimedia.

Teachers’ perceptions in this study were largely positive when discussing their experiences using multimedia to engage students in the online classroom. Because of this, bias may be involved in the teachers’ responses. A more accurate way of measuring teacher online performance would need to observe the practical teaching in the classroom and how students were engaged in the learning process. Future researchers could conduct a mixed-method study based on the foundation of the current qualitative. The researchers can demonstrate questionnaires to make the results more valid and reliable regarding teachers self-evaluating their technology knowledge. Moreover, besides the interviews, using observations might reflect better on the teachers’ perceptions and evaluate the practical teaching of the overall teacher population.
Conclusion

This qualitative case study’s goal was to explore teachers’ perceptions and experiences regarding their teaching instructions in multimedia to engage their students in the online classroom. The aim of the study was met based on teachers’ responses in individual semi-structured interviews and focus groups. The data were collected, interpreted, and analyzed according to the research questions.

In the findings, teachers highlighted the various procedures they implemented to help them teach online classrooms during the COVID-19 pandemic. Teachers indicated the support aspects such as training programs, colleagues, and ICT departments in the school to deal with platforms’ features and use them efficiently in teaching, which led them to adapt quickly to an online situation. Although the teachers faced critical difficulties integrating multimedia into distance learning, they mentioned various multimedia applications in delivering learning content to engage their students in online classrooms effectively. Teachers described practical teaching instructions for multimedia usage to deliver learning content in online classrooms. The disparity in teaching practices forms educators’ experiences employing LMS tools, which shapes their level of technological knowledge and its impact on the effectiveness of technology applications in their classrooms (Herring et al., 2016); the main implication of the findings was the role of teachers’ technology knowledge of a platform’s features in the online classroom. A variety of conclusions emerged as 3-7 grade teachers in English, math, and science discussed their perceptions and experiences regarding appropriate multimedia applications that fit with online teaching and engaging students. According to Mayer (2014), choosing the appropriate multimedia content helps learners in the active learning processes of selecting, organizing, and
integrating information without overloading their working memory, making them more engaged in the learning environment.

The teachers reviewed types of multimedia selections such as videos based on specific criteria that impacted student engagement in the learning process. The findings might trigger future research possibilities to expand outcomes on teachers’ perceptions and teaching experiences regarding the quality of teaching instruction practices in selecting and delivering multimedia content to engage students.
REFERENCES


Herring, M., Koehler, M., & Mishra, P. (Eds.). (2016). *Handbook of technological pedagogical content knowledge (TPACK) for educators.* Routledge,


APPENDIX A

PROPOSAL LETTER TO YEIS PRINCIPAL
Dear Principal of YEIS,

I am a doctoral candidate at Northern Illinois University, within the Department of Curriculum and Instruction. Currently, I have developed a dissertation-level study, titled “Teachers’ Perceptions and Experiences of Utilizing Multimedia in Their Teaching to Engage Students in an Online Classroom,” which focuses specifically on educators in Saudi Arabia. I would like to get your permission to conduct my study at Yanbu International Elite School, which would include talking with six teachers about their experiences utilizing multimedia in online classes. If you’re open to this proposal, please email me at ralgufi@gmail.com or call via 0555528694

Best,

Rateeba Algoufi
APPENDIX B

PROPOSAL LETTER TO YEIS TEACHER
Dear YEIS teacher

I hope this email finds you well. I am a Ph.D. candidate at Northern Illinois University and I’m working on a doctoral degree in Curriculum and Instruction Leadership. I am doing a research study entitled K-12 teachers’ perceptions and experiences integrating multimedia in online learning classroom. The purpose of this qualitative case study is to understand and describe the perceptions and experience of K-12 teachers in their teaching instructions of utilizing multimedia in a way that is different from that in the traditional classroom. I have already gained permission from your school’s principal, and I am contacting you to see if you would participate in my study, as math, science or English teacher who has minimum five years teaching experience including at least one online classroom in Grades 3-7. If you meet the requirement and are interested in participating in my study, please reply to this email. Also, please don’t hesitate to contact me if you’re interested in a casual chat about the research. Thank you again for your time, and I’m looking forward to hearing from you.

Best,

Rateeba
APPENDIX C

TEACHER CONSENT FORM
Teacher Consent Form

Introduction

My name is Rateeba Algoufî, and I am a doctoral student in the Department of Curriculum and Instruction at Northern Illinois University. I am conducting research as part of a doctoral dissertation on teachers’ perceptions and experiences of utilizing multimedia content to engage students in online learning. The purpose of the research study is to explore teachers’ perceptions and experiences in their teaching instructions of integrating multimedia to engage students in online learning.

Eligibility

You were selected as a participant because you meet the following criteria:

- You are involved in teaching one or more online classrooms in Grades 3-7.
- You have at least five years of teaching experience.
- Your specialty (science, mathematics, or English).

Procedures

If you participate in this research, the following will apply:

1- The research will conduct an initial interview (30-40 minutes) to clarify the purpose of the study and the role of the participants.
2- Each participant will have to be interviewed via a one time a semi-structured interview process (45-60 minutes), which will help the researcher understand participants’ perceptions of their distance teaching experience by describing their teaching instructions using multimedia appropriate for engaging learners in Grades 3-7.
3- A follow-up interview for each participant (15-20 minutes) for additional questions and to review the transcript from the individual interview.
4- You will have to participate in one of two focus group discussions (45-60 minutes) designed to help the researcher understand teachers’ perceptions of the criteria for successful teaching in an online classroom using multimedia to increase student engagement. Participants will also have an opportunity to share their own experiences of using multimedia successfully (or unsuccessfully) in the distance learning environment.
5- The interviews will be conducted virtually using the Zoom video conferencing application.
6- The interviews will be recorded and then transcribed by the researcher into a written text format.

Protection and Privacy
Transcripts will be stored on a password protected computer/flash drive for the duration of the study. Once transcriptions are completed, all personal identifiers will be removed and replaced with unique pseudonyms to protect your identity. As such, all information collected will be held confidential through these protective measures.

**Voluntary Participation**

Your participation in the study will add a more profound understanding of the experience of using multimedia to integrate learners in online classes for K-12 teachers effectively. Your participation is voluntary, and you may withdraw from this study at any time without penalty. There are no risks or inconveniences related to the research.

**Contact Information**

If you have any questions before, during, or after this study, you can contact me at: ralgoufi@gmail.com or by phone at 0555528694.

**Signature of Consent to Participate**

Your consent form signature acknowledges your willingness to participate in the research and your agreement to record the interviews.

Participant’s Printed Name: __________________________

Participant’s Signature ___________________________

Date __________________________

**Signature of Consent to be Recorded**

Your signature below acknowledges your willingness and agreement to record the interviews.

Participant’s Printed Name ______________________

Participant’s Signature __________________________

Date: __________

Researcher’s Signature__________________________

Date________________________________________
APPENDIX D

INTERVIEW QUESTIONS
Interview Questions

Welcome and thank you for participating in the study of teachers’ perceptions and experiences about adapting multimedia teaching instructions to engage learners in online classrooms. Before being interviewed, please confirm that you would like to participate, and if you want to withdraw at any time, please let me know.

1. Tell me, when was the first time you became interested in using technology for instruction?
2. To what extent do you see yourself as being comfortable or uncomfortable with using technology in the classroom?
3. How does technology in online classrooms have an influential role in teaching instruction in your subject?
4. What are your main purposes of integrating multimedia tools into your teaching instruction?
5. Describe your teaching instruction in using multimedia in online classroom?
6. Describe what kind of teaching instruction with multimedia makes students more engaged in an online classroom?
7. How did your teaching instruction change with multimedia tools in the online learning environment compared with the physical classroom?
8. Identify 2-3 of the critical challenges in multimedia tools that you adapted in your teaching instruction for engaging students in an online learning environment?
9. What type of obstacles, if any, did you encounter when integrating multimedia tools into your instruction to engage students in an online learning environment?

10. To what extent do you see integrating online technology tools in teaching instructions to deliver multimedia content serves the learning process?

11. Evaluate your experience in using multimedia during online learning from 1 to 10 and explain why you gave it that rating. (1 being the worst and 10 being the best).

12. Can you describe your students’ engagement in distance learning?
APPENDIX E

FOCUS GROUP PROTOCOL
Focus Group Protocol

Introduction

My name is _______, and I will be the moderator and take notes in the focus group. This focus group aims to gain teachers’ perceptions and experiences of using multimedia in their teaching instructions to engage K-12 students in an online classroom.

Procedures

I will email you a consent form for participating in the focus group. Your form signature acknowledges your consent and agreement to participate and to keep our discussions confidential. You have the right to leave at any time if you feel uncomfortable for any reason.

Focus Group Guidelines

Below are some basic rules I would like to clarify to you to ensure that you feel comfortable putting forward your ideas:

- **Open discussion.** In the discussion group, there are no wrong or right answers. The door of freedom is open to everyone to express their opinions and experiences, and there is not necessarily a consensus.

- **Participation is essential.** Sharing and hearing the voice of everyone in the focus group is a vital point in making the discussion more productive, so if you have anything to add, do not hesitate.

Focus Group Process

1. There is a set of questions that will be discussed amongst your group. I will ask each question and then ask each participant to share his/her idea on that question.
2. The focus group discussion will be audio-recorded to ensure the accuracy of the information and ease of verification when needed. None of the participants’ names will be included in the focus group to maintain identity confidentiality. Please, if you have any questions before getting started, let me know.

3. The focus group discussion will be approximately 45-60 minutes.

Questions

1. What kind of multimedia do you use in your teaching instruction? Why?

2. Describe your teaching instructions experiences of your subject when you shifted to distance learning for K-12 students. What are your teaching instructions for integrating multimedia with the online classroom technology tools to engage learners effectively?

3. Describe your experience in technology that you had access to for delivering multimedia learning content.

4. What challenges do you face in your teaching instruction of delivering multimedia content through the online classroom?

5. What factors do you believe affect teachers’ teaching instructions in using multimedia effectively in online learning classrooms?

6. What do you think teachers need to improve their teaching instruction using multimedia to engage their students in distance learning?

7. What criteria for teaching instruction using multimedia do you consider appropriate for the success of distance learning in K-12?

8. How do you know when your students engage with learning content? Give an example.

Closing

Thank you for your valuable participation in the focus group discussion about teachers’ perceptions and experiences in the effectiveness of teaching instructions using multimedia to engage K-12 students in online classes. Your practical experiences and shared thoughts about online learning will help to support my research; your feedback also contributes to a broader understanding of the effectiveness of multimedia in a distance learning environment.
APPENDIX F

EXAMPLE OF THE CODING PROCESS
At least because of the bad connection, we need to wait for the time so that we don’t repeat and repeat and repeat some minutes are being wasted every lesson (LT). The internet connection is really hard to control that one (LT).

So, on my part, if my connection is slower
the other student cannot already cope up because of the internet connection problems (LT).

-because I’m no longer young
learned in school using traditional classrooms and there was no technology when I was learning that
-I started using technology 2015, my knowledge about technology was limited. (LK).

- I didn’t know how to share screen, I didn’t know how to write on the whiteboard
Actually, this one is limited to my teacher’s knowledge (LK)

-While in the online classroom, it will lead me to three days, which really is too long for one lesson (LM).

-So, in online class, it was difficult. I didn’t have that chance to get to know them well (LM)

- I shift the online classroom, the immediate feedback doesn’t it happen?(LM).

-the behavior of the students I mean through online, there are students that are skipping for the academic issue about the students’ behavior you can’t control them.

School aide

<table>
<thead>
<tr>
<th>Open coding</th>
<th>Axial coding</th>
<th>Selective coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least because of the bad connection, we need to wait for the time so that we don’t repeat and repeat and repeat some minutes are being wasted every lesson (LT). the internet connection is really hard to control that one (LT).</td>
<td>The obstacles of teaching online. - Lack of internet -lack of knowledge -lack of classroom management. The support aspects in teaching online. -school aide -ICT assistance. -colleague help. Find solution. -Extend time - Record technique - Send lesson in advance. -Post complete materials</td>
<td>Teaching online classrooms based on teachers’ technology practices and exploring the online teaching difficulties.</td>
</tr>
<tr>
<td>-So, on my part, if my connection is slower the other student cannot already cope up because of the internet connection problems (LT). -because I’m no longer young learned in school using traditional classrooms and there was no technology when I was learning that -I started using technology 2015, my knowledge about technology was limited. (LK).</td>
<td>1- Support aspects in online teaching 2- Difficulties in teaching online 3- Solutions in teaching and delivering content in online classrooms</td>
<td>1- Support aspects in online teaching 2- Difficulties in teaching online 3- Solutions in teaching and delivering content in online classrooms</td>
</tr>
</tbody>
</table>
we are the school provide teachers website hardcore, they provide us a multimedia they call this educational material for us easy to deliver the lessons.

ICT support
after some seminars with ICT with our administration with the admin, they gave a seminar and they teach us how to use the zoom. They gave us videos like, tutorial videos.

Colleague help
I asked my colleagues about the technologies they use in teaching, and it helped me a lot.

availability (S)
- They can ask me using the chat box and actually it is 24/7 as the teacher has to be available 24/7 to any questions if I give the homework, if I really, if I give assignments. They would ask me right away anytime even 12 midnight or 1 AM with my and as a teacher,

Extend time (S)
- in one lesson I think I do need to discuss it into three sessions or three days. Find solution for me to record this to make sure that the they learned that lesson.

record technique (S)
- with the help of technology and multimedia, I was able to record myself and present to the students how to do the activity.

Send lesson in advance (S)
I did, this I recorded, prerecorded, in an online teaching, and then send it to the students, an advanced lesson pre-advanced lesson for the students.

Alternative (S)
- they said Kahoot again? I used to play they had me and that message should be that I need to find another application, not Kahoot but because they get bored already using Kahoot so I explore, and I found out that there was a better one. And I found out that the Quizzes is better than Kahoot and there are many applications app to like Quizzes,
APPENDIX G

MAJOR THEMES AND SUBTHEMES FOR RESEARCH QUESTIONS
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<td>• Teachers’ descriptions of the online classroom transition.</td>
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<td>• Procedures and teaching practices in dealing with online classroom challenges</td>
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APPENDIX H
CODING CHART
Adapting teaching online classroom based on teacher’s technology practices.

- Teachers' descriptions of the online classroom transition.
- Support aspects for online classroom
- Procedures and teaching practices in dealing with online classroom challenges

Difficulties in teaching online

- lack of knowledge
- Technical Issues
- lack of classroom management

The Practical usage of multimedia in online teaching instructions.

- Teachers' perceptions of the multimedia technology's role in teaching
- Describing the practical ways of utilizing multimedia in online classrooms
- Criteria of multimedia chosen for online classroom

The relationship of multimedia usage and students' engagement in the online classroom.

- self-rated teaching performance.
- Teachers' description of students' engagement.