A Study of K-12 Physical Educators' Perceptions of Instructional Technology

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Abstract

The purpose of this study was to gain insight into the perceptions of physical education teachers regarding the use of technology use in their courses by replicating and expanding Kahl's 2018 research. This study provides new perceptions that supplement the original findings. Semi-structured interviews were conducted with eight physical education teachers from the state of Kansas. The analysis of the interview data revealed several themes, with over 87% of the participants indicating that they perceived instructional technology as having positive aspects. All the participants reported integrating instructional technology into their courses. Moreover, 50% of the participants reported feeling that they lacked the necessary facilities to support technology use. The results of this study provide insight into the under-researched phenomenon of instructional technology use in physical education and can be used to inform stakeholders about technology practices moving forward.

Dedication

This dissertation is dedicated to God and my husband, Mike. God gave me the power to persevere, and Mike gave me unrelenting support.

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Chapter 1

Introduction

As student use of technology has increased, student health has decreased (Kemp, 2020; Korhonen, 2021; Wagner et al., 2021). According to research, children between 8 and 10 years old are engaged with technology-based media for 8 hours daily, and this figure escalates to an average of 11 hours for those older than 10 (Strasburger et al., 2013).

The health of our children is at risk. In a study conducted by the United Nations Children's Fund Office of Research - Innocenti, which included 38 countries, the United States (US) ranked last in terms of childhood physical health (Gromada et al., 2020). Furthermore, research from the Centers for Disease Control spanning a decade from 2009 to 2019 revealed that fewer than 25% of adolescents engaged in the recommended 60 minutes of physical activity per day (Merlo et al., 2020). These compelling statistics underscore the need for innovative approaches in physical education (PE), such as leveraging technology to enhance student wellness. As children in the US increasingly engage with digital devices, it is important to explore how this technology can be effectively integrated to enhance their health outcomes.

Limone and Toto (2021) explained that the closure of schools due to COVID-19 led to an increase in students' reliance on technology. This increased dependency was partly attributed to the shift towards online learning to continue education despite the closure of school buildings. Education Week (2020) reported that school closures began in February 2020 in response to COVID-19. By the end of March 2020, the majority of US schools had shut down (Education Week, 2020). While core classes heavily utilized

technology, reports like Gallagher's (2020) literature review suggested that PE may need to catch up with many school subjects to enhance students' educational experiences. As technologically adept youths progress through a technology-filled educational system, PE teachers must consider their students' relationship with technology when designing lessons (Butz, 2022).

Chapter 1 provides an overview of the reasons for this study. The first section offers a brief background of instructional technology and PE. The background leads to the problem statement, which is the second section of this chapter. Next, the chapter reveals the purpose and significance of the study. Following the list of significant reasons for the study, the researcher supplies the delimitations and assumptions. Next, the chapter provides the research questions. The chapter concludes with an overview of the complete study's work by chapter.

Background

Physical educators are tasked with educating students to promote and maintain their health. A physical education (PE) teacher's beliefs and perceptions impact what and how they teach. Therefore, it is essential to research PE teachers' perceptions of technology to determine whether to use it to meet students' needs.

This study was rooted in instructional technology and kindergarten through 12th-grade level (K-12) PE teachers' perceptions. Instructional technology is defined as "the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" (Januszewski & Molenda, 2013, p.1). In this study, instructional technology is referred to as instructional and educational technology.

According to prior research, how teachers perceive instructional technology affects how they implement and use it (O'Brien, 2021; Smith, 2021). In 2018, Kahl researched K-12 PE teachers' perceptions of instructional technology use in their classes. Results indicated challenges in implementing instructional technology. Specific results included challenges keeping up to date with new software and hardware, funding technology, and lack of training on instructional technology. The results also shared the benefits of implementing instructional technology. The benefits included reinforcing student learning and fortifying teacher effectiveness. Kahl's study was completed prior to the COVID-19 school shutdowns. When COVID–19 hit the world, and schools were closed to prevent the spread of the virus, teachers were forced to utilize instructional technology to continue student education.

Historically, PE did not require instructional technology; instead, it emphasized the importance of physical activity and movement for students (Ennis, 2017; Ho et al., 2018). Guidelines, standards, and benchmarks for instructional design in PE are often based on information provided by the Society of Health and Physical Educators (SHAPE America, 2013). This group provides critical guidelines (Chriqui et al., 2019) for high-quality PE programs. While SHAPE America (n.d.a) has mentioned instructional technology use, as of 2023, they were updating their guidance towards the best practices after the forced use of instructional technology during the COVID-19 stay-at-home orders. The new standards are scheduled for release in 2024.

Statement of the Problem

COVID-19 forced teachers to use technology to provide education to their students. Consequently, students had to utilize technology to receive their education from

their teachers. The result was an increased use of technology by students and teachers. Technology increased sedentarism in students (Chandrasekaran & Ganesan, 2020; Kelly, 2022), which impacts student health and physical education. Since technology has a broad presence in teachers' and students' lives, it is critical to understand PE teachers' perceptions of instructional technology use in their courses.

The broad presence of technology has resulted in students spending a great deal of time with technology (Korhonen, 2021; Strasburger et al., 2013; Wagner et al., 2021). Kemp (2020) reported that two million more people were using technology, and the Parents Together Foundation (Ritchie, 2020) reported a nearly 500% increase in time use of technology by kids after the onset of COVID-19. Much of the time students spend using technology is done in a sedentary state. That sedentary lifestyle goes against one of the critical areas physical educators are tasked with: activity is critical to wellness. A fundamental problem is knowing if and how physical educators perceive instructional technology for developing physically literate students (Kahl, 2018, p. 2).

The PE teacher's perception and beliefs regarding technology can impact how and if technology is used in PE classes (Kim et al., 2013; Shifflet & Weilbacher, 2015; Smith, 2021). O'Brien (2021) found that teachers' perceptions are underrepresented yet critical because teachers are primarily responsible for selecting educational tools and strategies. Ertmer's (2005) work also revolved around how teachers' perceptions impact their pedagogy. Since it has been reported that most students spend over six hours a day utilizing technology (Perrin & Atske, 2021; Ritchie, 2020), it is important to research PE teachers' perceptions regarding the use of instructional technology. Technology can enhance education and has become entwined in the core subject curriculums; however,

PE, as a whole, appears to have some catching up to do when it comes to integrating technology (Armijo,2016; Gallagher, 2020). A physical educator is responsible for teaching students how to be healthy and maintain that health. Researching and learning about PE teachers' perceptions of using and implementing technology is critical for learning the potential impact on student education. Following the integration and technological push that the COVID-19 pandemic caused, physical educators are now, more than ever, in a position to share how they have integrated technology into their classes and how they feel it impacted their programs in today's educational environment (D'Agostino et al., 2021; Mercier et al., 2021).

Wyant et al. (2021) and Kahl (2018) recommended expanding the research regarding K-12 PE teachers' perceptions of technology use in their classrooms. COVID-19's forced utilization of technology in PE while schools were shut down presents an opportunity to update and share these perceptions. This can help shape the future of technology in PE. This study sought to expand research on PE teachers' perceptions of instructional technology use.

Purpose of the Study

The purpose of this phenomenological study was to explore K-12 physical education teachers' perceptions towards instructional technology, examining their integration strategies and the perceived support and challenges. Additionally, the study compared contemporary teacher perceptions with previous findings to assess similarities and differences. More specifically, the researcher examined various aspects of the experiences of K-12 PE teachers with instructional technology: (a) the perceptions K-12 PE teachers have regarding the use of instructional technology; (b) the methods K-12 PE

teachers employ to integrate instructional technology into their practice; (c) the perceptions K-12 PE teachers hold concerning encouragement for or barriers to the use of instructional technology PE teachers; (d) the differences between K-12 PE teachers' current perceptions and those reported in Kahl's 2018 study.

This necessary examination could establish a foundation for implementing practices by conducting interviews with K-12 PE teachers. It aimed to gain updated insights into the utilization of instructional technology following the COVID-19 shutdowns. This researcher focused on studying K-12 PE teachers in Kansas, replicating Kahl's 2018 study, which has the potential to address this imperative.

Significance of the Study

Although the objective of qualitative studies is not to generalize findings, they can still be used to draw inferences by assuming that trends or current practices will persist or remain relevant. This study provided updated and diverse information for stakeholders on the continued use and application of instructional technology in PE.

As mentioned, this study updated and broadened Kahl's (2018) research but was significant for several additional reasons. First, it was designed to assist PE teachers in identifying why and how instructional technology impacts physical education. Second, the results can help determine how PE teachers adapt or revise their curriculums and adjust their budget toward instructional technology. A third significance is that the study may also provide data that aids PE teachers and administration in the application and reception of grants. The examination of perceptions from PE teachers may provide stakeholders insight into how best to support the PE department's instructional technology needs. This study's results allow administration and PE teachers to come

together, using the information in this study to guide strategic planning and missions for school districts. Finally, the results of this study can assist in preparing students in higher education teacher preparation programs by guiding the use of instructional technology in teacher training.

Delimitations

Delimitations are self-boundaries set by the researcher. They describe the parameters established for the investigation (Lunenburg & Irby, 2008). This study had three delimitations: instrumentation, population, and interview protocol.

The first delimitation was instrumentation. Following Kahl (2018), the researcher interviewed PE teachers to understand their perception of technology use in PE. Kahl (2018) recommended this additional research to enhance knowledge surrounding technology implementation in PE. A second delimitation was the population. Kahl's (2018) study focused on PE teachers in a section of New York as participants. This study focused on PE teachers in Kansas. The researcher attempted to minimize the limitations associated with the research design. To compensate for limitations in accessing participants, the researcher used purposive and convenience sampling, which involves selecting participants who are already known to the researcher or are currently available. The third delimitation was the modification of Kahl's (2018) interview protocol. Kahl's study was completed before the COVID-19 shutdowns, which increased technology use. The researcher of the current study modified the interview protocol to include PE teachers' perceptions on whether or how technology use changed when returning to in-person instruction due to the COVID-19 shutdowns. Additionally, some of Kahl's

questions, such as demographic information, were irrelevant to this study's purpose, such as demographic information.

Assumptions

Assumptions are defined as "the postulates, premises, and propositions that are accepted as operational for the research in question" (Lunenburg & Irby, 2008, p. 135). For this study, several assumptions were made. Firstly, it was assumed that the participants fully understood the interview questions. Secondly, it was assumed that the participants answered the questions truthfully. Thirdly, the researcher assumed that the participants accurately described their perceptions. Lastly, it was assumed that the data collected was unbiased and provided answers to the research questions.

Research Questions

Kahl (2018) guided this current study's research questions.

RQ1

How do K-12 physical education teachers perceive instructional technology use?

RQ2

How do K-12 physical education teachers integrate instructional technology into practice?

RQ3

How do K-12 physical education teachers perceive encouragement or barriers to using instructional technology by K-12 physical education teachers?

RQ4

How do K-12 physical education teachers' current perceptions vary from Kahl's 2018 study?

Definition of Terms

Words often have multiple meanings or are only familiar to specific genres. To provide clarity, the researcher provided the following definitions to support and frame the study.

Instructional technology

Instructional technology is defined as "the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" (Januszewski & Molenda, 2013, p.1).

Pedagogy

Alexander (2008) argued that pedagogy is the act of teaching combined with thoughts, ideals, and beliefs that inform and sustain that teaching.

Perception

According to McDonald (2012), perception is an individual's view. It is closely aligned with beliefs and practices (Ertmer, 1999).

Physical literacy

SHAPE America (n.d.b) states that Physical literacy is the desire, ability, and confidence to be physically active in a way that benefits the healthy development of the whole person.

Technological Pedagogical Content Knowledge

Technological Pedagogical Content Knowledge (TPACK) is a conceptual framework that supports the importance of technology and provides insight into its use (Mishra & Koehler, 2009).

Organization of the Study

This research is organized into five chapters. Chapter 1 introduced the study and included background information, the statement of the problem, the study's purpose and significance, the delimitations and assumptions, the research questions, and definitions of terms that occur throughout the study. Chapter 2 is a literature review relevant to the study. It includes a definition of instructional technology and provides the conceptual and theoretical frameworks that support the study. Chapter 3 pinpoints the methods used for this research to investigate the phenomenon. It includes the overall research design, the setting and sampling procedures, the instruments and data collection procedures, the data analysis and synthesis processes, the procedures used to guarantee the study's reliability and trustworthiness, the researcher's role in the study, and the study's limitations. Chapter 4 provides the findings from the study, including descriptive information. Finally, Chapter 5 summarizes the study, including results and recommendations for future research. The results and recommendations include the study summary, purpose statement, research questions, methodology, and significant findings. Chapter 5 closes with a conclusion, implications for action, recommendations for future research, and concluding remarks regarding the use of technology in PE.

Chapter 2

Review of Literature

The literature review begins with the definition of instructional technology. A conceptual framework using technological, pedagogical, and content knowledge (TPACK) follows the definition to clarify how technology can best interface with education (Mishra & Koehler, 2009). The third section of the literature review shares research on instructional technology throughout school (outside PE), followed by student use of technology. After that, the focus is narrowed to instructional technology use in PE. Finally, to help clarify what impacts instructional technology use, this chapter includes a section on factors and barriers and a section on professional development.

Instructional Technology Defined

Instructional technology is defined as using technological tools to guide learning and increase student efficiency (Cox & Graham, 2009 a, b; Januszewski & Molenda, 2008). Mitchell's (2021) definition added that instructional technology advances curriculum standards and course benchmark delivery. Finally, O'Byrne et al. (2021) added that instructional technology is a systematic approach to filling a specific area of knowledge while using appropriate technology. All of these definitions imply increased efficiency in learning with the appropriate use of technology.

Instructional and educational technology share similarities in terms of utilizing technology, guiding learning, and aiming to improve performance. However, instructional technology primarily focuses on tools for advancing course delivery and content knowledge (Koehler, 2012; Mitchell, 2021), while educational technology emphasizes tools for enhancing performance (Kurt, 2017). Singh (2019) described the

differences simply as instructional technology being the tool and educational technology being the manual for applying the tool. The definitions are comparable enough to cause interlacing of the terms, leading to literature defining instructional and educational technology similarly (Januszewski & Molenda, 2008).

Now that instructional technology has been defined as facilitating learning and improving performance using technological tools, it is beneficial to understand a conceptual framework for using instructional technology. The following section provides an overview of the Technological Pedagogical Content Knowledge (TPACK) framework.

Conceptual Framework

The conceptual framework identified for this study is the Technological Pedagogical Content Knowledge (TPACK) framework, which supports the importance of and insight into technology use, including physical educators' use (Mishra & Koehler, 2009). The TPACK framework effectively guides teachers in integrating technology into curricula (Cox & Graham, 2009 a; Harris, 2008; Mishra & Koehler, 2009). The core concepts of TPACK include Content, Pedagogical, and Technological Knowledge and their interactions with each other (Harris, 2008; Mishra & Koehler, 2009). As explained by Koekoek and Hilvoorde (2018) and Harris et al. (2010), the TPACK framework outlined three things; the first identifies the learning outcomes or content of the lesson. The second determines activities or pedagogy used for teaching and learning the content. Finally, the third is where technologies are chosen to support the activity type and aid learning and teaching.

Green (2017) gathered data by applying the TPACK survey to over 250 Georgia educators. Utilizing a 50-question TPACK survey and a K-means cluster analysis, three

profiles emerged: a) High-TPACK, b) Mid-TPACK, and c) Low-TPACK. A chi-square test revealed that student achievement differed significantly across the three clusters. A score of $\chi 2(8) = 15.851$ with $p=.045$ was because the students with a High-TPACK teacher performed at a higher level on standardized assessment. The results of the study showed that teachers with a strong understanding and integration of Technological Pedagogical Content Knowledge (high TPACK level) have students who perform higher on standardized tests such as the Criterion-Referenced Competency Test (CRCT) and the local End of Course Tests (EOCT) (Green, 2017). These tests were the measures of student achievement. The impact of TPACK shared through Green's (2017) study reinforces why it is important to understand and utilize this framework.

The TPACK framework defines three categories of knowledge and how those categories intersect (Bradshaw, 2021). The first category of TPACK is content knowledge. It is the level of understanding regarding the subject matter being taught (Bradshaw, 2021). This level includes familiarity with concepts, theories, frameworks, knowledge and proof of evidence, and ways to develop that knowledge (Koehler, 2012). Once the teacher knows what content is being taught, they must apply pedagogical knowledge to implement how it will be taught.

The second component of the TPACK framework is pedagogical knowledge, which includes understanding and implementing instructional and training methods along with teaching and learning practices (Bradshaw, 2021; Koekoek & Hilvoorde, 2018). Pedagogical knowledge can be defined as the act of teaching combined with thoughts, ideals, and beliefs that inform and sustain that teaching (Alexander, 2008). Self-examination for a teacher looking at this component would require them to reflect on and

answer how their students learn best, what instructional strategies are needed to meet their needs, and what is needed to meet the lesson plan requirements (Falasz, 2022).

The final component is technological knowledge; this category is the comprehension of technology, its tools, and its resources. Understanding technology means many things, including understanding accessible and appropriate apps, utilizing a management system, using the internet to research ideas for meeting standards, and emailing or having video discussions with peers and experts (Koekoek & Hilvoorde, 2018). Comprehending technology can also mean understanding the computer hardware that can be used; for example, how to get and use a wireless connection, display images on a large screen, or troubleshoot technological problems. In other words, a teacher must understand technology for finding, collecting, and documenting, but they must also understand how technology works to share information with their students. These skills can be crucial for effectively integrating instructional technology. The TPACK framework highlights the importance of understanding the technology before integrating it into content areas. It reminds us that it is not just a matter of adding technology. Technology, pedagogy, and content must be entwined and overlapped. The TPACK framework includes four areas of overlap; the pedagogical content area, the technological pedagogical area, the technological content area, and the area where all three – technological, pedagogical, and content knowledge areas overlap in the center of the Venn diagram.

The first overlap lies in pedagogical content knowledge. According to Shulman (1986), pedagogical content-designing instruction is based on the student's existing knowledge. This area encompasses best practices for learning in a particular course. The

second overlap involves the fusion of technological and pedagogical knowledge. It combines an understanding of technology, its role in achieving the desired learning outcomes, and its potential impact on teaching (Falasz, 2022; Koekoek & Hilvoorde, 2018). The third overlap is referred to as the technological content knowledge area. This area uses technology to enhance learning and improve content delivery (Falasz, 2022). Finally, the center of the TPACK framework model visualizes how all areas of the technological pedagogical content knowledge overlap. This area recognizes that content, pedagogical, and technological knowledge impact each other. All three areas must be critically considered when designing technological instruction.

According to Gibbone et al. (2010), understanding perceptions of physical education teachers' technology use can provide helpful information for practitioners and administrators. Gibbone et al. (2010) cited Lee and Solmon's (2005) belief that perceptions provide an understanding of teachers' decisions. Teachers' decisions reflect technological, pedagogic, and content knowledge (TPACK) levels. Gibbone et al. (2010) investigated 616 secondary physical education teachers' attitudes and practices regarding technology use via survey data. Results conveyed that PE teachers had positive attitudes but limited use of technology, which can impact how practitioners and administration direct the use of TPACK and instructional technology integration.

The TPACK framework emphasizes the significance of technology usage. However, a qualitative study by Werner (2020) involving 57 health and physical education teachers revealed that mastery experiences and social persuasion during physical education teacher education (PETE) programs could influence teachers' perception of self-efficacy in integrating technology. The study utilized a 5-point Likert

scale survey conducted via email, with participants rating their success in integrating technology based on their own experiences. These results show that experiences utilizing instructional technology impact TPACK growth.

In order to extend a clear understanding of the need to examine PE teachers' experiences and perceptions, the researcher broadened this literature review to include work from multiple areas in the field of K-12 education regarding instructional technology. The literature review also includes student technology use and its ties to student health and PE. Finally, the literature review includes the evolution of instructional technology use in PE, factors and barriers to implementation, and professional development needs.

Instructional Technology Research: K-12

Instructional technology impacts all areas of education (Williams, 2013). Research specific to K-12 PE is limited. Due to the limited research literature specific to instructional technology use by K-12 physical educators, this section will provide instructional technology studies from multiple K-12 areas to provide a more comprehensive understanding. Ascribing administrators' role in instructional technology and curriculum development funding, the researcher examined administration studies first. Next, studies that involved instructional technology use by elementary, middle, and high school groups will be shared. Content area studies will follow the grade-level group research, and then the literature review will share what has been found regarding students and their use of technology. Next, the researcher will narrow the literature exploration to share what has been found regarding K-12 physical educators. The chapter continues

with research literature regarding factors and barriers to instructional technology use and then concludes with the importance of professional development.

To present a comprehensive overview of K-12 instructional technology use, the researcher began at a broad level, including studies examining K-12 level administrators' perceptions of instructional technology. The administration often dictates how and where funding for instructional technology is applied. They can also influence how and what instructional technology is applied to courses. Therefore, it is impactful to understand the perceptions of the administration concerning instructional technology use.

According to Obert (2022), administrators have a crucial impact on instructional technology use. Loor's (2021) interviews of four Long Island, New York administrators reflected that leaders must support teachers' growth by providing time to work with peers and coaches regarding technology use. Over half of the administrative participants identified that leadership must include modeling expectations, practicing continuous learning, and providing for instructional technology needs (e.g., computers and Wi-Fi).

An additional administration study was conducted by Richardson (2022). The study of ten K-12 school principals from the Southern US complemented Loor's (2021) results, as all of Richardson's participants reported providing funding to support technology. Moreover, Richardson's participants attested to implementing leadership practices that supported the integration of instructional technology and incorporated it into the school's mission.

While the research has revealed positive results, the need for perceived improvement among administrators was also found. A study by Fan (2021) included interviews with two Colorado principals and an assistant principal as part of a qualitative

study exploring stakeholders' perceptions of technology use in PE. The results revealed that the administration needed an understanding of PE programs. The study went on to identify a need for more personnel support, resources, finances, curriculum clarity, and teacher professional development.

While understanding perceptions of administration provides knowledge and a broad view of instructional technology perceptions from the management level, it is vital to consider teachers' perceptions. Teachers are critical to the application of instructional technology in the classroom. Several research-based articles have focused on using instructional technology in different grade-level groups. The following section explores literature that examined the perceptions of elementary, middle, and high school staff regarding instructional technology use.

Beginning with elementary research, Smith (2021) surveyed 94 southern Alabama elementary teachers' perceived behaviors toward instructional technology use. They used a quantitative correlational research design to study the level to which the unified theory of acceptance and use of technology (UTAUT) concepts influenced elementary teachers' behavior and intentions to utilize technology in their instruction. The quantitative correlational results indicated a significant relationship between the participants' perceived behavioral instructional technology intentions and their effort, performance, and social influence. The performance expectancy ($p = .000$) significantly predicted an elementary teacher's behavioral intentions to use technology.

Several elementary grade-level studies showed a perceived need for professional development (Edwards, 2021; Mitchell, 2021; Moore, 2022). Mitchell (2021) surveyed 79 South Carolina-certified elementary teachers, then conducted face-to-face interviews

with 12 of those teachers. Results revealed that elementary teachers had positive attitudes toward instructional technology use even though 33% of those interviewed felt that more professional development was needed. One of the 12 interview participants felt professional development should be more convenient and conducive to effective technology development. Furthermore, Mitchell's survey results noted a perceived need for additional time to practice using instructional technology. These perceptions reflect the TPACK framework, which emphasizes understanding the best use of technology and pedagogy within the instructional content.

The middle school studies also reflected the need to consider TPACK. Like the elementary level studies, professional development and time were also identified as perceived needs at the middle school level (Groves, 2021) study. The Groves study interviewed five Missouri middle school teachers individually then in groups to identify teacher perceptions of technology integration. All middle school teachers in this study mentioned time and professional development as needs for instructional technology use. Drinkard's (2022) study also identified the perceived need for professional development to increase comfort levels regarding implementing instructional technology. Drinkard studied six south central Texas middle school teachers through surveys, observation, and interviews. The researcher also analyzed the six teacher's lesson plans. All six participants stated the need for more professional development. Time was also mentioned in this study, through the need for more time to learn and implement technology.

Working with peers and coaches was an additional need perceived at the middle and high school levels. Pepperman (2021) and Groves (2021) both identified a preference for middle school teachers to work with peers and coaches to build confidence in

instructional technology use. Pepperman's study utilized an online ten-question questionnaire that was answered by 33 participants located in the Southeastern US. Groves' participants were from the central US. Groves (2021) interviewed ten high school teachers regarding their perceptions of instructional technology.

Additionally, Groves (2021) and Deeley (2021) found that high school teachers perceived peer support and professional development as necessary in embracing instructional technology use. Groves collected data from ten participants using individual and group interviews. Deeley had 25 participants from Virginia answer a questionnaire and then did an additional semi-structured interview with 10 participants from the group.

Yarborough (2021) also studied high school teachers' perceptions. They conducted a semi-structured interview of 12 South Carolina high school teachers, revealing that they perceived barriers to Internet access and teacher technology as preventing implementation. The teachers in the study also felt that support and professional development allowed for successful implementation. These results are significant as they provide information to help eliminate perceived barriers to instructional technology use.

While research in elementary, middle, and high school classroom studies indicated a desire for additional professional development in technological, pedagogical, and content knowledge (TPACK), it is essential to consider research from other areas of education to highlight the existing gap regarding instructional technology use among K-12 PE teachers. The following section will continue this reinforcement by sharing research on instructional technology use within specific K-12 content areas.

Two studies on instructional technology perceptions in specialized classrooms

examined uses in math (Faulknor, 2022) and social studies (Hanshaw, 2021). Faulknor's (2022) qualitative study, which used semi-structured interviews with six math teachers, showed a willingness to use instructional technology. However, perceptions revealed that professional development was needed to advance implementation abilities. Hanshaw's (2021) single descriptive case study examined middle school social studies teachers' instructional technology implementation based on professional development. Results showed that participants believed technology improved instruction and student experience but needed more professional development. Both studies bring awareness to the need for TPACK, emphasizing technological knowledge.

Katowitz (2021) conducted a study with 280 special education teachers from 42 states after the start of the COVID-19 school shutdowns. The participants shared their TPACK perceptions through a 42-item Likert scale questionnaire. Results found that special education teachers perceived they were technically skilled but needed preparation, training, and pedagogy regarding technology use.

Jimenez-Johnson (2021) used interviews to study the perceptions of 15 urban middle school specialized English language (ELL) teachers. Their study explored how ELL teachers felt technological devices influenced academics. The results stated that technological devices were perceived as practical tools. However, it was again found that professional development is critical to ensure the technical, pedagogical, and content knowledge areas.

O'Brien (2021) studied teachers' perceptions of instructional technology use to support positive student behavior. Gamification, a form of instructional technology that teaches through games, was the focus of the instructional technology used in O'Brien's

study. The results from a survey of 129 elementary, middle, and high school teachers shared teachers' perceptions that some gamification strategies support positive behaviors. The participants believed that perceived ease of use and familiarity with gamification strategies could also impact use.

These studies expanded the literature background regarding perceptions of instructional technology use in schools from specific content areas. The course studies revealed the desire for additional professional development in instructional technology, and several studies identified the need for pedagogical, content area, and technological support.

Examining how technology impacts students is imperative because instruction is only necessary with students. The following section shares what the literature reveals regarding students and their use of technology.

Student Use of Technology: The Impact

Physical education teachers provide health education to students, often through exposure to physical activity. Quality physical education should build on the student's current physical activity and literacy level. The pandemic impacted activity levels as it bolstered the need for daily use of technology. A national survey before the pandemic by the Erikson Institute (2016) reported that 85% of parents surveyed allowed their young children to watch television and use tablets, smartphones, and computers. Most of those parents (72%) also voiced concern about a lack of activity due to technology use. After the pandemic started, technology availability and use continued, along with concerns regarding sedentaryism or the lack of physical movement. KewalRamani et al. (2018) stated that a US Department of Education survey revealed that 94% of children and

adolescents aged 3 to 18 lived in homes with computers. In a survey of educators, Murray (2013) found that 75% said technology was key to classroom content. A report by the U.S. Census Bureau (McElrath, 2021) stated that over 90% of US students have access to technology for educational purposes. Kelly (2022) stated that by the age of four years old, 75% of children have their own mobile device, and over 92% of nine- to eleven-year-old children exceed the American Academy of Pediatrics recommendations for internet media use. Time spent with technology is often a passive activity. Students must move to be healthy. Sedentaryism or lack of physical activity can lead to adverse health issues like obesity, cancer, and diabetes (Constantin, 2019; Kelly, 2022).

According to Constantin (2019) and Kelly (2022), physical activities benefit the body and fight the negative impacts of sedentaryism. Constantin's article on the Effects of Sedentarism on the Human Body states that society will become filled with more health problems without education and examples demonstrating how to change sedentary behavior. Constantin's peer-reviewed article synthesized how sedentarism impacts people. They shared information from the World Health Organization, which stated that one in four adults did not get enough physical activity. He states that the examples adults set impact how children will behave. Therefore, Constantin feels that active education from adults is needed to change sedentary behavior.

Recent research has highlighted the significant amount of time students spend using technology (Kelly, 2022), underscoring the importance of integrating technology in PE. However, there needs to be more research literature focusing on the perceptions of K-12 PE teachers regarding instructional technology use. The following section shares information regarding the progression of instructional technology use and aims to shed

light on the evolution of instructional technology use in PE, reinforcing the need for updated research.

Evolution of Physical Education Use of Instructional Technology

The use of instructional technology in PE is not new. This section begins with a timeline of technology integration in PE, then a list of current trends. Next, COVID's impact is explored as an extension of the evolution of technology in PE.

The timeline research found that technology could be found in PE in the 1970s. According to Kahl (2018), one of the earliest instances of its pedagogical impact in PE dates back to the 1970s and 1980s when fitness scores were input into computers to generate reports. Despite establishing the Youth Fitness Test in 1957 (Wallace, 2015), PE teachers only started utilizing this technology towards the end of the 20th century (Lumpkin, 1985). However, apart from these early fitness reports, the integration of instructional technology faced resistance within the field of physical education (Wyant et al., 2021).

A study by Wyant et al. (2021) showed the resistance to technology use by reporting that over 90% of the 63 physical educators in their mixed-method study preferred using their experience as their preferred resource. Eight participants from 18 US states participated in a survey and were recruited for a follow-up interview that reinforced the resistance to technology use.

As PE evolved after the printing of fitness tests, other digital and electronic technology devices, like cassette tape players, became more prevalent in PE classes in the 20th century. However, research from the 1920s through the 1990s focusing on the use or perceptions of PE teachers utilizing technology is nonexistent. This lack of literature

reinforces the gaps in how K-12 PE teachers described their instructional technology usage in instructional settings and how PE teachers incorporated it into their instructional practice (Kahl, 2018). It also reinforced the belief that PE was slow to integrate instructional technology (Villalba et al., 2017).

An older study that identified the slow integration of instructional technology in PE was conducted by Bennett-Walker (2006). They surveyed 181 Georgia elementary, middle, and high school physical education teachers. Their Likert-scaled survey questionnaire assessed PE teachers' technology use and barriers that prevent technology use. The results reported that technology use in PE was not statistically significant, noting that over 60% did not attribute the lack of use to a lack of desire.

By 2009, Gibbone's study of 616 middle and high school PE teachers from 42 states found that just over 30% of the PE teachers in their study felt they extensively applied technology. The study shared that a 36-item online questionnaire was developed specifically for their research to measure teachers' attitudes and technology use. The results found limited use of technology. Gibbon et al. (2010) stated that PE-specific technology was available but rare in physical education.

As technology and time evolve, Kretschmann's (2015) study surveyed of 57 high school PE teachers. They discovered that most PE teachers did not use technology in PE instruction. The data revealed that personal computers, laptops, and the internet were disregarded regarding integration into PE classes. However, they found that the greater the participant's technological understanding, the more likely they were to incorporate technology. While Kretschmann's study reinforced that technology use in K-12 PE was slow for standard use, that same year, Baert (2015) published literature providing

developmentally appropriate technology for students to gain movement competency according to PE National Standards and grade-level outcomes. Baert's literature supports the idea that PE was continuing its technological evolution.

In 2016, Armijo interviewed five experienced, certified PE teachers. One of the PE teachers was from the elementary level, two from the middle school level, and two from the high school level. The three-phase interview process reinforced the limited use of technology in PE by reporting that over 50% of the teachers interviewed tended to avoid technology.

In 2017, Villalba et al. studied 400 secondary education PE teachers from Spain using face-to-face standardized interviews to analyze the perception of PE teachers regarding obstacles to integrating technology. Their study reinforced the Gibbone et al. (2010) study that stated technology in PE has been slow to be accepted and integrated. The results of Villalba et al. identified the following barriers to technology use: loss of physical activity time, lack of resources, investment in time and training, unsuitable use, lack of knowledge, and technical problems.

In 2018, Kahl's study using 12 K-12 PE teachers from the Long Island, New York, area reported and reinforced resistance to the frequent use of technology. Fifty-seven percent of the PE teachers in Kahl's study stated in their one-to-one interviews that they used technology infrequently or not at all.

In 2021, a Wyant et al. study including 63 K-12 PE teachers from 18 US states reported that all participants used online resources. However, the data from their surveys and interviews showed that over half of the participants still preferred to rely on their own experiences over other (technology-based) sources.

While the evolution of integrating instructional technology in PE has been slow, many physical education groups have supported instructional technology use. For example, the National Association for Sport and Physical Educators (2009), the Online Physical Education Network (OPEN, 2022), and SPARK (M. Gilliland, personal communication, August 1, 2022) all believed that appropriate use of technology should supplement instruction, not be a substitute for effective instruction. OPEN and SPARK have provided many opportunities to utilize instructional technology (M. Gilliland, personal communication, August 4, 2022; M. Gilliland, personal communication, August 1, 2022) in PE instruction.

Franks (2019) and Kahl (2018) also studied PE instruction utilizing instructional technology. They specifically discussed instructional technology apps that educators and students could use. Franks' article explained two apps (Kahoot and MetricMe) a physical education teacher could use to collect student data. Franks felt instructional technology could be used to improve assessment accountability. Kahl's study provided apps mentioned during the interviews, such as Facebook, Twitter, Fitness Pal, and YouTube.

Other articles, such as Bennett-Walker (2006), Juniu (2011), and Cox et al. (2020), provided many suggestions on how teachers can use instructional technology to meet standards, including using apps, videos, and search engines. The Bennett-Walker (2006) research listed the top five technology uses as CD/tape players, stopwatches, internet searches, computers (for preparation), and videos. Juniu (2011) listed instructional technology that could help meet national PE standards, including video, internet, real-time data collection devices, and hand-held computers/tablets. Cox et al. (2020) also listed ways to use technology to meet national PE standards. They provided

over 30 suggestions. Their list included using skills analysis apps, video cameras, physical activity trackers, Flipgrid - a mobile application that can be used outside of class to promote or maintain physical fitness or health, online discussion boards, social media, electronic portfolios, researching an activity or sport, using the internet to explore and develop lessons and hand-outs, finding ways of making equipment accessible, heart rate monitors, data collection and analysis, Geocaching, and collaborating via video, email, or other platforms.

The evolution of instructional technology has been slow in the past, but it is evolving, and trends show that it will continue to impact PE. According to Kahl (2018), the 21st-century PE environment is well-suited for instructional technology. Physical education programs are being rethought and reformed with instructional technology in mind. This shift in practices was evident during the 2010 Global Forum for Physical Education Pedagogy conference, where the use of instructional technology in teaching physical education was examined (Edginton et al., 2011). Subsequently, the 2014 Global Forum for Physical Education Pedagogy conference identified instructional technology as a best practice for physical education (Edginton et al., 2011). The Society of Health and Physical Education (SHAPE America, 2013), along with two of the most popular PE websites, PE Central (n.d.) and the Online Physical Education Network (OPEN) (2022), have all included greater technology use opportunities (including lesson plans) in their programs as a current trend. Kahl (2018) stated that instructional technology can increase activity and improve instruction and assessment. The trends they found included using mobile devices to record movement and food intake, active gaming technology workouts,

and social media to learn about PE. Kumar and Singh (2019) and Yu (2020) also identified the trends in PE using mobile devices and gaming.

More recently, a publication, *Emerging Trends of Physical Education and Sports Science* (Singh, 2022), shared trends in PE from multiple articles. An article by Rao (2022) mentioned several instructional technology trends in PE. Rao (2022) stated that video, projectors, cameras, and phones allow students to observe errors and correct forms for movement skills. Kumar and Singh (2019) and Höger and Kleiner (2022) also identified video recordings as a trend in their literature. Rao went on to identify social media (Twitter and podcasts) as ways to share skills, lessons, and ideas globally. Montiel-Ruiz et al. (2022) and Siedentop and Mars (2023) reinforced the social media trend in their literature.

Montiel-Ruiz et al. (2022) collected data using 10 PE teachers and 56 students. Through interviews and focus groups, the results showed positive reactions to applying the trends of social network use for communication, collaboration, and physical activity promotion. Siedentop and Mars (2023) provided an example of US PE classes linking up via social media with host countries during the Olympics to discuss events. They also stated that social media is a powerful means of learning about and staying current with other trends.

Next, Rao's article also mentions the iPod Touch for activities like Geocaching and games that evaluate speed. Other trends mentioned included using learning platforms to submit assignments, social networks, and gaming products like Xbox Kinect, which has activities like dancing or Zumba. Technology gaming was also identified as a trend in

literature by Kumar and Singh (2019), Yu (2020), Comeras-Chueca et al. (2022), and Montiel-Ruiz et al. (2022).

Another article in *Emerging Trends of Physical Education and Sports Science* (Singh, 2022), titled Evaluating Academic Performance of School Childrens Through Physical Education Integrated Machine Learning (ML) Approach, studied artificial intelligence (AI) in PE (Poyyamozhi & Balaji, 2022). The article provided research on PE technology where AI could be used, including personalized PE and student evaluation. The literature showed that AI could be implemented in PE to provide knowledge provision and counseling techniques for students. (Poyyamozhi & Balaji, 2022).

Finally, an article by Kishore and Pungding (2022) presented information about hybrid learning. This trend was also mentioned by Wang et al. (2023). Hybrid learning includes face-to-face, online, and offline learning. The Kishore and Pungding study looked at Quadruple Quadrants and Flip Learning. The Quadruple Quadrants are e-video, e-content (visual diagrams), description and discussion, and assessment (through video). These tools can be used to observe, read, and discuss how an accurate performance looks. Students can also video themselves and others performing skills as a form of assessment. Flip Learning occurs when the lesson's core is provided for students to explore outside class time (usually via instructional technology). Reinforcement and feedback are shared during class. In other words, schoolwork is done at home, and homework is done at school. For example, students would be asked to watch videos regarding a motor skill on their own time, then the information learned from the video is performed with feedback during class. Kishore and Pungding's (2022) study aimed to determine whether educators

and learners could find advantages to the instructional technological utilization of Quadruple Quadrants and Flipped Learning. The results showed that utilizing these instructional technology trends would positively impact motor learning.

The impact of COVID-19 on instructional technology and K-12 PE is another research area that deserves exploring. Studies of K-12 PE teachers' perceptions before and after the COVID-19 strike can also provide background on why this study was necessary. The following section will review the literature regarding instructional technology use in PE before and after the onset of COVID-19.

Before the closing of schools due to COVID-19, few studies included K-12 physical educators and their perception of instructional technology. A study conducted by Bennett-Walker (2006) focused on technology use among 181 K-12 PE teachers in Georgia public schools. While over 90% of the teachers surveyed in this study shared that their use of technology included computer use for lesson preparation and internet use to gain information. However, less than 20% perceived their use of technology to include computer use during lessons and instruction.

Gibbone et al. (2010) conducted a study using instructional technology by 616 physical educators from middle and high school teachers. The researchers found that over 90% of the teachers in this study used a computer for work. However, nearly 70% self-assessed their application level of instructional technology as less than extensive.

A study of physical educators and their perception of instructional technology while teaching at a K-12 level was conducted by Hill and Valdez-Garcia (2020). The study surveyed 201 physical educators' perceptions regarding accessibility to instructional technology, the availability of technical support, and obstacles to using

instructional technology in their classrooms. Their results showed that over 80% of the participants had access to computers and projectors, but over 20% needed instructional technology connected to the internet in their classroom. Hill and Valdez-Garcia (2020) did not specifically identify how much PE teachers used instructional technology. However, their study did share that most participants felt they needed more technological knowledge (68.5%), incentives (67.8%), time (66.7%), and support regarding instructional technology integration (62.1%).

The studies cited in this section were conducted pre-COVID-19 and shared PE teachers' perceptions and openness to the use of technology. The studies also shared PE teachers' perceptions of needed help with barriers to accessing instructional technology, time, and support (Bennett-Walker, 2006; Gibbone et al., 2010; Hill & Valdez-Garcia, 2020). There is limited research literature regarding the perceptions of K-12 PE teachers' use of instructional technology before and after the pandemic. The following paragraphs broaden the understanding of what has been studied regarding perceptions of instructional technology use throughout the K-12 levels after the COVID-19 shutdowns.

Two studies were conducted on online PE during COVID-19. Foye (2022) and Jeong and So (2020)) conducted the research. Foye (2022) provided a follow-up study to Foye and Grenier (2021), which examined the experiences of 15 K–12 physical educators teaching online. The follow-up studied the same participants when the pandemic closed schools and identified lessons learned about online PE during the pandemic. The results included concerns that online physical educators did not have adequate training and perceived marginalization of PE content. Jeong and So's (2020) qualitative study examined six middle and high school PE teachers' experiences running online physical

education classes during COVID-19 in Korea. The data were collected through written journals, five individual interviews, and five group interviews. Results revealed that participants experienced significant confusion as they began online instruction, although the Ministry of Education and the municipal and provincial education offices provided training. The sudden shift to online classes due to COVID-19 left teachers unprepared and unfamiliar with the instructional technology teaching methods. Both studies stated that PE teachers' perceptions of online teaching included frustration with a lack of knowledge and training.

Other studies after COVID-19 regarding K-12 PE teacher perceptions of instructional technology were conducted by Butz (2022) and Stephens (2021). Butz surveyed 191 PE teachers and had four focus groups for their study regarding technology-based exergames. The results revealed that teachers perceived exergames as promoting physical literacy, motivating students' physical activity, connecting physical activity and student interests, and providing various physical activities.

Stephens's (2021) research used ten health/physical education teachers' perceptions through a qualitative interview process to identify data regarding the use of technology to prevent and reduce childhood obesity. Data showed that although most teachers perceived that technology could be used to prevent and reduce the incidence of childhood overweight and obesity, of the eight teachers who were comfortable using technology in general, only two teachers used technology for those purposes. Teachers in the Stephens study believed technology could be used and were willing to try it. Like data from the Foye (2022) and Jeong and So (2020) studies, Stephens' study also points out that lack of training is a challenge. While both post-pandemic studies revealed positive

perceptions of technological use, their studies only looked at specific, narrow forms of technology for PE courses through exergames and obesity prevention. Their dissertations show a need to provide an understanding of PE teachers' overall perceptions of instructional technology use after the pandemic's start.

Another area of literature reviewed by the researcher regarding instructional technology use in PE was the impact of factors and barriers. The following section presents the research and literature focusing on the more recent examinations and results, which can provide a background for answering this study's research questions.

Factors and Barriers that Impact Instructional Technology Use

Factors and barriers can impact perceptions. The literature regarding factors and barriers to technology integration in PE was clear. Finances were one such barrier. Lack of resources, specifically money, was a significant factor in preventing the use of instructional technology (Barroso et al., 2005; Bennett-Walker, 2006; Gibbone et al., 2010; Kahl, 2018; Wyant et al., 2021). Kahl's (2018) original study of ten physical educators from Long Island, New York, stated in their interviews that finances were the most significant barrier. One of the participants stated that the administration was supportive, but they did not have enough funding. They reported that lack of finances led to outdated technology and unstable WIFI and internet access in the gymnasium. The participants in Wyant et al.'s (2021) study of 63 surveyed PE teachers across 18 states shared their frustration with coming across resources that required payment. For example, some websites appear to have an exciting activity, but clicking on the activity leads to another page requiring a membership fee, which the PE teachers in the study did not feel was financially feasible.

Lack of finances could also be a contributor to the lack of support, which was another barrier that was mentioned often in the literature (Armijo, 2016; Barroso et al., 2005; Bennett-Walker, 2006; Gallagher, 2020; Gibbone et al., 2010; Hill & Valdez-Garcia, 2020; Kahl, 2018; Slutsky, 2016). For example, Hill and Valdez-Garcia's (2020) survey of 201 physical educators from the southern US revealed that over 20% of the participants needed more administrative support to obtain technology. Gallagher's (2020) literature review took a different approach to support as a barrier; their study revealed that technology could become a distraction and, therefore, may be perceived as not supportive of PE. Overall, support took on many forms, including lack of administrative importance for the PE department, lack of infrastructure in the gymnasium, lack of technical support, and lack of training. Lack of support can also include a lack of access to technology, a barrier revealed in the Hill and Valdez-Garcia (2020) survey of 201 physical educators.

Time was another frequently mentioned barrier to integrating technology in PE (Bennett-Walker, 2006; Gibbone et al., 2010; Hill & Valdez-Garcia, 2020; Kahl, 2018; Slutsky, 2016). The Bennett-Walker (2006) study revealed that fifty percent of their research participants felt that time was a significant barrier. The Hill and Valdez-Garcia (2020) study reported that testing took priority, reducing the time to incorporate technology.

Armijo (2016), Bennett-Walker (2006), Gibbone et al. (2010), and Kahl's (2018) studies all mention a lack of desire as a barrier to utilizing technology in PE. The studies ranged from 20% (Bennett-Walker, 2006) to over 50% (Armijo, 2016) of PE teachers who lacked the desire to incorporate technology. The Wyant (2021) participants stated

that they preferred to rely on their own experiences over technology. This lack of desire could impact teachers' willingness to incorporate technology into lessons (Williams, 2013).

Kohl and Cook (2013) said that good professional development is essential to ensure the continued delivery of quality physical education. In other words, inadequate professional development opportunities create barriers to quality physical education (Hardman et al., 2014). Gallagher's (2020) and Slutsky's (2016) literature state that teachers need help implementing technology, as reflected by the teachers' perceived need for more professional development. Gallagher's (2020) literature study listed a need for more professional development as a barrier to implementing technology based on Hyndman's (2018) article on the reasons teachers struggle with technology use. Slutsky's (2016) survey interviewed 21 rural southern US middle and high school teachers and revealed that professional development is essential and needs to be differentiated.

Finances, support, time, desire, and professional development are consistent barriers to implementing instructional technology. While money can help eliminate many barriers, desire is a barrier that money may not be able to break down. Another consistent barrier is the need for professional development. The literature review identified professional development as a common theme throughout the K-12 literature review process. Due to the significant number of study results revealing the need for professional development, the following section will examine professional development related to instructional technology use. While professional development is not the intent of this study, the literature review has revealed its importance and the need to address it.

Instructional Technology Use Related to Professional Development

Another focus for instructional technology use studies emphasized professional development's impact. The research available in this area is extensive and includes the following studies: Bowman et al., 2022; Drinkard, 2022; Gooditis, 2022; Groves, 2021; Hanshaw, 2021; Heberer, 2021; Hunt, 2022; Mitchell, 2021; Okoye, 2010; Wright-Bostic, 2021. The results of the studies support the perception that professional development regarding instructional technology is needed. Bowman et al.'s (2022) study of over 700 midwestern teachers revealed through an online survey that professional development might be most impactful when it targets values (perceptions) and improves instructional technology skills. Drinkard's (2022) research used an exploratory case study to survey six middle school teachers' perceptions of technology implementation in south central Texas. Their results also revealed the need for professional development to support the desired instructional technology implementation. Finally, Mitchell's (2021) study of 79 elementary school teachers from South Carolina revealed through survey data that more practice time and professional development were desired for technology integration.

Summary

By breaking down the literature, Chapter 2 has defined instructional technology as using technological tools to guide learning and increase student efficiency and has provided a background for understanding the TPACK conceptual framework. This Technological Pedagogical Content Knowledge (TPACK) framework is important because it supports the importance of and insight into technology use. After defining instructional technology and providing the TPACK conceptual framework, this chapter

provided literature that offered background towards the need for an update regarding K-12 PE teachers' perceptions of technology use in their classrooms, the literature review provided background by sharing instructional technology research from multiple K-12 education areas. Next, the chapter shared literature regarding the impact of technology use on students. After revealing the concerns about technology use by students, the chapter gave the evolution of technology use in PE. Next, the literature review provided factors and barriers to instructional technology use. While studying the literature reviewed, a theme developed and revealed a perceived need for professional development. Consequently, the researcher included additional research findings regarding professional development as it applies to instructional technology use.

This chapter shared an in-depth background and need for further research. The following chapter will provide the methods employed to complete this study. The methods chapter will include the research design, setting, sampling procedures, instruments, data collection procedures, data analysis and synthesis, reliability and trustworthiness, researcher's role, and limitations.

Chapter 3

Methods

This study examined Kansas K-12 physical educators' perceptions of utilizing instructional technology in their courses by building upon Kahl's 2018 study. This chapter details the methods used to carry out the research. The researcher explored the various aspects of the experiences of K-12 PE teachers with instructional technology. Firstly, the study examined K-12 PE teachers' perceptions regarding the use of instructional technology. Secondly, it focused on the methods that K-12 PE teachers employ to integrate instructional technology into their practice. Thirdly, the study also sought to explore K-12 PE teachers' views concerning encouragement for or barriers using instructional technology. Finally, the study aimed to identify differences between K-12 PE teachers' current perceptions and those reported in Kahl's 2018 study.

Research Design

According to Lunenburg and Irby (2008), qualitative research examines human phenomena by looking intensely at individuals. It emphasizes understanding by examining people's words, actions, and records. A phenomenological study is a form of qualitative research in which the results examine participants' lived experiences (Lunenburg & Irby, (2008)). It allows perceptions to be expressed without theories influencing them (Creswell & Creswell, 2018). The process typically involves conducting interviews, collecting and analyzing data, data interpretation, and building themes (Creswell & Creswell, 2018).

This study specifically examined Kansas K-12 PE teachers' perceptions of using instructional technology. The phenomenological study process was chosen because it

allowed the researcher to explore the perceived experiences using technology identified by PE teachers through semi-structured interviews.

Setting

The research was conducted through semi-structured interviews using Zoom's internet video platform The platform was chosen for three main reasons. First, it allowed the researcher to reach a broader demographic area in Kansas. Second, Zoom was a popular communication platform with which many people were already familiar. Third, Zoom provided transcription capabilities, making it a suitable choice for phenomenological research.

Sampling Procedures

The general population for this study was K-12 PE teachers. The target population consisted of certified K-12 PE teachers employed in the Kansas public school system. This population was chosen to offer additional phenomenological data for Kahl's 2018 study and increase the geographical boundaries by including teachers from the state of Kansas. Another reason to utilize this population is to provide an interview invitation and informed consent form updated look into K-12 PE teachers' perceptions of instructional technology use. An interview invitation and informed consent form were developed to identify suitable participants and confirm their approval to participate in the study (see Appendix B). The researcher employed purposive and convenience sampling techniques. Lunenburg and Irby (2008) define purposive sampling as the selection based on the researcher's understanding of the target group, while convenience sampling involves selecting readily available people during the research period. Guided by Creswell and

Creswell's (2018) recommendation for three to ten participants in phenomenological research, the researcher established a sample size of eight participants for this study.

Instruments

The interview protocol was the primary instrument, focusing on the participants' perceptions of their experiences using instructional technology in their PE courses. The study employed a semi-structured interview protocol adapted from Kahl (2018). The number of research questions in the original study was seven. The current study reduced the number of research questions to four, with the final question targeting differences between Kahl's and the current study. Consequently, the interview questions were streamlined from 25 in the original study to 12 in the current research to form the interview protocol (see Appendix A). An informed consent form was also developed (see Appendix B). This revision facilitated the collection of educator demographics by creating three questions and provided a contemporary perspective on technology usage in instruction with nine questions.

The interview protocol included three demographic questions (DQ) and nine interview questions (IQ), as displayed in Table 1.

Table 1

Semi-structured Interview Questions

Number	Question	Rationale for Question
DQ1	Are you currently teaching PE in Kansas? Probe: If so, what grade level(s)?	Establish rapport and gather demographics
DQ2	Did you teach PE prior to the pandemic? Probe: If so, did you utilize technology prior to the pandemic?	Establish rapport and gather demographics
DQ3	Did you teach PE during the stay-home orders during the pandemic?	Establish rapport and gather demographics

Number	Question	Rationale for Question
IQ1	Can you tell me what technology you use? Probe: What are your thoughts about the use of technology in PE?	Answer RQ1 (technology use)
IQ2	Where did you obtain your resources for instructional technology in the classroom?	Answer RQ1 (technology use)
IQ3	Can you describe your perception of the instructional technology that is available for use in PE? Probe: Are there unit or lesson plans available that you use that include instructional technology? Probe: Tell me about one or two of the newest and most innovative activities you do with your students in PE.	Answer RQ2 (technology integration into practice)
IQ4	Tell me your vision of an effective physical educator. Probe: Can you expand on that by sharing how that vision connects with how students learn in today's classes? Probe: Do you feel students learn similarly or differently from prior to the pandemic? If it is different, how?	Answer RQ2 (technology integration into practice)
IQ5	Does your school district's physical education curriculum incorporate instructional technology usage? Probe: If so, how and what is required for technology use? Probe: To your knowledge, is this followed by PE teachers district-wide?	Answer RQ2 (technology integration into practice)
IQ6	What types of support do you receive from your administration and other staff on implementing instructional technology in your program? Probe: What type of support would you like to receive?	Answer RQ3 (technology barrier or encouragement)
IQ7	What challenges or barriers exist in integrating instructional technology as a PE teacher in your building? Probe: How do you feel such challenges and barriers could be alleviated?	Answer RQ3 (technology barrier or encouragement)
IQ8	What factors promote the use of instructional technology in your program?	Answer RQ3 (technology barrier or encouragement)
IQ9	Are there any comments or thoughts about instructional technology in PE that you would like to mention that should have been covered in this interview?	Answer RQ4

Note. Adapted from *Analyzing Qualitative Trainee Reactions: A Phenomenological Study of Instructional Designer Practices* (p. 45), by S. Naso, 2021.

Data Collection Procedures

An Institutional Review Board (IRB) application form was originally submitted on November 1, 2023 (see Appendix D). The IRB application was approved on November 21, 2023 (see Appendix E). An updated IRB was submitted on December 6, 2023, to broaden the participant invitation pool to include social media. Final approval was received on December 15, 2023 (see Appendix E). Due to the updates, the IRB requested an updated application form after approval was provided. Therefore, the final IRB application is dated December 16, 2023 (See Appendix D). Permission to secure PE teachers to interview was sought from the President of the Kansas Association of Health, Physical Education, Recreation, and Dance (KAHPERD), the Kansas State Department of Education (KSDE), and the superintendent of a Kansas City school district (see Appendix C). All three groups provided permission to seek study volunteers through their clientele. Potential participants were contacted via email. The research participation request and informed consent form (see Appendix B) was emailed to PE teachers currently contracted to teach PE in Kansas. The email provided an overview explaining the study and its voluntary nature and a link was included in the email for participants to provide participation consent. Educators who clicked the survey link, were sent to a welcome message, an overview of the study's background information, a survey with the requirements to participate, and an informed consent notice. When potential participants continued with the survey, they were asked demographic questions that would qualify them for the research. If they did not qualify, they were exited from the survey and thanked for their time and effort. Once the participants completed the survey, they filled out a consent form, at which point a thank you message was displayed. Their responses

were recorded and stored in Google Forms, which was only accessible to the researcher via their login credentials. All responses remained confidential throughout the data collection process. Twelve potential participants were selected to interview and were notified via email. The email notification included a copy of the interview questions and a link to set up an interview time.

Twelve educators agreed to participate in the study; however, only eight followed through with participating in the interview. The interviews were conducted between January 3, 2024 and January 24, 2024, and were recorded via Zoom using transcription. The participants had the opportunity to read and approve or adjust the transcript. Participants were de-identified and given research-coded IDs to provide anonymity. Once the transcriptions were completed, the researcher collected, reviewed, and organized the data to analyze participants' perceptions concerning instructional technology.

Data Analysis and Synthesis

The following research questions guided the study:

RQ1

How do K-12 physical education teachers perceive instructional technology use?

RQ2

How do K-12 physical education teachers integrate instructional technology into practice?

RQ3

How do K-12 physical education teachers perceive encouragement or barriers to using instructional technology by K-12 physical education teachers?

RQ4

How do K-12 physical education teachers' current perceptions vary from Kahl's 2018 study?

The current study followed Kahl's (2018) data analysis by transcribing and coding based on emergent themes. Responses to the interview questions were assessed for themes regarding participants' perceived experiences of utilization, support, and barriers to instructional technology use. After coding the data based on themes, text from the interviews supporting the themes was identified and cited. Further analysis searching for themes, patterns, and discrepancies was used to answer the research questions (see the list above). The interviews were transcribed using Zoom. A Zoom meeting can be transcribed using audio transcription during the online session, allowing the researcher and participant to review responses and increase trustworthiness immediately. Instant availability allows the participants to make any needed corrections immediately, thus increasing the credibility of the data collected. Once the transcript was saved as a text file, the interviews were studied, and themes were identified. The researcher coded information related to the research questions by examining the interview transcripts. After coding the text from the interviews that supported the research questions, themes were extracted for inclusion in the results.

The interpretation phase occurred after the data was reorganized using coding and themes. Since the qualitative study was based on phenomenological experiences, the results included a detailed descriptive interpretation of the uncovered themes and patterns. The results were used to draw conclusions, answer research questions, and

develop considerations for additional research. The interpretation results and conclusions are provided in Chapters 4 and 5.

Trustworthiness

Credibility, transferability, dependability, and confirmability are the four critical criteria for trustworthiness in qualitative research (Lincoln & Guba, 1985). Credibility refers to accuracy and truthfulness found in a study (Lincoln & Guba, 1985). The researcher allowed participants to review their interview transcripts and interpretations to ensure credibility. Transferability determines the generalization of findings to other contexts (Lincoln & Guba, 1985). This study demonstrates transferability by comparing its results with Kahl's 2018 study. Next, dependability is defined by creating consistency with the qualitative study. Dependability is achieved by ensuring consistency throughout the study (Lincoln & Guba, 1985). This study maintained consistency by adhering to the interview protocol and rejecting embellishments of interview answers. Finally, confirmability is the ability to replicate the study's results (Lincoln & Guba, 1985). Confirmability was ensured by creating an audit trail that documents the data analysis process and provides a rationale for decisions made.

Researcher's Role

The researcher's role is to honestly and objectively provide scientifically supported results. Examining the researcher's background can offer insights into potential biases within their study. In this case, the researcher is a seasoned educator with vast experience in PE and technology integration. She was the first to introduce SMART boards in her district and advocated for integrating technology across all gyms. During the pandemic, the researcher navigated challenges such as remote learning and social

distancing, ensuring that all courses met established standards and benchmarks. However, the researcher's strong advocacy for integrating technology in PE may have created an opportunity for bias.

The researcher in this study took steps to mitigate potential biases. In addition to following the established interview protocol for all participants, the researcher maintained self-awareness and consistency to decrease bias and increase objectivity. Nevertheless, it is important to note that the researcher had prior working relationships with some of the participants, which could introduce a final potential bias. However, by remaining faithful to the interview protocol, the researcher was able to minimize the impact of this bias and increase the likelihood of achieving objectivity.

Limitations

Limitations are the factors that can affect the interpretation or the generalization of the study's results (Lunenburg & Irby, 2008). One limitation of this study was that, while the research results replicated Kahl's 2018 study of teachers from Long Island, New York, it only added a small sample of physical educators from Kansas. The original study interviewed ten physical educators from Long Island, New York. This research replicated and slightly expanded Kahl's study by interviewing eight PE teachers from Kansas. Due to the small sample size, the results should not be generalized.

Another notable limitation stems from the researcher's dual role as the investigator and the interview facilitator. Though participants were advised to be forthright in their responses, this double capacity could have influenced their responses. Furthermore, the method of participant selection introduces an additional constraint. Instead of a random selection process, the researcher extended email invitations and

chose respondents who fit the criteria of currently teaching PE face-to-face at a level from kindergarten through 12th grade in Kansas.

Summary

Chapter 3 described the methods of this qualitative phenomenological research study that aimed to examine Kansas K-12 physical educators' perceptions of using instructional technology in their Kansas PE courses by replicating Kahl's 2018 study. Four research questions guided the qualitative phenomenological method of semi-structured interviews. The interviews were conducted with eight qualified PE teachers using Zoom and governed by an interview protocol with three demographic questions and nine semi-structured interview questions. Transcriptions of the interviews were imported into a text file; then, the data was analyzed using the detailed and thick descriptions required for qualitative reporting. Chapter 4 provides research results.

Chapter 4

Results

The purpose of this phenomenological study was to replicate Kahl's (2018) study to investigate the perceptions of K-12 PE teachers regarding instructional technology use. The participants' feedback in this study provided the researcher with data to append to Kahl's study and identify recommendations for future reiteration. Semi-structured interviews were conducted with eight participants to execute the study. Each interview was completed via the Zoom platform. The interviews consisted of approximately ten questions (see Appendix A) based on the Kahl (2018) study, following semi-structured interview protocol research literature. The participants agreed to review their responses by reading the transcription provided during the interview. Transcribed replies to interview questions were reviewed against the Zoom recording and corrected where necessary. Recorded responses were analyzed for emerging themes, patterns, and discrepancies. Findings were used to answer the three research questions. This chapter provides the results of the analysis of the interviews. The chapter begins with information on participant demographics. Next, the themes that emerged were presented as reflected in the research questions.

Participant Demographics

The demographics of the participants were determined from their responses to the following questions:

1. Are you currently teaching PE in Kansas? Probes: If so, what grade levels?
2. Did you teach PE prior to the pandemic?
3. Did you teach PE during the stay-home orders during the pandemic?

Consequently, only people who answered yes to all the demographic questions were eligible to participate in the study. Only K-12 level PE teachers who taught in Kansas before, during, and after the COVID-19 Pandemic shutdown were interviewed. Eight Kansas PE teachers were interviewed.

Of the eight K-12 level practicing PE teachers from Kansas who participated in this study, three participants (E1, E2, E3) represented the elementary school levels of K-5th grades. Two participants (M1, M2) represented the middle school grades 6-8, and two PE teachers (H1, H2) represented the high school levels of 9th – 12th grades. One participant (EM1) taught K- 5th grade levels PE to the general population and K-9th grade PE to adaptive students (students requiring adaptations to PE to meet standards).

Themes that Emerged from RQ1

Research question one asked, "How do K-12 physical education teachers in Kansas perceive instructional technology use?" The interview allowed participants to showcase their experiences with technology and where they obtained their resources. Question one (Can you tell me what technology you use and what are your thoughts about the use of technology in PE?) allowed participants to share the types of technology they used and their perceptions about it. Interview question two (Where did you obtain your resources for instructional technology in the classroom?) allowed participants to expand on their perceptions by listing places they obtained technology. This section shared themes within research question one. It begins by identifying what types of technology were being used, then studies the perception of the technology. It will look at two themes, if and what technology was used by participants and where they obtained their resources.

Types of Technology Used by Participants

While all participants used some instructional technologies, there were variations in their perceptions of instructional technology usage in their instructional settings. The outcomes of the interviews revealed that all participants utilized computer technology in some capacity, as we categorized laptops, iPads, mobile devices, and personal computers as computers. Additionally, technology was used with applications such as SMART boards, Promethean boards, projectors, and the RackCoach program, which all operate on computers. Table 2 displays the broad range of technology being used by the participants. The pattern that emerged was that all participants used some technology.

Table 2

Types of Technology Used by Participants

Technology	E1	E2	E3	M1	M2	EM1	H1	H2
App: Bowling	X					X		
App: Clickers			X					
App: Microsoft Teams		X						
App: Nike fit					X			X
App: Plickers			X					
App: Stacks timer						X		
App: Zombie run					X			X
Computer	X					X		X
Heart rate monitors								X
iPad	X		X		X	X		
Lap Mileage Easy Scan			X					
Trackers								
Laptop computer				X				
Nintendo Switch						X		
Online fitness test			X					
Online with Students			X					
Pedometers			X					
Projector	X		X					X
Promethean board				X				
Puddle								X
RackCoach					X		X	X
SMART Board				X				
Smartphone								X
Speakers					X			X
Stereo	X	X						X
TV					X	X		X
We Fit						X		

Interview question one included a follow-up asking participants their perceptions of technology. Participants consistently revealed the perception that technology use is an option by sharing what they used. E1 used, “iPads,” “a projector that runs through my computer, and” “I use stereo equipment for sound.” E2 said they use “Microsoft Teams and YouTube.” E3 had an extensive list, including online programs, a fitness testing program, lap mileage, easy scan, trackers, iPads, videotape, other online things, data projectors, and clickers. M1 shared the availability and use of SMART Boards in the past and said, “I use a laptop computer every day to generate grades, use assessments, and make parent contacts.” Next, M2 shared that M2 used a “speaker, a couple TVs, and an iPad that's, on a tripod.” EM1 stated, “I use, computer iPad, TV, projector, Apple TV.” They went on to say, “I do have a Nintendo switch with a ring fit.” At the high school level, H1 shared their use of RackCoach with a projector. H2 had an extensive list that included a projector, RackCoach, television, apps, smartphone, computers, Synergy systems grade book, and speakers.

While all participants agreed that technology use was an option, the elementary school participants were divided on their perceptions of whether it should be used. One participant (E2) wanted to avoid using technology in their classroom. That participant stated, “I don’t like it (technology use).” Interestingly, while E2 expressed negative perceptions of instructional technology in the classroom, that same participant stated that they created and used videos regularly during the COVID-19 stay-home order, and they continued to use music provided by technology. Another elementary teacher (E1) leaned more toward the other end of the spectrum. They said, “I believe it could be very useful and very beneficial.” E3 fell in the middle. E3 stated, “I think for the K through 5 (grade

level students), it's very limited as to what we can and can't do just because of the age of the kids. Having older students junior high, high school, I think the perception to be able to have those students use their own type of technology works better."

The middle school teachers tended to stay more in the center. M1 was an example of taking a central point by stating, "I'm indifferent to it (technology) when trying to get kids to be as active as possible." M2 said:

> I very much appreciate it, especially in ways where it can make things more convenient. But I also don't want it to be something that's just relied upon. For instance, in my area, a lot of times I'll see somebody click play on a video and then they (the PE teacher) kind of just sit back and don't do much.

EM1 perceived that instructional technology could be used to help students stay active. They pointed out that they perceived that not using technology could lead to some students becoming sedentary. EM1 said, "I've got one adapted kiddo who doesn't want to move, but he wants to play on Switch, so guess what? You get to do this game on this Switch, and there's gonna be moving involved in it."

High school level participants perceived instructional technology as a way to organize, measure, and keep students on task. H1 said, "There are some different things (technology) that teachers can use that can help keep the PE classes organized and on task more." H2 said, "I do think it has a very strong way of helping, when it comes to measurements and maybe access the things that you just can't do in person."

The prevailing sentiment was that technology was accessible and could be used in physical education. Although opinions varied on the appropriateness of its use, some individuals expressed reservations about over-use.

The second interview question posed to participants was, “Where did you obtain your resources for instructional technology in the classroom?” This question provided an additional avenue for participants to share their perspectives on instructional technology use. The results show that most participants relied on themselves to obtain instructional technology resources. The data shows that 75% of the participants listed their most significant number of resources under the “self” heading, meaning they found and used things on their own. Only M1 and H1 perceived that their resources came more from district-provided sources. Table 3 shows where participants obtained the resources they use in their classrooms.

Table 3

Where Participants Obtained Resources Used in Their Classrooms

Participant	Self	School or District Provided
E1	Social media, Twitter, Facebook, Conferences, Social interaction	Conferences
E2	On my own, YouTube	Professional development
E3	Conferences, On my own, Colleagues	Parent-teacher organization, District purchase
M1		Instructional coach, Teacher learning teams
M2	Social media, Social interaction, College	
EM1	Twitter, Conferences, Search engines, OPEN, Pinterest, Other PE teachers	Professional development
H1	Myself	Professional development Coach clinics
H2	Conferences, Colleagues, Search engines	Conferences, College

In summary, the first research question (How do K-12 physical education teachers in Kansas perceive instructional technology use?) had a consistent theme that PE teachers

all have and utilize some technology. They all perceived that technology could be used in PE. However, the amount of perceived use varied considerably. For example, E2 did not perceive that PE teachers want or utilize any instructional technology other than maybe providing music. An example of the other end of the spectrum came from H1, who utilized RackCoach (a computer-based program) daily in their classes. Participants also shared in this section, their perceptions on where to get instructional technology for PE. Most felt they would find it on their own. Some perceived the school district as their main resource for finding technology for PE.

Themes that Emerged from RQ2

Research question two asked, how do K-12 physical education teachers in Kansas integrate instructional technology into practice?

The second research question delved deeper into participants' perceptions about using instructional technology by answering interview questions three, four, and five.

Availability of Instructional Technology

Interview question three, ("Can you describe your perception of the instructional technology available for use in PE?" Followed up with, "Are there unit or lesson plans available that you use that include instructional technology?" And, "Tell me about one or two of the newest and most innovative activities you do with your students in PE."). These questions delved deeper into participants' perceptions to gather data on whether feelings about availability impact the use of technology. Table 4 shares the results of the perceptions of availability regarding instructional technology.

As Table 4 shows, over 87% of participants had positive perceptions regarding the availability of instructional technology. The table also shows that 50% of the

participants had positive and negative perceptions regarding availability. At the elementary level, E1 and E3 shared positive and negative perceptions. E1 said, “The use is beneficial, it’s just not equitable.” E3’s positive statement was, “So I think at the upper level, I think it's easier to get the buy-in.” Their negative perspective stated, “I think for the K through 5, it's very limited as to what we can and can't do just because of the age of the kids.” E2 had a negative perception and stated:

> I just don't think that it's helpful for the kids in any way to be on technology when they're supposed to be exercising, and working out, and having fun away from technology. So, the perception is that with most PE teachers the perception is that it's (technology) not needed.

At the middle school level, the perceptions were mainly positive. M1 stated, “I mean for me personally I don't really use a whole lot of technology although I will say I'm sure there's an abundance of resources and stuff available to use.” M2 was positive and stated:

> I think that there's plenty of it out there and it's amazing how much keeps, you know, coming out. All the different things we see, I think that you have to, as an instructor, you have to decide really, like, obviously look at what's out there, but decide what you want to use and how you want to use it.

The K-9 teacher (EM1) also had positive perceptions and stated the following:

> I think some of it's (available technology) great. I think some of it you have to filter out what you're going to use, what's best practice, what's not best practice. But I feel like a lot of the instructional technology is awesome. And I think it just

> depends on if you're trying to fit technology into the curriculum or if you're trying to access the curriculum through technology.

Finally, the high school teachers had positive perceptions. H1 said, “Well, you know, I don't know a whole lot about what all is out there, but I know that you know, people are working towards bettering physical education all the time and you know the (technology) options are endless.” They went on to say, “They can find things that will work well for them.” H2 implied room for improvement by stating, “I feel very good about our accessibility to technology there. You know, it's good. It's not great, but it's good.”

The first follow-up question describing their perception of the instructional technology available in PE was, “Are there unit or lesson plans available that you use that include instructional technology?” While the simple answers were “yes” or “no,” participants’ perceptions showed various ways availability was acquired. Table 4 shows the yes and no responses.

Starting with the participants teaching at the elementary level, E1 said, “not formalized (lesson plans). It's more if you're looking to teach throwing, and this is how I use it (technology). It's nothing formal.” E2 only plans to utilize technology as a means to provide music. They said, “Other than music? No, but that is technology, so I do play music quite often, and sometimes you know, we'll play a specific song that we danced to and stuff.” The third elementary teacher also had lesson plans available that used technology. E3 said the following:

> Yeah, there's a few that are out there that are prepackaged a little bit, but not as many as we would like. A lot of it is just what we can develop with the resources we have, with the technology that we have. And, how do we combine that into our

use? And how it fits well for us. So, we're kinda' in a development stage of our own, I think, a little bit.

At the middle school level, M1 stated:

> I'm sure there is. Through PE Central. I know a few colleagues of ours have shared lesson plans that they've used that incorporate technology. But as far as me personally, again, I don't use technology a whole lot. Maybe once every couple of weeks we'll use a TV where I go over notes at the beginning of each unit, like a learning day.

M2 said, "None that I use no." EM1, who taught grade levels K-9, stated the following:

> Yes. So well, I mean, okay, I think it depends on your question. I make up some of my own lesson plans that incorporate technology. Like during our bowling unit I always use the My Bowling scorecard app, talk to the kids about, you know, how the app helps them keep score that kind of stuff.

Finally, at the high school level, H1 stated the following:

> Well, you know, I don't know a whole lot about what, what all is out there, but I know that, you know, people are working towards bettering physical education all the time and you know the options are endless so you know, if somebody, a PE teacher wants to find resources, I think if they go out and look for those things. They can find things that will work well for them.

H2 is like EM1, who made their plan, but they did not always use something pre-made. They stated the following:

> So some things are intuitive. The Rack app does its own thing, or, you write the lessons into it and they can help pre-make those. The heart rate monitors, no, I use

my own lesson plans. And then anything like projection wise, I would say that's me just finding it. Anything I use, like timer systems or anything, is just me knowing the app and finding out how to use it. So no, I don't just follow a plan.

The final follow-up question asked participants to tell the researcher about one or two of the newest and most innovative activities they did with their students in PE. The collection of responses created some exciting data regarding instructional technology use. The following chart divides the participants by elementary, middle, and high school levels and shows which participants stated that they used technology with their new or innovative lessons.

The Elementary level participant, E1, did not use technology in their new or innovative lessons. They shared, “We are part of a bike program for our K- 1 kids.” E1 added, “We also partner with KC Ballet.” E2 did not incorporate technology either. When asked to share a new or innovative lesson, they responded, “Probably Kingpin. So, it's a game that involves Kids going into enemy territory and trying to knock down the other team’s pins.” The third elementary participant followed the same path and did not include technology in their new or innovative lesson. E3 stated, “right now we're in the middle of a roller-skating unit. The other one (new or innovative lesson) is, we're in our national archery program.”

The participants from middle schools shared the following information. M1 shared the following:

> On our fitness test, students came up with score sheets that they can make changes throughout the year on. It's kind of a nice way of reflection that's

> throughout the year. We do baseline tests in the fall with everybody, and then we'll do a final test in the springtime.

M1's lesson was done with paper and pencil. M2's first lesson used technology, and the second did not. M2 stated:

> I use an application called video delay. So, when they walk out of the (weightlifting) rack, they can look up at the TV on the wall, and they can watch themselves doing the movement. It's been really helpful just because I can put like another image next to the TV and so they have something to compare it to. Also, we did get a grant last year, a really big grant, and we got about 35 mountain bikes. So, it's been a great experience, but it's also been a ton of work.

EM1 taught grades K-9, which included the elementary, middle, and high school levels. When sharing their innovative or new lesson, they said, "I created a winter and summer Olympics unit for my students and I'll show like real life pictures of like what does the Bobsled really look like."

Finally, at the high school, the participants both shared the RackCoach program. H1 states, "Most of the stuff I use is geared towards RackCoach, and it can be whatever I make it to be on RackCoach. It's a timing program that's very organized with colors and rotations and things." H2 stated, "I'm kind of thinking of the Rack (RackCoach) program." H2 adds, "Also, I do take the opportunity to teach dance and rhythms, and I don't think many high school teachers do. And so, I consider that unique."

Table 4 shares the distribution of perceptions. It includes perceptions of whether technology was available, whether lesson plans utilizing technology were available, and whether participants were using technology in their new or innovative lessons.

Table 4

Perceptions of Instructional Technology Availability and Use

Participant	Perception of technology availability	Are technology lessons available?	Are participants using technology in lessons?
E1	Positive, Negative	Yes	No
E2	Negative	Yes	No
E3	Positive, Negative	Yes	No
M1	Positive, Negative	Yes	No
M2	Positive	No	Yes, No
EM1	Positive	Yes	Yes
H1	Positive	No	Yes
H2	Positive	Yes	Yes

To summarize the data and table revealed a theme that participants perceived technology was available. Over 87% perceived some availability. While 75% perceived that lesson plans were available utilizing technology, only 50% utilized technology in their new or innovative lessons.

Effective Physical Educators

Interview question four, "Tell me your vision of an effective physical educator," was followed up by asking, "Can you expand on that by sharing how that vision connects with how students learn in today's classes?" Then, participants were asked, "Do you feel students learn similarly or differently from prior to the pandemic? If it is different, how?") was asked to determine if teacher's perceptions of high-quality PE teachers included technology use. The follow-up questions delved into whether there is a perceived connection between high-quality PE teachers, students, and learning styles since the COVID-19 shutdowns and the increased technology use it brought.

When participants were asked to share their perceptions of an effective PE teacher, the elementary participants, E1 stated:

> You have to be able to change. You also have to rethink how am I going to be able to meet all these milestones with kids only seeing them for 45 to 50 min a week? So obviously, you have to be very flexible. You have to bring the energy every day.

E2 said the following:

> The person should have a good relationship with all their students, the teacher. The educator should motivate the students. Encourage them. I believe that the goal for that teacher should be to make sure that the kids are getting as much movement in as possible. I believe it should be somewhat fun. They (the students) should enjoy going there. And then, after all that, some skills. (Students) Should be taught primary skills that will help them in their, you know, physical whatever sport they play or even if they don't care to play sports just any physical activity they're doing.

The third elementary participant, E3, stated:

> Well, I think the good physical educator is gonna be a person that knows how to assess and adapt and develop things that are going to be good for their clientele, their students, and their community. I think that's the biggest thing, and being flexible enough to adjust kind of on the fly and make things work for you the way you need to.

Next, at the middle school level, M1 shared their perceptions of an effective PE teacher by stating that it is “Somebody that's always flexible, willing to adapt, willing to change. And it's all based on student needs. I think every student, every class, every year is different.” M2 stated the following:

> First and foremost, I would, I hope that an effective physical education teacher understands. First, that is that you teach kids, right, so you're working with kids, you're, you're not here to teach kids to be professional basketball players or professional football players, so I think that's the first part, finding a way to connect with students, and then find a way to connect whatever it is that relationship is that you've built with what you want them to get from your class. I also think that an effective PE teacher, a majority of their kids should be able to walk out of the room at the end of the week and be able to list off some things that they learned or things they appreciated, things that they can reflect on.

Next, EM1 stated the following:

> I think somebody that connects to kids and shows them that activity is good. If they're gonna be exposed to a million different activities and they have some baseline physical literacy, then they're going to be able to find something that keeps them healthy for a lifetime.

High school perceptions were then reviewed. H1 stated:

> I think that an effective physical educator just has control of their class and they are organized and motivated and moving. I think that the main thing is to get kids excited and understand what the expectations are and once they have those two things, they are motivated enough to kind of go in and meet those expectations, and be active, and also have fun while they're doing it.

H2 shared, “I would like to see, you know, PE educators be motivating but also have a lot of different skill sets that they can provide.” Table 5 shows perceptions of effective PE teacher characteristics.

Table 5

Perceptions of Effective PE teachers

Participant	Flexible	Motivating	Active classes	Build relationships	Fun	Meet standards
E1	X	X				
E2		X	X	X	X	X
E3	X					
M1	X					
M2		X		X	X	X
EM1			X	X		
H1		X	X		X	
H2		X				X

In summary, the table shows that, although zero teachers mentioned technology use as necessary, over 60% perceive motivation as a critical factor for effective teaching. Since there are all types of motivation, it is plausible that instructional technology could be a motivator. For example, EM1 stated, “I've got one adapted kiddo who doesn’t want to move, but he wants to play on Switch.” Consequently, EM1 used technology as a motivator for that student. Other themes that were revealed included the need for flexibility, active teaching, building relationships, fun, and meeting standards. Almost 40% of the participants cited these characteristics as critical.

Next, the researcher probed deeper by asking participants how the effective PE teacher vision connects to students. Starting with the replies shared by elementary participants, E1 stated, “You have to make a connection with them. If there's a disconnect in what I'm trying to tell them is important, they are not going to feel or deem it important.” E2 said, “I feel like students learn better from educators they have a relationship with. I definitely believe that making things more enjoyable gives you better results.” Next, E3 shared:

> I think a lot of it has to do with kids today who are coming in with a different background, So, if I need to hand a kid, an iPad that he might be able to video tape or do something like that with what are their peers and do some peer assessment. That's easily done now more so than it's been in the past.

M1 felt, “Just giving students more experiences, you know, more exposure,” tied in with the effective teacher being flexible, adaptable, and willing to change based on student needs. M1’s perception of more experiences could also include technology use. M1 went on to say, “The more we can relate to student learning by effective methods of teaching the better. No, one student learns the same way.” Next, M2 shared the following:

> So I feel like, if you can kind of help them understand on a deeper level, you get more out of them nowadays. On top of that also, I would say finding ways to connect their interests with what you're talking about (is important).

EM1 teaches elementary, middle, and high school students. EM1 said the following:

> I think growth mindset is huge. I think that, as well, just social-emotional health in general. But I feel like, if we teach kids that they can become good at something instead of just, I'm athletically gifted or not, and there's no changing that, it's like your body is resilient, your brains are resilient. You have the opportunity to learn new things. Then I also think the use of technology kind of can access some of those kids that don't want to move.

Next, the high school information revealed the participant’s thoughts. H1 stated:

> I think, you know, they have to be motivated, and they have to wanna be there to learn. If they don't want to be there, then they're not gonna have the motivation to

learn. So. If you can, find ways to motivate the kids and relate it to them, I think that's the best.

H2 stated the following:

> I think of the effective physical educator, you always have to first love kids. The second is, you have to have a passion for your field of study, and you have to mesh those two together. I would like to see, PE educators be motivating but also have a lot of different skill sets that they can provide because, we do not have an active society, and so I think that is on our shoulders to help create an active society.

Table 6

Perceptions of How Effective PE Teachers Connect to Students

Participant	Flexible	Motivating	Build relationships	Fun	Technology	Increase instruction and skills
E1			X			
E2			X	X		
E3					X	
M1	X		X			
M2			X			X
EM1		X			X	
H1		X				
H2		X				X

Table 6 shows that 50% of the participants perceived relationships as being important to their vision of an effective teacher's connection with students. While relationships were a strong theme, being motivational was also perceived as very important. Almost 40% mentioned motivation as critical.

The subsequent follow-up question was, "Do you feel students learn similarly or differently from prior to the pandemic? If it is different, how? E1 stated,

"I have not seen the shift or a change. I know that the pandemic, I mean, we try and pile all the nonsense that's happening right now on the pandemic. I'm just not seeing it. I think Kids are kids."

Next, E2 said, "I think it's similar. I don't think it changed at all." Next, at the elementary level, E3 stated:

> I think it's a little bit different. I think they're more comfortable now technology wise as a group. I think they definitely learn differently and I think some of that has to do with their patients, their lack of patience. Their attention span, some of that has all changed and morphed a little bit. From what it used to be.

Turning to the results from the middle school, M1 shared:

> I think it's different. I think socially, the interaction between teachers and students are a lot different. Nowadays, I feel like students are more hands-off. They're more individual." The other middle school teacher, M2, shared, "I feel like there's a little bit more need to explain the why to students than there was in the past.

EM1, the K-9 teacher, said, "I think their resiliency is different. I think their grit and their determination are different. I think they learn the same but their grit and determination and resiliency are lower than they were before."

Next, high school-level statements included H1 saying, "I'm not sure it's much different from the pandemic. I think their motivation, their view on physical education, it has not really changed since the pandemic." H2 stated, "I would say (they learn) similarly. I think they're actually more inclined to just kind of get going instead of watching the instruction. I think they just got tired of being on a learning screen, so to speak."

Summarizing the participants' answers to interview question four, teacher's perceptions of effective PE teachers did not include technology use. The follow-up questions delved into whether there is a perceived connection between high-quality PE teachers, students, and learning styles since the COVID-19 shutdowns and the increased technology use it brought. Participants continued the perception that good relationships are important when connecting effective teaching with students. Two participants (25%) included the use of technology as important for high quality teachers with relationship to students. As for whether the increased use of instructional technology during the COVID-19 shut-down impacted the way students learned, the perceptions were split. Half reported that learning was similar and half felt students learned differently.

Instructional Technology Requirements

Finally, interview question number five ("Does your school district's physical education curricula incorporate instructional technology usage?" Followed up with, "If so, how and what is required for instructional technology use?" And, "To your knowledge, is this done district-wide?") allowed participants to share requirements for instructional technology use in their classes.

When answering the question regarding the districts' PE curriculums incorporating instructional technology use, E1 stated, "The curriculum kind of hasn't been updated to meet where we're at now (with technology)." E2 just said, "No." E3 expanded more, saying, "It touches upon it. We basically follow the state guidelines and the state standards along with the SHAPE (n.d.a.) standards that are out there."

The middle school had different perspectives. M1 said, "I wish I knew more about basically what we're supposed to be doing as far as technology in the district as far as our

curriculum goes." M2 said, "No. We don't have a specific technology incorporation in any curriculum, no."

Next, the researcher looked at what EM1 shared. They stated, "No. We're allowed to and encouraged to add whatever we want to our scope and sequence but there aren't specific things that are technology."

Next, the high school information shared that H1 stated, (the) "Simple answer is no. You know, our curriculum, for PE is pretty wide open." H2 said, "It does not require it if that's what you're saying. It's kind of more in that realm of, here's how you can do it (technology)."

The first follow-up question to "Does your school district's physical education curricula incorporate instructional technology usage?" asked if technology was required. If participants said no to whether their district curriculum incorporated technology, there is no need to ask if technology is required – it is not required. However, a few participants did share. E3 stated, "There's no true requirement." M1 said, "I would have no idea, and I honestly don't know if there's a requirement. I don't feel like there is." Finally, EM1 shared, "No, nothing that's required."

The next follow-up question asked if technology was used district-wide. Only E3 shared their perspective. E3 stated, "They would do more (district-wide) if we had more available and if we had more time available to do it."

In summary, the themes revealed by the second research question (How do K-12 physical education teachers in Kansas integrate instructional technology into practice?) was that most participants felt instructional technology was available for integration. Nearly 88% of participants had positive perceptions regarding the availability of

instructional technology. Secondly, 50% of participants utilized technology in their innovative or new lessons. These lessons integrated instructional technology through programs such as RackCoach, videos from YouTube, video delay, and TV proper form feedback. Thirdly, participants shared their perceptions of an effective PE teacher. While no participants mentioned the need to include technology, E3 perceived that current students are motivated by the use of technology, and this may motivate some physical educators to find ways to integrate instructional technology. Another interesting theme was the 50-50 split among participants regarding student learning styles before and after the pandemic. Half felt students learn differently and half felt it remained the same. Finally, the researcher looked at whether district curriculums incorporate technology to integrate instructional technology into use. The theme was that 100% of the participants perceived that the district did not require instructional technology and did not strongly influence how it was integrated into practice.

After exploring the information from research questions one and two, the following section will provide data from the third research question. The third research question identifies perceived encouragement and barriers to utilizing instructional technology.

Themes that Emerged from RQ3

Research question three, how do K-12 physical education teachers perceive encouragement or barriers to using instructional technology?

Perceptions from the participants regarding encouragement and barriers to implementing instructional technology were provided through interview questions six, seven, and eight. Question six asked what types of support the participants received from

their administration and other staff on implementing instructional technology in their program and what types of support they would like to receive. Question seven asked about challenges and barriers to integrating instructional technology, and question eight asked what factors promote the use of instructional technology in the participants' programs.

Perceived Support

Support received included the following quotes from the elementary participants: E1 said, "Very little (support). I understand that PE, art, music, they're important, but it's not at the top of their (administration and staff) list." E2 plainly said, "None" when asked what support they got. E3's support level did not show overwhelming promise as E3 stated, "I think as far as the bosses are concerned, they'd like to see us do as much as we can (with technology) and are in favor of doing that, but we shouldn't ask for too much."

At the middle school level, M1 said, "We have daily TLT (teacher learning team) meetings with our instructional coach. That instructional coach will then give us direction on technology use in the classroom." M2 projected positive support as they stated:

> What I love about my admin is I feel like if I got excited about something I think they kind of feed off of my excitement for something and so they try to find a way to make it happen for me.

EM1 gave their perspective as a K-9 PE teacher by stating,

> So, like our physical education admin, you know, like our coordinator, and the person in charge of curriculum and instruction give us those opportunities to learn new things, present different things at our professional developments and things

like that. My principal is always 100% supportive of me in terms of whatever I want to do and she'll come in and she'll provide the best she can.

The final perspectives are from the high school level, with H1 saying, “Probably not very much (support) if any at all.” H1 added, “You know, there's throughout my years been talks about using more technology and things and incorporating technology more.” Next, H2 said:

> We do have a data entry specialist that helps me a lot. Administrative support and the idea if I do write a grant, I always get signed off on, and because, you know, you (the administration) have to choose which ones you do, and they'll sign off on mine to go through, so that's good.

Table 7 shows where participants perceived the level of support was for technology use.

Table 7

Technology Support Received

Participant	Poor	Mediocre	Good
E1	X		
E2	X		
E3		X	
M1			X
M2			X
EM1			X
H1	X		
H2			X

The table shows that 50% of the participants perceived good technology support was available. Half of the participants felt the support available was less than good.

The follow-up question asked participants what support they would like to receive. Starting at the elementary level, E1 said, “Getting the help that we would need it would have to come from outside the district.” When asked what support they would like,

E2 said, “None. I don’t want it in the gym.” E3 said “More money and more space, makes all sorts of things better.”

At the middle school level, M1 said, “So what we're talking about right now (support) is probably what I need the most.” M2 shared:

> There have been several times where I'm sitting through some type of professional development or something like that and it has nothing to do with my subject, and I'm just thinking in my head like, I really wish I was at (another) high school right now observing or I wish I was at some school I haven't got to visit yet just so I can continue to see what's out there.

The K-9 perspective from EM1 stated, “Again, I think it probably comes down to, funding as much as anything else and just access to those things (technology).”

H1 and H2 shared their high school perspective also. H1 stated, “If we could receive from our administration, in-service time, things that are more related to our content area, it would be beneficial.” H2 was on the same page as H1 when stating, “I would love for PD (professional development) days to be for PE. That will help me do what I want to do or help me do things I don't even know exist.”

Perceived Challenges and Barriers

Next, participants were asked what challenges or barriers they perceive as existing for integrating instructional technology as a PE teacher in their building and how they feel these challenges and barriers could be alleviated. Insight was learned through the answers given during the interviews. E1 stated, “Consistency (is a barrier). Time (is a barrier), there's a time constraint as far as like minutes and then time as far as the number of days during the week that I see them (students).” E2 stated the following:

> The challenge would be explaining to me why it's needed in the gym because unless I feel like it's something that would benefit them in their physical education journey, I don't think it will ever be incorporated in the gym.

The third elementary teacher, E3, stated,

> I think we've touched on it already, and that's having the funds to be able to acquire what you think you would like to be doing with your students. And the age of our students and you know being able to get kids to be able to function well with, you know like let's use a heart rate monitor is an example, can they start and stop it or are you having to manage that like tying shoes for kindergartners where you have to do it all the time.

M1, at the middle school level, perceived space as a barrier, stating, Definitely space. Space is our biggest obstacle in the building that I'm at. The use of technology as well, I feel like as educators nowadays we are expected to know things when I really don't."

The other middle school teacher, M2, said, "The first two things that come to mind are resources and facilities." Next, the K-9 teacher, EM1, shared the following barrier:

> Definitely access to funds. Right this very second over winter break, we moved to a temporary facility, and they're tearing our building down and rebuilding our building. So, I think right now that the biggest barrier is just that access to it (technology).

At the high school level, H1 said,

> Well, I would say just, the certain technology needs that we would need to show the students, depending on what you're wanting to do, but you know, projectors,

> screens or, you know, (technology) for music or any type of avenue that you would use that technology on. We really don't have anything, in our gym.

H1 added, “As a PE teacher, as a health teacher, I don't have a classroom.” H2 shared, “I mentioned that with the time factor. We do have PE, professional development, but it's like twice a year, maybe 3 times.” They also stated,

> I have a lot of older PE teachers in my department who are not tech savvy and I have to help them a lot. that's a challenge because I'm just trying to get them to figure out their grade book, let alone push into the next realm (of technology).

Table 8 shows the results of the participant’s perceptions of barriers. The data revealed a theme of facilities being a perceived barrier. Half of the participants perceived facilities as a barrier, and almost 40% perceived professional development, equipment, support, and time as factors that prevent using instructional technology. A quarter of the participants shared that money and student age were barriers, and one participant felt they were their own barrier.

Table 8

Participant’s Perceptions of Barriers

Participant	Time	Money	Motivation	Support	Facilities	Equipment	PD	Student Age
E1	X							X
E2			X	X			X	
E3	X	X						X
M1					X		X	
M2				X	X	X		
EM1		X			X	X		
H1					X	X		
H2	X			X			X	

Note. PD = Professional Development

Perceived Ways to Eliminate Barriers

Regarding eliminating barriers, E1 shared, “During COVID, I saw the first-grade class 15 straight days in a row. So, now I've got those some of the (technology) issues taken care of. So that would be phenomenal.” E2 said, “So it would be tough for it (technology) to get implemented in the gym room unless somebody changes my mind.” Next, E3 stated, “Time, finances, time. Kids I think are gonna learn everything that they have a chance to learn if you have enough time to develop and give them that opportunity to learn it.”

Moving on to middle school, M1 said, “I feel like a lot of times in education we jump right into things and try to progress and get things done when we don't take time to hear thoughts and opinions from the people actually doing it.” M2 shared,

> I would say us being able to see what else is out there in similar settings and what they're using and then finding ways to incorporate it. But I mean building a new school, but that's not real realistic right now.

Next, EM1 provided the following quote:

> Our music department has a keyboard lab and they have it set so that travels from building to building. I feel like we could do the same thing in physical education.

At the high school level, H1 said, “More money and things to put that kind of technology in the areas in which we need it.”

H2 contributed, “Well, I did mention obviously professional development.” Table 9 provides a representation of the data collected and themes revealed through the interviews.

Table 9

Participants' Perceptions on Removing Barriers

Participant	Time	Money	Motivation	Support	Facilities	Equipment	Professional development
E1	x						x
E2			x	x			x
E3	x	x					
M1				x			x
M2		x	x		x	x	x
EM1						x	
H1		x			x	x	
H2				x			x

Table 9 provides data that shows a theme that most participants perceive they need additional professional development. Almost 40% of the participants perceived that additional money, support, and equipment could eliminate the barriers to instructional technology use.

Perceived Factors that Promote Instructional Technology

Finally, the eighth interview question invited participants to share what factors they perceive as promoting the use of instructional technology in their programs. This question provided various answers, beginning with E1, who stated,

> It's someone other than my voice. Sometimes we'll do yoga, so I'll pull up some videos and then they'll do and we'll talk about different poses and do yoga. Sometimes we'll do different, different movements, locomotor movements. I've got a couple of different pieces that I pull off of YouTube. It's kind of like an outside know-it-all or an outside presenter sometimes coming in and, telling them, hey, this is the best way to do things. And then it's also visual feedback too. So, I feel like there are a lot of benefits to it.

E2 shared, “If I went to like a conference and saw it being used in a way that I thought was good for the students that could help promote it.” Finally, the third elementary participant, E3 said:

> There again, it's the time and what are we really trying to accomplish? What's the goal for whatever unit you might be using that technology for? Is it to learn the technology or is the technology assisting in what the students are learning and those kinds of things. So, if we do a peer assessment, the technology aids them in their learning process, but they're not learning the technology.

At the middle school level, M1 said:

> Just, society, seeing the way kids interact with technology nowadays, opposed to say 20 years ago (promotes technology). Kids really do excel I feel like when it comes to interaction of technology opposed to coming from myself or the traditional instruction. So, in that aspect that really kind of lights a fire in need to become better when it comes to technology and how to bring it into the classroom as much as I can.

The following middle school participant, M2 stated, “Because kids are so used to using their Chromebooks. So, I guess the factor is like kind of following the norm right now that kind of promotes us using it more.” EM1’s response was as follows:

> Me! I really feel like the support from my admin and support from other PE teachers and permission to do it from the district, and the fact that honestly that all of our students have iPads that they can bring, like I could do a lot of things that way as well. And then you know having access to a television set (also promotes technology use).

Finally, at the high school level, H1 reported:

> I think the first thing that would promote us to use technology would be just the increase or advancement in our students, the buy-in of our students. Also, I think in some cases or in most cases, the technology is gonna help your instructor, you know, as well as help keep your kids on task and things like that.

H2 said technology is promoted:

> When they (technology items) are user friendly; that's number one and that's by me and by the students. It can't take a lot of time. So, it's pretty efficient. It needs to actually provide information that I can't just get by observation. And honestly, when my observation and the data that I get from the technology is different, that's when I pay the most attention because that's when I know I'm learning something and something's going to get better.

Table 10 Shows the participants' perceived ideas for what promotes technology use.

Table 10

Perceived Promotion of Technology Use

Participant	Student buy-in	Improved pedagogy	Self, administration, and staff buy-in	Availability	Normalization	Nothing so far
E1	X	X				
E2						X
E3			X			
M1	X		X		X	
M2	X		X	X	X	
EM1			X	X		
H1	X	X				
H2	X	X				

The table shows a theme that 75% of the participants perceive student buy-in is critical to promoting technology use. Half perceived the buy in of themselves, administration, and staff was key to promoting technology. A third theme was that almost 40% of

participants perceived the improvement of pedagogy as promoting technology use.

To summarize the themes for research question three (How do K-12 physical education teachers perceive encouragement or barriers to using instructional technology?), the researcher asked participants what support they received for using it. Half of the participants perceived their support as good. Next, participants were asked about challenges and barriers and how to eliminate them possibly. The most common theme was the lack of facilities. 50% of the participants felt the facilities needed to be improved. When asked what they perceived was needed to eliminate boundaries, over 60% said professional development was needed, while 40 % perceived money, support, and equipment as necessary for eliminating barriers. Finally, participants shared what factors promote the use of instructional technology. The theme was that buy-in by students, administration, staff, and self was the most significant promotion of technology use. Over 60% of the participants perceived student buy-in as promoting instructional technology use, and 50% believed that the administration, staff, and self-promotions impacted use.

Summary

This chapter summarized interview responses from eight K-12 PE teachers from Kansas. While the responses to the interview questions for the research questions varied, several themes emerged. For RQ1, over 87% of the participants reported that they perceived instructional technology as having positive aspects. For RQ2, 100% of the participants reported integrating instructional technology. Finally, RQ3 had a theme surrounding support and barriers to using instructional technology, revealing that 50% felt they lacked facilities supporting technology. Over 60% of the participants felt

professional development was needed. Chapter 5 provides an interpretation of the findings and recommendations for future research.

Chapter 5

Interpretation and Recommendations

This chapter reviews and extends the findings reported in Chapter 4. The chapter begins with a summary of the study. Next, the study's findings are deliberated as they relate to the literature reviewed in Chapter 2. Lastly, conclusions are presented.

Study Summary

This chapter summarizes the current study's findings on understanding PE teachers' perceptions of instructional technology use in their classes. The results update Kahl's 2018 study which was replicated. Chapter 5 reviews the overview of the problem, the purpose of the study, the research questions, and the methodology. Next, the chapter shares the major findings and the research conclusions. Finally, implications for action, recommendations for future research, and concluding remarks are provided.

Overview of the Problem

Due to the broad presence of student use of technology in the educational setting (Korhonen, 2021; Strasburger et al., 2013; Wagner et al., 2021), it is critical to understand PE teachers' perceptions of instructional technology for developing physically literate students. The problem was determining how physical educators perceive using instructional technology.

Purpose Statement and Research Questions

The purpose of this study was to gain an understanding of PE teachers' perceptions of instructional technology use for their courses by replicating and expanding Kahl's 2018 research. This study updated and added validity to the original study. Four research questions answered included:

RQ1

How do K-12 physical education teachers perceive instructional technology use?

RQ2

How do K-12 physical education teachers integrate instructional technology into practice?

RQ3

How do K-12 physical education teachers perceive encouragement or barriers to using instructional technology by K-12 physical education teachers?

RQ4

How do K-12 physical education teachers' current perceptions vary from Kahl's 2018 study?

PE teachers' perceptions about using technology were collected via interviews and were used to answer the four research questions.

Review of the Methodology

This study utilized a qualitative phenomenological process to examine K-12 physical educators' perceptions of using instructional technology. A phenomenological study allowed the researcher to explore perceived experiences using technology identified by PE teachers through semi-structured interviews. Convenience sampling was used to select eight physical educators currently teaching in a public school who were asked nine interview questions. Responses to the interview questions were assessed for themes regarding participants' perceived experiences of utilization, support, and barriers to instructional technology use.

Major Findings

This study researched perceptions of instructional technology use by eight K-12 level PE teachers. First, the researcher looked to identify how K-12 physical education teachers perceive instructional technology use. Participants shared their perceptions of using instructional technology in PE. The first major finding was that all participants used instructional technology. The participants did not distinguish between instructional technology devices (computers, projectors, smartphones) and apps as they relate to PE. For example, H2 shared that their instructional technology included a projector, RackCoach, television, apps, smartphone, computers, Synergy systems grade book, and speakers. E3 stated, that they use a couple of different online programs for fitness testing, lap mileage, easy scan, trackers, iPads, video tape, data projectors, clickers, and other online things.

A second finding was that their perceptions of instructional technology use showed that over 87% of those interviewed felt instructional technology in PE could be good. The participants shared perceptions such as EM1's statement, "I feel like a lot of the instructional technology is awesome," or E3's statement, "So I think at the upper level, I think it's easier to get the buy-in." At the high school level, participant H1 said, "They (PE teachers) can find things (instructional technology) that will work well for them."

Finally, when examining K-12 physical education teachers' current perceptions compared to Kahl's 2018 study, one common theme was that all participants (in both studies) had access to some technology. Another theme was that most study participants had favorable perceptions of instructional technology use.

Findings for the second research question about how K-12 physical education teachers integrate instructional technology into practice revealed participant's perceptions of the integration of instructional technology, the findings revealed that 75% of participants utilized technology in innovative or new lessons. These lessons integrated instructional technology through programs such as RackCoach, videos from YouTube, video delay, and TV showing proper form feedback. However, in order to integrate instructional technology, it has to be available. Another finding revealed that nearly 88% of participants had positive perceptions regarding the availability of instructional technology. They said things like "I believe it could be very useful and very beneficial (participant E1)," and "I very much appreciate it, especially in ways where it can make things more convenient (participant M2)."

One of the questions that Kahl asked in the original study was about the effectiveness of a physical educator. Kahl (2018) did not specifically mention the term instructional technology when asking this. When replicating the questions for the current study, the wording remained the same. Two additional possible impacts of integrating technology could be perceptions of an effective PE teacher and district requirements. When asked what an effective PE teacher was, none of the eight participants mentioned the need to integrate instructional technology; however, when answering other interview questions (for example, what are your thoughts about the use of technology in PE?), several mentioned a need for technology integration. Participant E3 perceived that current students are motivated by the use of technology, and this may motivate some physical educators to find ways to integrate instructional technology. EM1 taught all levels and stated, "We would lose some kids if we didn't use technology." H1 stated that

instructional technology increased the buy-in of high school students. Finally, the researcher asked whether district curriculums incorporate technology. One hundred percent of the participants perceived that the districts did not require instructional technology and did not strongly influence how it was integrated into practice.

When tying Kahl's study to how K-12 physical education teachers integrate instructional technology into practice, the results of both studies were similar. Kahl's and the current study showed how all participants used some instructional technology. Both studies had varied amounts of use, from very little to daily. This variance in technology use may be related to the TPACK framework, which highlights the importance of understanding technology and best practices before integrating them into content areas. It reminds us that it is not just a matter of adding technology because it is available. Technology, pedagogy, and content knowledge must be entwined and overlapped.

The third research question examined how K-12 physical education teachers perceive encouragement or barriers to using instructional technology in their courses. Results revealed three themes. One theme revealed that 50% of participants perceived needing facilities with supporting technology. For example, E3 shared that "last year she (co-teacher) had to teach in a in our cafeteria." H1 did not feel they had a room to put a projector even if they could get one. M1 shared, "The gym that we use is technically our varsity gym." This means that the gym must be maintained for athletic events, not for teaching courses and supporting instructional technology. The second theme was that over 60% of the participants felt professional development was needed. Thirdly, perceptions of support were split. Half of the participants felt they had good support, while 50% felt the support was poor to mediocre.

When the researcher examined how participants in the current study and Kahl (2018), both studies perceived encouragement or barriers to using instructional technology, Kahl's study revealed that 80% of the participants perceived satisfaction with encouragement through collaboration with colleagues in instructional technology. The current study showed that 50% perceived their colleagues and administrative support as good. However, the current study also mentioned that buy-in by students, administration, staff, and self-encouraged technology use. Next, 90% of Kahl's participants perceived money as the most significant barrier. Other barriers to instructional technology revealed in Kahl's study included finances, language, faculty pushback, and faculty members' computer literacy. The current study showed that 40% of the participants mentioned money as a barrier to instructional technology use. The most common barrier theme in the current study was perceived as facilities, which was mentioned by half of the participants.

Findings Related to the Literature

A literature review examined perceptions of instructional technology use throughout many areas of education. The literature review found that there had been little research conducted regarding the use of technology by PE teachers. The following information reviews how the themes that emerged from the current study's interviews are related to the literature reviewed in Chapter 2.

Emergent Themes from RQ1

The first research question asked how K-12 physical education teachers in Kansas perceive instructional technology use. The literature looked at several types of classrooms. The results all shared positive perceptions no matter the specific field.

Starting with Kahl's 2018 study, all participants stated they had access to some technology, and most had favorable perceptions of instructional technology use. Hanshaw's 2021 study of social study teachers showed that participants perceived technology improved instruction and student experience, and they also perceived a need for more professional development. A study by Jimenez-Johnson (2021) looked at ELL teacher's perceptions. The results stated that technological devices were perceived as practical tools. However, it was again found that professional development is critical. Faulknor's 2022 study of math teachers showed a perceived willingness to use instructional technology. Perceptions in Faulknor's study also revealed that professional development was needed to advance implementation abilities. Finally, the current study had a consistent theme that PE teachers all have and utilize some technology that could be used in PE. However, the amount of perceived use varied considerably.

Emergent Temes from RQ2

The next question asked how K-12 physical education teachers integrate instructional technology into practice. The literature review shared a wide variety of ways to integrate technology. Instructional technology was reported as integrated in multiple studies. The studies before 2018 revealed fewer integrated technology types than the current study. Kahl's (2018) study mentioned many integrated technology types, even though the study was less recent. This variance may be due to the replication, which asked the same questions as the current study. The current study identified almost 20 types of technology.

There are many ways PE teachers can integrate technology; however, many do not readily use it. Armijo's 2016 literature shared that as the 21st century progressed,

many PE teachers interviewed tended to avoid technology. In 2018 and 2021, the studies of Kahl and Wyant et al. reported that all participants used online resources. However, over half of the Kahl participants stated that they did not use technology much to teach, and half of the Wyant et al. teachers stated that they preferred to rely on their own experiences over other sources. The current study showed that while all participants had access to instructional technology, only 50% used it in their new or innovative lessons.

Emergent Themes from RQ3

The third question examined how K-12 physical education teachers perceive encouragement or barriers to using instructional technology. The literature studies examined the administration's perceptions due to the insufficient studies involving PE teachers. The study participants identified that leadership must include opportunities to participate in and practice professional development and provide for instructional technology needs (Loor, 2021; Richardson, 2022). Several elementary grade-level studies showed a perceived need for professional development (Edwards, 2021; Mitchell, 2021; Moore, 2022). At the middle school level, a study by Drinkard (2022) also mentioned a need for time to learn and implement technology. Groves (2021) and Deeley (2021) found that high school teachers perceived peer support and professional development as necessary. Yarborough (2021) also studied high school teachers' perceived barriers to Internet access, teacher technology, support, and professional development as preventing implementation. In the current study, half of the participants perceived they had good instructional technology support. When asked about barriers, 50% of the participants felt the facilities needed to be improved. When asked what they perceived was needed to eliminate barriers, 50% said professional development, and 40% perceived money,

support, and equipment as necessary. Finally, Kahl's 2018 study revealed that 80% of the participants perceived satisfaction with encouragement regarding instructional technology.

Conclusions

This study replicated the 2018 Kahl study to update and broaden the original findings. The study's findings provide practical implications for action and possibilities for future research. This section discusses these concepts and provides concluding remarks.

Implications for Action

The results of this study present several implications for actions regarding the implementation of instructional technology in physical education. As the amount of time people spend utilizing technology increases, physical educators must ensure they include technology to guide students in fighting sedentarism. School districts and administrators must ensure that PE provides the professional development, time, the use of a framework such as TPACK, and the technology needed to guide students' appropriate use of technology.

Because this replicates Kahl's (2018) study, their recommendations for stakeholders were considered and included if applicable. The current study showed that PE teachers have access to instructional technology, but the perceived need for professional development continues, as mentioned in Kahl's study. This study and Kahl's also showed that instructional technology use is inconsistent from one program to the next. Technology was not part of the current participants' curriculums; only 50% used it

in their new or innovative lessons. Therefore, this researcher identified the following implications for action:

- PE curriculum development that specifically includes appropriate instructional technology that meets standards and promotes physical literacy.
- Providing physical educators with updated instructional technology
- Increased instructional technology professional development
- Collaboration with students on the appropriate use of instructional technology

Recommendations for Future Research

As suggested by Kahl, the continued replication of the study with an increased number of participants is also recommended by the current researcher to provide the most accurate results. Next, both researchers suggest studying student's perceptions of public and private schools. Therefore, these results could provide a more accurate picture of technology's use and are encouraged. The recommendation for a longitudinal study could measure the implementation rate at which instructional technology is used. It might also show if instructional technology is positively impacting PE, which is essential. Next, Kahl and the current researcher endorsed studying demographics (either by elementary, middle, and high school levels or by rural, suburban, and urban locations) to help schools and teachers determine the best for their specific situation. Finally, Kahl and the current researcher recommended that pre-service teacher programs be studied for instructional technology use. This recommendation makes sense, as the perception of technology impacts its use: knowing the root of a college student's education can shed light on how their beliefs and perceptions came to light.

Concluding Remarks

This study contributed to the literature on PE teachers' perceptions of instructional technology use by providing an updated replication of Kahl's 2018 study. While the results reveal that participants can integrate instructional technology, the qualitative data implied that it is not a priority for PE and participants perceived need for more professional development to implement it, as the TPACK framework suggests. Thus, this study is a starting point for future exploration and analysis of instructional technology use in PE.

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Appendices

Appendix A. Interview Script

Semi-Structured Interview Protocol (Kahl, 2018)

Interviewer: Maurica Gilliland

(Begin by exchanging pleasantries.)

Thank you again for participating in this study. As a reminder, this study aims to explore how K -12 PE teachers in Kansas perceive the use of instructional technology. The interview should take no more than 45 minutes. Before we begin the interview questions, I would like to review a few things. First, thank you for agreeing to this interview and for signing the consent form. Second, I wanted to remind you that you can stop the interview anytime and skip any questions you prefer not to answer. Third, I will recording this interview. However, this interview and your identity will remain confidential. I will also permanently delete the recording once the study is done. Fourth, the interview will be transcribed while we go through the questions so that you can correct anything during this time. To see the transcription, you may need to click on the closed captioning option.

Based on the information I shared, I have two questions before we start: First, can I answer any questions for you at this point? Second, are you okay with me recording this interview?

Great, thanks.

Let's start with the demographic questions.

1. Are you currently teaching PE in Kansas? If so, what grade levels are you teaching?
2. Did you teach PE prior to the pandemic?
3. Did you teach during the stay-home orders during the pandemic?

Now, let's move to the research questions.

1. Can you tell me what technology you use?
    a. What are your thoughts about the use of technology in PE?
2. Where did you obtain your resources for instructional technology in the classroom? For example, professional development, conferences, search engines, Etc.
3. Can you describe your perception of the instructional technology that is available for use in PE?
    a. Are there unit or lesson plans available that you use that include instructional technology?
    b. Tell me about one or two of the newest and most innovative activities you do with your students in PE.
4. Tell me your vision of an effective physical educator.
    a. Can you expand on that by sharing how that vision connects with how students learn in today's classes?
    b. Do you feel students learn similarly or differently from prior to the pandemic? If it is different, how?
5. Does your school district's physical education curriculum incorporate instructional technology usage?
    a. If so, how and what is required for technology use?
    b. To your knowledge, is this followed by PE teachers district-wide?
6. What types of support do you receive from your administration and other staff on implementing instructional technology in your program?
    a. What type of support would you like to receive?

7. What challenges or barriers exist in integrating instructional technology as a PE teacher in your building?
    a. How do you feel such challenges and barriers could be alleviated?
8. What factors promote the use of instructional technology in your program?
9. Are there any comments or thoughts about instructional technology in PE that you would like to mention that should have been covered in this interview?
    a. If so, please share.

Thank you so much for your participation! The study would not be possible without you. Do you have any questions for me at this point? Thank you again for your time today and for your willingness to participate! Have a great day.

Appendix B. Interview Invitation and Informed Consent Form

Interview Invitation

Kansas PE teachers,

My name is Maurica Gilliland. I am a student currently working towards my doctorate at Baker University. Thank you for considering helping to identifying perceptions of K-12 PE teachers' use of instructional technology in their courses. As a physical educator who taught prior and during COVID-19 and are currently teaching, you are eligible to participate in this study. Participants will be asked to complete interview questions during a Zoom meeting that will not last longer than 45 minutes. All interview data will be de-identified and given a unique identifier to ensure participant anonymity. If you are interested, please click the link below to read the details and fill out the consent form information. If you qualify, you will be emailed the interview questions and the interview will be set up. Please pass this message along to others you know in this area. Thank you for your consideration and if you have any questions, please contact me at MauricaCGilliland@stu.bakeru.edu

Informed Consent Form

A Study of K-12 Physical Educators' Perceptions of Instructional Technology in Kansas

Study Description and Consent
Purpose and Procedures:
The purpose of this study is to examine instructional technology usage among K-12 physical education teachers to determine what instructional technology they utilize in their K-12 physical education curriculum. Possible benefits associated with this study are to gain knowledge of instructional technology being used in PE, to reflect on your own instructional technology use for physical education, and to become aware of how other educators feel about and use instructional technology for teaching. Administrators can benefit from the study results to potentially enhance program design and professional development opportunities based on the study. Participation in this study entails an interview conducted via Zoom by the researcher. There are approximately ten questions. The interview will occur in the fall semester. The interview replies will remain transcribed word-for-word by the researcher.

Voluntary Nature of the Study: Your participation is voluntary and is considered a service to your profession. No incentives or remuneration are provided to you for participating in this study. If you decide to participate in the study, you can withdraw at any time without penalty.

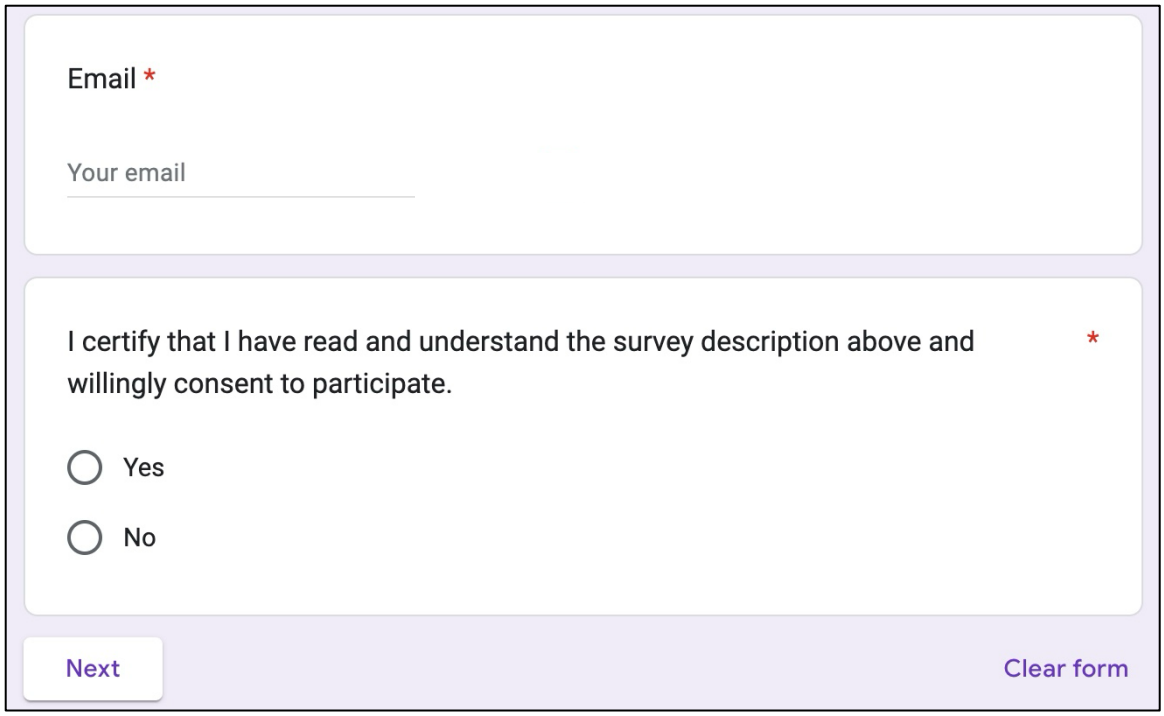
Privacy and Safety:
All interview responses will remain confidential. No known risks are associated with participation in the current study. Participants have the right not to answer questions during the interview. The researcher and advisors will store the data. For participation, you may send a written request for a summary of the study results and a copy of the Informed Consent Form for your files.

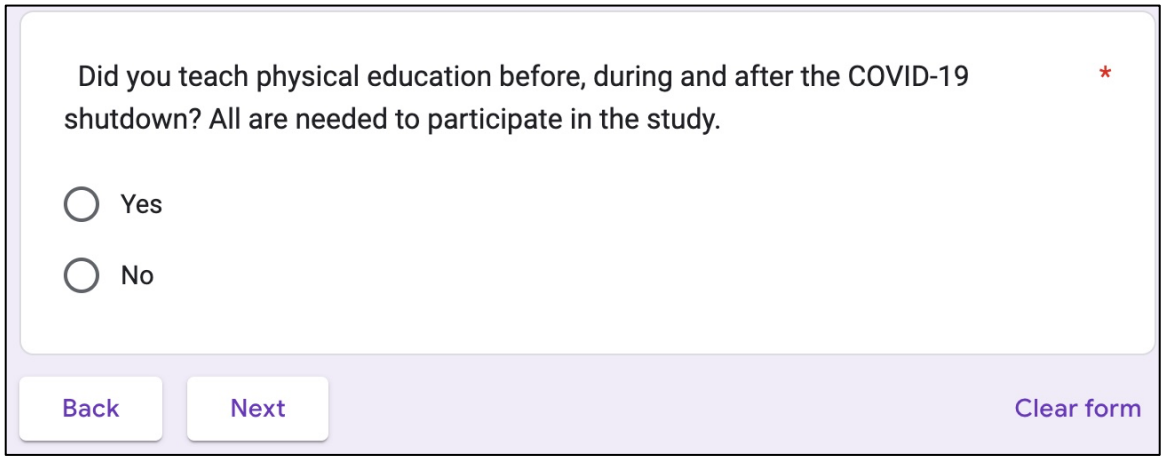
Contacts and Questions: For further information regarding the study, please contact the researcher with questions. You may contact the researcher or the researcher's major advisor.

Researcher:
Maurica Gilliland, Ed.D. candidate School of Education, Baker University
MauricaCGilliland@stu.bakeru.edu

Major advisor:
Wendy Gentry, Ph.D School of Education, Baker University
Wendy.Gentry@bakeru.edu

* Indicates required question


Email *
Your email
I certify that I have read and understand the survey description above and willingly consent to participate. *
Yes
No
Next
Clear form


Did you teach physical education before, during and after the COVID-19 shutdown? All are needed to participate in the study. *
Yes
No
Back
Next
Clear form

Are you currently under contract for and teaching physical education at one or more K-12 levels in Kansas? *

- ○ yes
- ○ No

Back Next Clear form

What grade level(s) are you currently teaching? *

- ☐ elementary school
- ☐ middle school
- ☐ high school

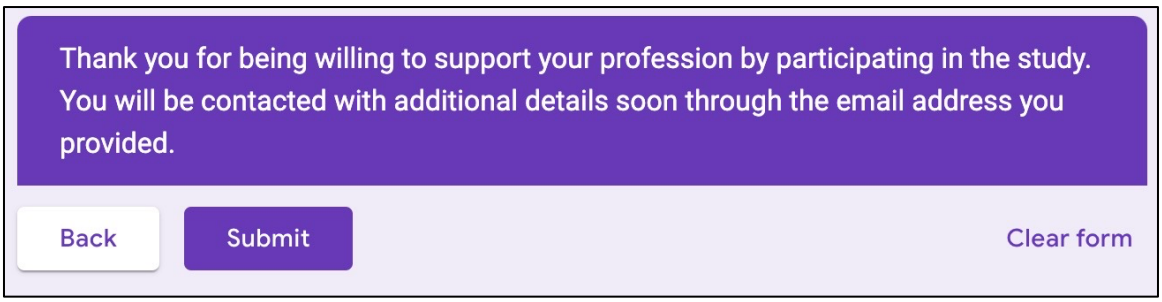
what is your name? *

Your answer

What is your preferred email address for receiving study information? *

Your answer

Back Next Clear form


Thank you for being willing to support your profession by participating in the study. You will be contacted with additional details soon through the email address you provided.
Back
Submit
Clear form

Appendix C. Letters and Approvals to Gain Access to Potential Participants

Dr. Opliger,

My name is Maurica Gilliland. I am a doctoral candidate from Baker University. As part of the completion of my doctoral program, I am conducting a study that examines the use of instructional technology among K-12 physical education teachers. Benefits associated with this study include the opportunity to enhance program design and professional development for physical educators. Participation in this study entails an interview via Zoom that will take less than 45 minutes to complete. Would it be possible for an email to be sent via your listserv that briefly describes the study and provides next steps for any physical educator willing to serve as a volunteer participant? Thank you for your time and consideration, Maurica Gilliland

John Oppliger reacted to your message:

Hello Jason,

I hope all is going well as you prepare for staff and students to return soon. As you know, I am working towards my Doctorate in Instructional Design and Performance Technology (IDPT) through Baker University. I am studying the perspectives of K-12 PE teachers concerning the use of instructional technology. Benefits associated with this study include the opportunity to enhance program design and professional development prospects. I am writing to request your permission to reach out to physical educators within USD 202 and ask if they would be willing to participate in the study. Individual interviews would be conducted via Zoom with the physical educators who qualify and are willing to participate. The interviews are expected to take around 45 minutes.

Thank you for your time and consideration,

Maurica Gilliland

Hello Ms. Gilliland,

Good to hear from you. We are happy to assist and you are welcome to contact our physical education staff members. Best of luck with your study.

Jason

Kent Reed,

Hello, my name is Maurica Gilliland. I am a doctoral candidate from Baker University. As part of the completion of my doctoral program, I am conducting a study that examines the use of instructional technology among K-12 physical education teachers. Benefits associated with this study include the opportunity to enhance program design and professional development for physical educators. Participation in this study entails an interview via Zoom that will take less than 45 minutes to complete. Would it be possible for an email to be sent via your listserv that briefly describes the study and provides next steps for any physical educator willing to serve as a volunteer participant?

Thank you for your time and consideration,

Maurica Gilliland

Hi Maurica! I can send your request out over the list serv if you like, can't guarantee what the response rate will be but we can try! 😊

Kent

Kent Reed
Climate and Wellness Program Manager
School Counseling
School Climate/Culture and Integration
SECD
Health/PE
Kansas State Department of Education

Appendix D. Baker University Institutional Review Board Application

Application Dated November 1, 2023

BAKER UNIVERSITY

IRB Request

Date 11/1/23

IRB Protocol Number _____ (IRB use only)

I. Research Investigator(s) (students must list faculty sponsor)

Department(s) IDPT

	Name	Signature	
1.	Maurica Gilliland	Maurica C. Gilliland Digitally signed by Maurica C. Gilliland Date: 2023.11.01 20:35:44 -05'00'	Principal Investigator
2.	Dr. Wendy Gentry	Wendy Gentry Digitally signed by Wendy Gentry Date: 2023.11.01 12:04:55 -04'00'	☑ Check if faculty sponsor
3.	Dr. Kyunghwa Cho	Digitally signed by Kyunghwa Cho Date: 2023.11.01 09:52:48 -05'00'	☑ Check if faculty sponsor
4.			☐ Check if faculty sponsor

Principal investigator contact information

Phone

Email

Address

[redacted]

Note: When submitting your finalized, signed form to the IRB, please ensure that you cc all investigators and faculty sponsors using their official Baker University (or respective organization's) email addresses.

Faculty sponsor contact information

Phone

Email

Expected Category of Review: ☐ Exempt ☑ Expedited ☐ Full ☐ Renewal

II. Protocol Title

K-12 Physical Educators Use of Instructional Technology

Baker IRB Submission form page 1 of 4

III. Summary:

The following questions must be answered. Be specific about exactly what participants will experience and about the protections that have been included to safeguard participants from harm.

A. In a sentence or two, please describe the background and purpose of the research.

Historically, physical education emphasized physical activity without the need for instructional technology, with guidelines primarily provided by the Society of Health and Physical Educators (SHAPE America). However, after the rise of instructional technology use during the COVID-19 stay-at-home orders, SHAPE America is updating its guidelines to reflect best practices. Given this background, the purpose of this phenomenological research study is to investigate how K-12 physical education teachers perceive the use of instructional technology in their courses.

B. Briefly describe each condition, manipulation, or archival data set to be included within the study.

This is a phenomenological study replicating and updating Kahl's 2018 work regarding K-12 physical educator's perceptions regarding the use of instructional technology. The study is exploratory and descriptive with no conditions, manipulations or archival data set being part of this study.

IV. Protocol Details

A. What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy.

Potential research participants will receive a description of the voluntary study, its qualifications, and a consent form from the researcher (please see attached). Data will be collected using a semi-structured interview for qualified participants who choose to participate in the study (please refer to the attached Interview Protocol). This protocol is adapted from Kahl's 2018 study.

B. Will the subjects encounter the risk of psychological, social, physical, or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.

The subjects will not encounter psychological, social, physical, or legal results. Participants may withdraw at any time.

C. Will any stress to subjects be involved? If so, please describe.

Participants will not be subjected to stress as the study is voluntary and they can opt out at any time.

D. Will the subjects be deceived or misled in any way? If so, include an outline or script of the debriefing.

Subjects will not be deceived or misled during this study. The email requesting volunteers gives an honest description of what will occur regarding this study.

E. Will there be a request for information which subjects might consider to be personal or sensitive? If so, please include a description.

The participants will be coded so that privacy is maintained. A participant may choose to not answer any questions that they are not comfortable with. The interview questions inquire about perceptions of the participants on the use of instructional technology. All participants will have the opportunity to review a transcript of their responses to ensure their perceptions and opinions are accurately represented.

F. Will the subjects be presented with materials which might be considered to be offensive, threatening, or degrading? If so, please describe.

The subjects will not be presented with offensive, threatening, or degrading material.

G. Approximately how much time will be demanded of each subject?

Potential participants will be sent an initial email with a survey to complete if they chose to participate. This will take no longer than 5 minutes. Interviews are scheduled to take no longer than 45 minutes for those who choose to participate.

H. Who will be the subjects in this study? How will they be solicited or contacted? Provide an outline or script of the information which will be provided to subjects prior to their volunteering to participate. Include a copy of any written solicitation as well as an outline of any oral solicitation.

Certified physical educators under contract to teach PE in Kansas elementary, middle, or high schools will be the subjects for this study (see the attached informed consent form). An email will be sent via the Kansas Association of Health, Physical Education, Recreation and Dance (KAHPERD) listserve, the Kansas State Department of Education (KSDE) listserve, and to contracted physical educators in Kansas districts (please see attached email). The includes a description of the voluntary study, qualifications, and a consent form. The instrument used for collecting the data is a semi-structured interview (see attached Interview Protocol).

I. What steps will be taken to insure that each subject's participation is voluntary? What if any inducements will be offered to the subjects for their participation?

No inducements will be provided. A consent form will be sent via email to potential participants, emphasizing that their involvement in the study is voluntary. The form will also state that participants have the freedom to exit the study whenever they wish and for any reason they choose. Please refer to the attached consent form.

J. How will you insure that the subjects give their consent prior to participating? Will a written consent form be used? If so, include the form. If not, explain why not.

Subjects will be given a consent form (see attachment) to be signed prior to participating in the study.

K. Will any aspect of the data be made a part of any permanent record that can be identified with the subject? If so, please explain the necessity.

No aspect of the collected data will be part of any permanent record that can be identified. Video recordings will be terminated after data analysis. Subjects' privacy will be protected by the removal of any personal information in the resulting report of this research.

L. Will the fact that a subject did or did not participate in a specific experiment or study be made part of any permanent record available to a supervisor, teacher, or employer? If so, explain.

No permanent record will be available to a supervisor, or employer that states whether a subject did or did not participate in this study.

M. What steps will be taken to insure the confidentiality of the data? Where will it be stored? How long will it be stored? What will be done with the data after the study is completed?

Names will be changed to insure the confidentiality of each participant. Data will be store in the researcher's personal computer that is password protected. Data will be stored for no more than seven years, then the confidential data will be deleted.

N. If there are any risks involved in the study, are there any offsetting benefits that might accrue to either the subjects or society?

There are no known risks involved in this study or offsetting benefits that might accrue to the subjects or society.

O. Will any data from files or archival data be used? If so, please describe.

No data from files or archival data will be used in the study.

Application Dated December 16, 2023

BAKER UNIVERSITY

IRB Request

Date 12/16/23

IRB Protocol Number _____ (IRB use only)

I. Research Investigator(s) (students must list faculty sponsor)

Department(s) IDPT

	Name	Signature	
1.	Maurica C. Gilliland	Maurica C. Gilliland — Digitally signed by Maurica C. Gilliland Date: 2023.12.19 07:01:30 -06'00'	Principal Investigator
2.	Wendy Gentry	Wendy Gentry — Digitally signed by Wendy Gentry Date: 2023.12.19 14:40:12 -05'00'	☐ Check if faculty sponsor
3.	Kyunghwa Cho	Digitally signed by Kyunghwa Cho Date: 2023.12.19 12:03:26 -06'00'	☐ Check if faculty sponsor
4.			☐ Check if faculty sponsor

Principal investigator contact information — Phone, Email, Address [redacted]

Note: When submitting your finalized, signed form to the IRB, please ensure that you cc all investigators and faculty sponsors using their official Baker University (or respective organization's) email addresses.

Faculty sponsor contact information — Phone, Email

Expected Category of Review: ☐ Exempt ☑ Expedited ☐ Full ☐ Renewal

II. Protocol Title

K-12 Physical Educators Use of Instructional Technology

III. Summary:

The following questions must be answered. Be specific about exactly what participants will experience and about the protections that have been included to safeguard participants from harm.

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Historically, physical education emphasized physical activity without the need for instructional technology, with guidelines primarily provided by the Society of Health and Physical Educators (SHAPE America). However, after the rise of instructional technology use during the COVID-19 stay-at-home orders, SHAPE America is updating its guidelines to reflect best practices. Given this background, the purpose of this phenomenological research study is to investigate how K-12 physical education teachers perceive the use of instructional technology in their courses.

B. Briefly describe each condition, manipulation, or archival data set to be included within the study.

This is a phenomenological study replicating and updating Kahl's 2018 work regarding K-12 physical educator's perceptions regarding the use of instructional technology. The study is exploratory and descriptive with no conditions, manipulations or archival data set being part of this study.

IV. Protocol Details

A. What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy.

Potential research participants will receive a description of the voluntary study, its qualifications, and a consent form from the researcher (please see attached). Data will be collected using a semi-structured interview for qualified participants who choose to participate in the study (please refer to the attached Interview Protocol). This protocol is adapted from Kahl's 2018 study.

B. Will the subjects encounter the risk of psychological, social, physical, or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.

The subjects will not encounter psychological, social, physical, or legal results. Participants may withdraw at any time.

C. Will any stress to subjects be involved? If so, please describe.

Participants will not be subjected to stress as the study is voluntary and they can opt out at any time.

D. Will the subjects be deceived or misled in any way? If so, include an outline or script of the debriefing.

Subjects will not be deceived or misled during this study. The email requesting volunteers gives an honest description of what will occur regarding this study.

E. Will there be a request for information which subjects might consider to be personal or sensitive? If so, please include a description.

The participants will be coded so that privacy is maintained. A participant may choose to not answer any questions that they are not comfortable with. The interview questions inquire about perceptions of the participants on the use of instructional technology. All participants will have the opportunity to review a transcript of their responses to ensure their perceptions and opinions are accurately represented.

F. Will the subjects be presented with materials which might be considered to be offensive, threatening, or degrading? If so, please describe.

The subjects will not be presented with offensive, threatening, or degrading material.

G. Approximately how much time will be demanded of each subject?

Potential participants will be sent an initial email with a survey to complete if they chose to participate. This will take no longer than 5 minutes. Interviews are scheduled to take no longer than 45 minutes for those who choose to participate.

H. Who will be the subjects in this study? How will they be solicited or contacted? Provide an outline or script of the information which will be provided to subjects prior to their volunteering to participate. Include a copy of any written solicitation as well as an outline of any oral solicitation.

Certified physical educators under contract to teach PE in Kansas elementary, middle, or high schools will be the subjects for this study (see the attached informed consent form). A message will be sent via the Kansas Association of Health, Physical Education, Recreation and Dance (KAHPERD) listserve, the Kansas State Department of Education (KSDE) listserve, to contracted physical educators in Kansas districts, and through social media platforms as forms of convenience sampling. The message includes a description of the voluntary study, qualifications, and a consent form (see attached Interview Invitation and Informed Consent Form). The instrument used for collecting the data is a semi-structured interview (see attached Interview Protocol)

I. What steps will be taken to insure that each subject's participation is voluntary? What if any inducements will be offered to the subjects for their participation?

No inducements will be provided. A consent form will be sent via email to potential participants, emphasizing that their involvement in the study is voluntary. The form will also state that participants have the freedom to exit the study whenever they wish and for any reason they choose. Please refer to the attached consent form.

J. How will you insure that the subjects give their consent prior to participating? Will a written consent form be used? If so, include the form. If not, explain why not.

Subjects will be given a consent form (see attachment) to be signed prior to participating in the study.

K. Will any aspect of the data be made a part of any permanent record that can be identified with the subject? If so, please explain the necessity.

No aspect of the collected data will be part of any permanent record that can be identified. Video recordings will be terminated after data analysis. Subjects' privacy will be protected by the removal of any personal information in the resulting report of this research.

L. Will the fact that a subject did or did not participate in a specific experiment or study be made part of any permanent record available to a supervisor, teacher, or employer? If so, explain.

No permanent record will be available to a supervisor, or employer that states whether a subject did or did not participate in this study.

M. What steps will be taken to insure the confidentiality of the data? Where will it be stored? How long will it be stored? What will be done with the data after the study is completed?

Names will be changed to insure the confidentiality of each participant. Data will be store in the researcher's personal computer that is password protected. Data will be stored for no more than seven years, then the confidential data will be deleted.

N. If there are any risks involved in the study, are there any offsetting benefits that might accrue to either the subjects or society?

There are no known risks involved in this study or offsetting benefits that might accrue to the subjects or society.

O. Will any data from files or archival data be used? If so, please describe.

No data from files or archival data will be used in the study.

Appendix E. IRB Approval

IRB Approval Dated November 21, 2023

BAKER UNIVERSITY
Own Confidence

Baker University Institutional Review Board

November 21, 2023

Dear Maurica Gilliland, Wendy Gentry, and Kyunghwa Cho,

The Baker University IRB has reviewed your project application and approved this project under Expedited Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.
6. If this project is not completed within a year, you must renew IRB approval.

If you have any questions, please contact me at skimball@bakeru.edu or 785.594.4563.

Sincerely,

Scott A. Kimball

Scott Kimball, PhD
Chair, Baker University IRB

IRB Approval Dated December 15, 2023

From: IRBProposals <IRBProposals@bakeru.edu>
Date: Friday, December 15, 2023 at 8:11 AM
To: Maurica C Gilliland <mauricacgilliland@stu.bakeru.edu>
Cc: Kyunghwa Cho <Kyunghwa.Cho@bakeru.edu>, Wendy Gentry <Wendy.Gentry@bakeru.edu>, verneda.edwards <verneda.edwards@yahoo.com>
Subject: Re: IRB approval possible change

Hello Maurica,
Thank you for following up on this. The original email came to my standard address instead of to the IRBProposals email address, so it got misplaced in the shuffle. Yes, please proceed as you've suggested – but also, please resend the submission form to include your additional solicitation protocols.
Thank you,
Scott Kimball

Scott A. Kimball, Ph.D.
Associate Professor of Biology
Dr. Roger Boyd Professor of Biology
Boyd Science Center, room MS229
Department of Biology and Chemistry
Baker University
P.O. Box 65
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Phone: 785.594.4563
Fax: 785.594.8360