## THE INFLUENCE OF TPACK MODEL AND COLLABORATIVE LEARNING TOWARDS BISHA CITY SECONDARY SCHOOLS' TEACHER TEACHING QUALITY ON THE USE OF MOBILE LEARNING PROFESSIONAL DEVELOPMENT

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by

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## LIST OF ABBREVIATIONS

NCTED	National Centre for the Professional and Educational Development
PD	Professional Development
CPD	Continuing Professional Development
M-learning	Mobile learning
СК	Content Knowledge
РК	Pedagogical Knowledge
ТК	Technological Knowledge
ТРАСК	Technological, Pedagogical, and Content Knowledge
ZPD	Zone of Proximal Development

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# PENGARUH MODEL TPACK DAN PEMBELAJARAN KOLABORATIF TERHADAP KUALITI PENGAJARAN GURU SEKOLAH MENENGAH BANDARAYA BISHA DALAM PENGGUNAAN PEMBANGUNAN PROFESSIONAL PEMBELAJARAN MUDAH ALIH

#### ABSTRAK

Penyelidikan ini bertujuan untuk mengenal pasti pengaruh kandungan, pedagogi, pengetahuan teknologi (TPACK) dan Pembelajaran Kolaboratif mengenai kualiti pengajaran dalam penerapan m-pembelajaran untuk pembangunan profesional guru-guru sekolah menengah Saudi. Dalam kajian ini, kaedah kuantitatif telah digunakan, dan responden terdiri daripada 282 guru dari sekolah menengah di Bandar Bisha di Arab Saudi. Pengumpulan data, penyelidik, membina tinjauan dalam talian dalam Borang Google di Google Drive. Kaedah yang terlibat menggunakan teknik persampelan rawak mudah untuk memilih responden kepada pendekatan kuantitatif untuk menghasilkan data statistik. Untuk menganalisis data, penyelidik menggunakan metodologi SPSS versi 26 untuk mengkaji hubungan antara pembolehubah menggunakan korelasi Pearson, selain menganalisis data kuantitatif menggunakan analisis deskriptif berdasarkan min, frekuensi, dan peratusan. Hasil kajian ini melaporkan bahawa guru-guru di Arab Saudi mempunyai persepsi positif terhadap pengaruh kandungan, pengetahuan teknologi dan pedagogi, dan pembelajaran kolaboratif dalam kualiti pengajaran untuk penggunaan m-pembelajaran untuk PD di sekolah menengah Bisha City. Selain itu, empat pembolehubah utama (pengetahuan kandungan, pengetahuan pedagogi, pengetahuan teknikal, pembelajaran kolaboratif) telah mengesahkan hubungan positif dan signifikan yang kuat dengan kualiti

pengajaran. Selain itu, blok bangunan mana-mana PD yang menggunakan mpembelajaran adalah kandungan, pengetahuan pedagogi dan teknikal dan pembelajaran kolaboratif. Aspek ini mungkin merupakan langkah awal dalam mengukuhkan program pembangunan atau latihan profesional di peringkat wilayah dan kebangsaan. Oleh itu, memahami persepsi guru terhadap pengaruh kandungan, pengetahuan teknologi dan pedagogi, dan pembelajaran kolaboratif dalam kualiti pengajaran untuk penggunaan m-pembelajaran untuk PD menggunakannya untuk pembelajaran mereka adalah penting untuk mengukuhkan pembangunan profesional untuk guru. Penyelidikan masa depan dalam bidang penggunaan pembelajaran mudah alih untuk PD pada semua elemen model TPACK mesti dijalankan untuk menambah pemahaman kita tentang penentu penggunaan pembelajaran mudah alih untuk PD. Hasil kajian ini memberikan maklumat yang berguna untuk Kementerian Pendidikan Arab Saudi untuk mempertimbangkan banyak faktor yang mempengaruhi kualiti pengajaran untuk penggunaan m-pembelajaran untuk PD.

# THE INFLUENCE OF TPACK MODEL AND COLLABORATIVE LEARNING TOWARDS BISHA CITY SECONDARY SCHOOLS' TEACHER TEACHING QUALITY ON THE USE OF MOBILE LEARNING PROFESSIONAL DEVELOPMENT

#### ABSTRACT

The research aims to identify the influence of the content, pedagogical, technological knowledge (TPACK), and collaborative learning on teaching quality in the application of m-learning for the professional development of Saudi secondary school teachers. In this study, the quantitative method was used, and the respondents consisted of 282 teachers from Saudi secondary schools in Bisha City. Hence, the research findings aim to contribute to the work of policymakers, teachers, practitioners, and future researchers on improving the quality of teaching. The data collection, the researcher, constructed an online survey in Google Forms in Google Drive. The method involved using simple random sampling techniques to select respondents to the quantitative approach to produce statistical data. To analyze the data, the researcher applied the SPSS version 26 methodology to examine the relationship between variables using Pearson's correlation, in addition to analyzing quantitative data using descriptive analysis based on mean, frequencies, and percentages. The results of this study reported that teachers in Saudi Arabia do have positive perceptions toward the influence of content, technological and pedagogical knowledge, and collaborative learning in teaching quality for the use of m-learning for PD in Bisha City secondary schools. Furthermore, the strong positive and significant relationship between teaching quality and the four primary variables (content

knowledge, pedagogical knowledge, technical knowledge, and collaborative learning) has been statistically confirmed. The findings of the present study also could have implications for the development of teacher training programs and to prepare teachers to use TPACK in their classrooms. Teachers' competence with TPACK was found to be below average in terms of understanding the concept, implementation, and assessment. To improve their teaching quality, secondary schools should provide teachers with training that encompasses a wide range of knowledge domains and includes the use of mobile learning (m-learning) for professional development The findings also suggest that training in cooperative learning is important to help teachers change their practice and their perceptions of classroom roles, and enhance their teaching quality. This could help update and change teaching and learning methods in Saudi classes, which seems to be essential to improving the quality of teaching outcomes. Future research in the area of the use of mobile learning for PD on all elements of the TPACK model must be conducted to supplement our understanding of the determinants of the use of mobile learning for PD. The results of this study provide information that can be useful for the Ministry of Education in Saudi Arabia to consider numerous factors that influence teaching quality for the use of m-learning for PD.

#### **CHAPTER 1**

#### **INTRODUCTION**

#### 1.1 Introduction

Mobile learning (m-learning) has gained significant popularity worldwide, particularly in developing countries, due to its potential to improve teaching quality and collaboration among teachers. It offers convenience, flexibility, and personalized learning experiences, which can enhance the effectiveness of traditional teaching methods (Ossiannilsson, 2018; Díaz-Ramírez et al., 2023). The importance of the application of m-learning in improving professional development for teachers as well as the quality of education has been discussed in the existing literature (Philipsen et al., 2019; Obonyo, 2023). The use of mobile applications and devices for PD, such as smartphones and tablets, allows teachers to access learning resources anytime and anywhere, leading to more flexible and convenient learning experiences which improve their knowledge retention and engagement (Alanazi et al., 2023; Alajmia et al., 2019; Pappas, 2017).

Teachers are believed to be the prime factor for making a significant contribution towards the enhancement of the quality of teaching. Moreover, the quality of teaching involves the skills and capabilities of the teacher being channeled into the effective distribution of the most effective learning practices to students. In this regard, teachers' perceptions can play a vital role in developing teaching approaches and enhancing the quality of teaching and learning activities within professional development (PD) in learning (Adipat et al., 2023; Sowndappan, 2023). The lack of effective training for teachers–such as the use of mobile learning for PD and a lack of awareness of updated pedagogical and professional competence, characterized as technological pedagogical content knowledge (TPACK) found as significant causes for poor performance (Safriana et al., 2023; Wijayanti et al., 2021).

Similarly, the use of effective learning and assessment system and appropriate technology, content, and pedagogy knowledge covered in TPACK are also highlighted as being the major factors leading to good quality and student learning and motivation (Mishra & Koehler, 2006; Adnan & Yunisari, 2023; Sacre & Lallemand, 2022). In addition, Castéra et al. (2020) pointed out that teachers nowadays value the use of information technologies for enhancing teaching and learning practices, which improves the teacher's and the performance of students. Specifically, the teacher's content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK) also prove fruitful for enhancing students' performance at the higher secondary school level in Saudi Arabia (Bingimlas, 2018).

In identifying teachers' perceptions of the factors that affect the quality of education, it was highlighted that the teachers' perceptions of TPACK can influence their knowledge and understanding of 21st-century learning, but there may be constraints in understanding students' abilities and the latest learning technology (Safriana et al., 2023). Teachers have positive perceptions about the of TPACK to effectively integrate technology into their teaching practices improving the quality of teaching in secondary school (Sacre & Lallemand, 2022). In addition, the teacher TPACK framework was designed to assess the knowledge of primary and secondary school teachers and has recently been applied to document the knowledge of higher education instructors (Maor,2017; Sacre & Lallemand, 2022; Rahayu et al., 2023).

education and gradually develops to become increasingly advanced (Chen et al., 2019; Safriana et al., 2023). Thus, the development of teacher TPCK is needed to create a quality learning process so that it can produce quality students to improve the quality of education and achieve national education goals for elementary school teachers (Chen et al., 2019; Jung et al., 2019; Ortiz Colón et al., 2023; Safriana et al., 2023).

As previously stated, the use of m-learning in teaching appears to be very significant, and it is clear that today's Saudi teachers require TPACK skills as well as collaborative learning to ensure effective learning and professional development. It is envisaged that the adoption of TPACK skills Collaborative learning will improve teaching among teachers (Azhar et al., 2022; Power, 2018; Ally et al., 2014). Many teachers and educators believe that using mobile technology in PD increases collaboration and ideal practices (Bernacki et al., 2020; Dahri et al., 2023).

It is important to assess Saudi secondary teachers' TPACK capabilities and collaborative learning toward teaching quality in this scenario. There are many studies on educators' TPACK and the impact of TPACK on the teaching process; however, there are few studies on secondary school teachers' TPACK. According to the literature, only a few studies focused on the TPACK framework among pre-service teachers and their impact on the teaching process(Lai et al., 2021; Ortiz Colón et al., 2023; Rahmawati et al., 2023). Consequently, it is imperative to exert endeavors in determining the secondary teachers in TPACK so that they can continually enhance their teaching quality and consequently enhance student learning in the future (Adnan & Yunisari, 2023; Safriana et al., 2023). Besides that, there is a lack of further research on collaborative learning especially in the use of m-learning for teachers' PD programs as it seems to fit 21st-century learning and teaching (Lu & Smiles, 2022; Sarwar et al.,

2019). Hence, this study seeks to fill a research gap by researching TPACK in using an m- m-learning for teachers' PD program to improve teaching quality among Secondary teachers in Bisha City in Saudi Arabia.

Teachers must establish an environment that is favorable for effective instruction in interactive classrooms rather than individualized learning when engaging in small cooperative groups (Adebola & Tsotetsi, 2022). This necessitates exertion, curiosity, and acknowledgment of the reality that the quality of teaching objectives relies on the teacher's role, as does collaborative learning through group work. Undoubtedly, collaborative learning is beneficial in augmenting the quality of teaching by utilizing mobile learning (Obonyo, 2023). From this perspective, it becomes clear why studying collaborative learning about the quality of teaching to improve student learning outcomes and support overall success is so relevant (Ismail et al., 2018).

Collaborative learning has become one of the mainstream instructions used in professional development to improve learner achievement and outcomes and teachers-teacher interaction (Kempen & Steyn, 2017; Owens et al., 2016; Sancar et al., 2021; Pozzi et al., 2023). In addition, a teacher's experience with cooperative learning may influence the outcomes of such teaching process and lead to whole-school improvement (Haiyan et al., 2017; Kempen & Steyn, 2017; Namaziandost et al., 2017). Lu and Smiles (2022) also proposed that to achieve academic accomplishments, self-esteem, interpersonal attraction, social support, and the overall quality of learning activities, the teacher requires collaborative learning.

In contemporary times, a significant concern revolves around the methods teachers can employ to facilitate their professional growth and augment the academic accomplishments of their students. Furthermore, an additional crucial impediment lies in the lack of familiarity that teachers possess about the cooperative learning mechanism, consequently impeding the students' ability to improve their educational outcomes (Adebola & Tsotetsi, 2022; Khasawneh et al., 2023). The research findings have confirmed that collaborative learning is effective in nurturing professional development and academic accomplishments among students while simultaneously enhancing the quality of teaching within the classroom (Sowndappan, 2023). To address this issue, this study seeks to find an efficient way to improve teaching quality and learners' understanding of collaborative learning and its implementation is, however, unlikely to be achieved if research only focuses on teacher knowledge.

Moreover, there is still some disagreement about what cooperative learning can lead to a more desirable impact, such as the improvement of teaching quality and academic learning. Additionally, further studies still need to be carried out on the effectiveness of using collaborative learning in teaching different subjects in diverse contexts (Adebola & Tsotetsi, 2022; Bhandari, 2022). Likewise, studies on the use of collaborative learning in Saudi Arabia are considered to be still in their infancy (Almulla, 2017). Consequently, the existing gap in the literature lies in the exploration of the potential impact of collaborative learning on the quality of teaching among teachers. Overall, the purpose of this study is to determine teachers' perceptions of content, technological and pedagogical knowledge, and collaborative learning in teaching quality for the use of m-learning PD in Bisha City secondary schools.

#### **1.2 Background of the Study**

Technological advancements worldwide have brought about dynamic changes in various societal domains, including the field of education. Within the context of Saudi Arabia in the 21st century, the education sector experiences such changes periodically through modifications in the curriculum, ultimately leading to the adoption of digital learning. Statistical data provided by the General Authority for Statistics in the country further reveals that as of March 10, 2021, internet usage among Saudi Arabian citizens has risen to 92.5%, indicating a technologically inclined society that relies on digital services and devices for fulfillment (Lutfi et al., 2023). Saudi Arabia is the leading market for 4G technology in the region, with a significant number of young individuals actively embracing and utilizing modern technology. Notably, the country's progress in terms of technology is primarily driven by advancements in mobile internet technology and widespread smartphone usage (Alanazi et al., 2023). Lutfi et al., 2023).

Additionally, the Saudi government has made substantial investments in the development of technological infrastructure by supporting internet-enabled services and establishing robust mobility networks (CITC, 2017). Consequently, the proliferation of smartphones in the country has facilitated the success and dominance of mobile learning (m-learning) in educational practices. However, despite the advanced telecommunications system in place, the implementation of m-learning remains in its early stages, particularly in developing nations including Saudi Arabia(Lutfi et al., 2023).

M-learning is the delivery of learning to students at any time and place through m-devices such as a laptop with Wi-Fi and learning using a smartphone (Efiloğlu Kurt, 2023). With the rising use of mobile phones and tablet computers, M-learning has become an attractive option for learners who wish to acquire new skills or update their existing ones (Dahri, Al-Rahmi, et al., 2023; Gupta & Kumar, 2022). Mobile learning applications via the internet support seamless learning by extending learning beyond the classroom into everyday real-world experiences. The use of mobile-based learning can contribute to sustainability by overcoming the constraints of traditional educational spaces and providing increased access to quality education (Dahri, Al-Rahmi, et al., 2023; Kashada & Koshadah, 2018; Öztürk, 2018). Learning carried out through m-learning involves the use of laptops, hybrids, smartphones, and tablets in m-learning applications will increase to access learning content online (Chiappe-Laverde et al., 2021; Ally et al., 2017; Lutfi et al., 2023).

However, the adoption of mobile-based learning among teachers in developing countries is often hindered by various factors, including a lack of technical skills, inadequate infrastructure, and negative attitudes toward the use of technology in education (Dahri, Al-Rahmi, et al., 2023). By examining the teachers' adoption of mobile-based learning for 21st-century, this study has the potential to contribute to the promotion of professional development in education

Teacher training programs have traditionally relied on in-person interactions between trainers and trainees, with workshops and seminars organized by government and non-governmental organizations serving as the primary method of teacher training. Nevertheless, this approach is not without its limitations, such as restricted access to training opportunities for teachers in remote areas and limited avenues for continuous professional development (Dahri, Al-Rahmi, et al., 2023). In response to these challenges, there has been a shift towards utilizing mobile-based training for teachers (Dahri et al., 2023).

The Ministry of Education in Saudi Arabia has implemented various measures aimed at advancing the professional development of teachers with the ultimate goal of improving the quality of education and enhancing student learning outcomes. Teachers' Professional Growth Program (TPGP) and the National Center for Professional Development (NCPD), have been established aim to enhance teaching practices and offer courses in areas such as instructional design, assessment, evaluation, classroom management, leadership, and educational technology (Singh et al., 2022).

In addition, these programs offer comprehensive courses in key areas such as instructional design, assessment, evaluation, classroom management, leadership, and educational technology including mobile learning. To fully harness the potential of laptops, tablet computers, and mobile technology in education, it is important to provide teachers with adequate training and support in using these devices effectively. As a result, the Ministry of Education has taken steps to introduce the E-learning, Program, which provides teachers with online training courses in educational technology and instructional design (Dahri et al., 2023; Singh et al., 2022). Teachers are not only focused on the subject matter and principles of teaching to achieve curriculum demands, but also integrate teaching principles and learning material interactive style by using technologies (e.g., mobile, laptop, and internet connection) as a supporting area in teaching quality and learning process.

The nature of what constitutes 'quality' in school education is a subject of ongoing debate in both developed and developing countries. Several factors can be different in developed and developing countries when it comes to determining the quality of teaching, whereas ensuring quality in teaching is a continuous process (Warisno, 2020). Teacher's TPACK is important for teaching quality because it integrates pedagogical, content, and technological knowledge, which are essential for effective instruction (Sacre & Lallemand, 2023). These components of TPACK have been able to create effective technology, support pedagogical practices, and work on technology at the point of sustaining new information (Azhar et al., 2023). Teachers with higher TPACK are more competent in providing cognitive activation to students, leading to better instructional quality (Adnan & Yunisari, 2023). As such, TPACK plays a vital role in enhancing teaching quality by equipping teachers with the necessary knowledge and skills to effectively integrate technology into their instruction. However, TPACK has not yet been studied significantly in specific domains regarding the reaching quality among teachers.

Research suggests the significance of TPACK in PD specifically content knowledge related to the subject they teach, such as follow-ups on any new advancements or curriculum-based content (Heba et al., 2015). Although teacher knowledge is recognized as a strong influence on teaching quality, empirical evidence examining this relationship is scarce (Sacre & Lallemand, 2023; König & Pflanzl, 2016; Wekerle et al., 2022). It is crucial to ensure quality teaching and improve teaching practices in secondary education which, in turn, will foster deep student learning and understanding. In addition to content knowledge, pedagogical knowledge was related to instructional quality, problem-solving specifically the degree of cognitive activation provided to students, and collaborative learning strategies in PD programs (Heba et al., 2015; Sacre & Lallemand,2023). However, few studies – and to the best of researchers' knowledge, in high schools– examined the relationship between teachers' pedagogical knowledge and their quality of teaching (Adnan & Yunisari, 2023). Nazari et al. (2019) state that teachers are qualified to master the pedagogy and content knowledge to produce satisfying teaching and learning processes. Teachers with strong pedagogical content knowledge can integrate content and pedagogy effectively, leading to better academic performance of students in Iran. Therefore, teachers must have a firm grasp of relevant information, concepts, principles, and methods to make informed pedagogical decisions.

Technological knowledge is important for prospective primary and secondary school teachers to facilitate understanding for students (Chai et al., 2019; Jung et al., 2019). Therefore, having technological knowledge is essential for teachers to improve teaching quality and enhance students' learning experiences (Heba et al., 2015; Sacre & Lallemand,2023). Adnan and Yunisari (2023) showed that teachers' pedagogical competence was higher than technological and content knowledge because they adopted lesson plans from the Internet to improve their teaching quality in Indonesia. How to integrate this high technological knowledge with pedagogy hence stays unclear; prior work identified opportunities for novel technologies in education e.g., Sacre and Lallemand (2023) in the Netherlands, yet there remains a research gap in this regard in secondary education.

Collaborative learning among teachers is a topic that has been explored in several studies. Italian teachers have been found to propose collaborative learning activities to some extent in both face-to-face and online settings, including during the COVID-19 outbreak. The study further highlights that collaborative learning activities are proposed to some extent but not always in line with recommendations from the research community (Pozzi et al., 2023). Adebola and Tsotetsi (2022). discusses collaborative learning among pre-service teachers in rural universities in South Africa. It suggests that strategies such as micro-teaching and group work can foster collaborative learning among teachers. In Nepal, English teachers have shown positive attitudes towards collaborative teaching practices, as it helps construct new knowledge, establish a social atmosphere conducive to learning, and solve students' problems(Bhandari, 2022). In the Saudi Arabia context, a study by Al Asmari (2016) demonstrated that teachers expressed their concerns about networking with colleagues, directions from the experts, and discussions to assist them in resolving the issues in the classroom that are caused by the short period of CPD (continuing professional development), a large number of participants, and seating arrangements.

The studies also highlighted that inadequate offers for teachers' training and collaboration can hinder their professional development. Additionally, creating a collaborative learning environment among teachers that encourages students' oral contact and allows them to learn by helping each other can be beneficial (Adebola & Tsotetsi, 2022). However, teachers do not wish to enroll in workshops for tedious long talks; they prefer hands-on examples. Teachers want activities that engage them and provide practical examples of how to implement new technologies or teaching methods. There are considerable initial challenges when teachers change from lecture-style to Collaborative learning. Furthermore, there are some challenges and difficulties in implementing collaborative learning in the Saudi context, such as curricula and the assessment system (Almulla, 2017). Thus, the gap within the research is looking at collaborative learning and finding out if it has an impact on teaching quality.

In conclusion, there have been numerous studies conducted on TPACK that necessitate further improvement and a more detailed explanation (Adnan & Yunisari, 2023; Chai et al., 2019). The required details encompass the competencies of teachers about TPACK, specifically in terms of preparation, implementation, and evaluation of learning activities, as well as the application of TPACK in teaching students (Maor, 2017; Wardani, 2022). Theoretically, the TPACK framework constitutes an integration that teachers must employ effectively to enhance teaching quality. Regrettably, certain teachers have disregarded the components of TPACK in the context of teaching and learning processes, both in terms of instructional and technological aspects (Adnan & Yunisari, 2023; Sacre & Lallemand, 2023). However, little evidence exists regarding how secondary teachers' TPACK knowledge can support their teaching quality. Building off previous research on teaching quality (e.g., Backfisch et al., 2020; Haron et al., 2021; Zhang& Zhang, 2023), research on TPACK (e.g., Adnan & Yunisari, 2023; Chen & Jang, 2019), and collaborative learning (Ismail et al., 2018; Sarwar et al., 2019) this study investigated effects of TPACK (as teachers' knowledge of content, pedagogy, and technology) and collaborative learning on teaching quality.

#### **1.3 Problem Statement**

After the introduction of the Saudi Vision 2030 plan in 2016, the government focused on transforming the education system in Saudi Arabia by improving recruitment, training, and development of teachers, enhancing curricula and teaching methods, improving values and core skills, and promoting creativity and innovation. However, the quality of education in public schools was not effectively monitored (Dahri, Al-Rahmi et al., 2023). The government developed and implemented continuing professional development in the sector to improve the quality of teaching in the education system. Consequently, the Ministry of Education in Saudi Arabia has introduced initiatives for teachers' professional development to enhance education quality and improve student learning outcomes (Dahri, Al-Rahmi et al., 2023). The Ministry of Education established NCPD and NCPD to enhance teaching practices and offer courses in areas such as instructional design, assessment, evaluation, classroom management, leadership, and educational technology (Dahri, Al-Rahmi, et al., 2023; Assalahi, 2021; Singh et al., 2022).

Today, the use of m-learning PD programs for teachers has gained less attention as an effective approach to enhance the quality of teaching, motivated by the importance of teacher training and the growing interest in mobile-based training programs (Dahri, Al-Rahmi, et al., 2023). Comparatively speaking, studies have indicated that 73% of teachers are dissatisfied with PD training quality as the PD curriculum did not reflect the skills required by the teachers (Aldhafiri & Aldhafiri, 2020). These results were in line with the study by Alzahrani (2020), where teachers reported on the difficulty of profiting from PD and in-service training that they enrolled in. To illustrate, the trainers were not able to fulfill the teachers' demands, did not meet the qualifications, and did not have alternative models for professional development.

Saudi PD training's poor design and evaluation strategies of the PD training caused a negative perception of teachers' PD programs (Aldhafiri & Aldhafiri, 2020; Assalahi, 2021; Alshaikhi, 2018). Consequently, more than half of the teachers in Aldhafiri and Aldhafiri's (2020) study perceived that professional development (training faced failure in assisting them in their teaching and enhancing their teaching performance. The offered professional development programmes only created a slight improvement in teachers' pedagogical knowledge and skills. The study by Masters et al. (2010) reported that the primary approach to improving in-service teachers' quality is through PD. However, professional development training lacks regularity and a strategic manner that considers the difference in the teaching subjects and teachers' needs leading to poor support for teachers' teaching quality (Aldhafiri & Aldhafiri, 2020). This situation has posed a challenge to the Ministry of Education in adopting training strategies that allow teachers to be updated with the latest educational knowledge and practices in their fields. In a more recent study, female English teachers expressed that the PD courses did not provide the expected support to enhance their skills and knowledge and assist in the students' learning (Aldhafiri & Aldhafiri, 2020).

The use of mobile technology in teachers' professional development, instructional design, and content delivery can be bridged through cooperation and exchanges between teachers (Ally et al., 2014). Mobile technology offers flexibility, cost-effectiveness, and anytime-anywhere access to professional development programs, which can enhance teachers' learning outcomes (Dahri et al., 2022). However, the lack of a collaborative learning culture among teachers in existing PD programs restricts the opportunity to exchange experience and creative ideas that may improve teaching qualities (Klatt et al., 2020). In most cases, the majority of Saudi teachers rarely work in teams; they accomplish their tasks on their own in private (Shafai, 2014). To explain this point, teachers have busy schedules, which limits the time for collaboration with colleagues and leads to their reliance on traditional methods of teaching (Hancock et al., 2019).

Additionally, the use of technology in collaborative learning environments has been shown to enhance the quality of learning experiences. The application of a collaborative learning approach by secondary school teachers in Saudi Arabia presents a wide range of characteristics about personal attributes, attitude, pedagogical competence, subject matter comprehension, and classroom approach (Altheyab, 2023). Moreover, the lack of collaboration among teachers in PD training creates a negative perception of teachers' PD programs (Aldhafiri & Aldhafiri, 2020; Assalahi, 2021; Alshaikhi, 2018). Thus, this study explores the perceptions of teachers regarding issues including collaborative learning that contribute to poor collaborative learning and the impact of policy/planning and implementation. This study endeavors to fill the gap in the existing literature by examining teachers' perceptions, which have not been done before in the context of Saudi Arabia.

To enrich the learning process, both the government and curriculum designers of Saudi Arabia have also directed their attention towards fostering collaboration. This unequivocally illustrates the successful implementation of collaborative practices. Nevertheless, the practical comprehension of teachers' collaborative practices in terms of learning (Almulla, 2017) and how it impacts their teaching proficiency remains unexplored. However, the study conducted by Shafai (2014) reported that the limited time allotted for collaboration, as well as the insufficient support and encouragement for implementing collaborative efforts within schools, have a detrimental effect on teachers' inclination to initiate collaboration with their peers. Furthermore, there exists a certain level of discord regarding the specific circumstances in the classroom where collaboration learning can yield a more favorable outcome, such as the enhancement of teaching quality and academic learning, This study was conducted to identify whether teacher's collaboration learning influence teaching quality.

The existing research focuses on teachers' TPACK and the impact of TPACK on the teaching process in different countries such as Malaysia, Singapore, Indonesia, and the Netherlands (Azhar et al., 2023; Castéra et al., 2020; Lestari, & Rahayu, 2023; Sacre & Lallemand, 2023; Rahayu et al., 2022; Wardani, 2022). Summarizing such studies, an encompassing construct suggests that content knowledge, technological knowledge, and pedagogical knowledge affect teachers' teaching process. However, there are few studies on how to integrate theological knowledge, content knowledge, and pedagogical knowledge in the use of m- m-learning for teachers' PD programs to influence the teaching quality of secondary teachers. Moreover, despite the profusion of studies was university and English teachers, there is a lack of knowledge about domain-specific, pedagogical, and technological knowledge of secondary teachers' TPACK in the use of m-m-learning for teachers' PD programmes (Azhar et al., 2023; Castéra, et al., 2020; Sacré & Lallemand, 2022). Crucially, taking secondary teachers perceptions of Teachers' perceptions of the use of mobile learning (m-learning) and its connection to TPACK has not been the focus of previous research. As teachers are thought to be the chief contributors to the education system, examining their perceptions is a helpful way of gaining insights into various aspects of teaching quality and student performance.

Previous research in the Saudi secondary school context showed a gap between teachers' technological use and their knowledge of technological use (Alsahli, 2012 as cited in Zalah, 2018). This situation indicated teachers' awareness of the benefits of using technology in their teaching, although they lacked knowledge about technology and the methods of using it. This result was in line with other recent issues highlighted in technology knowledge, to which Alharbi's (2019) study highlighted the inadequacy of PD programmes in the effective methods of using technology in education. As for the teachers who faced inadequacy of integrated knowledge, TPACK (Technological

Pedagogical and Content Knowledge) was required if they aimed for an effective application of technology for improvement in teaching and learning procedures. However, the content was found to not support the use of technology (A. R. Alharbi, 2019).

Sulaimani et al. (2017) stated that as a result of the inadequacy of focused training and administrative limitations, the teachers could not successfully integrate technology into their teaching. It was also highlighted that the understanding of the use of a particular application or technology does not represent technology integration. However, the successful implementation of technology consists of the incorporation of technological, pedagogical, and content knowledge for a contextualized purpose (Sulaimani et al., 2017). This condition indicates the teachers' inadequacy of integrated knowledge, TPACK, which could enhance the quality of their teaching. Thus, teachers should possess a further understanding of technological knowledge (Albuloushi, 2019).

In the aspect of knowledge content (CK), Sulaimani et al. (2017) stated that despite the value of the workshops shown by participants and their confidence in their knowledge of TPACK, it was found that the training was not relevant for content (Sulaimani et al., 2017). Furthermore, the staff in the colleges of education who are experienced in teaching should have a strong association with the planning and use of the PD content (Aldahmash et al., 2019). Teachers' content knowledge was not high (Bingimlas, 2018); they were weak in terms of content and presented poorly organized materials and inconsistent training methods (Aldhafiri & Aldhafiri, 2020). These results were in line with the study by Alzahrani (2020) where teachers reported difficulty profiting from PD and in-service training that they were involved in due to the repetitiveness of topics and meaningless information. In Alsubhi's (2020) study, teachers received low organizational support for PD that focused on their field of teaching. He suggested that studies be conducted on the possible weaknesses of the instructors who present the PD content in Saudi Arabia, considering that many participants described the PD instructors as "not knowing".

The Kingdom holds an aspiring objective to transform the nation's revenue stream by reducing its reliance on oil using a new Saudi Vision 2030 plan (Kingdom of Saudi Arabia, 2016). In this case, e-education factors are among the essential instruments for educating the public. Given that e-education, success would only be on the same level as the teachers' TPACK, the development of the teachers' quality of teaching is important in fulfilling the crucial strategic objectives (Albuloushi, 2019). Therefore, the improvement in teachers' collaborative learning, technological, pedagogical, and content knowledge (TPACK), and teaching standards is crucial in assisting teachers in fulfilling the strategic objectives of Vision 2030.

#### **1.4 Research Purpose**

This study aims to identify the influence of TPACK and collaborative learning on teaching quality in the application of m-learning for the professional development of Saudi secondary school teachers. Through the understanding of the content, pedagogical, technological knowledge, and collaborative learning in professional development, teachers would be able to apply these methods to improve their quality of teaching.

#### 1.5 Research Objectives

The objectives of this study are as follows:

- To examine the level of teachers' perceptions on content, technological and pedagogical knowledge, and collaborative learning in teaching quality for the use of m-learning PD in Bisha city secondary schools.
- To investigate the influence of Content Knowledge in the use of mlearning for teachers' PD programmes on the teaching quality of Bisha City secondary school teachers.
- iii) To investigate the influence of Technological Knowledge in the use of m-learning for teachers' PD programmes on the teaching quality of Bisha City secondary school teachers.
- To investigate the influence of Pedagogical Knowledge in the use of mlearning for teachers' PD programmes on the teaching quality of Bisha City secondary school teachers.
- v) To investigate the influence of Collaborative Learning in the use of mlearning for teachers' PD programmes on the teaching quality of Bisha City secondary school teachers.

#### **1.6 Research Questions**

This research has answered the following research questions:

 What are the levels of teachers' perceptions of content, technological and pedagogical knowledge, and collaborative learning in teaching quality for the use of m-learning PD in Bisha City secondary school?

- What is the significant influence of Content Knowledge in the use of mlearning for teachers' PD programmes on the teaching quality of Bisha City secondary school teachers?
- iii) What is the significant influence of Technological Knowledge in the use of m-learning for teachers' PD programmes on the teaching quality of Bisha City secondary school teachers?
- What is the significant influence of Pedagogical Knowledge in the use of m-learning for teachers' PD programmes on the teaching quality of Bisha City secondary school teachers?
- What is the significant influence of Collaborative Learning in the use of m-learning for teachers' PD programmes on the teaching quality of Bisha City secondary school teachers?

#### **1.7** Research Hypotheses

The following are the hypotheses based on the research questions:

- Ha1: There is a significant influence of Content Knowledge (CK) in teaching quality on the use of m-learning in teachers' PD programmes.
- Ha2: There is a significant influence of Technological Knowledge (TK) in teaching quality on the use of m-learning in teachers' PD programmes.
- Ha3: There is a significant influence of Pedagogical Knowledge (PK) in teaching quality on the use of m-learning in teachers' PD programmes.
- Ha4: There is a significant influence of Collaborative Learning in teaching quality on the use of m-learning in teachers' PD programmes.

#### **1.8** Significance of the Research

As teachers are thought to be the chief contributors to the education system, examining their perceptions is a helpful way of gaining insights into various aspects of teaching quality and student performance. Thus, this study explores the perceptions of teachers regarding issues including content knowledge, pedagogical knowledge, and technological knowledge as the main elements of TPACK in professional development and the factors that contribute to teaching quality. This study endeavors to fill the gap in the existing literature by use of m-learning in teachers' PD programs and examining teachers' perceptions, which has not been done before in the context of Saudi Arabia However, without an understanding of the concerns and needs of the teachers, the government or organizers of the professional development programmes would not be able to increase the quality of the training programmes. This condition would subsequently affect teachers' improvement, followed by their teaching. The teachers' dissatisfaction with the training programmes would reduce their participation, which would not be favourable for many parties.

This study suggested innovative ways of learning for teachers, considering the irrelevance of the traditional ways. As teachers pursue their professional development, teachers should ensure that their journey is interesting and updated by utilizing new tools and approaches to encourage their professional development. By experiencing the convenience and joy that the current technology can offer, teachers can utilize these new tools in their teaching and enhance their technological knowledge. While starting a new and unfamiliar task may be daunting, the benefits to be gained from it would be meaningful.

The present study is focused on analyzing teachers' perceptions of quality teaching and its impact on students' academic performance in secondary schools in Nepal. With the help of existing literature, this study has both explored existing knowledge and expanded it. Another contribution of this study is made to the literature on education and Saudi teachers' PD. Every country has its respective culture, and the Saudi culture is incorporated into its education system. Therefore, Saudi teachers' opinions are more relevant to Saudi PD training programmes. Provided the uniqueness of some practices in Saudi culture, it would be worthy to recognize these practices in teachers' professional development.

#### **1.9** Scope of the Research

This research is centered on the utilization of mobile learning for the professional development of secondary school teachers in Saudi Arabia. Specifically, it examines the impact of content, pedagogical and technological knowledge (TPACK), as well as collaborative learning, on the quality of teaching. In this study, quantitative data from teachers' opinions through survey questionnaires is used to assess the theoretical as well as the practical situation of teaching quality. This research was performed in the context of Saudi Arabia secondary school teachers from public schools. To illustrate this point, secondary school teachers may have slightly different concerns compared to primary or preschool teachers.

#### **1.10** Research Limitations

The sample of the study was limited to public secondary schools in the city of Bisha during the 2021/2022 academic year. This region was selected, given that it is large and contains diversity; it comprises both rural and urban regions. This condition limits teachers' participation in training programmes conducted outside of their geographical locations due to difficulties in traveling and cost. Nevertheless, the result of the research could be utilized as a reference for other research works regarding PD in Saudi Arabia. With the many variables in the research, a quantitative method was applied to explain the relationship between the variables in the form of statistics. Therefore, it is recommended for future research to utilize qualitative or mixed-method analysis to offer an in-depth comprehension of the topic highlighted in this study.

#### **1.11** Operational Definition

The operational definitions of terms are described in the following sections.

#### 1.11.1 Content Knowledge (CK)

Content knowledge is defined as teachers' knowledge regarding a subject matter to gain an understanding of and elaborate on (Koehler et al., 2013). In the context of this research, content knowledge was described as teachers' knowledge of the use of m-learning in the PD programme regarding the subject matter.

#### 1.11.2 Pedagogical Knowledge (PK)

Pedagogical knowledge is defined by Koehler et al. (2013) as teachers' thorough understanding of the procedures or approaches of teaching and learning. In the context of this research, this term was described as teachers' thorough understanding of the application of m-learning in the PD programme in the procedures and approaches of teaching and learning.

#### 1.11.3 Technological Knowledge (TK)

Technological knowledge is challenging, given that this term could become outdated at any time (Koehler et al., 2013). Nonetheless, it was explained that specific methods of thinking and applying technology could be applied to all technological instruments and sources. In the context of this research, technological knowledge was described as the teachers' understanding of the application of m-learning in the PD programme that builds comprehension about the compatibility of technology instruments, tools, and sources with the teaching and learning procedures.

#### 1.11.4 Professional Development (PD)

Teachers' PD is described as teachers learning, knowing the ways of learning, and converting their knowledge into practice in favour of their students' development (Avalos, 2011). In the context of this research, teachers' PD through m-learning was defined as teachers learning, knowing the ways of learning, and collaborative learning among teachers and converting their knowledge into practice in favour of their students' development.

#### 1.11.5 Mobile Learning (M-learning)

M-learning or m-learning is defined as the act of learning through mobile tools including smart mobile phones or tablet PCs (Chee et al., 2017). In the context of this research, M-learning or m-learning was described as the act of learning for teachers at any place or time through mobile devices including smart mobile phones or tablet PCs.