

Effect of using mobile devices as an instructional tool on teachers' creativity: an interpretive phenomenological study of Pakistani teachers' experiences

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Abstract

Purpose – The purpose of this study is to investigate the effect of using mobile devices as an instructional tool on teachers' creativity and to promote their usage as instructional tools in educational settings. The research also studies the perceptions of teachers on the effect of using mobile devices as an instructional tool on their creativity and what features of mobile devices are believed to help in terms of enhancing their creativity.

Design/methodology/approach – This qualitative inquiry used an interpretive phenomenological analysis (IPA) method for inspecting the professional capabilities of Pakistan's primary and secondary school teachers. Data were gathered from nine individuals through interviews. Three themes regarding creativity emerged from the study data.

Findings – It is found that the use of mobile devices as a teaching tool significantly increases teachers' creativity by enabling them to manifest their creativity and explore different pedagogical vistas in which they can use a wide variety of instructional resources and tools. Using mobile devices as a teaching tool improved three skills: motivation, self-confidence and communication skills. Mobile applications, cameras and portability of these devices are among the features that teachers considered to have encouraged their creativity.

Research limitations/implications – Finding the obstacles and difficulties teachers have while utilizing these tools to demonstrate their creativity may be valuable for future studies. First, because respondents were teachers from elementary and secondary classes, the population was not entirely homogenous, even though they had adequate help. Second, only semi-structured interviews were utilized for data gathering in this study. Further data collection methods, including observational research or participant-written reflective diaries, are thought to have been preferred.

Practical implications – For future research, it may be interesting to determine whether the results of this study can be applied to other demographic groups. Based on this study, it is also recommended to conduct a quantitative study to know teachers' perceptions of the impact of these devices on creativity, since these studies can have promising results for teachers.

Social implications – Through the use of various materials, tools and activities, these devices provide several distinctive teaching alternatives. Because of this, using it as a teaching tool gives teachers the ability to tailor courses to a range of learner types. Additionally, having easy access to a multitude of online resources and the capacity to interact with others helped in ideation. The teachers experienced feelings of motivation, self-confidence and a desire to impart information, all of which are traits of creative teachers. Based on the findings of this study, we may now think about using mobile devices in the classroom to encourage teachers' creativity.



Originality/value – The outcomes of this research indicated that teachers' creativity is strongly influenced by their use of mobile devices as instructional tools. This paper advances the understanding of teachers' creativity by highlighting their lived experiences. This study is novel because it highlights how these devices have the potential to be used as instructional tools, which has not been highlighted by any study so far.

Keywords Instruction tool, Smart devices, Teachers, Mobile devices, Interpretive phenomenological analysis

Paper type Research paper

1. Introduction

Mobile technologies have grown so ingrained in everyone's lives that they have permeated all facets of existence (Livas *et al.*, 2019). Mobile technology, according to Al Hamdani (2013), for a few decades, has evolved into a new term, "learning through mobiles," which is the practice of teaching and learning by accessing mobile devices. Several types of mobile devices hold significant potential as tools for education and learning. These devices include laptops, virtual assistant gadgets, smartphones and tablets (Sung *et al.*, 2016). Additionally, these devices have aided the learning process and supported educators and trainers in delivering lessons (Khubyari, 2016).

The significance and importance of creativity are underscored by the fact that it is recognized as a significant contribution of the 21st century (Page and Thorsteinsson, 2017). The National Advisory Committee on Creativity and Cultural Education (NACCCE) (1999) highlighted the characteristics and abilities possessed by creative teachers. One primary trait of a creative teacher is that they can easily alter and change their teaching methods according to the situation. A creative teacher is the one who can "integrate the current and existing information in a decent or unique way, and it provides a unique method to nurture the cognition in order to achieve a meaningful output (learning)" (Ayob *et al.*, 2013, p. 9).

Unfortunately, mobile devices are not widely recognized as efficient educational tools in Pakistan. Even when teachers attempt to incorporate these devices into the classroom as learning resources, they encounter resistance from both school administrations and, at times, parents. Numerous schools in Pakistan require teachers to deposit their phones at the office, only returning them after school hours (ARY News, 2019). This practice deprives teachers and students of a valuable educational resource. It is recommended that teachers possess a functional understanding of mobile devices (García-Martínez *et al.*, 2019). Similarly, the teaching profession demands ongoing creativity as teachers craft new approaches and employ information in novel ways (Lapéniené and Bruneckienė, 2010). However, relatively few studies have been conducted to examine teachers' creativity. Therefore, this study aims to bridge this gap in the literature by investigating the impact of mobile device usage on teachers' creativity. Henriksen *et al.* (2021) recommended research into necessary creative approaches related to advanced technology, identifying a scarcity of literature linking technology and creativity from teachers' and students' perspectives. Investigating the viewpoints of teachers related to the effect of using mobile devices on their creativity can help educational institutes acknowledge the importance of such devices and provide training to teachers to use them as instructional tools.

1.1 Aims and objectives

Building on these considerations, this study seeks to enhance the understanding of teachers' experiences and insights into the impact of mobile devices as instructional tools on their creativity. This research aims to address the following key questions:

- (1) How do teachers perceive the use of mobile devices as an instructional tool to promote their creativity?
- (2) What features of mobile devices do teachers recognize as helpful in terms of promoting and exhibiting their creativity?

1.2 Mobile devices in education

Recent research underscores the significant potential of mobile devices to enhance educational practices. According to a United Nations Educational, Scientific and Cultural Organization (UNESCO) report from 2013, mobile devices include a range of portable and connected technologies, including mobile phones, smartphones, e-readers, netbooks, tablets, iPads and computers. Within the realm of mobile devices, two prominent terms emerge: mobile learning and mobile teaching. These terms, though distinct, are interrelated concepts shaped by the expectations and experiences of both learners and teachers. Mobile learning refers to the use of mobile devices to facilitate learning at any location and time (Kukulska-Hulme and Traxler, 2005), while mobile teaching involves harnessing mobile devices to support instruction and teaching (Ismail *et al.*, 2022).

Numerous studies propose that the attractive features of mobile learning render it an effective means for teachers to foster engaging and enjoyable learning experiences (Liu and Hwang, 2010; Hwang and Chang, 2011). Moreover, the integration of mobile technologies into the teaching and learning is expected to exert a profound impact on the experiences and achievements of both teachers and learners (Alvarez *et al.*, 2011). To encapsulate this paradigm shift, our study defines mobile devices as technological tools that expand the scope of teaching, enabling learning to occur beyond traditional boundaries (Ismail *et al.*, 2022).

Within the specific context of this study, smartphones and tablets emerge as exemplars of mobile devices, as they are most prevalently utilized by teachers for both their own instructional practices and classroom teaching within Pakistan. Consequently, our research primarily centers on investigating how smartphones and tablets serve as instructional tools to enhance teachers' creativity in their teaching.

1.3 Creativity and teachers

Individuals who are consistently seeking and exploring novel methods to enhance their teaching methods are typically regarded as creative teachers. As the creativity of teachers plays a pivotal role in shaping the effectiveness of the learning processes, creative teachers inspire students to cultivate problem-solving skills by creating engaging and suitable learning environments. In today's educational context, two significant concepts frequently under discussion are creative teaching and teaching for creativity. As emphasized by Cremin (2009), creative teaching "involves teachers in making learning more interesting and effective and using imaginative approaches in the classroom." This approach is intertwined with the teacher's personality and how they express their creativity in their daily teaching practice. In a parallel manner, teaching for creativity "is seen to involve teachers in identifying children's creative strengths and fostering their creativity" (Cremin, 2009).

1.4 Role of mobile devices to support teachers' creativity

A number of studies have expressed the opinion that mobile devices can change the way teachers teach and their perceptions of both their pedagogy and themselves (Pachler *et al.*, 2010). Consequently, within teaching and learning environments, mobile devices hold the potential to contribute to pedagogical innovation and transform practices (Danaher, 2009). In the context of mobile learning and teaching, teachers transition from traditional teaching methods to innovative ones as they employ a variety of media (Shepherd and Vardiman, 2014). A study conducted among teacher educators looked into how they perceive using mobile devices to showcase ingenuity in various instructional strategies. According to the findings, prospective teachers believed that mobile devices helped them become more creative by identifying when changes were needed, using them to access information and adjusting these resources to achieve improved results aligned with strategic goals (Onion, 2014). Similarly, in a study conducted by Onyema *et al.* (2019), it was discovered that the

incorporation of mobile phones in teaching results in innovative approaches and enhanced creativity in both teaching and learning. Furthermore, [Nishizaki's \(2015\)](#) research indicated that the utilization of tablets and iPads within classrooms can significantly transform the landscape of teaching and learning.

The connection between mobile devices and creativity has primarily been explored in the context of students' learning experiences (e.g. [Jahnke and Liebscher, 2020](#); [Yeh et al., 2020](#)). In a study by [Kyobe et al. \(2022\)](#), it was discovered that the use of smartphones by students actually enhances their creativity. [Ganguin and Hoblitz \(2012\)](#) delved into the interplay between innovative mobile phone usage and mobility. Their research concluded that while communicating through mobile phones, users establish connections, express ideas, create and recreate content, share knowledge and develop feedback systems. These processes, in turn, stimulate the creativity of students. Similarly, [Yeh et al. \(2020\)](#) discovered that practicing mindfulness through smartphone usage could enhance awareness, attentiveness and inventiveness, ultimately leading to an increase in creativity. They conducted a pilot study involving 49 college freshmen. Mobile devices have the potential to expand the scope of traditional teacher-led classroom instruction, while an innovative classroom setting empowers students to exceed the mere memorization of curriculum content ([Yeh et al., 2020](#)). According to [Masrom and Ismail \(2008\)](#), the abundance of diverse resources available on smartphones – including photographs, movies, music and animations – significantly influences users' innovative thinking.

Studies that have explored the relationship between mobile devices and teachers' creativity have examined this connection in conjunction with other technological tools rather than exclusively focusing on mobile devices (e.g. [Ridha and Fithriani, 2023](#); [Loveless et al., 2006](#)). Other research has focused on how teachers' use of mobile devices influences students' creativity (e.g. [Jahnke, 2013](#)). Upon reviewing the existing literature pertaining to mobile devices and creativity, it becomes evident that previous research primarily centers on the link between mobile device utilization and creativity, particularly within the context of students and their learning. Nevertheless, there is a noticeable lack of literature addressing the impact of mobile device usage on teachers' creativity. This research endeavors to bridge this gap by delving into teachers' firsthand experiences with employing mobile devices as instructional tools and its potential impact on their creativity.

2. Method

2.1 Research design

Interpretive phenomenological analysis (IPA) was chosen as a research methodology over other qualitative methods because this research doesn't solely aim to describe the lived experiences gained from the effect of using mobile devices on teachers' creativity. It also places a strong emphasis on interpreting the experiences themselves. In light of this, IPA was selected for this research. Through the use of this method, the researchers aimed to uncover detailed insights into how teachers' creativity is impacted by their use of mobile devices. This approach provides a comprehensive understanding of their thoughts, emotions and motivations.

2.2 Theoretical framework

The theoretical basis for this research is the Technological, Pedagogical and Content Knowledge (TPACK) framework, which provides a perspective on the relationship between pedagogy, content and technological knowledge. [Henriksen et al. \(2016\)](#) assert that TPACK is a critical factor guiding teachers in using technology to enhance creativity in ways that align with the material and techniques being employed. TPACK centers on effective teaching with technology, demanding an in-depth grasp of subject matter concepts, pedagogical methods

for content delivery via technology and understanding related to how concepts can be made easy in terms of learning and what makes them difficult. Consequently, this theoretical lens enables us to delve into the intricate relationships between technology, pedagogy and content knowledge, offering insights into how these factors converge to shape teachers' experiences and perceptions of creativity enhancement through mobile technology.

2.3 Research participants

The eligibility criteria for selecting participants for this study were as follows: (1) individuals had to be engaged in teaching at the primary or secondary level; (2) participants should be conducting online teaching sessions using either tablets or smartphones; (3) the duration of their online teaching experience must exceed 12 weeks and (4) they were required to utilize a diverse range of online tools on their mobile devices for the purposes of teaching and learning. A total of 10 individuals took part in this study, with seven being women and three being males (e.g. as shown in Table 1). All participants held a full-time teaching occupation, with a range of experience spanning from two to fifteen years. For an IPA-based study, purposive sampling was recommended by Smith and Fieldsend (2009). However, after employing purposive sampling, the desired sample size was not attained. Consequently, the researchers opted for another sampling strategy known as snowball sampling, which involves expanding the sample size by having selected participants recommend the study to other individuals (Marshall and Rossman, 2006).

2.4 Data collection

Interviews are a fundamental technique of data gathering in phenomenological studies (Smith and Fieldsend, 2009) because they enable the study participants to contribute accounts of their experiences (Moustakas, 1994). Each interview was scheduled to last from an hour to an hour and a half. After evaluating the available literature on mobile devices and creativity, semi-structured interview questions were developed. Before conducting the actual interviews, these questions were pilot-tested with three teachers. Subsequently, due to the COVID-19 lockdown, virtual interviews were conducted via Skype and recorded. Later, the first author transcribed the interviews in a secure location to ensure participant anonymity.

2.5 Instrument

The semi-structured interviews were designed after reviewing the available literature on the TPACK framework, mobile devices and creativity. No qualitative and quantitative tool was available that could be adopted or adapted for this study. Therefore, the researcher reviewed available literature and also compared and analyzed various survey questionnaires on TPACK, mobile devices and creativity. Moreover, after devising the interview questions, the

Table 1.
Demographics of the
participants

Participants	Gender	Work Experience	Level
P1	F	04y	Primary
P2	F	04y	Primary
P3	F	10y	Secondary
P4	F	11y	Secondary
P5	F	09y	Secondary
P6	F	08y	Secondary
P7	<u>M</u>	11y	Secondary
P8	<u>F</u>	16y	Primary
P9	<u>M</u>	07y	Secondary
P10	<u>M</u>	8y	Secondary

researcher tool was approved by the two supervisors, and once it was approved by both of them, the pilot study was conducted.

2.6 Data analysis

Following the methods outlined by [Smith and Fieldsend \(2009\)](#) for IPA investigations. The analysis of the data began by thoroughly reading the transcripts multiple times to deeply engage with the data. In the next step, the researchers engaged in initial note-taking, categorizing the comments into three types: exploratory comments, descriptive comments, language comments and conceptual comments. Following the three types of comments mentioned earlier, the subsequent step was to identify the emerging themes. Next, the researchers proceeded to identify connections among the emerging themes, grouping them to form clusters of emergent themes categorized under main themes.

Moving on to the subsequent phase, the aforementioned steps were repeated with each transcript one by one, following the approach outlined by [Smith and Fieldsend \(2009\)](#). During the final phase of the analysis, the researchers examined patterns across all the cases and established connections among them. In this phase, emergent and subordinate themes underwent reconfiguration and relabeling. Subordinate themes that didn't recur in most cases were eliminated. Subsequently, the subordinate themes were amalgamated, resulting in the creation of three superordinate themes, with each superordinate theme comprising a set of relevant and interconnected subordinate themes.

2.7 Trustworthiness

Trustworthiness was assured in this study by establishing credibility and confirmability. The credibility of this study was established through member checks. According to [Smith and McGannon \(2018\)](#), in member checking, participants ensure that their responses are correctly captured by making edits and corrections to the interview transcripts. Confirmability aims to establish the fact that the data and its interpretation are not the creation of a researcher's imagination ([Tobin and Begley, 2004](#)). The researcher set aside all her preconceived ideas, notions, biases and thoughts regarding the phenomenon, which allowed her to capture the meaning of the participants' true description of their lived experience.

3. Findings

The data underwent analysis, unveiling three key themes: (1) features that encourage creativity, (2) from conventional to creative: mobile devices transforming teaching practices creativity and (3) possessing creativity. The process of analysis resulted in the discovery and separation of certain themes, while others had connections with each other. As a result, it is critical to view all themes as a whole. [Table 2](#), which graphically represents the themes and subthemes, can be found below.

Theme 1: Features that encourage creativity.

Mobile devices offered various features that nurtured teachers' creativity, including mobile applications, cameras and portability. These features were highlighted by participants as instrumental in fostering their creativity. Moreover, these unique features set mobile devices apart from other instructional technologies.

Mobile applications (mobile apps).

This subtheme highlights how apps empower participants to enhance their teaching methods through the creation of engaging content. The utilization of various apps enabled participants to teach with creativity, as it provided them with the opportunity to present subject-related content in fresh and engaging ways. For instance, Participant 1 mentioned,

Table 2.
Themes and sub
themes

Superordinate themes	Subordinate themes
Theme 1: features that encourage creativity	1. Mobile applications (mobile apps) 2. Camera 3. Portability
Theme 2: from conventional to creative: mobile devices transforming teaching practices	1. Unlocking innovative potential 2. Idea generation
Theme 3: possessing creativity	1. Self-motivation 2. Self-confidence 3. Communication and knowledge sharing
Source(s): Table by authors	

I tried out an app called Kahoot, and it's really interesting. Kahoot provides many interesting activities, including pre-made quizzes that students can solve based on the topic. It was my first time using such apps to teach students. These apps not only help teachers teach in new ways but also encourage students to be more creative

Similarly, Participant 4 shared her experience by stating, "During my teaching using mobile devices, particularly when creating videos, I realized the significant advantage of video editing. With the aid of various apps, one can make alterations and enhancements to the videos."

By utilizing mobile apps, Participant 4 effectively transformed her lesson videos, injecting a sense of creativity and interest into her teaching materials. This demonstrates her ability to enhance the learning experience through the innovative use of these apps, effectively modifying and revitalizing her lesson video content to capture and maintain students' attention.

3.1 Camera

The majority of the participants highlighted the significance of the camera feature, emphasizing how it served as a powerful tool for them to express their creativity in their teaching methods. Participant 5 while sharing her experience mentioned,

One day, I was baking a cake at home while also teaching a lesson. I let my students know that I'd be back in five minutes because I noticed my cake was emitting some smoke during that lesson. I informed them that I had a pancake cooking in the microwave. It was an enjoyable experience for both me and my students, as I carried my tablet to the kitchen and showed them the cooking process. The camera of my tablet allowed me to conduct my lesson in this way. Soon, I started receiving comments from students, asking why we couldn't conduct the whole class in that interactive way.

The participant's comment demonstrates that the camera feature of mobile devices enabled her to teach with creativity by integrating real-life situations into her lessons. She shared an interactive approach that was made possible by the camera, not only adding an element of excitement to the lesson but also allowing her students to witness a practical scenario in real-time. Similarly, Participant 4 mentioned,

if we want to show an experiment, we can record a video of that experiment with our phones. As you know, now everybody has a mobile phone. Everybody does not have a camera as it is very expensive. But in our mobiles, there is a feature of the camera and it plays a significant role to make creativity explicit.

The camera feature of mobile devices empowers teachers to visually enhance their teaching and create unique and engaging learning opportunities. It allowed them to capture real-life scenarios, experiment demonstrations and interactive activities, making the learning process more immersive and creative.

3.2 Portability

This theme underscores that the participants saw the devices' portability as a factor that affected their creativity. It also suggests that the portability feature reduced the inconvenience of waiting for resources for their students. The participants were able to search for materials and resources at any time and at any location. This ready-to-access resource, no matter when or where, had an impact on their creativity. Participant 2 mentioned,

Firstly, these gadgets can be carried everywhere we go. Furthermore, since they are in our possession, there is no need for us to wait. They provide us with immediate access to search for everything.

She could perform an instant search due to the portability of these devices. Her time was saved because browsing and searching became easy. Similarly, Participant 1 stated, "If you want to record, these gadgets are accessible everywhere." Participant 8 mentioned, "Our principal expects us to create diverse activities when we integrate mobile devices into teaching. Mobiles are incredibly convenient since we carry them all the time. We can easily use Google to search for various exercises and activities."

This suggests that the device portability enabled participants to search for things whenever they wanted. The portability of these devices enhanced creativity by giving users the freedom to use them wherever they wish rather than being restricted to a specific location.

Themes 2: From conventional to creative: mobile devices transforming teaching practices

This theme highlights the shifts in teaching approaches brought about by mobile devices. The participants outlined that the utilization of mobile devices as an instructional tool unleashed their creativity and provided them with various opportunities to experience and express creativity. Furthermore, this theme included the subthemes: opportunity to express creativity, making a lesson interesting and idea generation.

3.3 Unlocking innovative potential

This subtheme highlights how mobile devices unlock the innovative potential of teachers, inspiring them to abandon conventional methods in favor of more innovative and creative pedagogies while, at the same time, making their subject-related content interesting and engaging. By using mobile devices, teachers found new ways to teach that were different from before. It was their first time using these devices for teaching, so they experimented with various ways to teach students using these devices.

Participant 3 mentioned, "In Pakistan, the education system primarily imparts theoretical knowledge to students, lacking diversity and experimentation. Physics experiments undertaken by students are often basic. However, there are tools and applications for designing and simulating physics experiments. My awareness of these tools developed through my use of mobile devices. Presenting physics experiments to students in this manner offers a valuable and effective teaching approach. I learned to conduct such experiments with students when I used mobile devices as an instructional tool."

Participant 3 highlighted the constraints of traditional classroom teaching without any technology integration. However, the use of mobile devices offered diverse opportunities to instruct subject contents in novel, innovative and interesting ways, resulting in unlocking teachers' creativity. Furthermore, many participants highlighted instructional techniques that they had never used before, but when they employed them, their creativity increased. Similarly, Participant 5 proposed a novel strategy for students who participated in virtual classrooms. When she spoke,

"Amid the pandemic, I went shopping and noticed a sale happening on certain products. The idea struck me to hold a live class right there, using the opportunity to teach my students

about various marketing techniques. So, I initiated a live video session on the spot. The experience was enjoyable for both my students and me, as I showcased real-life products on sale. This unique teaching approach was something I hadn't tried before".

The participants didn't have experience using these tools, so their teaching methods were limited. They kept teaching in the usual way, with less interest in trying new things. Using mobile devices for teaching was new to them. They tried different ways to teach, like using new teaching strategies, approaches and pedagogies, to see what helped their students the most.

3.4 Idea generation

This theme emphasizes how the use of mobile devices as an instructional tool allowed the participants to generate more ideas related to the content they teach. Participants explored several materials, tools and resources on their mobile devices that helped them generate new ideas. Participant 2 remarked, "I found a lot of new ideas on the internet that I hadn't thought about before. With mobile devices, we can see teaching materials from teachers all around the world. They give us their plans for teaching, and we can learn from what they do. So, I don't only have my own ideas, but I also get ideas from other people. These ideas actually ignited fresh ideas within my own mind".

By using mobile devices, they gained access to teaching materials and strategies shared by educators globally. This exposure to a diverse range of ideas from others sparked their creativity. They not only had their own original ideas but also drew inspiration from the ideas shared by other educators. Likewise, Participant 7 said, "Utilizing mobile devices helped me generate more ideas. For instance, I taught my primary class students how to send emails. Typically, students learn to send emails after the 10th grade. I conceived this idea while teaching using mobile devices.because it allows you to easily come across resources and material which help you to get brainstormed about the topic and get more ideas".

The participants' ability to easily access a wide range of information and resources fueled her generation of ideas. With the availability of mobile devices, they could conveniently search for all sorts of information. Moreover, having access to abundant resources easily enabled them to generate ideas about how to deliver lessons and activities in unique ways.

Theme 3: Possessing creativity

This theme highlights that utilizing these devices as a teaching tool helped teachers develop self-motivation, confidence and communication skills. The respondents' creativity was stimulated by such abilities.

3.4.1 Self-motivation. This theme demonstrates how participants felt self-motivated when they started using mobile devices for teaching. They encountered no extrinsic motivation, such as a reward or acknowledgment and were all driven by some kind of internal motivation. One of the primary reasons individuals were motivated was because they loved utilizing these gadgets. By retaining the desire to persevere and continue the action, enjoyment fosters intrinsic motivation (Reeve, 1989). Participant 3 made a similar statement. As she put it,

"I found great satisfaction teaching using mobile devices, even though external recognition or appreciation was not a driving factor for me. My own sense of accomplishment brought me happiness." On another occasion, she shared, "I found myself thoroughly engrossed in the process. I would actively search for GIFs, captivating videos, and innovative ways to make my lectures more engaging and dynamic. It was a transformation where I began deriving genuine enjoyment from it. To be candid, I truly started relishing the experience"

The speaker expresses that their satisfaction and happiness come from teaching using mobile devices, irrespective of external recognition or praise. This demonstrates an internal drive or

self-motivation to engage with the teaching process and enhance it through creative means. The participants' enthusiasm for actively searching for engaging materials and innovative approaches using mobile devices indicates a personal drive to make the teaching experience enjoyable and dynamic.

3.4.1.1 Self-confidence. Most of the participants developed self-confidence as a result of having access to materials, tools and information that made it simple for them to learn new things. Hence, mobile devices serve as a vehicle for continuous learning and growth, erasing the boundaries of limited access to information and resulting in the building of self-confidence.

Participant 4 viewed tutorials and videos and accessed relevant resources to have a better understanding of how to teach, which ultimately helped to build confidence. "A teacher gains confidence," she claimed. "For instance, if I went for teaching at someplace for the very first time, I would shiver and my legs might tremble. However, if I go for an interview after watching videos, online lessons of five to six teachers and going through relevant online material, I will obviously get an idea how to teach. So, novice teachers can learn many this way and ofcourse they can easily do that on their mobile devices".

The same was expressed by Participant 8, "I felt more confident. I gained a lot of knowledge which I was prior ignorant of. Easy Access to ample of resources made me confident to try new things."

Mobile devices serve as valuable tools for professional growth and self-development among teachers. Since they could learn anything from viewing other people's videos and having easy access to resources and material, their confidence was boosted.

3.5 *Communication and knowledge sharing*

This theme highlights how the participants' creativity benefited from exchanging information and communicating with one another. Through collaboration and the sharing of ideas, they were able to generate fresh concepts and discover new ways to use mobile devices for teaching purposes.

Participant 5 shared, "Whenever we needed to share something, we had options like Zoho and WhatsApp. Similarly, when we needed to communicate information, we often used Zoom among us teachers. Sharing ideas and communicating has become convenient and easy with mobile devices. I believe this has significantly enhanced our creativity."

This demonstrates that she could accomplish more due to information sharing. She suggested using two tools, WhatsApp and Zoom, for interacting with each other. These platforms allowed her to share her thoughts and expertise. Participant 3 also mentioned,

"Many of my friends live abroad. They have already taught online, so I reached out to them and we talked about the tools, websites and online resources they found helpful. Certainly, from these conversations, I gained insights into how I could enhance my online teaching and better engage students. And, of course, mobile devices like smartphones have made long-distance communication much more convenient and this thing has impact on my overall creativity".

She was able to communicate and share information with people from different countries using portable devices and also with her colleagues. She discussed with them what strategies were successful for them and what might not work for others. This communication and exchange of information helped her gather more ideas for conducting lessons.

4. Discussion

Mobile device usage and its impact on learner creativity have been explored in previous studies (Yeh *et al.*, 2020; Jahnke and Liebscher, 2013), yet there is limited understanding regarding how these devices influence teachers' creativity. The main objective of this study was to investigate the relationship between the usage of mobile devices and teachers'

creativity, focusing on “how participants interpret their lived experiences.” This study found that features such as applications, cameras and portability in mobile devices contribute to teachers’ creativity, although there is a lack of research specifically on how applications and cameras promote creativity. Various studies have indicated that the portability of mobile devices affects creativity (e.g. [Loveless, 2007](#)).

This study uncovered that the utilization of mobile devices as instructional tools significantly enhanced the teachers’ creativity, enabling them to showcase their creativity through the exploration of various pedagogical approaches that encompass a diverse range of instructions and tools. Consequently, they were able to infuse their teaching with greater intrigue, engagement and impact. The teachers employed a variety of innovative teaching methods to educate their students. The available literature also implies that these devices boost teachers’ creativity ([Onion, 2014](#)), which is in line with our study. Similarly, [Cremin \(2009\)](#) highlighted that creative teaching “involves teachers in making learning more interesting and effective and using imaginative approaches in the classroom.” Teachers were able to generate additional ideas, adapt to the new teaching environment and discover innovative ways to teach students using these devices. Moreover, given that the respondents used these tools to pick suitable and appropriate resources and pedagogy to deliver their subject, the findings are also consistent with the TPACK framework.

This study found that using mobile devices as an instructional tool improved three skills: self-motivation, self-confidence and communication and knowledge sharing. The participants experienced a heightened sense of self-motivation as they found enjoyment in incorporating these tools into their teaching practices. Moreover, the study demonstrated that participants experienced an increased sense of self-confidence due to their access to a wide range of knowledge and the ability to communicate not only with those in close proximity but also with individuals residing in distant locations. This newfound confidence was noteworthy, as it aligns with the recognized traits of creative teachers, as highlighted by [Cremin \(2009\)](#). Confidence has been cited in several research studies as one of the traits of creative teachers (i.e. [Cremin, 2009](#)). Furthermore, the participants’ utilization of mobile devices had a positive impact on their communication and information-sharing abilities, thereby influencing their overall creativity. This finding concurs with the research by [Rasheed et al. \(2020\)](#), which emphasizes that the act of sharing knowledge, facilitated by mobile device usage, contributes positively to creativity. Similarly, [Wang and Noe \(2010\)](#) suggest that sharing information and innovative concepts with others can foster creativity and provide fresh perspectives on various issues.

5. Implication and conclusion

In conclusion, this paper advances our understanding of teachers’ creativity by highlighting their lived experiences. By exploring how teachers perceive the impact of mobile device usage on their creativity and identifying the specific features of these devices that influence teachers’ creativity, this study initiates a meaningful discussion about the significance of these devices for fostering teachers’ creativity. This research underscores the potential of mobile devices as effective instructional tools in the context of Pakistan. This study demonstrates how these devices offer diverse teaching alternatives through various materials, tools and activities, allowing teachers to customize their lessons to cater to different types of learners. Furthermore, the easy accessibility of online resources and the ability to engage with others facilitated the generation of new ideas. The teachers experienced feelings of self-motivation, self-confidence and a desire to share knowledge, all of which are traits of creative teachers. Building on the findings of this study, educators could contemplate integrating mobile devices into the classroom to stimulate and enhance teachers’ creative capabilities.

Based on these findings, it is recommended that teachers should be allowed to have these devices on school premises for educational purposes, as they can significantly contribute to

fostering teachers' creativity. To ensure responsible usage, school authorities should establish regulations and guidelines governing their use. Furthermore, it is advisable to provide teachers with training on effectively incorporating mobile devices as instructional tools, both during their pre-service training and throughout their careers. These training sessions should encompass appropriate methods for integrating these devices into the teaching environment.

For future research, it would be valuable to explore whether the outcomes of this study can be extrapolated to other demographic groups. Additionally, considering the insights gained from this study, conducting a quantitative study to assess teachers' perceptions of the impact of these devices on creativity is recommended. Such studies could yield promising insights for teachers.

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