



Introduction

RESEARCH PAPER

**Adoption of ICT Tools and Techniques during the Covid-19: A
Qualitative Study of University Teachers in Punjab**

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ABSTRACT

The main objective of the present qualitative study was to explore the university teachers' epistemological beliefs about adopting Information Communication Technology tools and techniques during the COVID-19 pandemic. The data were collected from university teachers of district Lahore with the help of semi-structured interviews. Thematic data analysis technique was used to analyse it. The findings show that, in comparison to public university teachers, private teachers attended the training session more enthusiastically and developed their knowledge and skills for online teaching. Most of them believed they didn't have proper exposure to online teaching before. Most participants used Skype and Google Meet before Covid-19 for virtual classes. From an epistemological perspective, the researchers found that adding new ICT tools and methodologies into regular classroom activities would improve students' learning outcomes. Connectivity issues create a considerable gap between teaching and learning during COVID-19. The study highlighted that online learning may not get desired results in underdeveloped countries like Pakistan.

KEYWORDS

University Teachers, Epistemological Beliefs, Information & Communication Technology (ICT), Tools and Techniques

Introduction

In December 2019, a virus named Covid-19 emerged, affecting the whole world. Due to its speedy spread, the world experienced lockdown in their entire country and educational activities. Similarly, Pakistan's government locked every action to reduce the spread of COVID to protect its citizens. Most of the activities were shifted from physical mode to online schools, and colleges and universities also started diverting their teaching-learning activities from face-to-face to online.

The role of Information Communication Technology (ICT) intensified during that specific period because it was the only choice for the universities to continue their teaching-learning process by establishing their own LMS (Learning Management System). So, universities developed their own LMS to continue teaching activities by using ICT tools (Arshad et al., 2020).

Many studies by researchers highlighted that the role of ICT in teaching was already important as teachers were using it to prepare lesson plans, classroom management strategies, teaching methodologies, assessment and evaluation etc. (Ertmer & Simons, 2005). But as covid-19 arrived, its role was increased, changing teachers' personal beliefs about using it. They start to use ICT more than previously to teach the learners.

Beliefs play an important role in individuals' behaviour establishment, especially for an educator with various ideas, like teaching-learning, intellect and self-efficacy. It was necessary to know teachers' beliefs with their teaching and teaching with ICT and using ICT in their classroom management (Kaya, 2017).

According to Tickle et al. (2005), epistemological beliefs are the individual perspective about knowledge and its criteria and how it is acquired, and Brownlee (2004) also describes that teachers have different epistemological beliefs in their teaching process, i.e., dualism, multiplism, relativism and commitment. In conclusion, it is described that epistemological beliefs are individual perspectives about knowledge and how it's acquired and about its certainty, limitations, etc.

According to Alibakhshi et al. (2020), teachers' beliefs are fundamental as they play a crucial role in their teaching decisions. It is vital to investigate their beliefs regarding educational activities, as these beliefs can lead them towards their performance in teaching practices. So it's necessary to explore their beliefs. ICT tools and techniques increase teachers' efficiency as they start to use them in their teaching activities. The ICT tools like computers, laptops, tablets, smartphones, the internet, social media, messenger apps etc., are used to communicate with others. While defining techniques, Luo and Lei (2012) describes them as pattern/methods of using these ICT tools (Hou et al., 2012). So, ICT tools and techniques may be used to make the teaching-learning environment effective.

During the covid-19 pandemic, the entire world shifted from physical to online mode. Universities also started their online system to reduce physical interactions among people, so ICT was the only solution to continue teaching learning during the pandemic (Ahmad & Murad, 2020). Many studies highlighted the importance of ICT during covid-19, but they also highlighted that in Pakistan, the online mode of teaching could not produce the desired results in the quality of education due to many reasons, i.e., they don't have proper ICT skills and issues like internet, gadgets, load shedding etc.

Literature review

According to Fortaleza (2021), contemporary epistemology calls for contemporary methods that are founded on scientific knowledge. Since the globe is currently being made aware of the disease (covid-19) through the media to protect people from its spread, Covid-19 is a pandemic and contagious in the current unforeseen circumstances of Covid-19. Instead of using face-to-face instruction, the approach has been changed to an online ICT one. Respectfully, keeping students entertained during lockdowns with intelligent and lucid ideas can be difficult. The internet is one of the most influential ICT tools used nationwide to save students' valuable study time. We strive to improve this method for future learning with a complete understanding and issues while taking classes to be overcome in future.

Latest ICT Tools in Higher Education

Orlik (2018) said that as an epistemological approach, ICT technologies are being used by universities all over the world to balance the workload of research and instruction. Teachers and students are using ICT as professionals in using research tools for data collection and analysis. This approach has increased their knowledge and professionalism. Learning in the digital age fosters creativity and innovation without requiring students to spend additional funds on books or other expenses.

Computer-Aided ICT Learning Tools

Banister and Fischer (2010) stated that ICT could be defined as having the ability to use computer programmes or log on to computer-generated systems, regardless of the institutional or cultural environment. In contrast to those who are laymen to use ICT tools after being well educated but do not have thinking and ideas to use ICT tools, Uzunboylu and Tuncay (2010) described the digital divide as ICT tools may be utilised to find the space between those university students who can enjoy access to ICT and those who cannot. This is because one may know about technologies' potentialities to use them effectively. According to Warschauer (2007), the digital divide is a method ICT employs to show unequal access to digital technology. He continued by saying that rather than a single division, many other types of socioeconomic and educational inequality are related to ICT access.

Opened Access to Internet Source

According to Annetta and Minogue (2004), students may have opened access to the internet as an ICT tool to finish their homework and university work. Technology is the only thing that makes educational growth possible compared to those who lack the means to complete their academic assignments during the covid-19.

Role of Epistemic Knowledge in Online Learning

Zohar and Barzilai (2014) share their views that epistemic knowledge and reasoning are important in online learning. In this regard, three steps, searching, assessing, and integrating various online resources, are essential for optimising online resources. When enrolling in online programmes, teachers must follow them to ensure they thoroughly comprehend the subject. Because epistemic thinking is connected to online learning strategies that involve self-assessment, integration, construction, and justification of arguments that are based on numerous online sources, teachers can use epistemic thinking effectively in online mode as an ICT tool.

ICT Tools as Models for Recording Lectures in Universities

According to Fournier-Viger et al. (2010), ICT tools at the university level are intended to record lectures for students' learning, and students may contribute solutions to their difficulties. They are designed to create tutoring agents that can change how students and teachers behave to reuse patterns for teaching and learning.

It is evident that the latest development approaches have a high impact on learning and followed the studies made by Jupp and Awad (2013). He learned that the ideas underlying epistemological beliefs have evolved over time as new research has been conducted. Innovative methodologies have been used to make the study digitalise by favouring the most recent technologies like internet-enabled devices like smartphones, mobile phones, tablets, and laptops and that make level the matter by emerging trends to open this tiny window where social media resources make help the students in learning like Google, Due to the speed of development, the way people think has altered. For individuals who wish to study and discover themselves in the world with a new philosophy and thinking, learning is made simple by exchanging information through audio, video, and written work.

Material and Methods

The study was qualitative in nature. A semi-structured interview protocol was used to explore the Adoption of Information Communication Technology (ICT) tools and techniques during the COVID-19 outbreak. The population of the study was all teachers of public and private universities in Punjab who taught online during the COVID-19 outbreak. Eight public and eight private universities from the district of Lahore were selected as sample through a purposive sampling technique. Participants were interviewed till the saturation of results. Thematic analysis technique was used to analyse the collected data through interview protocol. For this, the researchers followed the six-step process offered by Braun and Clarke(2006) involving familiarisation, coding, theme generation, reviewing the themes, defining them and finalising them.

Results and Discussion

Some themes were generated by using the steps mentioned above by Braun and Clarke (2006) and after classifying them into themes. The themes are:

Prior Experience with ICT before Covid-19, Beliefs about using ICT, Expertise in Using ICT, Orientation to using ICT Tools, and Adoption of ICT Tools. In the final step, the researchers penned down the results of the findings; the majority of the participants believed that they don't have proper exposure to online teaching but use technology or technical assistance in their teaching, i.e., multimedia projector; few of the participants having teaching experience of more than five years noted that they conduct or present presentations online on various educational-related platforms, i.e., seminars, conferences, training sessions, orientations, etc.

One of the participants responds that:

"No long experience, but I have been teaching some online classes or involved in online training, teaching sessions in different occasions. These classes were half face to face whereas rest of the half classes were online."

Participants were asked, "What online tools and strategies did you employ for teaching?" The majority of participants said they taught online using Google Meet, Zoom, and Blue Button. Also, individuals who were teaching in Distance Education programs or at Virtual University used the LMS.

The majority of the participants used Skype and google meet software before Covid-19 for their virtual classes or presentations, but after the pandemic, Covid- 19 the whole scenario of teaching or learning was transformed from the traditional classroom to online/virtual classrooms. The teachers and students use more than two online software for their teaching and learning. Most public and private universities either purchase ready-made software to continue the classes and develop their virtual system for this purpose.

One of the participants stated:

"I used WhatsApp, Zoom and Google Meet for this purpose before covid-19."

However, one of the participants said:

"As I told earlier, I did not teach online before covid-19. So I didn't use any ICT tools."

The majority of the participants agreed that their respective universities arranged the workshops for the training of teachers regarding online classes, but some universities did not go for regular training sessions. Private universities' teachers were recorded the number of sessions was conducted and arranged by the university for the assistance of teachers in the virtual classroom, and the administration followed up on the online classes along with the subject teacher.

Participant no. 14 stated:

"It was new after the covid-19 and before the covid-19, we never taught online. And I did not take any orientation for this purpose especially because no orientation or training session has been conducted by our university for the teachers or students. However, I learn a lot of things related to ICT tools and techniques by myself."

However, one of the participant said that one week of training was offered to them. The participant said:

"Yes, one week orientation was given us related to teach online. It was online and physical both."

Whereas the public universities arrange training sessions for teachers, it is online. Public university teachers don't take online training sessions seriously; some learn through YouTube videos or they take help from their colleagues and they upload or conduct classes via already available presentation slides. However, private universities keep noticing every virtual classroom and ensure the latest and updated presentations/slides.

The majority of the private teachers' epistemological belief about adopting and properly using ICT tools and techniques during Covid-19 because they attend and follow the instruction given in the training sessions and their respective departments. Public teachers' epistemological beliefs about the adoption and proper use of ICT tools and techniques during Covid-19 were that they have knowledge about ICT tools and technology previously, or few of them attended the sessions offered by private organisers or private universities/ public universities which help them a lot in teaching and learning.

One of the participant stated:

"I already had good enough skills of using ICT tools and techniques. So, I didn't feel any need of the training for using the ICT. However, as far as it is concerned with the orientation, nothing like this was offered by our institute."

In Pakistan, there are few barriers faced by teachers during online classes. Unavailability of electricity and internet and slow data coverage are the major challenge/hurdle and obstacles while virtual classes are conducted. The majority of the teachers of both public and private universities suggested that during the pandemic, the educational institutions offered online classes along with the availability of laptops, computers, and the internet so that the teachers and students attend the course on time and correctly.

Discussion

Teachers' beliefs and conceptions play an important role in making instructional decisions. Likewise, investigating teachers' epistemological beliefs and conceptions regarding educational activities that can lead to predicting teachers' practices and

performance in teaching (Alibakhshi et al., 2020). Digital tools and techniques give teachers the potential to deliver online instructional activities effectively. The ICT tools like computers, laptops, tablets, smart phones, internet, social media, messenger apps etc. are used to communicate with others. Techniques are the patterns or methods to using these tools (Hou et al., 2012). The ICT tools and techniques may be used for the effective teaching and learning.

The results of the study revealed that the majority of the participant of private universities were of the view that the training session offered them, and they efficiently joined the training of proper utilisation of ICT tools and techniques whereas, in public universities, the teachers were not taking seriously the training session offered by their respective department. Few participants of public universities recorded that they were used to delivering a lecture with a demonstration through a multimedia projector, but in online classes, there were no proper way or tool prescribed by their department or institution. From an epistemological perspective, we found that adding new ICT tools, strategies, and methodologies into regular classroom activities in online classrooms, especially in the current situation, would improve students' learning outcomes. Connectivity or internet issues create a huge gap among teaching and learning during COVID-19 in Pakistan. The study's findings highlighted that online learning could not produce desired results in underdeveloped countries like Pakistan, where most students cannot access the internet.

Conclusion

On the basis of the findings the following conclusion are made i.e. most of the teachers don't have proper exposure to online teaching but use technology or technical assistance in their teaching, i.e., multimedia projector. The participants used Skype and google meet software before Covid-19 for their virtual classes or presentations, but after the pandemic, Covid- 19 the whole scenario of teaching or learning was transformed from the traditional classroom to online/virtual classroom. The teachers use more than two online software for their teaching and learning. Most public and private universities either purchase ready-made software to continue their teaching learning proves or develop their virtual system for the conduction of online courses. Private universities' teachers were recorded the number of sessions was conducted and arranged by the university for the assistance of teachers in the virtual classroom, and the administration followed up on the online classes along with the subject teacher. Whereas the public universities arrange training sessions for teachers, it is online. Public universities teachers don't take online training sessions seriously, and they upload or conduct classes via already available presentation slides. However, private universities keep noticing every virtual classroom and ensure the latest and updated presentations/ slides. In Pakistan, there are few barriers faced by teachers during online classes. Unavailability of electricity and internet and slow data coverage are the major challenge/hurdle and obstacles while virtual classes are conducted. Universities thereby need to seize the opportunity to strengthen its evidence-based practices, provide ICT related training sessions to their teachers enable to adopt ICT tools and techniques for better teaching learning process in any adverse situations and to make the curriculum responsive to the needs of the changing times.

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