

Unveiling the path to sustainable online learning: addressing challenges and proposing solutions in Pakistan

Razia Fakir Mohammad and Preeta Hinduja
Department of Education, IQRA University, Karachi, Pakistan, and
Sohni Siddiqui
*Department of Educational Psychology, Technical University of Berlin,
Berlin, Germany*

Abstract

Purpose – The pandemic's health and social issues have significantly altered the character and manner of teaching and learning in higher education across the country. The use of technology to replace or integrate face-to-face learning with online learning has become a necessary requirement for promoting and continuing learning processes. Furthermore, integrating technology is a goal of Sustainable Development Goal 4 (SDG 4) to make teaching and learning more innovative and sophisticated. This paper is based on a systematic review grounded in a synthesis of research papers and documents analyzing the current status of teachers' pedagogy through online learning modes in the context of Pakistan.

Design/methodology/approach – Through content analyses of academic studies in higher education and reflection on the online teaching experiences, this study discusses how students' learning is associated with teachers' teaching approaches in the modern era of digitalization and innovation.

Findings – The review and analysis suggest that online teaching is not viewed as an innovative phenomenon; rather, teachers simply teach their traditionally designed face-to-face courses through the use of technology. The paper suggests that transforming teachers' pedagogical insight to make online learning sustainable is an urgent need for higher education.

Originality/value – The analysis provides a basis for consideration of teacher learning and quality education (SDG #4) to fulfill the nation's agenda for sustainable development. The analysis helps educators and administrators in higher education institutions reflect on their policies and practices that have short- and long-term effects on students' learning outcomes.

Keywords Digitalization, Issues of teachers, Teaching strategies, Pakistan, Higher education, SDG 4

Paper type Literature review

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1. Introduction

In Pakistan, roughly 31% of young people are unemployed right now, and many of them hold professional degrees (Tribune, 2022). Lack of opportunities and a weak job system can be problems contributing to this issue (Falak, 2021). However, a lack of profound and high-order thinking skills to fulfill employment requirements and a lack of self-efficacy are some of the main challenges identified that also reflect on the kind of education the youth have been receiving and whether it leads to a quality of life that is economically sustainable (Rab *et al.*, 2019).

The research indicates that university students experience varying levels of anxiety, ranging from normal to mild and severe (Anjum and Godil, 2019; Iorga *et al.*, 2018; Mallhi *et al.*, 2022). Student's failures and fears of traditionally rooted examinations and lack of success in meeting family expectations result in their low self-esteem (Anjum and Godil, 2019). The challenges are exacerbated by parents' growing concerns about their children's social isolation, intolerance and aggressive behavior (Imran *et al.*, 2020; Siddiqui *et al.*, 2021). In addition, the recent pandemic issues of increased youth unemployment (Tribune, 2022) and the extent of students' stress all point to the need for a new perspective on the role of education in general and teacher pedagogy in particular (Mallhi *et al.*, 2022; Ning *et al.*, 2020).

Recent literature has recognized online learning as an alternate practice in the 21st century due to its easy access, flexibility of learning space, management of learning time, regulation of self-learning agendas (Abdul, 2020) and habits and sharpening of communication skills (Ratheeswari, 2018). Furthermore, our experiences and observations suggest that online learning enables students to discover new material by browsing digital libraries and websites and participating in the global dissemination and exchange of information and knowledge. Students have control over how much time they spend, what they study and how they learn. Students also return to difficult topics until they are secure in their comprehension, allowing them to build problem-solving abilities, rationalize their decisions and take responsibility of their learning path (Mohammad and Kamran, 2023).

However, analysis of many studies at the national level shows limitations of online pedagogy in supporting learners intellectual, social and emotional skills and ethical wellbeing in higher education (Abbasi *et al.*, 2020; Adnan and Uddin, 2021; Aqdas *et al.*, 2023; Iqbal *et al.*, 2022; Mukhtar *et al.*, 2020; Ullah *et al.*, 2021). Students perceived decline in communication when shifted to online teaching and learning (Abbasi *et al.*, 2020; Adnan and Anwar, 2020; Aqdas *et al.*, 2023), motivation issues (Adnan and Uddin, 2021; Aqdas *et al.*, 2023; Akram *et al.*, 2021), feeling of boredom (Iqbal *et al.*, 2022), handling emotional and behavioral problems (Mukhtar *et al.*, 2020; Shahzad *et al.*, 2020), insensitive attitude, lacking sympathy and empathy (Aqdas *et al.*, 2023), could potentially inhibit students' learning. In accordance with many studies, some universities in Punjab province have reported better experiences by offering student-focused learning environments that support pupils' intellectual development (Abdullah and Mirza, 2020; Shahzad *et al.*, 2020). Contrary to the Punjab, where students mentioned the continuation of learning and satisfaction with digital pedagogy, in Sindh province, faculty are still inclined to traditional modes that negatively affect intended growth and well-being (Akram *et al.*, 2021; Asad *et al.*, 2021). A huge communication gap, improper assessment, low-quality feedback and less teacher–pupil interaction and student engagement were prominent issues (Akram *et al.*, 2021; Tabassum *et al.*, 2022).

Global research indicated similar issues, such as a lack of student engagement and insufficient feedback to boost learner motivation, and proposed that teachers employ more interactive materials while teaching online (Ferri *et al.*, 2020). Several studies (Sobko *et al.*, 2020; Thaheem *et al.*, 2022) identified comparable difficulties in generating a feeling of community and assuring students' interest in learning. Teachers struggle to create a

sense of community, and they confront difficulties in keeping pupils motivated in distant learning. Perhaps, the concerns and difficulties arise as a result of the abrupt transition to address the issues of continuity in education during the pandemic (Siddiqui *et al.*, 2023). The change in teaching mode primarily help students acquired knowledge in a manner similar to face-to-face learning in higher education and appeared unable to assist students in processing learning that balances the development of time, self-learning skills and collaborative and communication skills, all of which are unquestionably owned by each student (Mohammad and Kamran, 2023; Wargadinata *et al.*, 2020).

The overarching question is what role does the higher education play in meeting the demands of the twenty-first century by providing a collaborative, safe, meaningful, and relevant teaching pedagogy? Especially, in this age, when the educational structure is undergoing profound change as a result of rapid growth in digital education, the ultimate goal of higher education is to assist students in developing the necessary knowledge, skills and attitudes to live a fulfilling life in their respective societies. With this theoretical stance, teachers' methodologies must emphasize the process of knowledge construction through investigation, argumentation, communication and problem-solving skills (Engel *et al.*, 2023). Hence, the pedagogy that fosters long-lasting outcomes such as problem-solving skills and innovation will not only address the issues of employability but also improve the graduates' role as responsible and engaged citizens.

The systematic review, as adapted in this study, discusses what pedagogical decisions and methods can enrich the utility of online learning modes, which in turn provide students with skills and behaviors to accomplish their living goals in the current era and beyond. By adapting innovative pedagogy and teaching methodologies, we can prepare graduates to be competent, adaptable and successful professionals. Hence, the focus of this paper is on defining the pedagogical techniques required in the digital age, where graduates perceive learning as a dynamic and engaging process and are capable of acquiring the skills and behaviors required.

This paper focuses on the fundamental question: What pedagogy is required for online learning to be sustainable?

2. Methodology and materials

A systematic review of published materials followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for stages of identification, screening, eligibility and inclusion (refer to Figure 1). In addition, the first author, who possesses over two decades of higher education experience, performed document analysis on their personal diaries and portfolios. Through this document

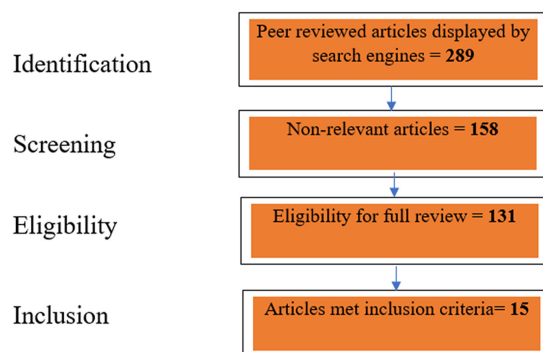


Figure 1.
Search and retrieval
process

Source(s): Developed by authors

analysis, the first author derived qualitative insights and integrated them into the portfolios alongside the thematic findings generated during the systematic review process. The documents included research papers and extracts from the authors' reflective entries in their course portfolios.

Portfolio development, in the context of this study, was seen as a way of knowing and the building block of teachers' epistemology, which forms their educational philosophies and practices. Portfolios encourage teachers [professionals] to think more deeply about their teaching and about subject matter content and to become more conscious of theories and assumptions that guide their practices and philosophical stance (Zeichner and Wray, 2001, p. 614). This idea of a portfolio as a means to self-inquiry and learning from practices originated in the notion that a portfolio is a (holistic) compilation of evidence that demonstrates the acquisition, development and exercise of knowledge and skills in relation to your work practice (Retallick and Groundwater-Smith, 1996, p. 13). Since teaching is a socially constructed phenomenon (Clandinin and Connelly, 1994; Lortie, 1975), and teachers' reflection on practices (Schon, 1983) provides them with discoveries and experiences that lead to alternative directions and activities, one of our data sources was reflective entries to address the research question. The authors' involvement in self-inquiry, various practices discussed in the literature and the implementation of interactive teaching in the learning context helped them understand the reality of online teaching in the learning context and its effectiveness. Hence, portfolios were used as a means to understand and develop teaching through self-inquiry on rationalizing and justifying online teaching practices.

This study was conducted over a period of six months while we were understanding and practicing online teaching methods in classrooms. The focus of analysis was to understand and translate theory into practice through the evidence gathered from self-reflexive commentary. Reflection and analysis of the practices and relevant literature engaged us in examining our own teaching and learning experiences, which further enhanced online teaching capabilities and their outcomes.

2.1 Search strategy for systematic review

Regarding gaining the theoretical perspectives, the authors utilized renowned search engines such as Google Scholar, Eric Data Base, Research Gate, Scopus and Web of Science to access the research relevant to the focus of this study. These search engines are widely recognized for their comprehensiveness and prestige, to look for articles published from January 2017 to January 2023. They employed the PRISMA (Moher *et al.*, 2009) statement to present the search results and selection procedure (refer to Figure 1). To ensure that all pertinent articles were included, the researchers analyzed the first ten pages of each search using various keywords and databases. Although they usually discovered relevant publications within the first three to four pages, they continued to examine up to ten pages to ensure that they did not miss any studies.

Theoretically, in the National Policy on Education (GoP, 2017), the government of Pakistan emphasis on pupils' intellectual, emotions, ethical and social growth to promote the quality of life through education. Previous reviews reported pedagogical issues in higher education and proposed some measures to help attain some of the focused areas prior to 2018 (Aslam *et al.*, 2012; Azam *et al.*, 2014; Nabi *et al.*, 2017). Therefore, the time selected was after the National Educational Policy took initiatives to meet quality education mentioned in SDG4. Considering that the study will start and continue in February 2023, it was decided to gather information on the topic from the last 6 years and one month. This was done (from 2017–Jan 2023) based on a selection of recent articles. As a result of the pandemic, the need of ICT in education emerged in 2020. Researchers also examined research articles from 2019 onward to identify additional challenges that occurred in higher education institutions (HEIs) during the crisis.

The search was conducted using a combination of the following keywords: issues of teachers, teaching strategies, Pakistan, higher education, online learning, challenges, SDG 4. The search identified 289 articles for initial screening. After preliminary screening of the selected articles by reading the abstracts and identifying the inclusion criteria, 131 articles were selected by for full review. During screening, 158 research publications were rejected because they were nonrelevant to the theme and information was beyond the scope of the study (e.g. Inclusive education in higher education, K–12 setting, technical issues in ICT, published in nonindexed journals, articles that did not address pedagogical concerns in higher education, reviews, published before 2017). Three reviewers worked simultaneously to reduce include bias and synthesis bias, the summary of review articles is provided in [Table 1](#).

2.2 Inclusion criteria

Publications were considered if the following criteria were met.

- (1) Empirical studies concerned with teachers' pedagogy in distance/online learning in higher education in Pakistan published in peer-reviewed journals indexed with Web of Science, Scopus, Eric and Higher Education Commission (HEC) Pakistan indexed journal list were included. Conference abstracts, letters or theoretical reviews were excluded (see flow chart, [Figure 2](#)).
- (2) Studies investigating pupils' perspectives and challenges about distance learning offered by HEIs after COVID-19 pandemic were included. However, institutions that offer online education since their establishment are excluded.
- (3) Experimental studies were considered that shed light on how teachers on traditional and virtual platforms influence students' engagement and attainment of learning goals set by the curriculum. However, studies dealing with cultural/economic influences on pupils' motivation were excluded.
- (4) Authors included comparative studies made in HEIs investigating pedagogical variations (in different departments) in different provinces of Pakistan.
- (5) Comparative studies (aiming to compare what pedagogical approaches are used to promote Education for Sustainable Development (ESD)).
- (6) Predictive studies investigating the influence of teachers' coping strategies on classroom management.
- (7) Studies exploring teaching methods, least and most preferred (in different disciplines) and how they are linked with 21st century learning in HEIs are included.
- (8) Comparative studies (aiming to find out how ethics is focused in different nations' curriculum) were added.
- (9) Corelation studies focus relationship between teacher-pupils interaction and motivation and SRL were included.
- (10) Published work with primary data was focused and, works with secondary data and meta-analysis were excluded.
- (11) The age of study participants was not restricted and all papers were selected and discussed according to age groups.
- (12) Unpublished papers or preprints were excluded.
- (13) Only articles in English were considered.

Authors	Purpose	Participants	Teacher–pupil interaction	Impact on learning
1 Iqbal <i>et al.</i> (2022)	To assess perspective about online classes after the pandemic	707 students from various disciplines (social sciences, health sciences, engineering and technology, business, commerce, arts and humanities) 436 undergraduates (e.g. BA, BSc), 200 Graduate (e.g. MA, M.Sc., BS Hons), 71 Postgraduate (e.g. MPhil., PhD) in Sindh	Traditional noninteractive lecture-based pedagogy is used Assessment techniques is limited to individualized assignments	Students showed dissatisfaction. Negative impacts include: lack of teacher–pupil interaction, student–student interaction, interpersonal and communication skills, hands-on activities, boredom, feeling overburdened with academic tasks and responsibilities, an inappropriate physical place and inability to grasp concepts and objectives effectively Students' motivation to learn was negatively affected by less interaction with peers and teachers
2 Adnan and Anwar (2020)	Investigating the effectiveness of online learning amid pandemic	164 undergraduate and postgraduate students with male and female ratio 1:2 filled out closed-ended questionnaire	Online lectures that were less interactive and students' engagement was not guaranteed	Students' motivation to learn was negatively affected by less interaction with peers and teachers
3 Ullah <i>et al.</i> (2021)	Identifying the challenges of online education during the pandemic	Simple random sampling, 550 questionnaire were filled by students from different level of studies at Lahore such as secondary, higher secondary, under-graduation and graduation	Online fewer interactive lectures	Most students at different levels of education felt less comfortable taking online classes, gaining self-confidence, improving their learning skills and socializing
4 Thaheem <i>et al.</i> (2022)	To compare learning outcomes achieved through online teaching in Indonesia and Pakistan	Mixed method study used quantitative questionnaire data collection from 102 Indonesian teachers and 66 teachers from Mehran University of Engineering and Technology, Pakistan. Qualitative semi-structured interviews were conducted from 10 teachers 5 from each country	Both countries' teachers reported similar personal and pedagogical challenges. Also, they hardly ensure students' engagement in discussions, provide the sense of community and sustain their levels of motivation	Both countries teachers reported that online teaching could not achieve the goals set for the class

*(continued)***Table 1.**
Summary of the
studies reviewed

Authors	Purpose	Participants	Teacher-pupil interaction	Impact on learning
5 Shahzad <i>et al.</i> (2020)	Impact of Virtual Teaching (VT) on ESL Learners' Attitudes under COVID-19 circumstances	An experimental approach was used to check the influence. 100 participants were postgraduate level students from two universities in southern Punjab, selected through convenience sampling	Teachers could maintain pupils' retention and motivation In spite of this, it was difficult to handle emotional and behavioral problems associated with learning on a virtual platform, capture and maintain pupils' attention equally and cope with individual differences Inefficiency was reported in relation to classroom management, persistent communication and assessment. Indicators are (<i>Classroom management</i> : content delivery, student engagement, time management and monitoring of students, practical work; <i>Communication barrier</i> : insufficient feedback, inappropriate online discussion, less teacher-pupil interaction; <i>Difficulty in assessment</i> : teacher incompetence)	Apart from technical issues, virtual teaching is welcomed by students during the pandemic, they have observed new happy experiences
6 Akram <i>et al.</i> (2021)	Challenges of teachers' pedagogy during COVID-19	A mixed method approach was used to collect data from public sector teachers in Karachi. 82 teachers recruited through simple random sampling completed the survey and 15 were interviewed		Lower-motivation and lesser participation was observed

(continued)

Authors	Purpose	Participants	Teacher–pupil interaction	Impact on learning
7 <i>Abid et al. (2021)</i>	Explore pedagogy–technology balance and student engagement in online learning	Qualitative semi-structured interview from 11 faculty members teaching at various universities	Teacher characteristics (sensitivity, flexibility and self-efficacy), implementation of differentiated instruction and continuity of instruction influence teaching effectiveness In addition to other factors, teachers' and students' positive attitudes toward e-learning and computer literacy can better support the adoption of e-learning Accessibility of teachers (i.e. easy communication between teacher and student outside the classroom)	The faculty showed willingness to adopt an online mode of teaching and learning, despite the heavy workload and limited resources as a source of stress. The faculty showed a desire to participate in CPD that supports online learning
8 <i>Qazi et al. (2022)</i>	Barriers and facilitators to adoption of online learning	Qualitative interviews were conducted from academics, administrators and IT members		Continuity of learning is observed on an online platform where teachers and students are skilled and willing to learn
9 <i>Mukhtar et al. (2020)</i>	Advantages and limitations of online learning during COVID-19, in health universities	Using a qualitative case study approach, 12 faculty members and 12 students were interviewed at the University College of Medicine and University College of Dentistry, Lahore	However, student participation was low during online lectures, students lose concentration on ongoing lectures In addition discipline issues (dealing with student misbehavior during online) and poor assessment were potential limitations	Shift to self-directed learning, much focus on theory, lack of lab/practical experience

(continued)

Table 1.

Authors	Purpose	Participants	Teacher–pupil interaction	Impact on learning
10 Abbasi <i>et al.</i> (2020)	Students' perceptions of e-learning	Quantitative data (377 questionnaires were completed; 37 males and 245 females) from a private medical college called Liaquat College of Medicine and Dentistry, Karachi. Pre–post test was used to observe the effect of the treatment (virtual instructions) offered to students of Agha Khan University, Karachi, Pakistan	Lack of interaction between teacher and students	Students perceived learning as unsatisfactory and less effective than face-to-face teaching
11 Saeed <i>et al.</i> (2023)	Experimental approach to teaching clinical skills on an online platform by modifying Peyton's framework	200 students (59% female and 41% male) from all provinces participated in the study using convenience sampling. (The largest sample was based in Punjab and Capital Territory 55% (27% Islamabad, 28% other cities of Punjab), followed by Khyber Pkhtunkhwa (28%), Kashmir (14%), Sindh (2%) and Baluchistan (0.5%))	Results report success in teaching nine clinical skills (including history and examination skills)	Students were satisfied with their learning experience
12 Adnan and Uddin (2021)	Comparing the effectiveness of online learning (OL) during the first and second waves of COVID 19	550 students enrolled in public and private universities in Lahore	Students reported some improvement in teaching processes during the second wave compared to the first wave. However, despite this, more than 30% of students were dissatisfied with the teaching process	Students (38%) cited lack of socialization in class, lack of self-motivation (32.5%)
13 Tabassum <i>et al.</i> (2022)	Evaluate assessment techniques		Almost 40% of students are given clear instructions to understand assessment topics The majority felt that the assessment questions were quite complex to complete within the time allotted and that the results were unreliable	Unreliability of online assessment results has a negative impact on CGPA. Students found it difficult to: attempt quizzes (about 50%), cope with the complexity of assigned questions (about 50%), have insufficient time to complete tasks (>50%)

(continued)

Authors	Purpose	Participants	Teacher–pupil interaction	Impact on learning
14 Nousheen, and Kalsoom (2022)	To assess the impact of sustainable pedagogy on the learning outcomes of the course in the teacher education program in the online setting. The study also compares the results with the results achieved when teaching with lecture-based pedagogy	Using an experimental (pre–post test) approach, sustainable pedagogy was used as the instructional design in the experimental group ($n = 25$), while the lecture-based method was used in the control group ($n = 24$)	Sustainability pedagogy was used (e.g. case studies, critical incidents, discussions, debates and problem-based teaching)	Students participating in the experimental group analyzed problems related to Pakistani society, culture, environment and economic issues and made useful suggestions on how to overcome them and contribute to sustainable development
15 Aqdas <i>et al.</i> (2023)	Impact of online learning on student performance	Sixty students (20 male and 40 female) in their fifth and sixth semesters (third year) of the Bachelor of Studies in English Language program at a public sector university in Islamabad were selected as participants	Authoritarian teaching, huge communication gap, teachers; insensitive attitude toward students, lack of empathy were reported	Students have never experienced this lack of interaction and authoritarian teaching in a face-to-face setting, Pupils' mental health is negatively affected

Source(s): Developed by authors

Table 1.

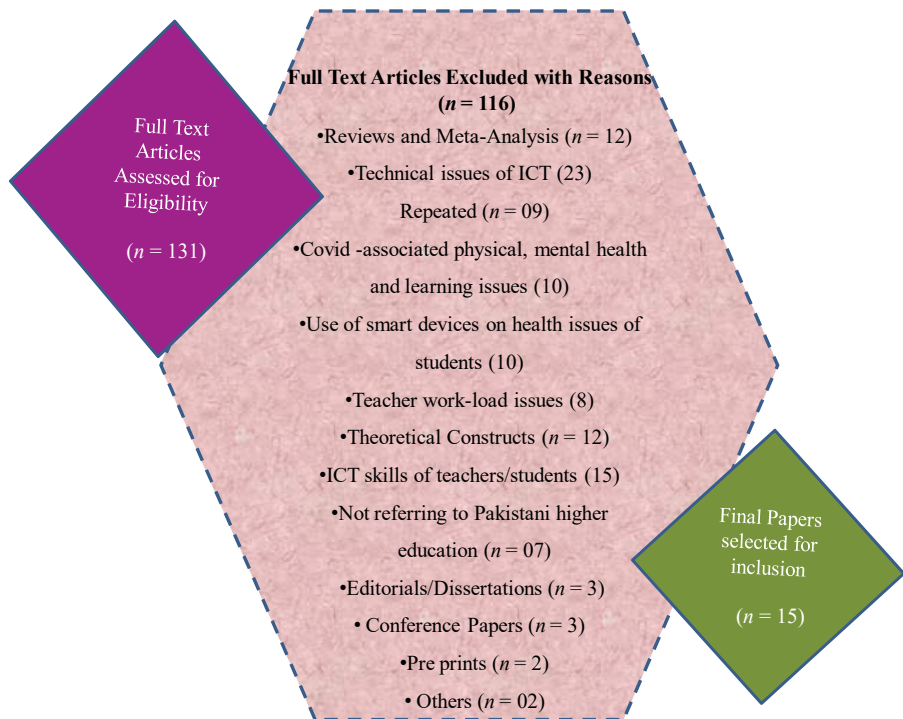


Figure 2.
Flow chart for
inclusion and exclusion
of studies

Note(s): For further details the Table 1 is attached
Source(s): Developed by authors

3. Literature review

With the advent of technology, education institutes have experienced various outcomes and issues. With the inclusion of digital technology into academic settings, there is a greater expectation for teachers and educators to have digital literacy and be adept in using technology, in addition to pedagogical insights and deeper subject knowledge. A variety of study conducted during COVID-19, when online learning was adapted globally to ensure continuity, demonstrates that students' online learning experiences had various outcomes and problems (Mohammad and Shaheen, 2020). The research indicates that online learning is productive when the teachers' pedagogies are embedded in deep learning (Mohammad and Shaheen, 2020; Røe *et al.*, 2022). Deep learning in this paper is viewed as active learning approaches that allows students with opportunities to seek out valuable information and make meaning out of it and share it with others (Allen and Tanner, 2005; Bernard *et al.*, 2009; McGreal, 2017), which in turn enhances both students' meaningful learning and their attitudes toward education (Armbruster *et al.*, 2009). Active learning challenges the transmission style of pedagogy, which promotes primarily the retention and replication of factual knowledge while providing little practical value or relevance to students (Børte *et al.*, 2023; Watermeyer *et al.*, 2021). This paper argues that unless a student goes through deep learning, every attempt at virtual and/or in-person teaching remain instrumental.

Within UNESCO's emphasis on the Sustainable Development Goal (SDG 4), teaching should promote values and skills among students that help them to become self-regulated

learners and contribute positively to their individual lives as well as promoting social efficacy (Hopkins, 2012; UNESCO, 2020). To achieve this, individual learners need to be engaged and participate in their learning actively and interactively. The education research suggests that learning through face to face or virtual mode becomes real and relevant to students when they are participating in the academic tasks, rationalizing concepts, asking questions, discussing their ideas with peers and teachers, receiving timely feedback and enjoying the entire process (Fink, 2016) such engagement encourages learners to put forth the effort necessary to develop their knowledge, skills and attitude.

According to SDG 4 (Michelsen and Adomssent, 2007; Hinduja *et al.*, 2023), the role of higher education is to engage students in deep learning experiences that emphasize intellectual curiosity, honest inquiry, appreciation and developing individuals' capacities to think rationally, initiate future plans, work in an interdisciplinary manner, see interconnections and interdependencies, identify relationships, work with open-minded thoughts, trans-cultural understanding and cooperation and demonstrate sympathy, empathy and solidarity. The research suggests universities' role in furthering research and innovation to promote individuals as intelligent and responsible citizens, both locally and globally. Furthermore, pedagogical decisions and techniques, motivation and academic well-being of faculty members are essential elements in achieving long-term learning results at all levels of education.

3.1 Analysis of findings: pedagogical shift for sustainable online learning

This section discusses the teaching methodologies that nurture learners' active engagement in their learning processes. The discussion on the activities, nurturing active learning, is a systematic reflection on the document analysis and reflection on our work experiences (as discussed in the methodology section). It is important to indicate that the author's epistemic stance was guided by the deep learning outcomes that were attempted through interactive methodology while teaching online. The reflection on practices and the document analysis of the literature could be seen as theory supported by practice. Some strategies that could contribute to the achievement of deep learning capabilities are discussed below.

3.1.1 Opening discussions. Providing students with a view of the big picture that presents the key concepts, expectations, and potential learning outcomes enables students with a framework to plan and monitor their learning experiences (Khan and Abid, 2021; Røe *et al.*, 2022). When students know learning goals, instructional design and assessment methods,

Reflection from a course portfolio: example 1

I introduce course the course handbook as a living document. The course review involves them in studying and comprehending what the course objectives are and/or should be. For example: Are the course objectives consistent with the interests and learning goals of the students? Are the course's approach, content and assessment in line with their learning goals? Which skills can/do the students bring to this course? What requires further review? I had first-hand experience with the course evaluation procedure and assessment when I enrolled in a Kings College London courses on "curriculum design, and assessment and feedback." Through this fellowship program, I was able to see curriculum review as an effort to better educate and enliven the curriculum and curriculum design as a process rather than a finished product (as discussed in Pinar, 2006). My reflection on engaging students in open discussion suggest that incorporating students in curriculum review is not only an effort to inform and enrich the curriculum, but it also aids the students in three ways: (1) participating in codesigning the parameters of the course in which they will be working; (2) learning about the process of learning and what it entails; and (3) developing an appreciation for their own contribution to their learning process (ref: Mohammad, Portfolio, 2022).

they have a more coherent picture of what will be learned and how it will be learned and assessed. They develop a sense of ownership and feel more confident about their learning (Abid *et al.*, 2021). To achieve this, teachers need to provide students with an outline of the structure of their learning sessions. For example, identifying overall course expectations, a course schedule, assessment expectations and success criteria and when and how a teacher would provide feedback to the students are some ways of creating transparency in the faculty–student relationship (Røe *et al.*, 2022). Learning objectives and success criteria that are shared and discussed with students begin to give them a framework to assess and discuss their learning, i.e. what they have learned and where they are stuck (Mohammad, 2021). This allows students to begin to take responsibility for their learning journeys, to understand what they can do and to plan appropriate actions moving forward.

3.1.2 Interactive lectures. According to our findings, interactive lectures can be used by teachers to bridge the gap between what students already know and the evolving structures and new points in the subject matter (Abid *et al.*, 2021; Ning *et al.*, 2020). Our observations show that interactive lectures differ from standard lectures (Mahmood, 2021; Huerta, 2007); interactive lectures involve a variety of activities that encourage students' active engagement and social contact with peers and tutors, such as.

- (1) Assigning pre-session readings and generating discussions by incorporating their reading reflection.
- (2) Engaging students, individually and/or collaboratively in analyzing videos, procedures, theories or most efficient practices observed their merits and demerits, and their contextual relevance.
- (3) Providing students with a question box to submit their concerns, questions, and reflections on the topic/theory for discussion in the follow-up session.
- (4) Including a question and answer session in the middle or at the end of the lecture.

Reflection from a course portfolio: example 2

I provided examples to analyze and provide viewpoints to invite their participation in the lecture. For instance, in my course on classroom assessment, I provide students examples of both well- and poorly constructed test items to spark discussion and assist them in formulating standards for creating effective test items (SR and/or CR items). In order to comprehend what constitutes an “effective” feedback practice in classrooms and its significance for scaffolding learning, stories and films are shared and analyzed during the lectures (ref: Mohammad, Portfolio, 2022).

Students are jolted out of their passive, limited positions by interactive lectures, which provide a challenging and intellectually exciting learning environment (Abid *et al.*, 2021; Huerta, 2007). Teachers are also shifting from a subject-focused to a learning-focused approach to teaching, in which learning is prioritized and students are expected to operate at a high level of thinking, creativity, autonomy and responsibility (Khan *et al.*, 2017; Nousheen and Kalsoom, 2022).

3.1.3 Collaborative tasks and dialogue. Project work, case analysis, problem-solving tasks and scenarios are viewed as proactive mechanisms for assisting students in developing and experiencing a variety of key skills, such as leadership skills, communication skills, social skills, work ethic skills and personal responsibility, as well as the ability to appreciate learning with and from one another (Nawaz and Mahmood, 2023; Ning *et al.*, 2020; Nousheen and Kalsoom, 2022). These are the essential skills to survive successfully in the 21st century (Sellars *et al.*, 2018), when students collaborate in groups, their self-confidence grows; they

Reflection from a course portfolio: example 3

Although fractions are an important topic in mathematics, most teachers teach them by rote rather than assisting their pupils' conceptual understanding. Student teachers in my course are working on visualizing fractional operations using diagrams, language and modeling in groups. The discussion, using various techniques, assists them in rationalizing the formal techniques underpinning fraction addition, multiplication and division. In my perspective, engaging learners in lectures helps them improve mathematical thinking, imagination and ownership of their study. They are also encouraged to do group inquiry on topics such as how mathematical identities, algebraic expressions and equations originate as a result of pattern-seeking (ref: Mohammad, Portfolio, 2022).

become more adaptable and flexible. Working in collaborative tasks allows students to observe their own and their peers' learning styles, change these styles to suit different tasks and engage deeply with the subject matter (Gosling, 2014; Ning *et al.*, 2020). These characteristics foster an in-depth approach to learning. Researcher experiences and literature indicate that students benefit from dialogic engagement and collaborative work, while interacting online as well (Abid *et al.*, 2021).

The teacher's role is to observe and facilitate the discussion by asking probing and high-order thinking questions. Through a social and cognitive process, this type of discussion allows experiential learning. It improves critical thinking abilities, teamwork and self-reflection (Abid *et al.*, 2021; Roe *et al.*, 2022).

3.1.4 Encouraging self-reflection. Research indicates that engaging students in self-reflection on their learning nurtures their thinking and learning experiences (Holton and Clark, 2006). Learners' involvement in self-reflection on the activities and various practices could help them understand the reality of their identity as learners, their learning difficulties, and their own contribution to academic achievement (Fatima *et al.*, 2022; Mohammad, 2021; Yasmin *et al.*, 2019). Understanding and analyzing learning through reflection is seen as: substantive rather than technical; academic rather than administrative; analytical and appreciative rather than a deficit-based learning approach in this regard. Researcher experience indicates that engaging in reflection provides students with their feelings, experiences, and judgments as a learning web for the journey of learning and unlearning to become an effective learner.

The paper suggests that a teacher must understand the significance of encouraging learners to communicate to themselves through reflection. For instance, encouraging students to reflect by asking, "What aspect of the discussion or session do you think was most

Reflection from a course portfolio: example 4

My conduct as a teacher instills emotional security and intellectual inspiration. I offer thorough written or verbal feedback, highlighting the beneficial elements of their instruction, i.e. constructive criticism on both successful work and work that needs further refinement. I provide timely feedback so that students can use it to raise the caliber of their work. In addition, I encourage my students to confront and query my formative feedback if they feel it is unclear or does not further their learning. While completing their academic work, the students in my classes are willing to discuss their worries. Democratic learning is the cornerstone of my profession, and teaching is my passion.

My students were very reflective when I provided them with timely and reflective feedback on their presentations and/or assignments. They would also provide feedback to their colleagues, which in turn would enhance their learning about the course work as well as develop a critical and constructive stance of thinking. The feedback always started with strengths and further discussed areas for improvement (ref: Mohammad, Portfolio, 2022).

effective?" Why? How so? What did you learn and what did you not learn? And why is this so? What specification(s) could I use to optimize your and my learning? Students feel more connected to what they are learning this way. Connectivity to learning is essential for students to examine their learning progress and requirements, as well as to produce a sense of empowerment and ownership over their learning.

3.1.5 Integrating formative feed-back. Formative assessment is a powerful way to ensure students' engagement and positive attitude toward learning on online platform (Fatima *et al.*, 2022; Røe *et al.*, 2022). Every student needs that strong feeling that someone cares about and understands him or her as a learner. As a result, formative assessment for learning focuses not only on how teachers develop students' intellectual capacity but also on their emotional strength (Akram *et al.*, 2021; Fatima *et al.*, 2022). Feedback activities also encourage students' self-reflection on their learning and nurture their thinking and learning experiences (Holton and Clark, 2006). For example, it is also helpful to know that feedback includes information that allows students to close the gap between their current and desired performance (Røe *et al.*, 2022).

4. Making learning sustainable: discussion

Globally, there is agreement that deep learning entails empowering individuals and allowing them to understand situations and matters intellectually, morally and critically (Tadesse *et al.*, 2023) in order for them to progress as people and professionals. At the heart of this understanding is the need to develop learners' problem-solving, decision-making and creative thinking skills so that they are capable of addressing intellectual, social and emotional matters (within and outside their work places) rationally considering the cultural and intercultural values and perspectives of the organizations and societies they live in. Our analysis is that in the absence of reviving pedagogy, we will not be able to enable students to survive and succeed in the 21st century. The real essence of active learning requires a shift in teacher pedagogy in higher education. Online learning pedagogy must not view learners to passively attend sessions on screen as well as complete traditionally designed course work (Iqbal *et al.*, 2022; Mohammad and Shaheen, 2020). The existing scenario indicates that online learning is not conceptualized as a new phenomenon; rather, teachers view this as a quick replacement mode for the nonavailability of face-to-face learning scenarios (Schleicher, 2020). Perhaps the teachers' perspectives and practices of online teaching are limited. The provision of logistic materials and resolving connectivity issues alone may not address the effectiveness of online learning; teachers need skills and commitment to make a pedagogical shift to make learning meaningful and relevant to their students' needs.

As a result, the emerging need for online learning is to prepare teachers through rigorous training programs so that they can abandon traditional teaching methods (Adnan and Anwar, 2020; Aqdas *et al.*, 2023; Iqbal *et al.*, 2022; Saqib *et al.*, 2020; Shahzad *et al.*, 2020; Ullah *et al.*, 2021) in favor of more interactive teaching strategies such as those discussed above and others. Learning is not delivery; it requires the intellectual engagement of teachers and students and should be visible in terms of learning outcomes, as previously discussed. In the planning of online learning, it is necessary to model not only the content but also the different interactions that occur in this process (Saeed *et al.*, 2023). In fact, Bernard *et al.* (2009) have found that interactions increase learning outcomes.

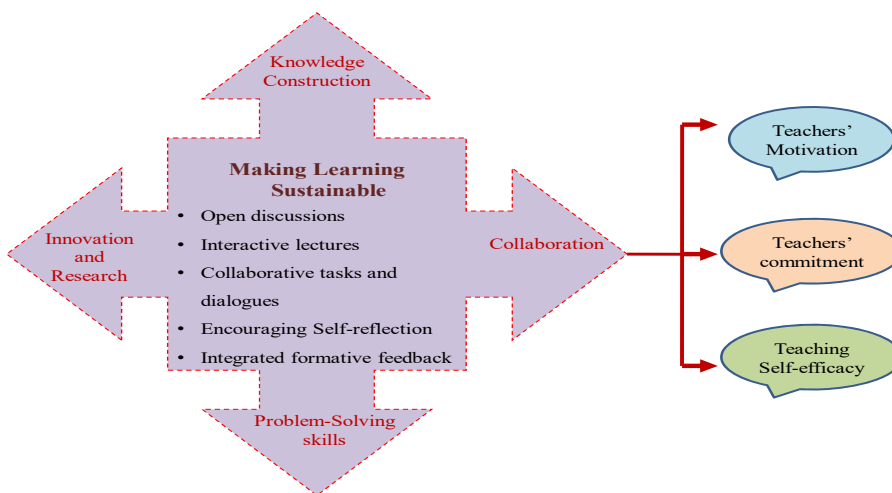
In order to achieve the efficacy of online teaching, today and tomorrow, holistic faculty development programs on what learning is and how individuals learn best face to face or from a distance are in high demand. Teachers must receive ongoing professional development as well as institutional support in order to gain confidence, commitment and motivation in understanding and implementing digital teaching, learning and better

assessment practices in their classrooms (Abid *et al.*, 2021; Nousheen and Kalsoom, 2022; Ufua *et al.*, 2021).

It is also important to recognize that in the context of this study, the university faculty members were willing to theorize interactive learning strategies and their implications in the real context of classrooms. They had support and space for planning, reflection and discussion. The literature provides a paradigm for teacher learning that incorporates teacher motivation, commitment and self-efficacy in giving meaningful learning to students regardless of modality, face to face or online. Teachers' commitment is influential factors predict effective online adaptation (Abid *et al.*, 2021); the findings are similar in Nigerian context (Ufua *et al.*, 2021). The faculty positive mind set, willingness to adopt an online mode of teaching and learning despite the huge workloads and restricted resources and desire to participate in CDP affect their performance on digital pedagogy (Abid *et al.*, 2021; Qazi *et al.*, 2022). Also, teacher self-efficacy is additional factors (Abid *et al.*, 2021).

Our systematic review and reflection on experiences revealed that revitalizing teacher pedagogy not only transforms learners' intellectual, moral and social growth but also increases teacher motivation, commitment and effectiveness while they reflect on the achievements obtained. Teachers' pedagogy is refreshed when they develop skills to design active learning that is aligned with learning outcomes and the learning context, feel comfortable sharing their own practices openly, reflect on the positive impact on students' learning and have commitment and motivation for their professional development (Dallimore *et al.*, 2008; Thaheem *et al.*, 2022).

It is suggested that pedagogical adaptations (i.e. providing prompts, focused discussions, identifying misunderstandings, reaching consensus in discussions, summarizing the topics and validating the understanding of the content via immediate and quick assessments and feedbacks (Abid *et al.*, 2021) can lead to knowledge construction, collaboration, problem-solving skills and research and innovation. Our model suggests, teachers' pedagogy contribute to teaching self-efficacy (Shah and Bhattarai, 2023). Teachers start to see themselves adequate when they think they believe in instructional usefulness, practice theories in classroom that directly or indirectly cater the needs of modern era (Yarim *et al.*, 2022). Their experience of



Source(s): Developed by authors

Figure 3. Figure shows that influence of teacher pedagogy on students' gain of knowledge and skills that in turn influence teachers' efficacy, motivation and commitment

making a difference in students' life and grow them useful member of the society, enhance teacher motivation and commitment (Yarim *et al.*, 2022) (see Figure 3).

5. Conclusion

Although HEIs in Pakistan have taken initiatives to introduce online or blended modes of learning to cope with the emergency and continue expectations of quality education (SDG4), the online platform encounters many issues, among them teachers' pedagogy (Siddiqui *et al.*, 2023). Most teachers believe they fulfill their task by using conventional lecture-based pedagogies. This leads to students' passive roles in the co-construction of knowledge, nurturing curiosity, and emotional development (Akram *et al.*, 2021; Asad *et al.*, 2021; Tabassum *et al.*, 2022). Finally, it is critical to remember that what students do is more important than what teachers do, and if students do not engage in distance learning, teachers risk wasting their students' learning time and motivation (Adnan and Uddin, 2021; Aqdas *et al.*, 2023). This paper concludes that in order to promote active learning through digitalized teaching, teachers at all levels must participate in freshening and refreshing teacher education courses, whether face to face or online, to take a break from their routine practices and engage in collaborative discourse about sharing best practices and addressing dilemmas. The transformation of teaching and learning is not a one-time event. At the same time, our institutions are also not designed for on-going professional learning (Ali *et al.*, 2022; Castéra *et al.*, 2020; Ning *et al.*, 2020). In a place where teachers are not engaged in learning, how can that inspire students to learn? (Castéra *et al.*, 2020; Ning *et al.*, 2020) Changes are needed in culture and practice that necessitate teachers observing other teachers, being observed by others, and engaging in an informed and comprehensive debate about the quality and effectiveness of their instruction. Moreover, the management School leaders and principals are educated and supported (effective teacher learning cannot be easily undertaken in a context that is unsupportive and lacks a teacher learning agenda (Turnbull *et al.*, 2021). This paper concludes that the revival of pedagogy does not evolve quickly and independently; change will require a collaborative effort and a revolutionary stance and approach. Concluding sustainability in learning resources we need: (1) revisiting the concept of online teaching with a broad vision of meaningful learning and sustainable learning goals, (2) ongoing teacher learning to gain pedagogical insights and make learning suitable, (3) research on best practices for sustainable online learning.

References

- Abbasi, S., Ayoob, T., Malik, A. and Memon, S.I. (2020), "Perceptions of students regarding E-learning during Covid-19 at a private medical college", *Pakistan Journal of Medical Sciences*, Vol. 36, COVID19-S4, pp. S57-S61, doi: [10.12669/pjms.36.covid19-s4.2766](https://doi.org/10.12669/pjms.36.covid19-s4.2766).
- Abdul, H.A. (2020), "Keberkesanan pembelajaran menggunakan forum dalam sistem E-learning: kajian kes pelajar tahun 4spi", Johor. Dissertation. Penerbit Universiti Teknologi Malaysia.
- Abdullah, N.A. and Mirza, M.S. (2020), "Evaluating pre-service teaching practice for online and distance education students in Pakistan: evaluation of teaching practice", *The International Review of Research in Open and Distributed Learning*, Vol. 21 No. 2, pp. 81-97, doi: [10.19173/irrodl.v21i2.4606](https://doi.org/10.19173/irrodl.v21i2.4606), available at: <https://files.eric.ed.gov/fulltext/EJ1250687.pdf>
- Abid, T., Zahid, G., Shahid, N. and Bukhari, M. (2021), "Online teaching experience during the COVID-19 in Pakistan: pedagogy-technology balance and student engagement", *Fudan Journal of the Humanities and Social Sciences*, Vol. 14 No. 3, pp. 367-391, doi: [10.1007/s40647-021-00325-7](https://doi.org/10.1007/s40647-021-00325-7).
- Adnan, M. and Anwar, K. (2020), "Online learning amid the COVID-19 pandemic: students' perspectives", *Journal of Pedagogical Sociology and Psychology*, Vol. 2 No. 1, pp. 45-51, doi: [10.33902/JPSP.2020261309](https://doi.org/10.33902/JPSP.2020261309).

- Adnan, M. and Uddin, A. (2021), "Online learning amid the second wave of the COVID-19 pandemic: students' perspectives", *Pakistan Journal of Distance and Online Learning*, Vol. 7 No. 1, pp. 47-60, available at: <https://files.eric.ed.gov/fulltext/EJ1321375.pdf>
- Akram, H., Aslam, S., Saleem, A. and Parveen, K. (2021), "The challenges of online teaching in COVID19 pandemic: a case study of public universities in Karachi, Pakistan", *Journal of Information Technology Education: Research*, Vol. 20, pp. 263-282, doi: [10.28945/4784](https://doi.org/10.28945/4784).
- Ali, M.S.I., Sultana, N., Shaheen, A., Thalh, N.P. and Ibrahim, M. (2022), "Major issues of teacher education in Pakistan", *Webology*, Vol. 19 No. 1, pp. 7153-7164.
- Allen, D. and Tanner, K. (2005), "Infusing active learning into the large-enrollment Biology class: seven strategies, from the simple to complex", *Cell Biology Education*, Vol. 4 No. 4, pp. 262-268, doi: [10.1187/cbe.05-08-0113](https://doi.org/10.1187/cbe.05-08-0113).
- Anjum, G. and Godil, A. (2019), "Fear of achievement among young women in urban Pakistan: a phenomenological analysis of fear of achievement (FOA)", *Cogent Social Sciences*, Vol. 5 No. 1, pp. 1-18, doi: [10.1080/23311886.2019.1666620](https://doi.org/10.1080/23311886.2019.1666620).
- Aqdas, S., Ahmed, A. and Soomro, M.A. (2023), "Exploring the impact of online classes on students' performance during Covid-19: voices from Pakistan", *International Journal of Instruction*, Vol. 16 No. 1, pp. 753-766, [10.29333/iji.2023.16142a](https://doi.org/10.29333/iji.2023.16142a), available at: <https://www.e-iji.net/volumes/372-january-2023,-volume-16,-number-1>
- Armbruster, P., Patel, M., Johnson, E. and Weiss, M. (2009), "Active learning and student-centered pedagogy improve student attitudes and performance in introductory biology", *CBE—Life Sciences Education*, Vol. 8 No. 3, pp. 203-213, doi: [10.1187/cbe.09-03-0025](https://doi.org/10.1187/cbe.09-03-0025).
- Asad, M.M., Rind, A.A., Khand, Z.H., Rind, I.A. and Mughal, S.H. (2021), "Curriculum up-gradation practices among higher education institutions of Pakistan: does curriculum ideologies make difference?", *Journal of Applied Research in Higher Education*, Vol. 13 No. 4, pp. 980-990, doi: [10.1108/JARHE-07-2020-0207](https://doi.org/10.1108/JARHE-07-2020-0207).
- Aslam, H.D., Javad, T., Nokandeh, M.H.M., Sharifi, H., Jalalian, M. and Lodhi, M.A. (2012), "A review of teachers' professional development initiatives and associated issues and challenges in higher education institutes of Pakistan", *Journal of American Science*, Vol. 8No.1, pp. 54-60, available at: <http://www.americanscience.org>
- Azam, F., Omar Fauzee, M.S. and Daud, Y. (2014), "Teacher training education programme in three Muslim countries Afghanistan, Iran and Pakistan", *Journal of Education and Human Development*, Vol. 3 No. 2, pp. 729-741, available at: <https://repo.uum.edu.my/id/eprint/26318>
- Bernard, R.M., Abrami, P.C., Borokhovski, E., Wade, C.A., Tamim, R.M., Surkes, M.A. and Bethel, E.C. (2009), "A meta-analysis of three types of interaction treatments in distance education", *Review of Educational Research*, Vol. 79 No. 3, pp. 1243-1289, doi: [10.3102/0034654309333844](https://doi.org/10.3102/0034654309333844).
- Børte, K., Nesje, K. and Lillejord, S. (2023), "Barriers to student active learning in higher education", *Teaching in Higher Education*, Vol. 28 No. 3, pp. 597-615, doi: [10.1080/13562517.2020.1839746](https://doi.org/10.1080/13562517.2020.1839746).
- Castéra, J., Marre, C.C., Yok, M.C.K., Sherab, K., Impedovo, M.A., Sarapuu, T., Pedregosa, A.D., Malik, S.F. and Armand, H. (2020), "Self-reported TPACK of teacher educators across six countries in Asia and Europe", *Education and Information Technologies*, Vol. 25 No. 4, pp. 3003-3019, doi: [10.1007/s10639-020-10106-6](https://doi.org/10.1007/s10639-020-10106-6).
- Clandinin, D.J. and Connelly, F.M. (1994), "Personal experience methods", in Denzin, N.K. and Lincoln, Y.S. (Eds), *Handbook of Qualitative Research*, Sage Publications, pp. 413-427.
- Dallimore, E.J., Hertenstein, J.H. and Platt, M.B. (2008), "Using discussion pedagogy to enhance oral and written communication skills", *College Teaching*, Vol. 56 No. 3, pp. 163-172, doi: [10.3200/CTCH.56.3.163-172](https://doi.org/10.3200/CTCH.56.3.163-172).
- Engel, O., Zimmer, L.M., Lörz, M. and Mayweg-Paus, E. (2023), "Digital studying in times of COVID-19: teacher-and student-related aspects of learning success in German higher education", *International Journal of Educational Technology in Higher Education*, Vol. 20 No. 12, pp. 1-20, doi: [10.1186/s41239-023-00382-w](https://doi.org/10.1186/s41239-023-00382-w).

- Falak, M.A. (2021), "Sustainable educational institutes", available at: <https://tribune.com.pk/story/2334835/sustainable-educational-institutes> (accessed 20 January 2023)
- Fatima, S., Ali, M. and Saad, M.I. (2022), "The effect of students' conceptions of feedback on academic self-efficacy and self-regulation: evidence from higher education in Pakistan", *Journal of Applied Research in Higher Education*, Vol. 14 No. 1, pp. 180-199, doi: [10.1108/jarhe-07-2020-0209](https://doi.org/10.1108/jarhe-07-2020-0209), available at: <https://www.emerald.com/insight/2050-7003.htm>
- Ferri, F., Grifoni, P. and Guzzo, T. (2020), "Online learning and emergency remote teaching: opportunities and challenges in emergency situations", *Societies*, Vol. 10 No. 4, p. 86, doi: [10.3390/soc10040086](https://doi.org/10.3390/soc10040086).
- Fink, L.D. (2016), "Five high-impact teaching practices: a list of possibilities", *Collected Essays on Learning and Teaching*, Vol. 9, pp. 3-18, doi: [10.22329/celt.v9i0.4428](https://doi.org/10.22329/celt.v9i0.4428), available at: <https://celt.uwindsor.ca/index.php/CELT/article/view/4428>
- GoP (2017), "National education policy 2017-2025", available at: <https://pbit.punjab.gov.pk/system/files/National%20Educaton%20Policy%202017.pdf> (accessed 20 January 2023).
- Gosling, D. (2014), "Collaborative peer-supported review of teaching", in Sachs, J. and Parsell, M. (Eds), *Peer review of learning and teaching in higher education: International perspectives*, Springer Netherlands, Dordrecht, pp. 13-31. doi: [10.1007/978-94-007-7639-5_2](https://doi.org/10.1007/978-94-007-7639-5_2).
- Hinduja, P., Mohammad, R.F., Siddiqui, S., Noor, S. and Hussain, A. (2023), "Sustainability in higher education institutions in Pakistan: a systematic review of progress and challenges", *Sustainability*, Vol. 15 No. 4, 3406, Article doi: [10.3390/su15043406](https://doi.org/10.3390/su15043406).
- Holton, D. and Clarke, D. (2006), "Scaffolding and metacognition", *International Journal of Mathematical Education in Science and Technology*, Vol. 37 No. 2, pp. 127-143, doi: [10.1080/00207390500285818](https://doi.org/10.1080/00207390500285818).
- Hopkins, C. (2012), "Twenty years of education for sustainable development", *Journal of Education for Sustainable Development*, Vol. 6 No. 1, pp. 1-4, doi: [10.1177/097340821100600101](https://doi.org/10.1177/097340821100600101).
- Huerta, J.C. (2007), "Getting active in the large lecture", *Journal of Political Science Education*, Vol. 3 No. 3, pp. 237-249, doi: [10.1080/15512160701558224](https://doi.org/10.1080/15512160701558224).
- Imran, N., Zeshan, M. and Pervaiz, Z. (2020), "Mental health considerations for children and adolescents in COVID-19 Pandemic: mental health considerations for children in COVID-19 Pandemic", *Pakistan Journal of Medical Sciences*, Vol. 36, COVID19-S4, pp. S67-S72, doi: [10.12669/pjms.36.COVID19-S4.2759](https://doi.org/10.12669/pjms.36.COVID19-S4.2759).
- Iorga, M., Dondas, C. and Zugun-Eloae, C. (2018), "Depressed as freshmen, stressed as seniors: the relationship between depression, perceived stress and academic results among medical students", *Behavioral Sciences*, Vol. 8 No. 8, pp. 1-12, 70, doi: [10.3390/bs8080070](https://doi.org/10.3390/bs8080070).
- Iqbal, S.A., Ashiq, M., Rehman, S.U., Rashid, S. and Tayyab, N. (2022), "Students' perceptions and experiences of online education in Pakistani universities and higher education institutes during COVID-19", *Education Sciences*, Vol. 12 No. 3, p. 166, doi: [10.3390/educsci12030166](https://doi.org/10.3390/educsci12030166).
- Khan, Z.H. and Abid, M.I. (2021), "Distance learning in engineering education: challenges and opportunities during COVID-19 pandemic crisis in Pakistan", *The International Journal of Electrical Engineering and Education*, pp. 1-20, doi: [10.1177/0020720920988493](https://doi.org/10.1177/0020720920988493).
- Khan, A., Egbue, O., Palkie, B. and Madden, J. (2017), "Active learning: engaging students to maximize learning in an online course", *Electronic Journal of E-Learning*, Vol. 15 No. 2, pp. 107-115, available at: <https://academic-publishing.org/index.php/ejel/article/view/1824>
- Lortie, D. (1975), *Schoolteacher: A Sociological Study*, University of Chicago Press, London.
- Mahmood, S. (2021), "Instructional strategies for online teaching in COVID-19 pandemic", *Human Behavior and Emerging Technologies*, Vol. 3 No. 1, pp. 199-203, doi: [10.1002/hbe.2218](https://doi.org/10.1002/hbe.2218).
- Mallhi, T.H., Ahmad, N., Salman, M., Tanveer, N., Shah, S., Butt, M.H., Alatawi, A.D., Alotaibi, N.H., Rahman, H.U., Alzarea, A.I., Alanazi, A.S., Alzahrani, M.S., Alshehri, S., Aljabri, A. and Khan, Y.H. (2022), "Estimation of psychological impairment and coping strategies during COVID-19 pandemic among university students in Saudi Arabia: a large regional analysis", *International*

-
- Journal of Environmental Research and Public Health*, Vol. 19 No. 21, pp. 14282, doi: [10.3390/jerph192114282](https://doi.org/10.3390/jerph192114282).
- McGreal, R. (2017), "Special report on the role of open educational resources in supporting the sustainable development goal 4: quality education challenges and opportunities", *The International Review of Research in Open and Distributed Learning*, Vol. 18 No. 7, doi: [10.19173/irrodl.v18i7.3541](https://doi.org/10.19173/irrodl.v18i7.3541), available at: <https://www.irrodl.org/index.php/irrodl/article/download/3541/4433>
- Michelsen, G. and Adomssent, M. (2007), "Education for sustainable development strategies in German universities", in Wals, A.E.J. (Ed.), *From Cosmetic Reform to Meaningful Integration: Implementing Education for Sustainable Development in Higher Education Institutes: the State of Affairs in Six European Countries*, DHO, Amsterdam, The Netherlands, pp. 21-24.
- Mohammad, R.F. (2021), "Engaging teachers in professional development: course design at higher education", *European Journal of Teaching and Education*, Vol. 3 No. 3, pp. 25-34, doi: [10.33422/ejte.v3i3.703](https://doi.org/10.33422/ejte.v3i3.703).
- Mohammad, F.R. (2022), "*Professional learning portfolio*", Iqra University [unpublished document].
- Mohammad, R.F. and Kamran, M. (2023), "Examining the efficacy of online learning in nurturing students' learning: an analysis of students' experiences", *Asian Association of Open Universities Journal*, Vol. 18 No. 3, pp. 218-232, doi: [10.1108/AAOUJ-11-2022-0163](https://doi.org/10.1108/AAOUJ-11-2022-0163).
- Mohammad, R.F. and Shaheen, M. (2020), "Novel transformation and change in schools' practice of distance teaching in Pakistan", *Journal of Education and Social Sciences*, Vol. 8 No. 2, pp. 70-79, doi: [10.20547/jess0822008206](https://doi.org/10.20547/jess0822008206).
- Moher, D., Liberati, A., Tetzlaff, J. and Altman, D.G. (2009), "Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement", *PLoS Med*, Vol. 6 No. 7, p. e1000097, doi: [10.1371/journal.pmed.1000097](https://doi.org/10.1371/journal.pmed.1000097).
- Mukhtar, K., Javed, K., Arooj, M. and Sethi, A. (2020), "Advantages, limitations and recommendations for online learning during COVID-19 pandemic era", *Pakistan Journal of Medical Sciences*, Vol. 36, pp. S27-S31, [10.12669/pjms.36.covid19-s4.2785](https://doi.org/10.12669/pjms.36.covid19-s4.2785), COVID19-S4.
- Nabi, G., Liñán, F., Fayolle, A., Krueger, N. and Walmsley, A. (2017), "The impact of entrepreneurship education in higher education: a systematic review and research agenda", *Academy of Management Learning and Education*, Vol. 16 No. 2, pp. 277-299, doi: [10.5465/amle.2015.0026](https://doi.org/10.5465/amle.2015.0026).
- Nawaz, S. and Mahmood, A. (2023), "Interplay of design thinking and technology integration: a project-based learning design", *Journal of Contemporary Trends and Issues in Education*, Vol. 2 No. 2, pp. 77-94, doi: [10.55628/jctie.v2i2.33](https://doi.org/10.55628/jctie.v2i2.33).
- Ning, B., Rind, I.A. and Asad, M.M. (2020), "Influence of teacher educators on the development of prospective teachers' personal epistemology and tolerance", *Sage Open*, Vol. 10 No.1, pp. 1-14, doi: [10.1177/2158244020914639](https://doi.org/10.1177/2158244020914639).
- Nousheen, A. and Kalsoom, Q. (2022), "Education for sustainable development amidst COVID-19 pandemic: role of sustainability pedagogies in developing students' sustainability consciousness", *International Journal of Sustainability in Higher Education*, Vol. 23 No. 6, pp. 1386-1403, doi: [10.1108/IJSHE-04-2021-0154](https://doi.org/10.1108/IJSHE-04-2021-0154).
- Pinar, W.F. (2006), *The Synoptic Text Today and Other Essays*, Peter Lang, New York, NY.
- Qazi, M.A., Sharif, M.A. and Akhlaq, A. (2022), "Barriers and facilitators to adoption of e-learning in higher education institutions of Pakistan during COVID-19: perspectives from an emerging economy", *Journal of Science and Technology Policy Management*, doi: [10.1108/JSTPM-01-2022-0002](https://doi.org/10.1108/JSTPM-01-2022-0002).
- Rab, M., MacDonald, S. and Riaz, N. (2019), "Digital globalisation of knowledge and the impact on higher education in South Asia", *EDULEARN19 Proceedings*, pp. 547-557, doi: [10.21125/edulearn.2019.0187](https://doi.org/10.21125/edulearn.2019.0187).
- Ratheeswari, K. (2018), "Information communication technology in education", *Journal of Applied and Advanced Research*, Vol. 3 No. 1, pp. 45-47, doi: [10.21839/jaar.2018.v3iS1.169](https://doi.org/10.21839/jaar.2018.v3iS1.169).

- Retallick, J. and Groundwater-Smith, S. (1996), *The advancement of Teacher Workplace Learning*, Centre for Professional Development in Education Charles Sturt University, Wagga.
- Røe, Y., Wojniusz, S. and Bjerke, A.H. (2022), "The digital transformation of higher education teaching: four pedagogical prescriptions to move active learning pedagogy forward", *Frontiers in Education*, Vol. 6, doi: [10.3389/educ.2021.784701](https://doi.org/10.3389/educ.2021.784701).
- Saeed, S., Kashif, U., Zaki, S., Samad, K., Yousuf, M., Raza, M., Jabbar, S. and Khan, U. (2023), "Teaching clinical skills using online modality through modified Peyton's Framework: an experience from a medical University in Pakistan", *Journal of Advances in Medical Education and Professionalism*, Vol. 11 No. 1, pp. 15-23, doi: [10.30476/jamp.2022.95986.1669](https://doi.org/10.30476/jamp.2022.95986.1669).
- Saqib, Z.A., Zhang, Q., Ou, J., Saqib, K.A., Majeed, S. and Razzaq, A. (2020), "Education for sustainable development in Pakistani higher education institutions: an exploratory study of students' and teachers' perceptions", *International Journal of Sustainability in Higher Education*, Vol. 21 No. 6, pp. 1249-1267, doi: [10.1108/IJSHE-01-2020-0036](https://doi.org/10.1108/IJSHE-01-2020-0036).
- Schleicher, A. (2020), "The impact of COVID-19 on education: insights from "education at a glance 2020", available at: <https://www.oecd.org/education/the-impact-of-covid-19-on-education-insights-education-at-a-glance-2020.pdf> (accessed 20 January 2023).
- Schon, D.A. (1983), *The Reflective Practitioner: How Professionals Think in Action*, Basic Books, New York.
- Sellars, M., Fakir Mohammad, R., Bui, L., Fishetti, J., Niyozov, S., Reynolds, R., Thapliyal, N., Li-Smith, Y.L. and Ali, N. (2018), "Conversations on critical thinking: can critical thinking find its way forward as the skill set and mindset of the century?", *Education Sciences*, Vol. 8 No. 4, p. 205, doi: [10.3390/educsci8040205](https://doi.org/10.3390/educsci8040205).
- Shah, D.B. and Bhattarai, P.C. (2023), "Factors contributing to teachers' self-efficacy: a case of Nepal", *Education Sciences*, Vol. 13 No. 1, p. 91, 91 doi: [10.3390/educsci13010091](https://doi.org/10.3390/educsci13010091).
- Shahzad, S.K., Hussain, J., Sadaf, N., Sarwat, S., Ghani, U. and Saleem, R. (2020), "Impact of virtual teaching on ESL learners' attitudes under COVID-19 circumstances at post graduate level in Pakistan", *English Language Teaching*, Vol. 13 No. 9, pp. 1-9, doi: [10.5539/elt.v13n9p1](https://doi.org/10.5539/elt.v13n9p1).
- Siddiqui, S., Kazmi, A.B. and Siddiqui, U.N. (2021), "Internet Addiction as a precursor for cyber and displaced aggression: a survey study on Pakistani youth", *ADDITCA: The Turkish Journal on Addictions*, Vol. 8 No. 1, pp. 73-80, doi: [10.5152/ADDICTA.2021.20099](https://doi.org/10.5152/ADDICTA.2021.20099).
- Siddiqui, S., Arif, I. and Hinduja, P. (2023), "Technostress: a catalyst to leave the teaching profession- A survey designed to measure technostress among teachers in Pakistan during COVID-19 pandemic", *Journal of E-Learning and Digital Media*, Vol. 20 No. 1, pp. 53-79, doi: [10.1177/20427530221107506](https://doi.org/10.1177/20427530221107506).
- Sobko, S., Unadkat, D., Adams, J. and Hull, G. (2020), "Learning through collaboration: a networked approach to online pedagogy", *E-learning and Digital Media*, Vol. 17 No. 1, pp. 36-55, doi: [10.1177/2042753019882562](https://doi.org/10.1177/2042753019882562).
- Tabassum, F., Akram, N. and Moazzam, M. (2022), "Online learning system in higher education institutions in Pakistan: investigating problems faced by students during the COVID-19 pandemic", *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT)*, Vol. 17No. 2, pp. 1-15, doi: [10.4018/IJWLTT.20220301.oa1](https://doi.org/10.4018/IJWLTT.20220301.oa1).
- Tadesse, E.F. and Khalid, S. (2023), "Are teachers and HE are on the same page? Calling for a research-teaching nexus among Ethiopian and Pakistani academics", *Journal of Applied Research in Higher Education*, Vol. 15 No. 1, pp. 130-151, doi: [10.1108/JARHE-09-2021-0348](https://doi.org/10.1108/JARHE-09-2021-0348).
- Thaheem, S.K., ZainolAbidin, M.J., Mirza, Q. and Pathan, H.U. (2022), "Online teaching benefits and challenges during pandemic COVID-19: a comparative study of Pakistan and Indonesia", *Asian Education and Development Studies*, Vol. 11 No. 2, pp. 311-323, doi: [10.1108/AEDS-08-2020-0189](https://doi.org/10.1108/AEDS-08-2020-0189).
- Tribune, E. (2022), "Over 31% of educated youth unemployed, reveals PIDE", available at: <https://tribune.com.pk/story/2342344/over-31-of-educated-youth-unemployed-reveals-pide> (accessed on 20 January 2023).

-
- Turnbull, D., Chugh, R. and Luck, J. (2021), "Transitioning to E-Learning during the COVID-19 pandemic: how have higher education institutions responded to the challenge?", *Education and Information Technologies*, Vol. 26 No. 5, pp. 6401-6419, doi: [10.1007/s10639-021-10633-w](https://doi.org/10.1007/s10639-021-10633-w).
- Ufua, D.E., Emielu, E.T., Olujobi, O.J., Lakhani, F., Borishade, T.T., Ibidunni, A.S. and Osabuohien, E.S. (2021), "Digital transformation: a conceptual framing for attaining Sustainable Development Goals 4 and 9 in Nigeria", *Journal of Management and Organization*, Vol. 27 No. 5, pp. 836-849, doi: [10.1017/jmo.2021.45](https://doi.org/10.1017/jmo.2021.45).
- Ullah, A., Ashraf, M., Ashraf, S. and Ahmed, S. (2021), "Challenges of online learning during the COVID-19 pandemic encountered by students in Pakistan", *Journal of Pedagogical Sociology and Psychology*, Vol. 3 No. 1, pp. 36-44, available at: <http://www.doi.org/10.33902/JSPS.2021167264>.
- UNESCO (2020), "Education: from disruption to recover", available at: <https://en.unesco.org/covid19/educationresponse> (accessed 20 January 2023).
- Wargadinata, W., Maimunah, I., Eva, D. and Rofiq, Z. (2020), "Student's responses on learning in the early COVID-19 pandemic", *Tadris: Journal of Education and Teacher Training*, Vol. 5 No. 1, pp. 141-153, doi: [10.24042/tadris.v5i1.6153](https://doi.org/10.24042/tadris.v5i1.6153).
- Watermeyer, R., Crick, T., Knight, C. and Goodall, J. (2021), "COVID-19 and digital disruption in UK universities: afflictions and affordances of emergency online migration", *Higher Education*, Vol. 81 No. 3, pp. 623-641, doi: [10.1007/s10734-020-00561-y](https://doi.org/10.1007/s10734-020-00561-y).
- Yarim, M.A., Yildirim, I. and Akan, D. (2022), "Motivation factors of candidates teachers for their professions", *GLST Education and Learning Research Journal*, Vol. 24, pp. 43-63, doi: [10.26817/16925777.1319](https://doi.org/10.26817/16925777.1319), available at: <https://files.eric.ed.gov/fulltext/EJ1353627.pdf>
- Yasmin, M., Naseem, F. and Masso, I.C. (2019), "Teacher-directed learning to self-directed learning transition barriers in Pakistan", *Studies in Educational Evaluation*, Vol. 61, pp. 34-40, doi: [10.1016/j.stueduc.2019.02.003](https://doi.org/10.1016/j.stueduc.2019.02.003).
- Zeichner, K. and Wray, S. (2001), "The teaching portfolio in US teacher education programs: what we know and what we need to know", *Teaching and Teacher Education*, Vol. 17 No. 5, pp. 613-621, doi: [10.1016/S0742-051X\(01\)00017-8](https://doi.org/10.1016/S0742-051X(01)00017-8).

Further reading

- Basar, Z.M., Mansor, A.N., Jamaludin, K.A. and Alias, B.S. (2021), "The effectiveness and challenges of online learning for secondary school students—A case study", *Asian Journal of University Education*, Vol. 17 No. 3, pp. 119-129, doi: [10.24191/ajue.v17i3.14514](https://doi.org/10.24191/ajue.v17i3.14514).
- Najib, H.M., Bakar, N.R.A. and Othman, N. (2017), "E-pembelajaran dalam kalangan pelajar di Sebuah institusi pengajian tinggi selangor: E-learning among students of higher education institutions in selangor", *Attarbawiy: Malaysian Online Journal of Education*, Vol. 1 No. 1, pp. 74-82, doi: [10.53840/attarbawiy.v1i1.121](https://doi.org/10.53840/attarbawiy.v1i1.121).

Corresponding author

Sohni Siddiqui can be contacted at: s.zahid@campus.tu-berlin.de

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