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21st CENTURY TEACHING AND LEARNING SKILLS: IMPLICATIONS FOR TEACHER EDUCATION

Dr. Syeda Naureen Mumtaz[1], Dr. Fakhra Aziz*[2], Dr. Farzana Yousaf[3], Zoha Batool[4]

[1]Assistant Professor, University of Education, Lahore
[2]Professor, Lahore College for Women University, Lahore
[3]Assistant Professor, University of Education
[4]MPhil Scholar, University of Education

[1]syeda.naureen@ue.edu.pk, *[2]fakhra.aziz@lcwu.edu.pk, [3]farzana.yousaf@ue.edu.pk, [4]zoha.batool@yahoo.com

Corresponding Author: *
Dr. Fakhra Aziz*[2]

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ABSTRACT

*This study aims to examine the contemporary teaching and learning practices employed by pre-service teachers in the twenty-first century and to explore the interrelationship between these pedagogical and learning approaches. In addition to assessing the strategies used to foster effective student learning, the study also evaluates the extent of educators' knowledge in research-related domains. A quantitative correlational research design was adopted to achieve these objectives. The sample comprised prospective B.Ed. (Hons) students enrolled in morning and evening programs across four public universities in Lahore, Pakistan. Data were collected using two validated instruments: the *21st Century Learning Skills Usage Scale* and the *21st Century Teaching Skills Usage Scale*. The findings reveal that pre-service teachers exhibit a diverse range of twenty-first-century learner competencies, including cognitive skills, autonomy, collaboration, adaptability, and creativity. Furthermore, they demonstrate several teaching competencies aligned with twenty-first-century educational demands, such as administrative effectiveness, techno-pedagogical proficiency, positive instructional strategies, pedagogical flexibility, and the ability to innovate in teaching methods. Statistical analysis indicates a significant positive correlation between the use of 21st-century teaching skills and learning skills. The study concludes with implications for enhancing teacher education programs in light of the evolving demands of contemporary pedagogy.*

Keywords: *21st century skills, learning skills, teaching skills, Prospective teachers. Implication and Education*

INTRODUCTION

The rapid change and development in the twenty-first century require people to equip themselves with specific skills and competencies. The Partnership for 21st Century Skills (2009) defines twenty first century skills as knowledge, skills, literacy, and competency that people need to prosper in their daily life and at work. The emphasis of 21st century skills is on real-world classroom issues and contemporary subjects.

Information technology expertise, learning abilities, and employment skills are also included in the list of skills (Partnership for 21st Century Skills, 2009).

In the fast-paced and ever-evolving 21st century, individuals need to develop a set of distinctive skills and abilities. These essential attributes, encompassing knowledge, skills, literacy, and competency, are collectively known as twenty first-century skills, as defined by The Partnership for 21stCentury Skills. The emphasis of these skills lies in addressing contemporary issues and challenges, both within the educational setting and the broader context of everyday life and the workplace. This comprehensive skill set includes proficiencies in information technology, a capacity for continuous learning, and a range of workplace competencies.

In this context, studies have been done in a number of areas, such as identifying the educational setting, educational institutions, and student factors required for developing 21st-century skills encompassing topics like, how to integrate these skills into lessons, creating a new literacy system that includes these skills, as well as developing a scale (Eguchi, 2014; Laughlin, 2014; Ongard & Tuipae, 2015; Siddiq & Wilson, 2017).

Studies on the value of 21st century skills in the industry, how to foster 21st century skills in STEM and engineering education, and how to measure 21st century abilities are available (Bell & McLain, 2017; Murphy & Niepel, 2017). The conclusion reached after examining the connections among both sets of competences was that modern skills are more extensive than digital skills. Moreover, unlike digital skills, information and communication technology do not always support 21st century abilities.

According to Casner and Barrington (2006) the term "21st century skills" frequently mentions a collection of competencies that are not only necessary but also significant for understanding and surviving in the twenty-first century. The labor market today is seen as global (OECD,2010), which means that highly trained workers in wealthy nations compete for jobs with those who have the same talents in countries with lower incomes. Comparing this with 20 years ago, when employment was localized and only citizens of the nation of residence were eligible to apply for these sorts of jobs.

Technology's quick development has made 21st-century skills more valuable in this century. In the 21st century, digital technology use is spreading across the globe and throughout the world, and it has turned into a necessity for day-to-day living. This has led to the emergence of a new generation of students, those who were both born and reared in the digital age (Sahin, 2009). The Partnership for 21st Century Skills (2009) refers to this knowledge, skills, literacy, and competency as 21st century skills, which are what people need to succeed in their daily life and at work.

Recently, 21st century skills have become more and more prominent focus of various educational studies. Kang and You (2012) for instance, created a scale for assessing pupils in elementary schools on their mastery of three categories of 21st-century skills: 1) the cognitive (information management, information construction, information use, and problem-solving); 2) the affective (self-identity, self-value, self-management, and self-responsibility); and 3) the sociocultural (social membership, social sensitivity, socialization abilities, and social accomplishments).

The 21st century skill set usually consists of a range of competencies, including digital, responsibility for society, creativity, critical thinking, cognitive development, communication, problem solving, and global awareness for a review of frameworks (Dede, 2010).

21st Century Skills and Education

Individuals should prioritize obtaining 21st century abilities. Rotherham and Willingham (2010), Wan Husin et al. (2016), underline the significance of education in the development of twenty first century abilities. According to the modern understanding of education, the learning and teaching processes should help students prepare for a future in which they will need to constantly learn new things and be able to use their 21st Century Skills (Mutiani & Faisal, 2020; Park & Suh, 2020). This goes beyond simply assisting pupils in acquiring new material and expanding their knowledge. Students with 21st-century skills will be the skilled labor force of the

future. As a result, developing 21st Century Skills as early as possible is vital in order to get ready for a future career and way of life (O'Neal & Cotten, 2017).

Education

A country's growth and success depend on its level of education. As science and technology improve, every nation must deal with the issues of globalization and education internalization. The development of pupils' 21st-century talents is another emphasis of the educational issues of today. As a result, both public and private schools must place an equal emphasis on teaching students both the foundations and a fresh set of reasoning abilities and critical thinking (Silva, 2009).

In today's world, especially in collegiate programmes and modern careers and workplaces, "21st-century skills" refers to a broad variety of abilities, expertise, work behaviours, and character traits that are thought to be essential for success. These skills can be applied in every area of study as well as in every educational, professional, and civic environment all through the life of a student (Moyer, 2016).

In an effort to address the challenges such as technological advancement, globalization, shift from industrial to knowledge economy, and need for educational systems to adapt, various countries around the world have proposed and implemented alternatives to assist people in obtaining learning via non-formal and informal education. These challenges posed by the rapidly evolving worldwide and knowledge economy.

In the twenty-first century, technology utilization is an essential instrument for enhancing student learning. PCs are easily accessible in most classrooms. The main issue facing education today is the lack of integration of technology in classrooms and educational institutions.

Implementation for the Improvement of Teacher Education

According to Taylor (2012) teachers have a variety of responsibilities when it comes to orchestrating educational settings in complex, modern learning contexts. To improve the atmosphere for learning and lesson, educators should be open to collaborating with peers, adults, and other experts. Taylor (2012) expands on the idea of "authentic learning" and claims that "it is a common feature of many innovative learning environments to make the learning experience authentic and meaningful by engaging students with real-life problems, offering hands-on experiences, and incorporating students historical, natural, and cultural environment in learning activities.

Students will be better prepared for future learning by taking part in real learning with inquiry-based learning and teamwork (Taylor, 2012). Most teachers use project-based learning to incorporate 21st century skills (Sweet, 2014). According to Zhao and Zheng (2014) according to the definitions found in PBL (Project Based Learning) handbooks for teachers, projects are complex tasks, based on challenging questions or problems, that involve students in design, problem-solving, decision-making, or investigative activities; it gives students the opportunity to work relatively autonomously over an extended period of time; and it culminates in realistic products or presentations.

RESEARCH OBJECTIVE

To examine the relationship between prospective teachers' learning abilities and essential 21st century teaching skills, and how these contribute to success in teacher education

RESEARCH QUESTIONS

The present study aims to find answers to the following questions:

- Which learning abilities do prospective instructors need to develop for success in the 21st century?
- Which teaching skills are essential for the prospective instructors to survive in the 21st century?
- To what extent do teaching and learning abilities of prospective teachers correlate?
- How have teaching skills and learning abilities helped teacher education?

METHOD

Researcher used a post-positivism approach in this study. According to post-positivists, a researcher's

ideas and even personal identity can influence what they see and what they conclude from it. The goal of post-positivism is to acknowledge and account for these prejudices in the body of information and theories that theorists produce.

This research study is quantitative in nature. The first and second study questions seek to identify how prepared prospective teachers are to teach and learn in the twenty-first century. Finding the connection between teaching skills and 21st century learning is the goal of the third research question. The quantitative descriptive correlation method was employed in this research.A non-experimental research method known as correlation research involves measuring two variables, understanding, and evaluating their statistical relationship, and doing so without the interference of any other variables. A scale for 21st-century teaching and learning skills has been adapted based on research. For the study, the researcher utilized this scale to measuring the use of 21stcentury teaching and learning skills. In this study, the researcher only utilized closed-ended questions.

Sample

Using a planned strategy of selection, researcher chose a smaller subset of data from a larger population to create a sample. The district of Lahore was chosen by the researcher as a population. There are many towns in Lahore, and two were randomly selected for this study. Four public universities in Lahore were specifically chosen by the researchers because they offer the B.Ed. (hons) programs. The study's techniques utilized cluster sampling. The target participants were prospective teachers of the B.Ed. (Hons) program in the 7th semester, from both the morning and evening shifts. The study involved 320 B.Ed. (hons.) students who were registered for the morning and evening shifts of the seventh semester. All participants were enrolled in four-year degree programs at public universities in Lahore, Pakistan.

Instrumentation

Two instruments were used for data collection, the 21st Century Learner Skills Usage Scale and the 21st Century Teacher Skills Usage Scale by Göksün & Kurt (2017). The 21st Century Teacher Skills Usage Scale has 27 components in total, which are broken down into five groups: generative skills, affirmative skills, adaptable teaching methods, and technological pedagogical abilities.

The 21st Century Learner Skills Usage Scale's four components are cognitive abilities, autonomous abilities, Collaboration and flexibility abilities, and innovation abilities. The five-point Likert scale with response options: "never (1), rarely (2), sometimes (3), usually (4), and always (5)." Was used in the questionnaire.

DATA COLLECTION AND ANALYSIS

This section offers details about the study's participants, the data collection process, and the instrument used. The researcher acquired all the data by himself. During the seventh semester, the researcher conducted a physical examination of the relevant courses in the selected B.Ed. (hons) programs and explained the study's purpose to the participants. All participants' identities were kept secret while the data was being collected.

Questions from students regarding the questionnaire tool are answered by the researcher. Each student was given a questionnaire. They selected a response (a number from 1 to 5) for each item on the scale. Using the SPSS 25 ver., the researcher examined the quantitative data and produce some implications for teacher education.

Table 1. Mean and SDs of Score obtained for each factor on 21st Century teaching skills Usage scale

Sr#	21st skills teaching skills	M	SD
1	Administrative skills	4.04	.723
2	Techno-pedagogical skills	3.94	.789
3	Affirmative skills	3.89	.868
4	Flexible teaching skills	3.98	.937
5	Generative skills	3.99	.950

The ratings of prospective teachers on the use scale for 21st-century teaching skills are displayed in Table 1. Administrative skills (TADS), Techno-pedagogical skills (TTPS), Affirmative skills (TAFS), Flexible teaching skills (TFTS), and Generative skills (TGS) are the categories they fall under. The educational system used affirmative skills the least (UTAFS, M= 3.89) and administrative skills the most (TADS, M = 4.04), according to ranges. The rating on the 21st Century Teacher Usage Skills Scale, which has a maximum point of five and a midpoint of three, shows that it is approaching the highest score that can be obtained.

Table 2. Score obtained for each factor on 21st Century learning skills Usage scale (N=320)

Score	N	M	SD
ULCS	320	3.83	.651
ULAS	320	3.93	.674
ULCFS	320	3.84	.743
ULIS	320	3.72	.960

Table 2 lists the pre-service teachers' scores on the 21st Century Learning Skills Usage Scale, which were categorized as Cognitive (LCS), Autonomous (LAS), Collaboration and Flexibility (LCFS), and Innovation (LIS) skills. Range analysis shows that the most frequently used abilities in the school system were autonomous skills (ULAS, M = 3.93) while Innovation skills (ULIS, M = 3.72) were the least.

Table 3: Correlation between 21st Century Teaching skills Usage and 21st Century Learning Skills Usage and its Sub-Dimensions

Sr No	Skills	1	2	3	4	5	6	7	8	9
1	UTADS	-								
2	TTPS	.884**	-							
3	UTAFS	.753**	.729**	-						
4	UTFTS	.639**	.593**	.702**	-					
5	UTGS	.759**	.722**	.628**	.462**	-				
6	ULCS	.616**	.616**	.533**	.403**	.519**	-			
7	ULAS	.592**	.555**	.507**	.390**	.518**	.793**	-		
8	ULCFS	.470**	.552**	.424**	.293**	.344**	.796	.697**	-	
9	ULIS	.296**	.364**	.270**	.110**	.260**	.595**	.559**	.662**	-

Table 3 demonstrates the substantial correlation between the pre-service teachers' overall scores on the 21st century teaching skills usage scale and the 21st century learning skills usage scale. According to Buyukoztuek (2012), a low coefficient is one with a value below 0.30, an intermediate coefficient is one with a value between 0.30 and 0.70, and a significant degree of connection is indicated by a value above 0.70.

CONCLUSIONS/DISCUSSION

The study's research topics were evaluated in relation to how pre-service teachers used the four categories of collaboration and flexibility skills, cognitive skills, innovative skills, and autonomous abilities. Five attributes of 21st-century teacher skills were examined: generative skills, flexible teaching strategies, positive skills, administrative skills, and techno-pedagogical abilities. It is simple to assess the use scores that were obtained when one is aware that the average score was three, the lowest score that could be obtained was one, and the highest rating in each of the scales and scale aspects was five.

The analysis of the 21st century student skills usage scale and its sub-dimensions (cognitive skills, M =3.83, innovation skills, M=3.72, collaboration and

flexibility skills M=3.84, and autonomous abilities, M=3.93) revealed levels of use that were above the mean. Pre-service teachers selected autonomy skills as the ability that was most frequently employed, while innovation skills were the skill that was least frequently used. It can be assumed that the ability in question was utilized more often than normal if the use score is higher than the midpoint.

According to reports, pre-service teachers scored (M=3.89 for affirmative skills, (M= 4.04 for administrative skills, (M=3.99 for generative skills, (M=3.98 for flexible teaching skills, and (M=3.94 for techno-pedagogical skills on the 21st century teacher skills usage scale. Among the above-mentioned talents, pre-service teachers used their administrative skills the most frequently. The use score above the midpoint could indicate that above the midpoint, the related skill was used. If a skill was utilized above the midpoint, it may be shown by a use score above the midpoint. Furthermore, a strong relationship has been found between student competencies and the application of 21st-century teaching strategies. This study found a substantial correlation between the pre-service teachers' 21st century skills for learners and the 21st century student abilities scale. In addition, a statistically significant association between the skills of the 21st century educator and the indicator of how well they are applied was found. The research of Brun and Hinostroza (2014) revealed the necessity of occupational development for educators who work in offices. The importance of implementing 21st century teaching practices is shown by Bunker's (2012) conclusion that students in the 21st century could not be corrected by the instructional tactics utilized by existing teachers. Since the teaching abilities examined in the current study were developed within the context of 21st century pedagogy, one could claim that those in pre-service who aspire to become teachers would benefit from adopting modern techniques for teaching in their careers.

Implications for Prospective Teacher's Education

The researcher makes a few conclusions and recommendations for improving teacher education programs in Pakistan, concentrating on skills and tactics for enhancements, based on the study's findings and a thorough analysis of the body of current literature. To implement these suggestions effectively, it is imperative for the concerned authorities responsible for teacher education in the country to act.

1. 21st century teaching and learning skills Integrate into the curricula

Implication: As governments include twenty-first-century skills into teacher education curricula and as aspiring teachers change towards seeking to cultivate these talents in their future pupils, this study can serve to highlight key strategic priorities in this transition.

Concern authorities: Universities, department's deans, teachers.

2. 21st century teaching and learning skills Integrate into pedagogies

Implication: Prospective teachers who desire to be aware of the 21st century skills that their students are developing concentrate on incorporating such target skills into their teaching methods by emphasizing the skill categories that are most prevalent in literature, such as critical thinking, problem solving, communication, and teamwork.

Concern authorities: Educators, department's deans.

3. 21st century teaching and learning skills Integrate into pedagogies

Implication: The components of skill utilization show that learners utilize Autonomous skills the least. To encourage the application of autonomous abilities, it is suggested that more separation-joining technique-based teaching activities be included to teacher candidates' academic coursework. By using the separation-joining strategy, pre-service teachers will be capable of enhancing their ability to study independently, since they will be more proficient in using their talents for both solo and group work.

Concern authorities: Educators, pre- service teacher.

4. Teacher lack in student skills

Implication: After analyzing teacher skill usage, it was found that all of the use was over the medium

level. We are measuring their technological-pedagogical skills in their current position as instructors, not curriculum-specific characteristics like branch and subject. In the twenty-first century, however, teachers must also be learners. Experienced teachers working in the twenty-first century. The assumption in twenty-first century classrooms is that students lack skills. Learners in the twenty-first century may require information about teaching skills.
Concern authorities: Universities, educators, prospective teachers.

5. Techno-pedagogical skills
Implication: When the sub-dimensions of teacher skill utilization are studied, teachers employ techno-pedagogical abilities the least. One reason of this predicament is a lack of Affirmative Action courses in the education department curriculum. To illustrate how teacher candidates might integrate their own branch material with progressive skills into their teaching processes, instructional activities or lessons may be provided.
Concern authorities: Teachers, department's deans.

6. Affirmative skills
Implication: Educational trips, pass slips, theatre performances, discussions or debates, and buzz sessions are some other learning activities can planned. Educational institutes should organize programs like "The Asian school" to enhance the adaptable teaching abilities of aspiring educators. With today's technological resources, such smart boards and video cameras, educational capabilities can be prepared to help pre-service instructors apply the 21st century learner skills more rapidly and effectively.
Concern authorities: Teachers, department's deans, education faculty.

7. Consultation of Precautions for the improvement of teacher education
Implication: Take the appropriate safeguards to assist students in developing autonomous thinking, cooperation skills, and creativity, especially in high education.
Concern authorities: Government universities, department deans, educators.

8. Allocation of Funds
Implication: Establish protocols for allocating funding for professional growth in technology that is suitable for usage with 21st-century tools.
Concern authorities: Government.

9. Incorporation of skills other than cognitive skills into curricula
Implication: The use of students' cognitive, autonomous, collaborative, adaptable, and innovative abilities was investigated in that study. Since students' cognitive abilities are more developed than those of their other aids, it is essential to take these abilities into account when developing new curricula in order to gain fresh perspectives and conduct research.
Concern authorities: Department deans, educators

10. Online professional development programs
Implication: Providing resources to let organizations create professional development programs online for incorporating technology. A shared vision in schools could be fostered by offering online training programs in technology integration that encourage involvement from every employee, including administrators, support workers, and teachers.
Concern authorities: Government universities, department deans, educators.
The link between the 21st Century Teaching Skills Usage Scale and the 21st Century Learning Skills Usage Scale is displayed in the above table. These ranges demonstrate that all the variables includes in the analysis have a significant degree off association. Each element shows a strong relationship with the others. It demonstrates the strong link between the administrative skill (UTADS) and technological skill (UTTPS) ranges.

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