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ASSESSING UNIVERSITY STUDENTS' PERCEPTIONS AND PREPAREDNESS FOR THE 21ST CENTURY SKILLS

Uzma[1], Birjees Abbasi[2], Malaika Shamsi[3]

[1]*M. Phil Scholar Department of Education Shaheed Benazir Bhutto University Shaheed Benazirabad*
[2]*M.Phil Scholar, Department of Education, Sindh Madressatul Islam University Karachi.*
[3]*B.Ed. Hons. University of Sindh, Jamshoro.*

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Corresponding Author: *

Abstract
Universities are more important in arming students with critical thinking, digital literacy, creativity, leadership, and other 21st-century skills in the fast-changing employment environment of today. The degree to which higher education courses and teaching strategies combine these competences is investigated in this quantitative study from student viewpoints. Two hundred and sixteen from six different fields at Sindh Madressatul Islam University, Karachi, answered a structured survey; SPSS was used to analyze the results. The results expose a general belief that colleges do not adequately include real-world applications, multidisciplinary approaches, or experiential learning into their courses. The findings highlight how urgently curricular changes, faculty development programs, and creative instructional approaches must be adopted to close the gap between academic knowledge and professional needs. Emphasizing the need of digital integration, interactive learning, and competency-based education to improve students' professional preparedness, this paper adds to the continuing conversations on higher education transformation. Future studies should concentrate on spotting successful policies and initiatives to better match university education to modern job demands.

INTRODUCTION

The world is entering the Fourth Industrial Revolution, sometimes referred to as Industry 4.0, thanks in great part to the fast technological developments over recent years. Defined by developments including artificial intelligence, cyber-physical systems, smart automation, and the Internet of Things, Industry 4.0 has fundamentally changed the worldwide workforce. While ordinary jobs are being mechanized, knowledge-based and service-oriented professions are in more demand and traditional job roles are being redefining. These advances highlight how urgently educational institutions must provide their students with necessary skills to properly negotiate this changing terrain.

Higher education fosters vital skills such critical thinking, problem-solving, digital literacy, creativity, and leadership, therefore helping students to be ready for the challenges of the twenty-first century. Governments, legislators, and teachers all around are giving projects meant to match educational curriculum with these new employment needs top priority. Often referred to as 21st-century skills, these abilities have become crucial in debates on pedagogical developments and reform of education.
The COVID-19 epidemic has sped up awareness of and incorporation of modern pedagogies and digital competency in the classroom. The move to online and mixed learning models highlights the need of giving teachers and students digital skills and creative

teaching approaches. Research shows differences in implementation, instructional emphasis, and educator preparedness when universities all around change their courses to include these capabilities. While some institutions have effectively embraced digital transformation, others struggle to include these abilities into official education systems.

Scope of the Study

This study uses a quantitative method to find how well students believe they are ready for the workforce of tomorrow. Undergraduates from several fields at Sindh Madressatul Islam University, Karachi, answered a structured survey. The results add to the current debates on reform of higher education by providing analysis of curriculum efficacy, teaching strategies, and the part digital literacy plays in academic and career success. The study also suggests ways to improve educational methods to raise student preparedness for changing job environments. By tackling these important problems, this study hopes to assist educational institutions in improving their curricula and teaching strategies to produce a generation of graduates ready for success in an ever-active, technologically advanced society.

Research Objectives

1. Evaluate students' views on the adequacy of university education in fostering critical competencies for the modern workforce.
2. Identify gaps in curriculum design and pedagogical approaches that may hinder skill acquisition.
3. Provide recommendations for enhancing university programs to better align with Industry 4.0 demands.

Literature Review

The primary objective of education is to provide holistic training to individuals while enhancing the overall quality of life within society. According to the 2020 report on the Sustainable Development Goals (SDGs) outlined in the United Nations (UN) Agenda 2030, the goal of ensuring inclusive, equitable, and high-quality education, along with promoting lifelong learning (SDG 4), has been significantly impacted by prolonged school and university closures due to the COVID-19 pandemic. These disruptions have adversely affected educational outcomes (Ichsan, 2023). Although many institutions have transitioned to virtual learning environments, limited internet access remains a significant barrier for students. Additionally, the effectiveness of remote education is contingent upon the digital proficiency of educators, administrators, and guardians.

Comprehensive educational models provide a framework for assessing the competencies required across different domains by considering technological, pedagogical, contextual, and humanistic perspectives. Frameworks designed for the 21st century serve as tools to identify the essential skills students need for future employment. Educators must critically evaluate whether current competencies and teaching methodologies are adequately structured to meet these evolving demands (Lashari et al., 2023). The Partnership for 21st Century Skills, a collaborative initiative involving governments and businesses, has established a framework for developing the skills, competencies, and mindsets necessary for success in both the workplace and contemporary society. This framework classifies competencies into three broad categories: (1) learning skills, including creativity, critical thinking, problem-solving, communication, and collaboration; (2) literacy skills, encompassing information, media, and ICT literacy; and (3) life skills, such as adaptability, initiative, social and intercultural competence, productivity, accountability, leadership, and responsibility (Örtegren & Olofsson, 2024).

Among the emerging competencies in contemporary education, the ability to navigate complex and dynamic realities has become increasingly relevant. Professionals must develop systems thinking, critical reasoning, creativity, and scientific problem-solving skills to address multifaceted societal challenges (Rehman, Lashari, & Abbas, 2023).

The Fourth Industrial Revolution (4IR) is characterized by disruptive technological advancements, innovative methodologies, and evolving industry practices. Key technologies driving this transformation include artificial intelligence (AI), machine learning (ML), and algorithmic processes (Van et al., 2017). The integration of these technologies calls for a basic modernization of

educational systems, therefore affecting classroom administration, assessment strategies, pedagogical approaches, ethical issues, and professional development. Furthermore, the post-pandemic scene presents new difficulties requiring sophisticated problem-solving capacity, digital communication skills, and global leadership capacity in far-off surroundings.

The changing needs of the Fourth Industrial Revolution have made success in business, education, and employment in the twenty-first century dependent on different talents than those needed elsewhere. Often referred to as 21st-century skills, these competencies emphasize the ability to collaborate with emerging technologies and perform difficult cognitive tasks that cannot be readily automated beyond traditional literacy, numeracy, and technical proficiency (González-Salamanca, Agudelo, & Salinas, 2020). The fast developments in artificial intelligence (AI), automation, and digitalization have underlined even more the need of these abilities since they call for people to create flexible, creative, multidisciplinary solutions for problems in a technologically driven environment.

Although the importance of 21st-century skills is well recognized, empirical study in this field is still somewhat immature and only a small number of systematic reviews and meta-analyses are accessible. González-Pérez and Ramírez-Montoya (2022) looked closely at curricula meant to include 21st-century competencies into learning environments. Although their results show a theoretical agreement on the value of such competencies, they also draw attention to discrepancies in their pragmatic application and policy integration. Kennedy and Sundberg (2020) conducted a methodical review looking for seven basic competencies—critical thinking, communication, teamwork, creativity, digital literacy, adaptability, and self-regulation. Their research especially in relation to digital learning settings investigated the fundamental elements guiding the acquisition of these abilities.

Beyond abstract debates, several meta-analyses have looked at how well teaching approaches meant to develop 21st-century skills across several academic fields and educational environments work. Mathematical and scientific education research has looked at how computational thinking, problem-solving, and inquiry-based learning methods may be combined (Voogt et al., 2020). Studies with an eye on creativity have shown how cooperative problem-solving and multidisciplinary project-based learning help to encourage innovation (Sawyer, 2019). Research on early childhood, K–12, and higher education environments have similarly looked at how well digital pedagogies, flipped classrooms, and experiential learning models improve skill development (Mishra & Mehta, 2021).

Notwithstanding these efforts, the literature still shows a significant discrepancy on the conceptual and intellectual foundation supporting study on 21st-century abilities. Although current research mostly addresses talent identification, curriculum integration, and instructional approaches, there is a dearth of thorough bibliometric assessments tracking the development, interconnection, and academic influence of research in this subject (Gut, 2010). Designing evidence-based instructional innovations that fit the demands of modern students and job markets depends on an awareness of the theoretical and methodological trends influencing this conversation. Future studies should take multidisciplinary approaches using data-driven methods to evaluate the longitudinal effects of 21st-century skill development on academic performance, employability, and lifetime learning outcomes.

Research Methods

This study uses a quantitative research methodology to evaluate whether colleges are sufficiently arming their students for the changing needs of the twenty-first century. It especially looks at how ready and how well undergraduate students view their university education and skill development. Comprising a sample of 216 undergraduate students from many academic fields, including Software Engineering, Education, Media and Communication Studies, Business Administration, Accounting and Finance, and English, the study is done at Benazir Bhutto Shaheed University, Lyari, Karachi. Participants are chosen using a stratified random sampling method, therefore guaranteeing a fair distribution among several academic divisions.

Designed to assess three main dimensions—students' self-perceived skills, their participation with skill-based learning methodologies, and their opinions of

the university's role in preparing them for the workforce—data collecting was done using a standardized survey questionnaire. The poll consisted in closed-ended and Likert-scale questions, so enabling a thorough evaluation of students' opinions and experiences.

The collected data was examined in Statistical Package for the Social Sciences (SPSS) using descriptive statistics, correlation analysis, and inferential statistical tests in order to identify interesting trends and correlations. Descriptive statistics provided knowledge of the distribution of students' responses while correlation analysis examined links between their reported competencies and perceptions. Additionally used was regression analysis to determine how much university education influences professionals' level of readiness.

With a rigorous quantitative approach, this study enhances knowledge of how successfully universities implement 21st-century skill development into their courses and teaching practices. For legislators, educators, and curriculum designers trying to match current work demands, the results offer perceptive analysis.

Results

Table 1

Demographic Characteristics of the Respondents

Demographic Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	108	50.0
	Female	108	50.0
Age Group	18-20 years	72	33.3
	21-23 years	98	45.4
	24+ years	46	21.3
Field of Study	Software Engineering	36	16.7
	Education	42	19.4
	Media & Communication Studies	38	17.6
	Business Administration	40	18.5
	Accounting & Finance	30	13.9
	English	30	13.9
Year of Study	1st Year	48	22.2
	2nd Year	58	26.9
	3rd Year	60	27.8
	4th Year	50	23.1

Comprising 216 undergraduate students from Benazir Bhutto Shaheed University, Lyari, Karachi, the demographic data in Table 1 offers a general picture of the participants in the study. Male (50%) and female (50%) respondents are equally distributed in the sample, therefore guaranteeing a fair representation of points of view. The age range of 21–23 years (45.4%) dominates most students; followed by 18–20 years (33.3%), and a lesser number aged 24 years and above (21.3%).

Academically, participants came from six different fields; Education (19.4%) was most often represented followed by Media & Communication Studies (17.6%), Business Administration (18.5%), and Software Engineering (16.7%). Reflecting a varied academic pool, the remaining students were from English (13.9%), accounting and finance (13.9%). Students from all four years of study were also included to guarantee a thorough awareness of how readiness for 21st-century abilities develops across their undergraduate course. The even distribution throughout academic fields and study levels improves the validity and generalizability of the results, therefore providing important new

perspectives on students's impressions of skill development in higher education.

Descriptive Analysis

The collected data was analyzed using descriptive statistics, including mean, standard deviation, and frequency distribution, to assess students' perceptions of their readiness and the effectiveness of their university in preparing them for the challenges of the 21st century.

Table *2: Descriptive Analysis*

Research Item	Mean (M)	Standard Deviation (SD)	Agreement Level (%)
1. My university provides opportunities to develop critical thinking skills.	3.89	0.92	78.3
2. The curriculum emphasizes problem-solving skills relevant to real-world challenges.	3.72	0.97	75.6
3. I feel confident in my ability to apply digital literacy skills in academic and professional settings.	3.94	0.89	79.1
4. My courses incorporate hands-on learning experiences and practical applications.	3.65	1.02	72.4
5. Faculty members integrate technology and innovative pedagogies in classroom instruction.	3.81	0.95	76.8
6. The university supports interdisciplinary learning across different fields of study.	3.58	1.05	70.2
7. Communication and collaboration skills are emphasized in my academic coursework.	4.02	0.84	80.6
8. The university provides career counseling and professional skill development programs.	3.45	1.08	68.9
9. I have access to mentorship opportunities with industry professionals and experts.	3.29	1.12	65.3
10. The university encourages student participation in research and innovation projects.	3.76	0.98	74.5
11. My academic training prepares me for leadership and decision-making roles.	3.68	1.01	73.1
12. Teamwork and group projects are integrated into course assessments.	3.85	0.91	77.4
13. Entrepreneurship and business skills are part of the university curriculum.	3.42	1.10	67.8
14. I feel equipped with adaptability and resilience skills for future career changes.	3.95	0.86	79.5
15. The university promotes ethical reasoning and social responsibility among students.	3.78	0.94	75.2
16. Internships and work-based learning experiences are encouraged.	3.63	1.03	71.8
17. The assessment methods used in my courses reflect real-world problem-solving scenarios.	3.71	0.99	74.2

Research Item	Mean (M)	Standard Deviation (SD)	Agreement Level (%)
18. The university adequately prepares students for international and multicultural work environments.	3.55	1.06	69.7
19. Faculty members encourage independent learning and self-motivation.	4.08	0.82	81.3
20. Overall, I feel prepared to enter the workforce with the skills developed during my university education.	3.88	0.93	78.7

The results of this study point out areas needing development as well as important areas where students feel their university education is successful in preparing them for skills of the twenty-first age. Independent learning and self-motivation (M = 4.08, SD = 0.82) and communication and teamwork abilities (M = 4.02, SD = 0.84) were among the highest ratings. These findings imply that students feel confidence in their capacity to work cooperatively and take responsibility for their learning, which fits the expectations of the modern workforce stressing autonomy, teamwork, and ongoing skill improvement. Likewise, students highly valued digital literacy (M = 3.94, SD = 0.89) and flexibility and resilience (M = 3.95, SD = 0.86), suggesting that they understand the need of technology competency in negotiating the changing employment environment. In a fast changing digital economy when professionals must interact with new technology and adapt to changing work situations, these skills are absolutely essential.

Notwithstanding these qualities, the study also revealed modest views of problem-solving skills (M = 3.72, SD = 0.97), interdisciplinary learning (M = 3.58, SD = 1.05), and work-based experiences (M = 3.63, SD = 1.03). Although students admit some focus on critical thinking and problem-solving in their curriculum, the results imply that current educational strategies could not completely translate into actual skill in addressing problems. Tackling difficult global issues calls for multidisciplinary learning, which also needs more development via cooperative projects and cross-disciplinary courses. The results show that although students appreciate practical, hands-on knowledge application, there is still need for development in including experiential learning into the university structure. By strengthening these areas, students would be more prepared for dynamic professional situations and the gap between academic knowledge and its practical application would be closed.

Lower-rated products especially included entrepreneurial education (M = 3.42, SD = 1.12) and mentoring chances with industry specialists (M = 3.29, SD = 1.12). These results draw attention to important weaknesses in the university's capacity to give students business-related skills and industry exposure. Restricted access to mentoring might make it difficult for students to create professional networks, get understanding of industry trends, and obtain career direction. Similarly, education in entrepreneurship seems to be undeveloped even if it is becoming more and more important for labor preparedness. To better equip students for self-employment and leadership positions in creative sectors, universities should think about include organized mentoring programs and entrepreneurship-oriented projects including startup incubators and business simulations.

The findings highlight generally the need of more robust institutional initiatives to improve industry involvement, career counseling, and practical skill development. Although students agree that their education helps to develop essential 21st-century competencies, there is still need to modernize courses, provide chances for real-world learning, and build linkages between academia and business. By filling in these areas, students will be far more ready for the workforce and will have not only technical knowledge but also the critical thinking, problem-solving, and adaptability abilities needed for success in the Fourth Industrial Revolution.

Conclusion

The results of this study underline important areas of strength and weakness in university education related to students' readiness for the workforce of the twenty-first century. The findings show that although

students believe they are competent in fundamental abilities such autonomous learning, communication, teamwork, and digital literacy, they voice worries about the useful application of their knowledge in real-world environments. The study indicates that universities should improve their strategies for experiential learning since it shows modest success in developing problem-solving abilities, multidisciplinary learning, and work-based experiences. The lowest-rated elements, such mentoring programs and entrepreneurial instruction, highlight how much colleges could improve industry-academia links and offer organized career help. The results imply that although colleges are doing better in arming their students with essential capabilities, there is still a great need to modernize courses, enhance faculty training, and implement creative pedagogical approaches fit for the demands of the worldwide workforce.

Universities should take a multifarious approach that gives curricular changes, faculty growth, and industry partnerships top priority in order to meet these difficulties. First, including project-based learning, internships, and multidisciplinary courses—experiential learning approaches—helps to close the theoretical knowledge gap with practical application. Second, in order to give students career direction and exposure to real-world difficulties, colleges should set robust mentoring programs in association with businesspeople. Expanding entrepreneurship education through startup incubators, company contests, and innovation centers can also help students to be creative and solve problems. A major emphasis should also be on digital transformation to guarantee that students are competent in newly developing technologies as artificial intelligence, data analytics, and automation. Finally, institutional and national policy changes should support ongoing faculty development as well as the acceptance of contemporary pedagogical strategies including competency-based education and blended learning. Following these suggestions will help colleges make sure graduates possess the critical, analytical, and leadership qualities needed to succeed in an always changing global economy in addition to being academically competent.

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