MS Research Thesis

RELATIONSHIP BETWEEN PERFORMANCE-BASED ASSESSMENT AND DEVELOPMENT OF 21ST CENTURY SKILLS AMONG UNIVERSITY STUDENTS

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This thesis has been accepted by the Department of Educational Leadership & Management (ELM), Faculty of Education, International Islamic University Islamabad in partial fulfillment of the degree of MS Education.

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AUTHOR'S DECLARATION

It is hereby declared that the author of the study has completed the entire requirement for submitting this research work in partial fulfillment for the degree of MS Education. This thesis is in its present form is the original work of the author except those which are acknowledged in the text. The material included in the thesis has not been submitted wholly or partially for award of any other academic certification than for which it is being presented.

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Sarah Salamat

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SUPERVISOR'S CERTIFICATE

The thesis titled "RELATIONSHIP BETWEEN PERFORMANCE-BASED ASSESSMENT AND DEVELOPMENT OF 21ST CENTURY SKILLS AMONG UNIVERSITY STUDENTS" submitted by Ms. Sarah Salamat Regd. No. 18-FOE/MSEDU/S23 is partial fulfillment of MS degree in Education, has been completed under my guidance and supervision. I am satisfied with the quality of student's research work and allow her to submit this for further process as per IIUI rules and regulations.

_____

Dr. Munazza Mahmood

DEDICATION

I dedicate my work to my greatest support system, my parents, for their unconditional love, sincere guidance, and unwavering support.

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Abstract

Performance-based assessment is the contemporary assessment in education that emphasizes demonstration of knowledge and skills providing a broader view of learners' abilities. In an era of rapid advancements and globalization, the acquisition of 21st century skills like communication, collaboration, creativity, and critical thinking skills are indispensable for personal and professional success. Therefore, the objectives of the study were to find out performance-based assessment implementation at the university level and the relationship between performance-based assessment and the development of 21st century skills among university students. The study was quantitative and a correlational research design was used. The population of the study included 600 students from the BS 5th, 6th, 7th and 8th semesters from the Faculty of Education at the International Islamic University, Islamabad, and the Department of Educational Sciences at the National University of Modern Languages. The Simple Random Sampling technique was used to select 234 students as a sample. Two research instruments were used to gather data; a self-structured performance-based assessment questionnaire and a 21st century skills questionnaire adapted from Amir (2018). Both questionnaires were closed-ended and consisted of a 5-point Likert scale. The researcher personally visited the universities to collect data. The data collected through questionnaires was analyzed using mean, and Pearson Product-Moment correlation (r) through SPSS software. It was found that the performance-based assessment was well implemented. Additionally, a significant positive correlation was found between performance-based assessment and critical thinking, creativity, communication, and collaboration skills. Based on the findings, it is recommended that universities adopt these assessments across a wider range of courses to promote 21st century skill development among students. Universities may develop a standardized framework for integrating these assessments across the curriculum. Additionally, it is recommended that universities may involve external stakeholders, such as industry experts to assist teachers in aligning performance-based assessments with job market demands. Moreover, it is recommended that teacher training programs may emphasize the use of these assessments to help future teachers foster 21st century skills in their classrooms.

Keywords: Performance-based assessments, 21st century skills, Skill development, Higher education

CHAPTER 1

INTRODUCTION

Assessment plays a crucial role in education as it helps determine the extent of knowledge gained and the skills developed by students. However, traditional assessments fail to measure the skills required by the 21st century world. Additionally, as assessment drives teaching and learning, it is found that utilization of these assessments reduces the use of pedagogical approaches that foster higher order thinking skills (Kozma, 2009). Performance-based assessment has gained significant attention from educational experts as a contemporary tool. It has shifted focus from traditional assessment. Performance-based assessment allows students to create and develop something, and perform tasks (Salendab & Dapitan, 2021). It enables students to use their prior knowledge and skills to execute specific tasks or projects emphasizing active student participation (Heydarnejad et al., 2022). It involves hands-on activities or real-world challenges, engaging students in the application of knowledge in meaningful ways, thus enhancing higher-order thinking skills (Lund & Kirk, 2010). Additionally, performance-based assessment helps students develop 21st century skills through active learning. Instead of just memorizing information, students work on projects, presentations, and group tasks that require them to think critically, and communicate effectively. Performance-based assessment also helps students work well with others, adapt to new challenges, and apply knowledge in practical ways.

Significant changes have been seen in the world in the last 50 years, and more rapid changes are expected to happen. From agriculture to industrial revolution and then to knowledge-based economies, major shifts have affected society and the job market. Acquiring skills is essential for success in both personal and professional aspects of life. In contemporary professional environments, individuals need to be proficient in 21st century skills, like communication, collaboration, creativity, and critical thinking skills. These skills help them to adapt to rapidly changing requirements of the world (Marope, 2017). Education plays a crucial role in humans' lives as it prepares them for the challenging world by equipping them with the required skills and knowledge. Therefore, adaptation at all educational levels is necessary based on global requirements (OECD, 2018). To prepare students for 21st century, education needs to

be made student-centered. Teachers play a crucial role in helping students acquire 21st century skills and knowledge. Therefore, they need to have expertise in 21st century skills and knowledge. Universities serve as centers of learning, innovation, and cultural advancement, preparing individuals for success in a fast-paced, interconnected world. This will help students become responsible and competent individuals.

As educators and leaders of the modern world deal with the challenges of equipping individuals with the desired 21st century skills, learning about the interplay between performance-based assessment and 21st century skills are essential. By incorporating performance-based assessment, universities can promote lifelong learning and ensure that students are well-equipped to navigate the complexities of modern society. By engaging students in authentic tasks such as projects, presentations, and collaborative assignments, these assessments enable learners to apply classroom knowledge in real-world scenarios. This approach cultivates essential skills such as creativity, critical thinking, collaboration, problem-solving, and decision-making. As the job market evolves, integrating performance-based assessments ensures that graduates are well-prepared to drive innovation, contribute to societal progress, and excel in dynamic professional environments. This research is essential as it addresses the pressing need to align educational assessment practices with the demands of the modern world, ensuring that students are not only knowledgeable but also capable of applying their knowledge creatively and effectively in real-world scenarios. Therefore, the integration of performance-based assessment into higher education is not merely an option but a necessity for preparing students to meet the challenges of the 21st century successfully.

1.1 Background and Context of the Study

Performance-based assessment is a form of assessment that provides learners with an opportunity to apply skills and knowledge. It inspires students to be eager for learning, encourages them to think critically and express their creativity (Aladini et al., 2024). Performance-based assessment engages students in activities that require them to take responsibility for their learning (Gyamfi et al., 2023). Performance-based assessment comprises two critical parts: the performance tasks assigned to students to perform and the criteria used to evaluate the resulting product or performance. Performance-based assessment helps teachers measure learning in more than one

domain. Performance-based assessment involves real-world tasks that students are likely to encounter in professional settings with clearly defined criteria and rubrics communicated to students in advance, and followed by provision of timely and constructive feedback highlighting their strengths and weaknesses (Ghaicha, 2016). Integrated with instruction, performance assessment activities occur throughout the learning process, facilitating student learning and aiding teachers in developing effective teaching strategies (Lund & Kirk, 2010).

Teachers can use different sorts of performance-based assessment in the classroom: process-oriented assessments, performances, and products (Salma & Prastikawati, 2021b). Products are student-produced works, such as projects, portfolios, etc., that offer concrete evidence. Whereas, performance-oriented assessment show how students apply their knowledge and abilities while the teacher watches them closely, like presentations, demonstrations, etc. (Salma & Prastikawati, 2021b). Assessment focused on process shed light on students' motivation, reasoning, and way of thinking. This type of assessment can also offer diagnostic data on how well students apply strategies for learning (Salma & Prastikawati, 2021b). Performance assessments are intended to evaluate a range of complex skills. By involving authentic, real-life tasks, performance assessments offer a clearer indication of students' abilities and a stronger prediction of how they might perform in real-world situations (Kirmizi & Komec, 2016). Depending on the complexity of skills assessed, performance-based assessment may take days or weeks. It promotes a growth mindset by focusing on improvement over memorization. Skills indispensable for the modern world are necessary for a productive and successful life. By engaging students in authentic tasks such as projects, presentations, and collaborative assignments, performance-based assessments allow learners to apply theoretical knowledge in practical settings, thereby enhancing their problem-solving abilities and decision-making skills.

From the Industrial Revolution to the digital revolution, individuals are required to be equipped with essential skills to thrive in the world. To keep up with the advancements taking place around the globe, students are required to become the students of 21st century and possess the necessary 21st century skills (Toro, 2019). The 21st century skills are deemed essential for success in the contemporary era. These are needed in all domains and include communication skills, and creativity, collaboration,

solving problems, and critical thinking (Abell, 2012). The 21st century skills allow lifelong learning, as individuals continue to adapt and grow with changing situations and new opportunities in their careers. Equipping students with 21st century skills at the university level not only prepares them for the present-day challenges but also the dynamic job market in the fast-paced world. This can be accomplished by employing instructional approaches and assessment methods that engage students rather than emphasizing solely on lecturing and memorizing (Senjiro & Lupeja, 2023). Employers are currently seeking individuals who excel in critical thinking, communication, and creativity to effectively navigate and address emerging trends and challenges in the workplace.

Recognizing the importance of these skills, various frameworks have been proposed by various organizations at the world level to guide their integration into educational practices including Assessment and Teaching of 21st Century Skills, Organization for Economic Co-operation and Development (OECD), and Partnership for 21st Century Skills. While all of these initiatives advocate for the critical skills and competencies necessary for success in the 21st century global landscape, the P21 Framework for 21st Century Learning stands out as a more comprehensive and widely embraced framework in the field of education. It emphasized the integration of 21st century skills into the field of education (P21, 2019). In this study, the 21st century skills are delimited to the learning and innovation skill set outlined in the P21 Framework for 21st Century Learning due to their foundational nature and pervasive relevance across diverse domains. While other skills certainly hold value, learning and innovation skills serve as the bedrock upon which individuals can effectively develop and apply other competencies. Skills of learning and innovation aim to equip students for the intricate demands of contemporary life and workplaces. These include creativity, critical thinking, collaboration, and communication. Learning and innovation skills are crucial because they enable students to navigate and excel in a rapidly changing world. Creativity is essential for developing new solutions in a technologically advanced landscape. Critical thinking helps address complex global challenges effectively. Collaboration fosters teamwork across diverse fields, and strong communication ensures ideas are conveyed clearly and persuasively. These skills are fundamental for success in modern life and workplaces, making them more critical than other skills. By

assisting students in developing these skills, universities will produce graduates who are well-equipped to succeed in the competitive landscape of the 21st century.

Performance-based assessment plays a crucial role in enhancing students' learning experiences by bridging the gap between theoretical knowledge and practical application (Chinda, 2014). It not only helps diagnose students' strengths and weaknesses but also fosters essential 21st century skills. Performance-based assessment has been shown to enhance critical thinking and creativity (Diastuti et al., 2024). Additionally, tasks such as presentations and discussions significantly improve communication skills, making students more articulate and confident (Salendab & Dapitan, 2021). Collaborative performance-based assessment further promotes teamwork, adaptability, and effective communication among peers (Kirmizi & Komec, 2016). Performance-based assessment offers authentic learning experiences that encourage students to apply knowledge in real-world contexts while helping teachers identify areas for improvement. These findings highlight the importance of PBA in developing well-rounded individuals equipped with essential skills for the modern world.

The mission of the Higher Education Commission in Pakistan is to support higher education institutions in contributing to the country's socio-economic growth (Khan, 2021). However, Pakistan faces economic challenges despite having a large youth population. Moreover, nearly 11% of the youth are presently unemployed (Patil, 2023). The substantial working-age population grants Pakistan a significant opportunity to improve its economy. The country needs to address youth unemployment by equipping them with skills through contemporary education. Higher education institutes play a crucial role in this endeavour by fostering 21st century skills and employing effective teaching and assessment methods. Employers today seek graduates who can think critically, communicate effectively, and demonstrate creativity, making the integration of performance-based assessment in higher education a crucial strategy for preparing students to navigate and address emerging workplace challenges.

While numerous studies, including Chinda (2014), Diastuti et al. (2024), Salendab & Dapitan (2021), and Kirmizi & Komec (2016), have highlighted the positive impact of performance-based assessment on fostering 21st century skills such as critical thinking, communication, and collaboration, much of the existing research is

limited to specific educational contexts and subjects, such as language learning. Despite the growing emphasis on the importance of 21st century skills in preparing students for the demands of the modern workforce and global challenges, there remains a significant gap in research exploring the comprehensive relationship between performance-based assessment and the development of these essential skills within the higher education sector in Pakistan. Most existing studies have been conducted in Western contexts or in specific disciplines, leaving the broader application and effectiveness of performance-based assessment in developing 21st century skills across diverse academic programs in Pakistani universities largely underexplored. Therefore, the current study aims to fill this gap by finding out the implementation of performance-based assessment and its relationship with the development of 21st century skills among university students in Pakistan.

1.2 Problem Statement

Performance-based assessment has gained fame for evaluating 21st century skills where traditional assessment methods often fall short. Performance-based assessment engage students in hands-on activities and authentic tasks that simulate real-world challenges. It enables students to apply their knowledge and skills in meaningful contexts, making the evaluation process more insightful and dynamic. Without performance-based assessment, evaluation of higher-order skills becomes a laborious task. While 21st century skills such as critical thinking, creativity, communication, and collaboration are increasingly recognized as essential for success in the modern workforce, research on the relationship between performance-based assessment and the development of these skills remains limited within the context of higher education in Pakistan. Existing studies are predominantly conducted in other countries or specific disciplines, leaving the broader application of performance-based assessment across different academic programs in Pakistani universities underexplored. Given the unique challenges faced by Pakistan's higher education system, including limited resources, diverse student populations, and varying levels of institutional support for innovative teaching and assessment methods, there is a pressing need to investigate the relationship between performance-based assessment and the development of 21st century skills. Moreover, according to the World Economic Forum's Global Competitiveness Report, Pakistan was ranked 118th out of 140 countries in education quality underscoring a

pressing need for improved alignment with economic demands (Ghazanfar, 2023). Therefore, this study aims to find out the implementation of performance-based assessment and the relationship between performance-based assessment and 21st century skills development among university students in Pakistan. The findings of this research will offer valuable contributions to the existing body of knowledge and inform educational policies and practices, enhancing the quality of higher education in Pakistan through effective assessment strategies.

1.3 Objectives of the Study

The objectives of the study were:

i. To find out performance-based assessment implementation at university level
ii. To measure 21st century skills among university students
iii. To find out the relationship between performance-based assessment and the development of 21st century skills among university students

1.4 Research Questions

RQ1. How performance-based assessment are implemented at university level?

RQ2. What is the level of 21st century skills among university students?

1.5 Hypotheses

H_{01}: There is no significant relationship between performance-based assessment and the development of critical thinking among university students

H_{02}: There is no significant relationship between performance-based assessment and the development of creativity among university students

H_{03}: There is no significant relationship between performance-based assessment and the development of communication skills among university students

H_{04}: There is no significant relationship between performance-based assessment and the development of collaboration skills among university students

H_{05}: There is no significant relationship between performance-based assessment and the development of 21st century skills among university students

1.6 Significance of the Study

The current study on the relationship between performance-based assessment and the development of 21st century skills among students at the university level holds paramount significance in multiple domains. Firstly, the study may assist educators in enhancing the quality of education by highlighting the effectiveness of performance-based assessment in fostering essential 21st century skills. By integrating performance-based assessment into their teaching practices, educators may create more engaging and authentic learning experiences that prepare students for real-world challenges. Additionally, the study may encourage teachers to improve their performance-based assessment practices by incorporating insights from students' perceptions and experiences. Understanding students' views on performance-based assessment implementation can help educators refine their assessment methods to better support student learning, motivation, and skill development. Secondly, university administrators may benefit from the study, making informed decisions related to resource allocation, and ensuring that sufficient support is provided for implementing performance-based assessment, such as investing in professional training programs, technological tools, and other essential resources. Additionally, the findings of this study can serve as a valuable resource for universities to reform educational policies and practices, including curriculum design and assessment frameworks, ensuring that students are equipped with the skills necessary for success in a rapidly evolving global landscape. Moreover, the educational institutions would be encouraged to prioritize the development of 21st century skills in students, contributing to broader economic and societal growth. By equipping students with essential skills, universities would help produce graduates who are better prepared to meet the demands of the modern workforce, address complex challenges, and contribute to sustainable development. An improved quality of education, driven by effective assessment practices, can foster lifelong learning, adaptability, and innovation among students, enabling them to thrive in an increasingly competitive and dynamic world.

1.7 Delimitations

The study was delimited to:

i. The Faculty of Education at International Islamic University, Islamabad, and the Department of Educational Sciences at the National University of Modern Languages.
ii. Students from BS 5th, 6th, 7th and 8th semesters
iii. Critical thinking, creativity, communication, and collaboration skills from P21 Framework for 21st Century Learning.

1.8 Operational Definitions

1.8.1 Performance-based Assessment

Performance-based assessment includes evaluative tasks and activities that offer students an opportunity to demonstrate their skills and knowledge.

1.8.2 21st Century Skills

The 21st century skills are a collection of skills essential for achieving success in the contemporary landscape of the 21st century. These include creativity, critical thinking, communication, and collaboration skills.

1.9 Research Methodology

The research paradigm was positivist. The positivist paradigm is grounded in the belief that reality is objective and can be observed, measured, and analyzed through empirical methods. This paradigm emphasizes the use of structured data collection instruments, such as surveys or questionnaires with predefined questions. Statistical tools are then used to analyze the collected data. This structured approach ensures that conclusions are drawn based on empirical evidence rather than subjective interpretation. This study was quantitative as it involved the collection and analysis of numerical data to address research questions and test hypotheses. In this study, a correlational research design was used to explore the relationship between performance-based assessment and the development of 21st century skills among university students. The correlational design allowed the researcher to examine the strength and direction of the relationship between the two variables without

manipulating them. It helps identify patterns in relationships between variables but does not form causality.

1.9.1 Population

The population of the study was 600 students from the BS 5th, 6th, 7th and 8th semesters from the Faculty of Education at the International Islamic University, Islamabad, and the Department of Educational Sciences at the National University of Modern Languages.

1.9.2 Sample and Sampling Technique

The Simple Random Sampling technique was used. The sample of the study included 234 students from the BS 5th, 6th, 7th and 8th semesters from the Faculty of Education at the International Islamic University, Islamabad, and the Department of Educational Sciences at the National University of Modern Languages.

1.9.3 Instrumentation

Two close-ended questionnaires were used to gather data for this study. A self-structured closed-ended performance-based assessment questionnaire and close-ended 21st century skills questionnaire adapted from Amir (2018) was used to collect data from students. Both the questionnaire consisted of a 5-point Likert scale.

1.9.4 Data Collection

The researcher personally visited the universities to collect data through close-ended questionnaires. The questionnaires were administered to the students. The collected data were handled with confidentiality and used exclusively for academic research purposes.

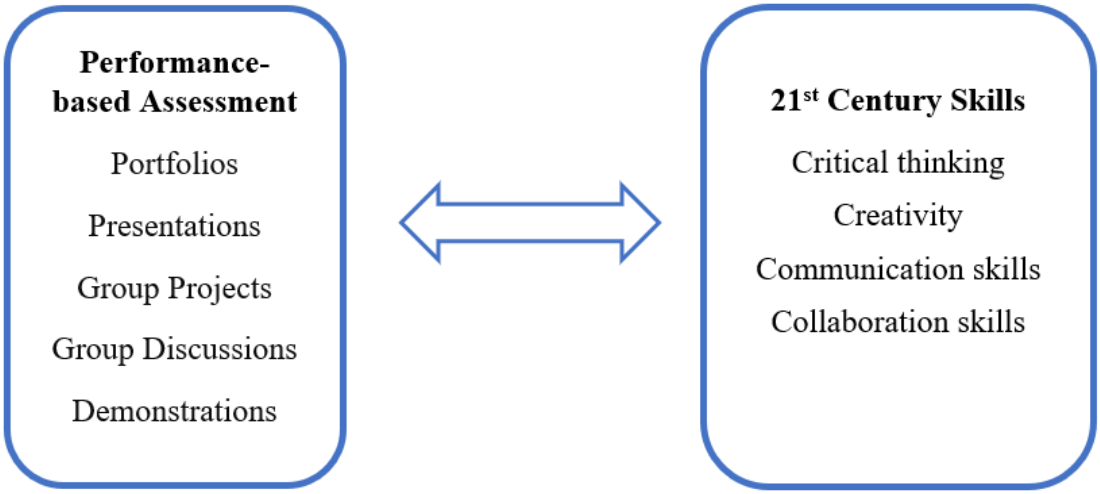
1.9.5 Data Analysis

Keeping in view the objectives, the descriptive and inferential statistics were applied to analyze the collected data. The respondents' data on performance-based assessment and 21st century skills questionnaires were analyzed through mean scores. Additionally, the relationship between performance-based assessment and 21st century skills among university students were analyzed through Pearson Product-Moment correlation (r).

1.10 Conceptual Framework

Figure 1.1

Conceptual Framework



CHAPTER 2

LITERATURE REVIEW

This chapter offers an extensive overview of existing academic literature and scholarly works pertinent to performance-based assessment and 21st century skills. By synthesizing and analyzing prior studies, the aim is to establish a contextual background for comprehending the function of performance-based assessment in skill development and the need for educational institutions to incorporate performance-based assessment and prioritize 21st century skills development among students in the rapidly advancing 21st century world. Through an investigation of essential concepts, theories, and empirical findings, the literature review seeks to provide a concise summary of existing relevant studies.

2.1 Assessment

In education, assessment takes an indispensable role as it includes appraising pupils' performances by teachers thereby gathering and measuring data regarding a certain topic or subject (Ghaicha, 2016). Assessment is irrefutably one of the most crucial facets of the educational process. It involves teachers assigning numbers and grades to students' work according to predetermined standards (Ghaicha, 2016). Assessments are specifically essential for developing skills among students at an early stage of the learning process (Lund & Kirk, 2010). The results of assessments aid and motivate students in improving their learning while also helping teachers enhance their teaching strategies (Salendab & Dapitan, 2021).

Determining what students have learned is done through assessment and assessing whether or not pupils have understood the lessons delivered by the teacher is crucial (Salma & Prastikawati, 2021b). Teachers need to find assessments that support the development of skills among students to attain success (Salendab & Dapitan, 2021). Assessment practices and strategies must motivate and challenge learners to encourage and enhance learning thereby also providing information on students' performances through testing and providing evidence on quality. These must serve all the purposes of assessment (Killian & Mays Woods, 2021). With the help of assessment, teachers can discover new and improved ways of assisting students in learning as well as adapting and modifying their teaching strategies. On the other hand, students get to

know their weaknesses, and areas that need improvement, to achieve the required learning outcome. Therefore, assessment is key to improving and maintaining the quality of education (Kimaro & Kapinga, 2020).

2.1.1 Traditional vs Performance-based Assessment

The traditional assessment aims at assigning grades to students and comparing them against the set standards. Whereas, performance assessment measures students' abilities and aptitude by allowing them to perform real-life tasks and demonstrate their learning in the best manner. Additionally, performance assessments guide instruction, provide feedback and evaluate students' competency. Traditional assessment practices focus on testing students' ability to recall, and understand content, but fail to uncover students' true ability related to applying the knowledge they have gained (Asamoah, 2019). It allows the demonstration of knowledge in a predetermined way (Dikli, 2003). On the other hand, performance-based assessment assesses and strengthens students' capacity to analyze, synthesize, reason and apply the knowledge they have gained (Asamoah, 2019). This type of assessment measures students' higher-order thinking skills (Dikli, 2003). Moreover, traditional assessments emphasize more on knowledge acquisition rather than application. Whereas, performance assessments measure and ensure students' ability to apply knowledge in meaningful ways (Asamoah, 2019). Concerning traditional assessment practices, the educators are evaluators and the students are the evaluatees. Therefore, they are known as teacher-structured. However, performance-based assessments allow students to form meaning or new knowledge from what has been delivered and learned. Such assessment practices involve and engage the students actively in the process. Hence makes the teaching and learning environment student-centered (Asamoah, 2019). Moreover, traditional assessments are standardized so they are one-shot, norm-referenced (Dikli, 2003). Contrarily, performance assessment offers teachers a true picture of the level of their students' learning (Asamoah, 2019). It also gives the teacher a chance to measure the strengths and weaknesses of the students in diverse areas (Dikli, 2003). However, these are time-consuming and more work-demanding. Lastly, traditional assessments are often detached from the teaching and learning process, occurring after instruction to determine if students have effectively mastered the content. In contrast, performance-based assessments are integrated into the instructional process, taking place throughout

the course to support students' learning while providing teachers with opportunities to refine their teaching methods and strategies (Asamoah, 2019).

2.1.2 Performance-Based, Authentic, and Alternative Assessments

Authentic assessment measures performance directly in a real-life setting (Ghaicha, 2016). Performance-based Assessment (PBA) has numerous names based on the diverse perceptions of authors (Gyamfi et al., 2023). Proponents of performance-based assessment argue that it incorporates a wide variety of assessment types, including authentic assessments, and alternative assessments. They believe these terms can be used interchangeably because they share similar characteristics and purposes (Gyamfi et al., 2023). Performance-based assessment encompasses authentic and alternative assessments, as all of them necessitate the use of higher-order thinking skills. It evaluates students based on established criteria that are crucial for the effective execution of tasks, similar to those encountered in the workplace (Gyamfi et al., 2023). According to the National Center for Research on Evaluation, Standards, and Student Testing (NCRESST), alternative assessments are called authentic or performance assessments, as they require students to create a response to a question or solution to a problem rather than choose from a set of available responses (Ghaicha, 2016). Performance assessments are often called authentic assessments as they assess students' performance engaged in problem-solving activities that are not just means of appraising student achievement. Moreover, authentic and performance-based assessments can be distinguished by the fact that authentic assessment tasks involve the representation of real-world situations through activities, while performance-based assessment focuses on evaluating the level of skill or ability demonstrated by the student. To clarify the argument, it is believed that only the assessor can determine whether a task is an authentic assessment or a performance-based assessment (PBA). This determination is based on the specific criteria of authenticity that the assessor considers essential (Gyamfi et al., 2023).

2.2 Performance-based Assessment

2.2.1 History

Standardized tests due to their limitations faced backlash in the 1990s. They were alleged to be superficial as they could not meet schools expectations in measuring

standards and therefore were unable to improve instruction (Ghaicha, 2016). These tests focused only on memorizing and recalling information and knowledge instead of emphasizing the development of higher order skills (Asamoah, 2019). Traditional assessments prevailed for many years stressing on results in education and ignoring the competence (Heydarnejad et al., 2022). Tests were often not informative enough to aid teachers in gauging the understanding level of students and hence were not suitable and supportive enough to help teachers in deciding appropriate strategies to overcome the misconceptions among students (Albu & Lindmeier, 2023). Therefore, a shift was made to happen to introduce and promote performance and alternative assessments into the language classrooms.

It was assumed that alternative assessments allow and encourage the application of learning in various contexts, as well as the growth of higher-order thinking and problem-solving skills (Ghaicha, 2016). Therefore, performance assessment gained increasing attention in higher education (Albu & Lindmeier, 2023). This shift was further reinforced by Grant Wiggins' proposal in 1989 that students should engage in tasks resembling real-life situations, leading to the development of contextual (authentic) assessment approaches. Classroom assessment should reflect real-life tasks and encourage students to use higher-order skills and assess varied learning outcomes (Ghaicha, 2016). Hence, the use of performance-based assessment has grown continuously in recent years, with an increasing focus on 21st-century skills and technological advancements (Bland & Gareis, 2018).

2.2.2 Introduction to Performance-based Assessment

Performance-based assessments are evaluation methods where students perform tasks, such as creating products (Aladini et al., 2024). Performance-based assessments, encourage students to complete tasks that mimic real-life scenarios, requiring them to use valuable skills like speaking and writing often combining multiple skill areas. As it places a strong emphasis on engaging, relevant tasks that motivate learners to implement what they have learned in real-world situations, this kind of assessment is closely connected with instruction (Kirmizi & Komec, 2016). Performance-based assessment focuses on observing and assessing the student’s progress in action and on action. Moreover, it informs about the process through which learners become skilled and provide authentic information about their competencies (Heydarnejad et al., 2022).

This type of assessment involves the evaluation of tangible activities performed by students (Aladini et al., 2024). Performance-based assessment involves two important parts i.e., the tasks that students are asked to do and the criteria based on which their performance will be judged (Lund & Kirk, 2010). Unlike traditional assessments, which often just verify if a student knows certain information, performance-based assessments emphasize both the process and the outcome, helping to draw out critical thinking and problem-solving skills. Because performance assessments are adaptable, these assessments can be tailored to fit individual learning needs, offering feedback that supports teaching and enhances student performance (Kirmizi & Komec, 2016).

Performance-based assessment uses a range of activities to evaluate students' abilities in real-world settings. These can include keeping journals, giving oral presentations, building portfolios, and doing self- and peer reviews (Salendab & Dapitan, 2021). Students might also take on research projects, create models, solve math problems, or participate in debates, each offering a practical way to demonstrate particular skills (Aladini et al., 2024). Additionally, hands-on projects like demonstrations or exhibitions allow students to show their knowledge and skills (Ghaicha, 2016). Altogether, these tools give teachers insight into students' competencies across areas like reasoning, physical abilities, and communication, making performance-based assessments both versatile and thorough for assessing learning (Salendab & Dapitan, 2021).

Performance-based assessments can be structured or unstructured. Unstructured methods involve those that depend entirely on the teacher's and students' creative imagination i.e., activities that can be carried out on school premises. The structured approaches are carefully created and designed. The results of the tasks are typically whether completed or not. Performance-based assessments are also categorized based on their focus on the process or the product. Focus on the process assessments, and ensure activities allow students to demonstrate how the information is processed. Whereas, focus on the product activities, ensures the accomplishment of certain behaviours, tasks, or activities. As performance-based assessment allows the selection of strategies specifically based on monitoring, it allows and encourages students' assessment of their abilities and skills in an authentic context (Salendab & Dapitan, 2021).

In performance-based assessment, instruction and assessment are interwoven in such a way, that it is impossible to differentiate. For example, an activity such as gameplay allows students to apply knowledge and skills thus increasing levels of competence while allowing teachers to assess areas such as students' knowledge, application of strategy, and group work. Feedback is then provided to students based on their assessment results helping them improve their performance (Lund & Kirk, 2010). In teacher education, performance-based assessment practices closely resemble real teaching situations that objectively evaluate the competence of teachers. Their main focus is on tasks and challenges that teachers would face in the real world (Albu & Lindmeier, 2023). Performance-based assessments involve teachers assessing the ability of students to apply the knowledge while enhancing their learning experience (Lund & Kirk, 2010).

2.3 Theoretical Foundation

2.3.1 Social Constructivism

Performance-based assessment is ingrained in social constructivist theory which pinpoints that assessment is interwoven into teaching and learning processes (Heydarnejad et al., 2022). It states that learning is actively constructed through interactions with others and the environment. Performance-based assessment emphasizes authentic tasks and activities that promote meaningful engagement and application of knowledge, reflecting real-world challenges and contexts (Aladini et al., 2024). By situating assessments within authentic settings, performance-based assessments encourage students to operate within their Zone of Proximal Development (ZPD), where they can demonstrate their skills with guidance and support, pushing their cognitive boundaries and advancing their understanding. Thus, performance-based assessments not only assess but also actively contribute to the construction of knowledge, aligning assessment practices with the principles of active learning and cognitive development central to social constructivist theory. Therefore, engaging in hands-on learning and implementing performance-based assessment can effectively enhance higher-order skills (Aladini et al., 2024).

Social constructivism underscores that learning is not a solitary endeavor but rather a social process where knowledge is actively constructed through interaction and

collaboration (Heydarnejad et al., 2022). In the context of the universities of Islamabad, with its diverse student population drawn from varying academic and socioeconomic backgrounds, social constructivism offers a powerful pedagogical approach. It recognizes that students bring unique prior knowledge and experiences to the learning environment, and collaborative performance-based tasks provide invaluable opportunities for students to learn from one another's perspectives, challenge pre-conceived notions, and co-construct deeper understanding.

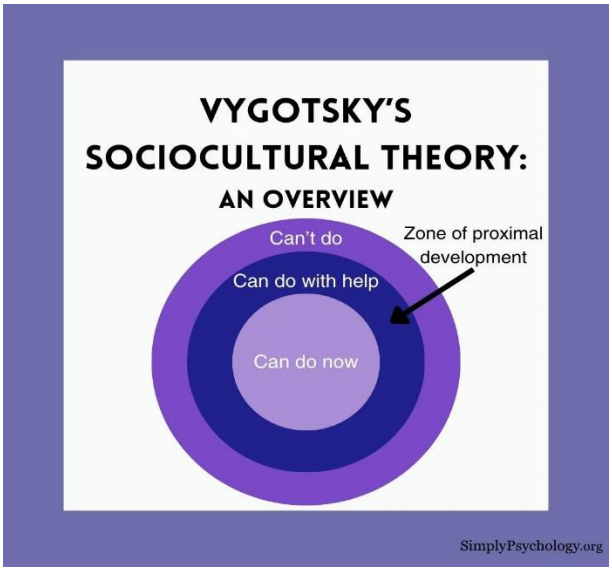
2.3.2 Sociocultural Theory

Performance-based assessment is also based on Vygotsky's sociocultural theory, which highlights learning as a social phenomenon and states that social interaction enhances the learning experience (Heydarnejad et al., 2022). Vygotsky's sociocultural theory posits that learning is fundamentally a social process, shaped not only by interaction with more knowledgeable others but also by the cultural tools and practices in one's environment. These tools ranging from language and symbols to technologies and shared cultural artifacts act as mediators that guide and structure thought processes. Through social interaction and the use of these cultural tools, learners gradually internalize new knowledge and skills, moving from dependence on external support to independent mastery.

Central to this theory is the concept of the Zone of Proximal Development (ZPD), which represents the gap between what learners can do independently and what they can achieve with appropriate guidance. Performance-based assessments align well with this framework because they immerse students in authentic tasks that demand social interaction, collaboration, and the application of relevant cultural tools (Heydarnejad et al., 2022). Projects, discussions, and demonstrations not only encourage learners to draw on their existing knowledge but also to refine their understanding through feedback and shared problem-solving with peers and educators.

Figure 2.1

Sociocultural Theory



By incorporating culturally relevant materials and practices into performance-based tasks, educators can make the learning experience more meaningful and relatable. This approach ensures that students are not merely memorizing information, but actively engaging with it in ways that reflect real-world contexts and cultural nuances. In doing so, performance-based assessment fosters deeper cognitive development, critical thinking, and higher-order skills outcomes that are especially valuable in diverse and rapidly evolving educational landscapes. Therefore, it is crucial to involve students in activities that involve social interaction to encourage and motivate them to openly share their thoughts and opinions (Espinosa, 2015). Universities in Islamabad, with their mix of local and international students, have the opportunity to use this diversity as a strength. By integrating culturally relevant materials, local symbols, and familiar practices into performance-based assessments, universities can make learning more accessible and engaging. Additionally, the social interactions between students of different backgrounds are an excellent opportunity for collaborative learning. Vygotsky's concept of the Zone of Proximal Development (ZPD) represents the space between what a learner can achieve independently and what they can accomplish with guidance from a more knowledgeable other. Performance-based assessments can be carefully crafted to fall within a student's ZPD, presenting them with challenges that are attainable yet require growth and development. Through appropriate scaffolding

and support, educators can effectively guide students toward acquiring new skills and competencies.

2.4 Common Elements of Performance-based Assessment

2.4.1 Open-Ended Tasks

Open-ended activities are a fundamental component of performance-based assessment. Although the word "open-ended" literally refers to any student-constructed response, in this context, it means more than simply permitting any response. Students can respond in surprising ways to open-ended exercises, which may be the desired outcome (Baker et al., 1993). Performance-based assessments offer students opportunities to establish and demonstrate skills (Lund & Kirk, 2010).

2.4.2 Focus on Higher-Order Thinking

The goal of performance-based assessments is to gauge various facets of higher-order thinking processes. Such assessments are intended to encourage students to think critically and are not merely superficial assignments (Baker et al., 1993). Performance-based assessments are found to be effective in measuring complex skills like communication skills which are regarded as crucial to thrive in today's society (Quansah, 2018).

2.4.3 Authenticity

Context sensitivity is a key component of performance-based assessment, where activities are created to replicate real-world scenarios that students can face. Assessment tasks should be as similar to real-world applications as possible, according to cognitive psychology. According to Baker et al. (1993), authentic activities are those that replicate non-routine, real-world challenges and offer a wider rather than more limited context. They also involve real-life problems or embed abilities in applicable contexts. A performance assessment should involve real-world situations. Authentic assessments emphasize useful skills and allow teachers to gain knowledge about their areas of strengths and weaknesses in their teaching methodologies. Moreover, it encourages autonomy among students as they perform tasks that involve real-world applications (Koné, 2021).

2.4.4 Complexity and Time Intensive

Complex problems requiring several performance types and a substantial time commitment from students are frequently included in performance-based assessments. Students may be required to complete these assignments in multiple steps, including problem identification, solution development, application, and reflection (Baker et al., 1993). Performance-based evaluations are complex as they commonly assess learning across multiple domains (Lund & Kirk, 2010).

2.4.5 Individual and Group Performance

Tasks that are performance-based are either group or individual. As the social construction of knowledge and the importance of teamwork in learning are given much importance, group performance is emphasized in research. In real-world scenarios, where team performance is frequent and crucial, the emphasis on group work is pertinent (Baker et al., 1993).

2.4.6 Student Choice

Compared to traditional tests, performance-based evaluations offer more options for students. Performance evaluation encourages students to contribute to the development of performance standards and criteria (Salendab & Dapitan, 2021). Students are able to design and carry out original processes, select certain topics, or decide on the order of tasks. Because it gives individuals the opportunity to work on projects that have personal significance, this aspect of choice is thought to inspire students to perform better. Furthermore, compared to traditional testing methods, offering options might more fairly account for cultural differences (Baker et al., 1993). Allowing students to make their criteria encourages them to perform well and encourages reflection on their work (Salendab & Dapitan, 2021).

2.5 Characteristics of Performance-based Assessments

Here are the key characteristics of performance-based assessment tools:

2.5.1 Student-Centered Actions

Performance-based assessments enable students to act, create, develop, and engage in meaningful tasks. Performance-based assessment focuses on evaluating productive skills rather than prioritizing selected-response formats, such as multiple-

choice questions (Koné, 2021). The philosophy underlying performance-based assessment entails that knowledge is built during learning, when students actively explore knowledge instead of relying on receiving knowledge from their teachers (Espinosa, 2015). Through performance-based assessments, students get the opportunity to demonstrate and apply the knowledge and skills they understand and understand through hands-on activities (Quansah, 2018).

2.5.2 Real-World Scenarios

Performance-based assessment provides students with the opportunity to perform real-life activities. These activities are beneficial as they allow them to use and adapt such skills in diverse real-life situations (Quansah, 2018).

2.5.3 Classroom Extensions

The activities must be non-intrusive and extensions of their daily class work (Salendab & Dapitan, 2021). Students' daily class activities and performance can be assessed using performance assessment tools. Performance-based assessments have an instructional component, learning and assessment occur simultaneously. Assessment and instruction are combined with various instructional styles, including, practice, reciprocal, or self-check. For example, the reciprocal teaching style requires students to analyze the performance of a partner and compare the performance with criteria provided by the teacher (Lund & Kirk, 2010).

2.5.4 Focus on Process and Product

Performance-based assessments involve meaningful instructional activities. These assessments may emphasize either the process, such as how learners process information, or the product, including the final task, activity, or behavior. Therefore, performance-based assessments evaluate not only the end result but also the approaches and methods employed to achieve it (Espinosa, 2015). In performance-based assessment, the process is just as important as the ultimate product. The process that students use to complete the assessment task must be included in the criteria. For example, for group projects teamwork and cooperation are key elements of the process, and students who do not demonstrate teamwork fail the assessment despite completing the task (Lund & Kirk, 2010).

2.5.5 Clear Criteria and Rubrics

Performance-based assessments entail two essential parts including the tasks that students perform and the criteria, based on which their performance will be judged (Lund & Kirk, 2010). Performance criteria are a key attribute of performance-based assessment; therefore, their clarity is crucial (Lund & Kirk, 2010). Performance-based assessment includes pre-determined standards that students are striving to achieve (Ghaicha, 2016). For performance-based assessments, rubrics are essential (Lund & Kirk, 2010). Well-designed rubrics help in the effectiveness of performance assessment tools. (Salendab & Dapitan, 2021). Performance assessment requires rubrics, scoring guides with pre-determined performance criteria, which clearly define acceptable and unacceptable performance and provide feedback to students regarding their progress and give a detailed evaluation of their final product (Ghaicha, 2016).

2.5.6 Articulation of Criteria in Advance

With performance-based assessments, teachers need to explain their expectations to students by giving them the criteria along with the assessment. Writing down expectations for students helps clarify the assessment which in turn helps students understand exactly what is expected of them. Providing criteria helps demystify the assessment and allows one to focus on important components and factors while completing the assessment. When creating an assessment task, teachers must remember that there are two parts. The first is the development of the task i.e., description of what students will do. The second part requires teachers to identify the criteria so that students know how the task will be assessed (Lund & Kirk, 2010). Furthermore, when lecturers clearly define the intended objectives that students are expected to achieve, they are better positioned to align these objectives with their teaching and assessment practices (Braun, 2021).

2.5.7 Feedback Mechanism

Unlike traditional assessment methods, where feedback typically involves returning test scores, performance-based assessment views feedback as a crucial tool for enhancing student learning as well as teacher's teaching practices (Espinosa, 2015). Therefore, students should be given feedback and informed about their strengths and weaknesses (Salendab & Dapitan, 2021).

2.5.8 Multi-Cultural Sensitivity

Performance-based assessments are designed to be sensitive to multicultural contexts, allowing students to link their personal interests and cultural backgrounds with the class instruction. This is why teachers should provide personalized and authentic assessments, such as performance-based assessments, that naturally scaffold students' learning in a sequential manner, boosting their confidence and motivation to learn (Espinosa, 2015). Performance-based assessments are highly contextualized, with strong washback, authenticity, and validity. Washback refers to the positive or negative influence that testing has on the teaching and learning process. Constructive feedback can enhance learning and create a supportive classroom environment while fostering cooperation between teachers and students. It also allows students to engage in discussions about their performance or grades with their instructors, allowing them to improve their work (Koné, 2021).

2.6 Performance-based Assessment Types

2.6.1 Group Projects

Student projects are excellent performance-based assessment (Lund & Kirk, 2010). They serve as comprehensive demonstrations of students' skills and understanding and emphasize student initiative and creativity. They are often interdisciplinary in nature. Teachers assess these projects using pre-established standards or criteria known to all participants (Rudner & Boston, 1994). Projects require students to engage in higher-order thinking (Lund & Kirk, 2010). For projects, students may be asked to demonstrate or deliver live performances in their class or to external audiences as part of their projects. Science fair projects are a well-known example. These activities can take the form of individual or group competition, or collaborative efforts completed over time (Rudner & Boston, 1994).

Group projects allow multiple students to collaborate on complex problems. This involves students planning together, discussing and doing research, and presenting in a group. This approach is particularly beneficial as it fosters teamwork and emphasizes achieving shared goals (Rudner & Boston, 1994). Project work can evolve into meaningful end products while at the same time allowing teachers to assess

learning. It allows creative students to shine and many times shy or quiet students are the ones who perform especially well on these assessments (Lund & Kirk, 2010).

2.6.2 Presentations

Presentations are another popular form of performance-based assessment. Oral presentations serve as the primary means for students to demonstrate their knowledge and skills through verbal expression (Gyamfi et al., 2023). The presentation requires students to showcase their knowledge on a specific topic in a structured and coherent manner. Furthermore, students have the option to use visual aids, such as slides, videos, and posters, to enhance the clarity and impact of their points. Students can deliver presentation in small groups or individually, depending on the instructor's preference (Lakha, 2024). Presentation focuses on both the process and the final product. Students are evaluated based on various criteria including understanding of content, their communication skills, creativity, and engagement with the audience (Umam et al., 2021). University teachers frequently use presentations and is common in higher education. Presentation help students improve their confidence to speak in front of the public as it allow them to practice communication skills (Seema, 2015). Additionally, presentations prepare students for academic and professional success by helping students practice and improve communication skills (Seema, 2015). It also helps students develop skills such as public speaking and effectively conveying information (Rosaroso & Rosaroso, 2015).

Presentation enables students to critically ponder, break down information, and crack problems. While preparing for presentations, students are actively engaged in learning as they explore various sources and materials online and in library. This helps students gain clarity of concepts and profound understanding of the topic. Moreover, the use of PowerPoint in learning help students highlight key points which is found to help students in capturing attention and retaining information (Sugeng & Suryani, 2018). Presentations include providing timely feedback to learners to help them recognize areas that need improvement (Sugeng & Suryani, 2018). Overall, presentation is a valuable tool that educators can use assess student learning authentically and effectively.

2.6.3 Group Discussions

Group discussions are an interactive process where members actively listen to one another and share their own ideas. It occurs in a systematic structure with a clear purpose and goal. Students are encouraged to voice their opinions freely, even if they differ from the group's perspective. However, they must listen patiently and must not let emotions like anger disrupt the discussion (Umale, 2020). Although conflicting opinions are welcome, but conflicts or arguments are discouraged. In group discussions, there is no assigned leader and students are expected to demonstrate leadership qualities by effectively guiding the group when needed. For discussions, emphasizing respect for others' opinions, adherence to time constraints, effective listening, and asking clarifying questions when necessary are some ground rules. Group discussions are cost and time effective (Umale, 2020).

Four key areas assessed in group discussions are identified. First is knowledge. Group discussions evaluate participants' knowledge, as only those who deeply understand the subject matter can speak effectively. These discussions assess the breadth and depth of knowledge. Participants need to analyze the topic and use their understanding, reflect critically, and propose new ideas to guide the group forward. The second is effective oral communication. Participants must speak clearly and to the point, and avoid excessive use of jargon, or unclear statements. Moreover, participants must use appropriate pronunciation and a moderate speaking pace. Furthermore, their non-verbal communication such as body language should align with verbal communication to reinforce the message. The third and fourth is leadership and team management skills. Group discussions involve managing the team effectively. A leader must be able to initiate discussions. He must prioritize the group's welfare over personal interests or ego. A leader should also facilitate team activities, and must be flexible enough to adapt to group opinions. Furthermore, a leader must maintain positive attitude, as being negative can hinder collaboration and discourage group members. Team management skills which involve coordination and effective functioning within the group (Umale, 2020).

2.6.4 Portfolio

A portfolio is an assemblage of work accumulated over a period of time (Gyamfi et al., 2023). It comprises a variety of evidence regarding the learner's skills, knowledge, and performances over time. This compilation enables students to take ownership of their learning with limited guidance from teachers, which enables them to self-evaluate their progress. All activities included in the portfolio are an indicator of the student's knowledge and capabilities. The collection may consist of various items, such as results of tests, assignments, projects, videos, or other work reflecting the student's engagement and work (Gyamfi et al., 2023). Portfolio assessments allow students to compile their work under teacher guidance or independently. These assessments let students showcase their knowledge through practical tasks (Quansah, 2018).

While working on portfolios, students are in the continuous process of creating, reviewing, and improving their work throughout the academic year. Being continuous, it helps teachers observe strengths and weaknesses across different situations. Students also get to demonstrate their learning over time (Quansah, 2018). Research shows three main advantages of the portfolio, firstly it reinforces pupils' learning, secondly, it enhances the role of instructors, and lastly, it improves the process of assessment (Kirmizi & Komec, 2016).

2.6.5 Demonstrations

The demonstration allows students to display their understanding of the subject content. In performance-based assessment, demonstration involves students performing specific tasks or experiments to illustrate their knowledge and skills. This approach encourages students to actively interact with the material instead of passively absorbing information. This approach allows students to construct their own answers, fostering deeper understanding and engagement with the material. It emphasizes the application of knowledge rather than rote memorization, which can lead to better retention and comprehension (Kabba, 2008).

Effective demonstrations require learners to engage in complex thinking and problem-solving. They must analyze information, synthesize ideas, and reflect on their learning, which promotes higher-order thinking skills. Many demonstrations involve

collaboration with peers, fostering teamwork and communication skills. Students often need to articulate their ideas clearly and work together to achieve common goals. High-quality demonstrations are assessed using explicit and meaningful scoring criteria. The demonstration process benefits from a partnership between teachers and students. Teachers guide students regarding the demonstration, while students take ownership of their learning. While demonstrations are valuable, they also present challenges. They require more time and resources compared to traditional assessments, and scoring can be more complex. However, the benefits of engaging students in authentic tasks often outweigh these challenges (Martin-Kniep, 2022).

In the context of teacher education, demonstration involves teacher candidates showcasing their teaching skills and competencies through practical tasks. Demonstration is a key component of performance-based assessments, which require teacher candidates to complete complex tasks to exhibit their learning and teaching abilities. These assessments are designed to provide a deeper understanding of a candidate's knowledge and skills in real classroom settings. The use of demonstration through performance-based assessments has transformed teacher preparation programs. It emphasizes the importance of hands-on experience and the skills required to apply theoretical knowledge in real-world teaching scenarios, ultimately leading to better-prepared educators (Polly, 2019).

2.6.6 Experiments

An experiment is a performance conducted on demand, where a student plans, carries out, and analyzes the results of an empirical research study based on questions formulated from logical assumptions, referred to as research questions or hypotheses (Gyamfi et al., 2023). In experiments, students apply inquiry skills and follow systematic procedures, using scientific explanations to draw conclusions about a particular issue or phenomenon. An example of an experiment is investigating the brightness of bulbs in series and parallel circuits in a laboratory setting (Gyamfi et al., 2023).

2.6.7 Peer Assessments

Peer assessments are excellent formative assessments that help students improve performance, especially in large classes where it is difficult for the teacher to

provide frequent individual feedback. In essence, peer assessments provide every student with a personal instructor, who can verify or reinforce cognitive learning related to skills or activities (Lund & Kirk, 2010). To create a peer observation instrument, teachers create a set of criteria for assessing students' abilities in those areas. Students being observed must understand that the purpose of the assessment is to encourage correct practice so they do not be penalized if errors are made. Students must understand that the feedback received from peers through the assessment is intended solely to help improve their performance (Lund & Kirk, 2010).

2.7 Benefits of Performance-based Assessment

In recent years, much research has been done on exploring the potential benefits of performance-based assessments and those concluded that performance-based assessment measure complex learning outcomes and provide tools for assessing the process as well as the product (Espinosa, 2015). The results support that performance assessments offer many advantages. Some of them are following:

2.7.1 Student Involvement

Student involvement is the main predictor of academic success (Price et al., 2011). Performance assessments are interactive tools that encourage learners to use and apply their previous knowledge and abilities to solve a task given by their teacher (Heydarnejad et al., 2022). They provide students with opportunities to develop and demonstrate skills (Lund & Kirk, 2010). These assessments are highly authentic. They connect academic learning to real-world practice. This prepares students for challenges outside the classroom (Kirmizi & Komec, 2016). Performance-based assessments inspire students to be eager for learning, encourage them to express their creativity, and allow them to make connections between desired outcomes and the management of their learning behavior. Students' motivation affects learning by affecting their engagement, their persistence in achieving goals, and their way of approaching learning (Aladini et al., 2024).

2.7.2 Student Motivation

Performance-based assessment involves students in the learning process which encourages and motivates them to learn. Additionally, performance-based assessments allow students' work to be compared to a set of criteria instead of with other students'

work which promotes learning (Espinosa, 2015). Therefore, performance-based assessment can be seen more like teaching than testing and hence is a learning experience in itself. According to cognitive research learning mostly occurs in active contexts and students construct knowledge while they engage and interact in the classroom (Espinosa, 2015). Performance-based assessment give students the choices to select the topics and procedures. This element of choice increases student's motivation to perform well as well as account for cultural differences (Espinosa, 2015).

2.7.3 Self-evaluation

Performance assessments allow teachers to know their strengths and areas for improvement. These assessments allow teachers to critically reflect on their teaching methodologies which help them pinpoint their own weaknesses and help them improve and modify their instructions (Espinosa, 2015). Additionally, performance-based assessments help in enhancing instruction, determining what content needs to be taught and to which level. Additionally, it helps in deciding suitable strategies as well as recognizing which core concepts needs to be emphasized (VanTassel-Baska, 2014).

2.7.4 Higher-level Thinking

Performance-based assessments allow students to apply their learning in a meaningful way and give teachers a means for incorporating higher-level thinking skills like analysis, synthesis, and evaluation (Lund & Kirk, 2010). Performance-based assessments involve activities where learners apply higher-level thinking skills (Salendab & Dapitan, 2021). Performance-based assessments encourage students to activate their knowledge and skills from several domains to complete the assigned task, while practicing higher-order thinking skills such as analysis and synthesis (Heydarnejad et al., 2022). When students apply and use knowledge, it helps teachers better determine students' understanding and uncover any misconceptions, they might have related to the topic (Lund & Kirk, 2010). For performance-based assessments, teachers must develop tasks that they can track and analyze clearly. Hence, these activities can highlight what a learner can do rather than just listing their skills (Salendab & Dapitan, 2021). Performance-based assessment and learning give students the chance to apply their knowledge and use higher-order thinking skills. It reinforces students' efforts to develop their ability for critical thought (Aladini et al., 2024).

2.7.5 Skill Development

Performance-based assessments allow students to create and do something. When these tasks for performance assessments are planned and implemented properly and students are given feedback about their strengths and weaknesses, they will develop higher-order thinking skills and problem-solving skills (Salendab & Dapitan, 2021). Heydarnejad et al., (2022) found implementing performance-based assessments in language classes helps students learn and practice speaking, listening, and writing more effectively (Heydarnejad et al., 2022). Performance-based assessment allows students to use their abilities to solve problems and find their strengths and weaknesses (Aladini et al., 2024). Carefully planned and implemented performance assessments help students improve higher-order thinking and problem-solving skills (Salendab & Dapitan, 2021). Moreover, it is found that performance tasks improved students' creativity and allows them to master and use productive skills (Kirmizi & Komec, 2016).

2.7.6 Effective for Online Classes

Performance-based assessments are also effective within online classes. Incorporating performance-based assessments in online classes leads to an effective learning experience (Aladini et al ., 2024). Aladini (2024) found that autonomy plays a crucial role in boosting students' motivation and engagement. In online classes, students experience autonomy, enhancing motivation as performance assessments build competence by encouraging students to set and pursue their personal goals. Challenging goals boost motivation and thereby, performance. Aladini (2024) found that online class participants who engaged in performance-based assessments showed a notable increase in setting personal goals, which likely boosted their motivation, highlighting the role of performance assessments in improving students' academic outcomes (Aladini et al., 2024).

2.8 Guidelines and Principles for Performance-based Assessment

2.8.1 Guidelines

To develop effective performance assessments, teachers can follow several steps. First, they must identify the specific knowledge and skills to assess. Next, they should determine the tasks that will demonstrate whether the objectives have been

achieved and outline what an ideal response looks like. Teachers also need to create clear evaluation criteria and share these with students. Providing a model response can help clarify expectations (Espinosa, 2015). Additionally, rubrics and scoring guides should be discussed with students before the assessment begins. Students can even contribute to developing these tools (Espinosa, 2015). Once the assessment is complete, teachers should analyze students' responses to gain insights. Finally, feedback must be given. Instead of just assigning a score, feedback should include detailed and constructive information. This helps both students and teachers improve in the future (Espinosa, 2015). Teachers must design interactive and engaging learning activities that align with real-world skills and tasks with clear rubrics for assessment and guidelines for students to let them understand expectations and assess their progress themselves (Aladini et al., 2024). The efficacy of performance assessments lies in their potential to raise students' and teachers' motivation to learn through other performance-based assignments. lack of clarity in performance measures and standards must be improved by using rubrics, strengthening validity and reliability, and providing adequate resources, professional development, and other support needed (Ghaicha, 2016).

2.8.2 Principles of Performance-based Assessment

Principles for performance-based assessment include establishing clear performance targets linked to instructional goals, striving for authenticity in products and performances, articulating criteria and performance standards, teaching and guiding students, using ongoing assessments for feedback and adjustment, and documenting and celebrating progress (Ghaicha, 2016).

2.9 Challenges in Implementing Performance-based Assessment

The implementation of performance-based assessments entails several challenges, particularly in terms of learning activities, evaluation criteria, and time constraints. Effective use of performance-based assessment requires teachers to invest substantial time in preparation, training, and ongoing support. However, due to time and resource constraints, many teachers tend to avoid administering performance tasks in class (Kirmizi & Komec, 2016). Instructors find performance-based assessment challenging because of its open-ended format and time intensiveness. it takes time to

create a performance task, administer it and then giving score. Students also require substantial amount of time to complete the activities (Espinosa, 2015).

2.9.1 Time and Labour Intensive

Performance-based assessment is labor intensive. It involves designing the performance task, physically assembling the resources required, and then administering the performance task. This takes time as well (Performance-Based Assessment, 2008). Teachers frequently report that the time and effort required to design, implement, and evaluate performance-based assessments is overwhelming. As Ghaicha (2016) notes, performance assessments necessitate the use of rubrics and scoring guides and predetermined performance criteria that clearly define acceptable and unacceptable performance. These tools are essential for providing students with feedback as well as for detailed evaluations of their final products. Therefore, creating and administering these assessments can be challenging. Moreover, teachers must ensure that the tasks are meaningful, authentic, and aligned with students' abilities (Kirmizi & Komec, 2016).

2.9.2 Scoring

Standardization of scoring procedures is another challenge. From research it is evident that there is diversity in the development of scoring procedures for performance-based assessment. Performance tasks also differ regarding the subject matter addressed and the possible solutions (Performance-Based Assessment, 2008). In performance-based assessment, there are number of possible solutions and ways to complete a task (Espinosa, 2015). Hence, it becomes difficult to evaluate student performance or task (Performance-Based Assessment, 2008). Additionally, the validity and reliability of performance-based assessment tools is not possible. The scores changes varies across instructors and with time (Yildirim & Orsdemir, 2013). Moreover, it is challenging for teachers to use this kind of assessment because these tools do not provide information in numbers and teachers find it difficult to decide on a grade (Herrera et al., 2013).

2.9.3 Fairness

Another challenge that Kirmizi & Komec (2016) found that teachers face is that performance-based assessments is prone to cheating. Teachers express concerns that students may copy material from the internet and put in less effort which compromises

the validity of the assessment (Kirmizi & Komec, 2016). Furthermore, they found both teachers and students perceive performance-based assessments as less fair in the context of group work as inequities arise when some students perform more work than others which undermine the intended objectives of collaborative tasks (Kirmizi & Komec, 2016).

2.9.4 Costly

For large-scale performance-based assessment, the costs of administration and scoring are high. Moreover, training teachers to judge student work, perform scientific observations, and identify clear criteria takes time as well as costs money but is necessary for effective performance-based assessment implementation (Performance-Based Assessment, 2008).

2.9.5 Classroom Management

Another challenge that teachers face while implementing performance-based assessment is classroom management. This is especially true for large classes (Lund & Kirk, 2010). Teachers report that it is difficult to manage large groups effectively due to the time required to complete such assessments. This raises questions regarding the practicality of performance-based assessments in such settings (Lund & Kirk, 2010).

2.10 Solutions to Address Challenges

To overcome these challenges, teachers need professional development, especially long-term, collaborative training to help them improve and hone their skills for effectively designing and implementing performance-based assessments (Kirmizi & Komec, 2016). Training teachers allows them to improve their knowledge and gain the necessary skills for preparing performance assessment tasks like creating rubrics with clear and specific criteria and alignment with learning objectives to effectively evaluate students (Yildirim & Orsdemir, 2013). In this way, teachers will also be able to appreciate the effort of students. Developing performance-based assessments takes a lot of time. To deal with this challenge, teachers must work cooperatively. For instance, teachers can share resources. This will make it easier and faster to design tasks and develop criteria (Yildirim & Orsdemir, 2013). Continuous feedback from experienced colleagues, and faculty members help support teachers in effectively implementing performance-based assessments (Kirmizi & Komec, 2016). Additionally, teachers

should give clear, achievable instructions to students about performance expectations and available resources. Emphasizing ethical values and ensuring task authenticity are essential, along with developing fair scoring criteria to uphold transparency and fairness. Teachers should act as decision-makers and supervisors, aligning tasks with curriculum goals and instructional strategies (Kirmizi & Komec, 2016). Teachers should use rubrics to accurately judge and score students' performance. For this teacher must have a clear desired outcome in mind and then establish knowledge and skills that will be assessed, determining standards and then creating the rubric on the above requirements. Additionally, teachers should keep checking rubrics regularly to ensure they are consistently measuring what they intend to measure to ensure their validity and reliability (Espinosa, 2015). Recognizing the connection between curriculum, instruction, and assessment is critical for the effective use of performance-based assessments (Ghaicha, 2016).

2.11 Performance-based Assessment and 21st Century Skills

The study shows that performance-based assessments significantly encourage students to think critically and approach tasks in innovative ways. Makmuroh and Pratama (2022) found that a process-oriented assessment not only evaluates student skills but also fosters higher-order thinking through probing questions and discussions. Moreover, the assessments provided authentic learning experiences, accurately reflecting students' abilities and motivating deeper engagement with the material. In line with Chinda (2014), these assessments bridge the gap between theory and practice, while also serving a diagnostic role by highlighting individual strengths and weaknesses. Additionally, the study found that performance-based assessments enhance key 21st century skills such as critical thinking, collaboration and communication, through tasks like presentations, discussions, and group projects. This finding is supported by Diastuti et al. (2024) and Salendab and Dapitan (2021), who reported strong positive impacts on critical thinking, creativity, and communication. Collaborative assessments further promote teamwork and interpersonal skills, echoing the work of Kirmizi and Komec (2016). Finally, Salma and Prastikawati (2021a) noted that these assessments provide opportunities for practical application, fostering both creativity and critical thinking while effectively identifying areas for improvement.

2.12 The 21st Century Skills

2.12.1 Theoretical Background

The 21st century skills are increasingly essential for both education and work in today's world (Laar et al., 2020). There is no single widely accepted definition of 21st Century skills. Consequently, numerous initiatives have developed frameworks to define and organize these skills. One such initiative is the Partnership for 21st Century Learning, a collaborative corporate organization, which categorizes these skills into three groups: learning and innovation skills encompassing creativity, critical thinking, communication, and collaboration; literacy skills including information literacy, media literacy, and ICT literacy; and life skills consisting of flexibility, initiative, social and cross-cultural skills, productivity, accountability, leadership, and responsibility (Laar et al., 2020). Another initiative, the Assessment and Teaching of 21st Century Skills project, identifies four categories: ways of thinking, such as creativity, critical thinking, problem-solving, and decision-making; ways of working, including communication and collaboration; tools for working, encompassing information and ICT literacy; and living in a world, consisting of citizenship, life and career skills, and personal and social responsibility (Laar et al., 2020). Similarly, the Organization for Economic Co-operation and Development (OECD) categorizes 21st century skills as information, communication, ethics, and social impact (Laar et al., 2020). While the precise definition and number of skills may vary among these frameworks, there is a consensus on some common skills, including ICT skills, collaboration, communication, and social and cultural skills, with most frameworks also emphasizing creativity, critical thinking, and problem-solving. The increasing number of frameworks underscores the growing recognition of the importance of technology skills in today's digital age (Laar et al., 2020).

2.12.2 The 21st Century Skills

Literature on 21st century skills highlight skills essential for the modern workplace. These encompass technical skills, given the increasing complexity of workplaces and their reliance on ICT. Proficiency in digital tools and software has become imperative as a result (Laar et al., 2020). Information skills, another crucial 21st century competency, involve searching for, evaluating, and organizing information

from multiple sources (Laar et al., 2020). Digital information management includes defining information needs and selecting relevant digital information. Communication skills are also vital, encompassing the clear and precise transmission of messages, understanding instructions, making requests, and asking questions ((Lazorenko & Krasnenko, 2019). 21st century workers must use ICT to effectively communicate, share ideas, participate in online communities, and maintain contacts (Laar et al., 2020). Collaboration skills involve working with others to complete tasks or projects, a process supported by ICT, which facilitates prompt interaction and exchange of ideas (Laar et al., 2020). Critical thinking is another key 21st century skill, essential for analyzing information, solving problems, and developing innovative solutions (Lazorenko & Krasnenko, 2019). In the era of disinformation, critically assessing online content is crucial (Laar et al., 2020). Creativity, the ability to generate novel ideas for products, services, or processes, is imperative for organizational adaptability and leadership. ICT supports creativity by enabling workers to search for and evaluate various concepts (Laar et al., 2020). Problem-solving is a valuable skill that involves using knowledge and abilities to address complex situations effectively (Laar et al., 2020). 21st century workers must identify problems, develop strategies, find multiple solutions, and apply knowledge to new contexts, with ICT playing a significant role in the process of problem-solving (Laar et al., 2020).

2.12.3 Importance of 21st Century Skills

The development of 21st century skills is a crucial topic of discussion amid the current digital revolution. These skills are essential for adapting and thriving in the modern era, particularly as the Fourth Industrial Revolution continues to alter the landscape (Kholili et al., 2023). With rapid advancements in digital technology, the world of work is evolving at an unprecedented pace. Developments in artificial intelligence and machine learning are impacting all sectors of the economy (Reeson et al., 2017). As routine tasks become increasingly automated, there is a growing demand for highly skilled workers. For example, the Australian Bureau of Statistics (ABS) classifies occupations based on the required level of training and experience (Reeson et al., 2017). It is anticipated that robots will replace more human workers, enabling those workers to use new technology to boost productivity and earn higher wages. As digital technology capabilities expand, an increasing number of tasks will be automated. To

keep pace with global advancements and digital revolutions, students must become 21st century learners equipped with the relevant skills (Toro, 2019). These 21st century skills are needed across all domains. They include communication skills, cultural competence, creativity, collaboration, critical thinking, and problem-solving abilities (Abell, 2012).

As the world advances at a fast pace with transformation and challenges faced in economic, social, and environmental sectors, it is crucial now more than ever to value human resources by equipping people with the required and essential knowledge and skills of 21st century to allow them to participate in the current world and to thrive in modern jobs (Bakay, 2022). Equipping with such skills will help individuals to perform their jobs with ease and allow them to adapt themselves with emerging trends in a rapidly developing world. Otherwise, firstly people would not be able to find a job and even if they did, they would not be able to keep it. Therefore, educational institutions play a very crucial role in raising human capital (Bakay, 2022). The skills needed by the labor market are changing rapidly with the advent of new technologies. Therefore, skills to be taught in the university must be determined while developing the curricula. Universities must consider the expectations of the business world regarding what knowledge and skills they require students to be equipped with (Bakay, 2022).

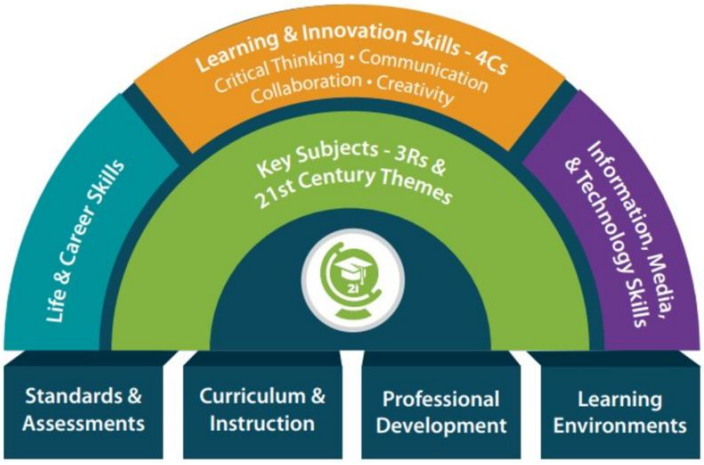
2.13 The P21 Framework for 21st Century Learning

The P21 Framework for 21st Century Learning was developed as a result of a collaboration between business leaders and educators. This framework aims to identify the essential knowledge and skills students need to achieve success in their professional and personal lives and to enhance their roles as citizens (Partnership for 21st Century Learning, 2019). These skills are taught and learned to improve thinking and learning processes as well as to enhance work and living style (Bakay, 2022). It has gained widespread acceptance among teachers and schools in both the United States and other countries, emphasizing the critical nature of 21st century skills. the P21 Framework is developed to help integrate 21st century skills into teaching practices. Students are required to be equipped with the essential skills to thrive in today's world, such as critical thinking, problem-solving, communication, and collaboration (Bakay, 2022). Each element of the Framework is integral to ensuring students are prepared to thrive in today's interconnected digital world (Partnership for 21st Century Learning, 2019).

To help educators integrate these skills into core academic subjects, the Partnership for 21st Century Learning (P21) has created a comprehensive learning framework. This framework outlines the skills, knowledge, and competencies necessary for students to excel in both work and life. It underscores that 21st century skills must be built upon a solid ground of knowledge in key academic areas such as English language arts, world languages, government, mathematics, economics, civics, geography, history, and science. Furthermore, the framework emphasizes the importance of interdisciplinary themes essential for 21st century readiness, including global awareness, financial literacy, civic literacy, entrepreneurial literacy, environmental literacy, and health literacy (Partnership for 21st Century Learning, 2019).

Figure 2.2

P21 Framework for 21st Century Learning



2.13.1 Key Themes and Subjects

For the 21st century learning process, a range of disciplines and themes are deemed essential. These core subjects include world languages, the arts, mathematics, economics, science, English (reading or language arts), geography, history, government, and civics. Alongside these subjects, several interdisciplinary themes are identified to enrich the curriculum and enhance learners' broader understanding of content. These themes include global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; and environmental literacy.

2.13.2 Learning and Innovation Skills

Skills related to learning and innovation equip students for the ever-evolving complexities of contemporary work environments and daily life (Partnership for 21st Century Learning, 2019).

2.13.2.1 Creativity and Innovation

Creativity involves using a variety of idea-generation techniques, such as brainstorming, to produce unique and valuable ideas. Additionally, it involves analyzing and evaluating one own's ideas and refining them. Moreover, creativity and Innovation require the implementation of ideas, and communicating them with others. It also includes becoming open to diverse perspectives and incorporating feedback effectively. Furthermore, it involves the demonstration of originality as well as being aware of the limitations of adopting new ideas Moreover, it involves viewing failure as a learning opportunity. Taking action on creative concepts to create meaningful outcomes is also a crucial aspect of this proficiency (P21, 2019).

2.13.2.2 Critical Thinking and Problem-Solving

Critical thinking and problem-solving involve the application of different types of reasoning, including inductive and deductive, depending on the context. Moreover, the analysis of interactions among different components within complex systems to understand overall outcomes. Furthermore, critical thinking and problem-solving involve making decisions, analyzing arguments and different points of view as well as gathering information from different sources and making connections between them, drawing conclusions by effectively interpreting available information. Furthermore, these involve solving problems using both traditional and innovative ways (P21, 2019).

2.13.3.3 Communication

This skill involves expressing thoughts through oral, written, and nonverbal communication skills across different contexts. It also involves listening effectively to others interpret effectively Moreover, it involves using communication for variety of reasons like to inform others or to motivate someone. Furthermore, it involves utilizing different media and technologies. Moreover, it involves to effectively communicate in diverse settings (P21, 2019).

2.13.4.4 Collaboration

This skill involves collaborating with others and working effectively and respectfully in diverse teams. It involves being flexible and ready to make compromises where necessary to achieve the group's common goal. Moreover, it involves taking shared responsibility and being appreciative of the separate contributions of each team member (P21, 2019).

2.13.3 Information, Media and Technology Skills

These skills are pivotal in a world marked by the abundance of information, and rapid advancements in technology. Effective citizens must be able to execute skills, such as information literacy, media literacy, and ICT literacy (Partnership for 21st Century Learning, 2019). Information Literacy involves getting information effectively while critically evaluating it. It involves using information accurately as well as being able to flow information from diverse sources (P21, 2019). Media Skills involve analyzing media and determining the influence of media on behaviors. Furthermore, it involves being able to be aware of ethical and legal issues in using media (P21, 2019). ICT skills involve using technology as a tool to perform various tasks like research, and communication. Moreover, it involves To be aware of the ethical and legal issues regarding the use of ICT (P21, 2019).

2.13.4 Life and Career Skills

Life and career skills equip students to manage the complexities of life and work environments (Partnership for 21st Century Learning, 2019). Flexibility and Adaptability involve adapting to change and working effectively in diverse environments and being flexible enough to deal with criticism and incorporate feedback effectively (P21, 2019). Initiative and Self-Direction involve setting goals while managing time. It involves working independently, without direct supervision. Moreover, it involves a commitment to lifelong learning with the ability to learn from past mistakes. (P21, 2019). Social and Cross-Cultural Skills involve effectively interacting and communicating with others. It involves respecting cultural diversity and working effectively with people from different social and cultural backgrounds (P21, 2019). Productivity and Accountability involve handling projects and setting and

accomplishing goals. It involves to stay persistent while facing difficulties and obstacles and stay focused on achieving the required the required result (P21, 2019).

2.13.5 Support System of 21st Century

The following elements are essential systems needed to ensure that students master 21st century skills.

2.13.5.1 21st Century Standards

Educational institutions and educators must emphasize and prioritize the cultivation of 21st century skills as well as core content knowledge. Students must have a comprehensive understanding regarding key academic disciplines and interdisciplinary themes relevant to the modern era. Educational institutions must engage students with real-world data and experts and help them have deep comprehension rather than mere surface-level knowledge. Students must be actively involved in tackling challenges and problems of the real world which helps them gain effective learning experiences.

2.13.5.2 Assessment of 21st Century Skills

For the assessment of 21st century skills, a balanced assessment framework is required which includes standardized testing as well as formative and summative evaluations within classroom settings to gain insight into their learning. Feedback mechanisms should be integrated into the learning processes to help students be aware of their strengths and weaknesses. Technology must be used as an assessment tool as well as portfolios should be used that showcase student achievements and serve to gauge whether students have achieved mastery of 21st century skills. Moreover, it offers compelling evidence to educators as well as prospective employers alike. This multifaceted approach contributes to a comprehensive evaluation of the educational system in fostering high levels of student competency.

2.13.5.3 21st Century Curriculum and Instruction

Educators are required to impart 21st century skills within the context of core subjects and interdisciplinary themes as well as allow the application of these skills across diverse academic domains. A competency-based approach underscores the acquisition of essential skills through innovative pedagogical methods and the

utilization of supportive technologies. It also emphasizes inquiry-driven and problem-based learning strategies. Educational institutions need to allow students to utilize community resources beyond educational boundaries as it will help enrich the learning experience of students and promote practical skill development.

2.13.5.4 21st Century Professional Development

Educational institutions should play a vital role in equipping teachers with the strategies and techniques needed to integrate 21st century skills in their teaching practices in classrooms. Teachers should be able to strike a balance in their instructions and use both traditional teaching methods as well as project-based method. Moreover, deep comprehensive knowledge regarding a particular subject matter helps in the development of critical thinking, problem-solving, and other essential 21st century skills. Hence, professional development is crucial. Therefore, to foster professional learning communities modeling effective classroom strategies is extremely important to promote ongoing professional development as this will allow educators to effectively address the diverse learning needs of their learners.

2.13.5.5 21st Century Learning Environments

Educational institutions should foster supportive learning practices to cultivate 21st century skills among students. For this, they should provide strong human support systems, and enriching physical environments. Educators should collaborate with professional learning communities to impart 21st century skills among students. Real-world learning experiences, including project-based activities and practical applications, make education more meaningful and engaging. Moreover, ensuring equitable access to quality learning tools, technologies, and resources enhances inclusivity and promotes global competencies. This approach also encourages broader community and international participation, enriching students' learning experiences.

2.14 Critical Thinking

Critical thinking is the ability through which a person can accurately analyze in depth anything including information, facts, or ideas. It further involves making interpretations or drawing conclusions from what was initially analyzed. Therefore, it involves using an analytical mindset to ask accurate questions in order to get the right information. The California National Council for Excellence defines critical thinking

as “the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action” (Ribau, 2023). The American Philosophical Association's consensus defines an ideal "critical thinker" as someone who is curious, open-minded, adaptable, fair-minded, and well-informed, thereby understanding various viewpoints and perspectives. These traits are also relevant for a creative person. So, creativity and critical thinking are two sides of the same coin. As in every step of creative process, critical analysis and evaluation is required and necessary (Thornhill-Miller et al., 2022). Critical thinking also involves recognizing and preventing biases from effecting reasoning. Facione and the landmark American Philosophical Association’s task force on critical thinking categorized 6 components of critical thinking which includes interpreting information, analysis, making inference, evaluation, providing explanations and self-regulation (Thornhill-Miller et al., 2022).

2.14.1 Assessment of Critical Thinking Skills

Tools used to measure different skills involved in the process of critical thinking involve mostly multiple-choice questions which require reasoning as the questions entail a specific situation with some information. The examples are, “California Critical Thinking Test”, “Watson–Glaser Critical Thinking Test” etc. “Case study or experiential methods of assessment” are also used but are less common. This includes partakers reflecting on past experiences, analyzing the situation they are facing and then taking action. These are used by teachers and employers often (Thornhill-Miller et al., 2022).

Research provides strategies for improving these assessments through modern evaluation methods. The three recommendations for enhancing the assessment of critical thinking include: assessing critical thinking in specific situations to study both the process and the related discourse, involving students or peers in evaluating critical thinking abilities to ensure the evaluation is not solely instructor-driven, and allowing learners or participants in an experiment to document, demonstrate, and justify their engagement in critical thinking, as this perspective can offer valuable insights into the fundamental aspects of the critical thinking process (Thornhill-Miller et al., 2022).

2.14.2 Support System for the Development of Critical Thinking Skills

To support the development of critical thinking, educational institutions can use variety of ways. To develop critical thinking, there needs to be a connection between personal dispositions, skills and, knowledge. When it comes to skill and knowledge, educational institution plays a crucial role in developing critical thinking, which involves training students to be able to evaluate information, media literacy, deductive and inductive reasoning, case studies or "concept mapping", as well as problem-solving in groups or individually (Thornhill-Miller et al., 2022). For training on critical thinking, instructions should involve components including, "working on attitudes and encouraging individuals to think", "teaching and practicing critical thinking skills", "training for transfer between contexts", and "suggesting metacognition through reflection on one's thought processes". Workshops are crucial to cultivate critical thinking (Thornhill-Miller et al., 2022).

2.15 Creativity

According to Van Laar et al., (2017), "creativity is the skill that generates new or previously unknown ideas and then treating familiar ideas in new ways and turning those ideas into a product, service, or process that is recognized as a novelty in a particular scope" (Indrawati, 2021). Creativity is also defined as "a multipurpose cognitive ability that implies fluency, flexibility, accuracy, and originality". Creative thinking involves being able to think differently as well as see things differently from most people. Additionally, it is associated with being flexible and adaptable to accomplish a goal. A creative thinker must have vast knowledge regarding a particular field, and be consistent and flexible (Ribau, 2023).

The frameworks for creativity studies include "the 4Ps", "the 5As" and "the 7Cs model". These frameworks provided four critical dimensions which include "the act of creating (process)", "the outcome of the creative process (product)", "the characteristics of creative actor(s) enacting the process (person)", and "the social and physical environment that enable or hinder the creative process (press)". There was an old belief that creativity is innate which is not true as a person can be trained to be creative through a variety of ways. Flexibility and being able to adapt in challenging situation are critical elements of creativity (Thornhill-Miller et al., 2022).

2.15.1 Assessment of Creativity

Assessment of creativity involves two approaches, “creative accomplishment” and “creative potential”. Four assessment tools are used for creative accomplishment. “Historiometric approach” involves quantitatively analyzing historical data including how many awards a person has won to gauge creativity (Thornhill-Miller et al., 2022). “Consensual Assessment Technique (CAT)” involves conducting subjective evaluations of judges on any creative product. The “Creative Achievement Questionnaire” is a self-report assessment of achievement made in public. “Inventory of Creative Activities and Achievements (ICAA)” is a “self-report scales” that assess a number of engagements in creative activity and achievement level. “Creative potential measures the cognitive abilities and/or personality traits that are important for creative work”. To assess creative potential, “the Remote Associations Test (RAT)” and the Alternative Uses Task (AUT)” are the two most common assessment tools. The RAT involves identifying the fourth word which is in some way associated with each of the three given words as convergently associating disparate ideas is a key element for creativity. The AUT involves a person creating as many ideas as possible on any clue. This test assesses divergent thinking (Thornhill-Miller et al., 2022).

2.15.2 Support System for the Development of Creativity

Institutions and programs foster creativity by cultivating an environment that encourages innovation, offering instruction on creativity and its techniques, and providing opportunities for students to develop attitudes and traits linked to creative potential and achievement. The environment can influence and stimulate creativity. For example, natural light, comfortable atmosphere, nature, colors like green and blue yellow, pink and orange can stimulate creativity (Thornhill-Miller et al., 2022). Programs and training focused on creativity enhancement, such as design-thinking initiatives have been found successful in fostering innovation. Additionally, for development of creativity, training on emotional and personality traits like empathy, openness, and mental flexibility is essential. Moreover, creativity is also found to be enhanced through targeted curriculum design, teacher professional development, and activities at all education levels (Thornhill-Miller et al., 2022).

2.16 Communication

Communication skills entail conveying information to others clearly and effectively using any media (Indrawati, 2021). Communication includes sending a message to the receiver and receiver understanding it (Ribau, 2023). To have good communication skills it is crucial have a clear purpose behind any communication and how to communicate it effectively. The communication can be done using any medium written or oral (Ribau, 2023). Communication is multi-dimensional and involve both verbal and non-verbal elements. Effective communication includes various skills. Linguistic competence is the ability to express oneself clearly in spoken and written forms and involves mastery of language. Pragmatic skills involve using communication according to the situation. Social skills involve understanding societal norms, and effectively interacting with others while understanding their intentions and perspectives (Thornhill-Miller et al., 2022).

2.16.1 Assessment of Communication Skills

Assessing, both verbal and non-verbal communication skills together present challenges due to their interconnected yet distinct nature. There are numerous methods to evaluate communication but they often evaluate these aspects separately. Moreover, communication skills rely on various elements, such as motivational traits like confidence, knowledge, and cognitive or socio-cognitive capacities like verbal reasoning, emotional intelligence, and empathy (Thornhill-Miller et al., 2022). To address these complexities, diverse assessment criteria is recommended to use. These include the clarity and understanding of interactions, the satisfaction derived from effective communication, efficiency, appropriateness (contextual relevance), and dialogue quality Multiple evaluation methods are recommended, such as self-report questionnaires, “hetero-reported questionnaires” which is observer-based questionnaires, and interactive tasks like role-playing, scenarios, or video analyses (Thornhill-Miller et al., 2022).

2.16.2 Support System for the Development of Communication Skills

Communication skills are crucial to thrive in the job market but the development of this skill during academic years often does not meet the expectations of the employers. Therefore, communication needs to be given priority and train students at

all educational levels and fields (Thornhill-Miller et al., 2022). Programs for training may be conducted such as classes on communication and utilizing self-assessment tools. Additionally, students need to be given opportunities for open interaction in small groups where they can practice communication and receive feedback. The opportunities may include, projects, role-play games, etc. Moreover, a learning process that includes computers is effective when learning another language as well and it gives anonymity which helps students overcome anxiety related to public speaking. These methods deal with either single or more communication dimensions (Thornhill-Miller et al., 2022).

2.17 Collaboration

Collaboration involves working in teams and developing social networks. It includes sharing resources, and information and making decisions together as a team while respecting and giving value to each other's opinions (Indrawati, 2021). Collaboration requires a person to be flexible, adaptive, compromising, and to be able to negotiate (Ribau, 2023). There is no single widely accepted definition of collaboration. Collaboration is broadly understood as the mutual effort of individuals working together in a team to achieve a shared goal. This includes coordinated actions among team members, sharing common goals and resources. Key elements of collaboration include mutual respect, trust, shared responsibilities, and accountability (Thornhill-Miller et al., 2022). For teamwork, skills that are essential are classified into 3 groups. Knowledge involves the understanding and expertise to achieve the goals effectively. This includes familiarity with the task and the ability to apply it in collaborative settings. Behavior focuses on the practical application, coordination, interaction both within the team and with external stakeholders. Finally, right attitude towards teamwork, collaboration, team cohesion, and maintaining high morale (Thornhill-Miller et al., 2022).

2.17.1 Assessment of Collaboration Skills

Traditional methods to assess collaboration often focus on quantifying specific behaviors within an interaction, such as turn-taking or the number of interruptions. However, these indicators may not provide clear insights, as an increase or decrease in these indicators, such as the number of speakers turns or interruptions can indicate either active and intensive collaboration or may indicate that significant challenges are

faced while initiating or sustaining effective teamwork. Alternatively, qualitative approaches offer a more nuanced understanding of collaboration by connecting different elements of collaboration. For example, in Computer-Supported Collaborative Learning (CSCL), a multi-dimensional framework is used to evaluate quality of collaboration in design tasks (Thornhill-Miller et al., 2022). Five primary aspects critical for collaboration in problem-solving tasks are focused in this assessment. These include communication, task-oriented processes, group-oriented processes, symmetry in interaction and individual task orientation. This framework has now recently used and adapted to assess collaborative skills in educational games (Thornhill-Miller et al., 2022).

2.17.2 Support System for the Development of Collaboration Skills

For development of collaboration among students, educational institutions can play a crucial role in different ways. Organizational structure, tasks and activities under curriculum, curriculum on collaborative skills, and extracurricular activities or opportunities for teamwork play a key role in the development of collaboration. Moreover, advancements in digital media especially after the COVID-19 pandemic, provided increased opportunities for students and teachers to collaborate both in synchronous and asynchronous manner in educational settings (Thornhill-Miller et al., 2022). Educational institutions that have invested in technologies like computer-supported cooperative work platforms provide students with opportunities to collaborate within hybrid interaction spaces. These spaces include advanced technologies like virtual and augmented reality as well as video conferencing, voice-only communication, or text-based interfaces. However, some still prefer face-to-face interactions which is a challenge to these technologies (Thornhill-Miller et al., 2022).

2.18 Critical Summary of Literature Review

The literature review underscores the pivotal role of performance-based assessment in fostering meaningful learning experiences for students. Performance-based assessments are dynamic evaluation methods where students engage in real-life tasks to demonstrate their abilities and skills. Performance-based assessment emphasize both the process and the outcome, offering a more comprehensive assessment than traditional tests, which focus solely on students' knowledge. They are closely tied to

instruction, allowing students to engage in meaningful tasks that reflect real-world applications (Kirmizi & Komec, 2016). By engaging students in the learning and assessment processes, performance-based assessment promotes active participation and allows learners to showcase their knowledge and skills in diverse ways (Asamoah, 2019). Despite its advantages, implementing performance-based assessment is not without challenges. Defining clear evaluation criteria remains a significant obstacle, compounded by the demand for substantial time, training, and resources for educators. Addressing these barriers is crucial to optimizing the efficacy of performance-based assessment across various educational settings. Moreover, educators must balance the authenticity of tasks with feasibility, ensuring that assessments remain both meaningful and manageable (Brown, 2013). The literature on 21st century skills emphasize the increasing significance of these skills in both education and the workplace due to the rapid advancements in technology and the evolving demands of the Fourth Industrial Revolution (Laar et al., 2020). These shifts necessitate educational institutions to equip students with these skills to ensure their success in an increasingly complex labor market (Bakay, 2022). Various frameworks have emerged to define and organize these skills. For instance, the Partnership for 21st Century Learning categorizes them into three broad areas: learning and innovation skills, literacy skills, and life skills (Laar et al., 2020). The P21 Framework for 21st Century Learning is a key model designed to guide educators in integrating 21st century skills into teaching practices. The literature emphasizes the necessity of a robust support system involving standards, assessments, curriculum, and professional development to ensure that these skills are effectively cultivated (Bakay, 2022). The development of 21st century skills is not only fundamental for academic success but also crucial for preparing students to navigate the complexities of modern work environments. Educational institutions play a pivotal role in fostering these skills, as they directly influence students' ability to adapt to technological advancements and perform in diverse, collaborative, and globalized settings (Reeson et al., 2017). Performance-based assessment significantly encourages critical thinking and innovation among students, as highlighted by Makmuroh and Pratama (2022). By focusing on process, performance-based assessment fosters higher-order thinking through providing authentic learning experiences. Studies by Chinda (2014) and Diastuti et al. (2024) support performance-based assessment’s role in

bridging theory and practice while enhancing 21st century skills like collaboration, communication, and creativity. Additionally, performance-based assessment promotes teamwork and interpersonal skills (Kirmizi & Komec, 2016). It offers practical application opportunities, promoting continuous improvement (Salma & Prastikawati, 2021a).

CHAPTER 3

RESEARCH METHODOLOGY

This chapter provides a thorough outline of the research methodology employed in this study. It offers a detailed description of the systematic approach used including research design, population, sample and sampling technique, instrumentation, data collection, and data analysis.

3.1 Research Design

The research paradigm was positivist. The positivist paradigm is grounded in the belief that reality is objective and can be observed, measured, and analyzed through empirical methods. This paradigm emphasizes the use of structured data collection instruments, such as surveys or questionnaires with predefined questions. Statistical tools are then used to analyze the collected data. This structured approach ensures that conclusions are drawn based on empirical evidence rather than subjective interpretation. This study was quantitative as it involved the collection and analysis of numerical data to address research questions and test hypotheses. In this study, a correlational research design was used to explore the relationship between performance-based assessment and the development of 21st century skills among university students. The correlational design allowed the researcher to examine the strength and direction of the relationship between the two variables without manipulating them. It helps identify patterns in relationships between variables but does not form causality.

3.2 Population

The population of the study included 600 students from BS 5th, 6th, 7th and 8th semesters from the Faculty of Education at the International Islamic University, Islamabad, and the Department of Educational Sciences at the National University of Modern Languages. The researcher obtained information regarding the student population from the respective universities. The selection of these specific semesters was intentional, as students at this stage have substantial academic exposure, including exposure to a variety of assessment methods, making them suitable respondents for

exploring the relationship between performance-based assessment and the development of 21st century skills.

Table 3.1

Population of the Study

Universities		Students
International Islamic University Islamabad	Faculty of Education	256
National University of Modern Languages	Department of Educational Sciences	344
Total Population		600

3.3 Sample and Sampling Technique

The Simple Random Sampling technique was used. The sample of the study included 234 students from the BS 5th, 6th, 7th and 8th semesters from the Faculty of Education at the International Islamic University, Islamabad, and the Department of Educational Sciences at the National University of Modern Languages, according to Gay (2000).

3.4 Instrumentation

Two close-ended questionnaires were used to gather data for this study. One was a self-structured performance-based assessment questionnaire and the other was 21st century skills questionnaire adapted from Amir (2018). Both questionnaires consisted of a 5-point Likert scale from Strongly Agree to Strongly Disagree. The questionnaires were administered to BS 5th, 6th, 7th and 8th semesters from the Faculty of Education at the International Islamic University, Islamabad, and the Department of Educational Sciences at the National University of Modern Languages.

The performance-based assessment questionnaire was developed based on an extensive literature review. The questionnaire focused on five different methods of performance-based assessment. These included Portfolios, Presentations, Group Projects, Group Discussions, and Demonstrations. The questionnaire consisted of total

46 items. 1-9 were related to portfolios, 10-18 were related to presentations, 19-29 were related to group projects, 30-38 were related to group discussions and 39-46 were related to demonstrations.

Table 3.2

Distribution of Items in Performance-based Assessment Questionnaire

S.no	Dimension	Items
1.	Portfolios	1-9
2.	Presentations	10-18
3.	Group Projects	19-29
4.	Group Discussions	30-38
5.	Demonstrations	39-46

The 21st century skills questionnaire was adapted from Amir (2018). The questionnaire developed by Amir (2018) was focused on learning and innovation skills i.e., critical thinking, creativity, communication and collaboration skills of P21 Framework for 21st Century Learning. The same skills were focused in the current study. The questionnaire developed by Amir (2018) was suitable for the population of this study as it was developed for students of the same level. The original questionnaire's validity and reliability were also considered before using for this study. The original questionnaire reliability was 0.853. The original questionnaire consisted of 46 self-report items; 12 for critical thinking, 15 for creativity, 9 for communication, and 11 for collaboration skills. The instrument was adapted after taking experts' opinions and suggestions. A few items were added and a few were removed. Moreover, the language was made more understandable for the target population. The adapted instrument consisted of a total of 44 items. The 1-12 items were related to critical thinking skills, 13-25 items were related to creativity, 26-33 items were related to communication skills and 34-44 items were related to collaboration skills.

Table 3.3

Distribution of Items in 21st Century Skills Questionnaire

S.no	Dimension	Items
1.	Critical Thinking	1-12
2.	Creativity	13-25
3.	Communication	26-33
4.	Collaboration	34-44

3.5 Procedure

3.5.1 Validity

The research instruments were checked for validity and reliability before administration. This is a crucial step as a valid and reliable instrument for data collection is vital for acquiring accurate results and findings with respect to the objectives and research questions of the study. A tool or instrument is valid when it measures what it intends to measure. The validity of the instruments was verified by seeking opinions and suggestions from experts specializing in education. The experts chosen to validate the research instruments were selected based on their knowledge and experience in the fields of educational assessment, educational psychology, pedagogy, and educational research (Appendix C). Each expert possessed a robust academic background and a proven track record in higher education, which ensured that they were well-equipped to evaluate the instruments critically. Their expertise in education allowed them to assess whether the questionnaire accurately captured the constructs of performance-based assessment and 21st century skills. The experts reviewed the questionnaire for clarity, relevance, and alignment with the research objectives. Based on their feedback, the researcher modified certain items. Researcher removed and merged items, refined wordings, and corrected grammatical mistakes. After incorporating the suggested revisions, the questionnaire was subjected to a pilot test to further assess its clarity and effectiveness.

3.5.2 Pilot Testing

The pilot test was conducted before administering the questionnaire as a pretest to check the instruments' reliability and clarity. The pilot test was carried out on a small group of students from the population of the study. However, these students were not included in the actual sample of the study. During the pilot phase, participants were provided with the questionnaire and asked to complete it, while also noting any ambiguities or difficulties they encountered in understanding the items. Feedbacks from the participants were taken to make any necessary adjustments to enhance the clarity and precision of the questionnaire items. The items in the questionnaire were clear to the participants. The data collected from the pilot test were then analyzed to measure the reliability.

3.5.3 Reliability

The reliability of the instrument was measured using Cronbach's alpha. The reliability coefficient of the instrument on performance-based assessment was .949 and the reliability coefficient of the instrument on 21st century skills was .947. Cronbach's alpha values are calculated independently for each scale. This high level of reliability for both scales indicates that the items within each scale are consistently measuring the intended constructs.

Table 3.4

Reliability of Questionnaires

S.no	Instruments	Cronbach's Alpha
1.	Performance-based Assessment	.949
2.	21st Century Skills	.947

3.5 Data Collection

The researcher personally visited the universities to collect data through two close-ended questionnaires. Prior to data collection, formal permission was obtained from the respective university administrations to ensure ethical compliance and smooth facilitation of the process. The questionnaires were administered to the students during

their classesS. The collected data were handled with confidentiality and used exclusively for academic research purposes.

3.6 Data Analysis

The collected data were added to SPSS version 21. Keeping in view the objectives, the descriptive and inferential statistics were applied to analyze the collected data. The respondents' data on performance-based assessment were analyzed through mean scores. Similarly, data from 21st century skills questionnaire were analyzed through mean scores. Additionally, the relationship between performance-based assessment and 21st century skills among university students were analyzed through Pearson Product-Moment correlation (r).

3.7 Ethical Considerations

Ethical considerations are crucial in research to ensure integrity and participant protection. The researcher obtained informed consent, maintained confidentiality and anonymity, and minimized potential harm. The researcher selected participants equitably and avoid exploiting vulnerable populations. Honesty in reporting findings and managing conflicts of interest were maintained in the current study. To maintain confidentiality, the researcher ensured data was accessible only to authorized personnel. The study was ethically sound due to the researcher's adherence to these guidelines.

3.8 Limitations of the study

The male students from International Islamic University, Islamabad were not included in the study due to time and accessibility constraints. The university has separate male and female campuses.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATIONS

This chapter entails analysis and interpretation of data collected through two close-ended questionnaires consisting of 5-point Likert scale on performance-based assessment and 21st century skills. The obtained data were analyzed using descriptive and inferential statistics techniques. The chapter is divided into two sections, descriptive and inferential statistics.

For descriptive statistics, mean scores were used to analyze data. The respondents' data on performance-based assessment and 21st century skills questionnaire was analyzed through mean scores. For interpretation of mean scores, the criteria are given below

Table 4.1

Range of Mean Scores

Scale	Value	Range of Mean Score
Strongly Disagree	1	1.00 to 1.80
Disagree	2	1.81 to 2.60
Neutral	3	2.61 to 3.40
Agree	4	3.41 to 4.20
Strongly Agree	5	4.21 to 5.00

(Sözen & Güven, 2019)

For inferential statistics, Pearson Product-Moment correlation (r) was used to analyze the relationship between performance-based assessment and 21st century skills among university students.

Table 4.2

Correlation Value Range

Correlation Value Range	Nature
0.80 - 1.00	Very Strong Correlation
0.60 to 0.79	Strong Correlation
0.40 to 0.59	Moderate Correlation
0.20 to 0.39	Weak Correlation
0.00 to 0.19	Very Weak Correlation

(Napitupulu et al., 2018)

The above table illustrates the ranges of correlation coefficient values for interpreting the relationship between performance-based assessment and 21st century skills among university students.

Objective 1: To find out performance-based assessment implementation at the university level

Table 4.3

Implementation of Performance-based Assessment

Statements	N	Mean
Portfolio	234	4.0057
Presentation	234	4.0494
Group Project	234	4.0085
Group Discussion	234	4.0218
Demonstrations	234	3.9984
Performance-based Assessment	234	4.0168

The table shows the mean scores of various performance-based assessment methods. The overall mean score for performance-based assessment is 4.0168 indicating that performance-based assessments are generally well-implemented and positively regarded by students. Presentations received the highest mean score of 4.0494. Group discussions received a 4.0218 mean score. Group projects (4.0085) and portfolios (4.0057) were also highly implemented. Demonstrations had the lowest mean of 3.9984.

Objective 2: To measure 21st century skills among university students

Table 4.4

21st Century Skills

Statements	N	Mean
Critical Thinking	234	4.0377
Creativity	234	4.0207
Communication	234	4.0203
Collaboration	234	4.1197
21st Century Skills	234	4.0496

The table shows the mean scores for various 21st-century skills. The overall mean score for 21st century skills is 4.0496, indicating that these skills are generally well-developed among students. Collaboration received the highest mean score of 4.1197. Critical thinking received a mean score of 4.0377. Students also had high creativity (4.0207) and communication skills (4.0203).

Objective 3: To find out the relationship between performance-based assessment and the development of 21st century skills among university students

H_{01}: There is no significant relationship between performance-based assessment and the development of critical thinking among university students

Table 4.5

Correlation between performance-based assessment and critical thinking skills

Variables	N	Pearson Coefficient (r)	*p*-value
Performance-based Assessment	234		
		.621	.000
Critical Thinking	234		

The table presents the correlation results between Performance-Based Assessment (PBA) and critical thinking skills. The Pearson correlation coefficient between Performance-based Assessment and Critical Thinking is r=0.621, which indicates a strong positive correlation. The *p*-value is 0.000, which is less than the significance level of 0.05. This indicates that the correlation between performance-based assessment and Critical Thinking is statistically significant. Hence, the null hypothesis (H_{01}: There is no significant relationship between performance-based assessment and the development of critical thinking) is rejected. Therefore, there is a significant positive relationship between performance-based assessment and critical thinking skills.

H_{02}: There is no significant relationship between performance-based assessment and the development of creativity among university students

Table 4.6

Correlation between performance-based assessment and creativity

Variables	N	Pearson Coefficient (r)	*p*-value
Performance-based Assessment	234		
		.684	.000
Creativity	234		

The table presents the correlation results between Performance-Based Assessment (PBA) and Creativity. The correlation coefficient between performance-based assessment and creativity is r=0.684, which indicates a strong positive correlation. The *p*-value is 0.000, which is less than the significance level of 0.05. This indicates that the relationship between Performance-based Assessment and Creativity is highly unlikely to have occurred by chance. Hence, the null hypothesis (H_{02}: There is no significant relationship between performance-based assessment and the development of creativity) is rejected because the p-value of 0.000 is less than 0.05. Therefore, there is a significant positive relationship between performance-based assessment and creativity.

H_{03}: There is no significant relationship between performance-based assessment and the development of communication skills among university students

Table 4.7

Correlation between performance-based assessment and communication skills

Variables	N	Pearson Coefficient (r)	*p*-value
Performance-based Assessment	234		
		.615	.000
Communication	234		

Table 4.14 illustrates the correlation between Performance-Based Assessment (PBA) and communication skills. The Pearson r value between Performance-based Assessment and Communication is 0.615, indicating a strong positive correlation. The *p*-value is 0.000, which is less than the significance level of 0.05. This indicates that the correlation is statistically significant. Hence, the null hypothesis (H03: There is no significant relationship between performance-based assessment and the development of communication skills) is rejected because the p-value of 0.000 is less than both 0.05. Therefore, there is a significant positive relationship between performance-based assessment and communication skills.

H_{04}: There is no significant relationship between performance-based assessment and the development of collaboration skills among university students

Table 4.8

Relationship between performance-based assessment and collaboration skills

Variables	N	Pearson Coefficient (r)	*p*-value
Performance-based Assessment	234		
		.579	.000
Collaboration	234		

Table 4.15 illustrates the correlation between Performance-Based Assessment (PBA) and Collaboration skills. The Pearson r value between Performance-based Assessment and Collaboration is 0.579, indicating a moderate positive correlation. The *p*-value is 0.000, which is less than the significance level of 0.01. This indicates that the correlation is statistically significant. Therefore, the null hypothesis (H_{04}: There is no significant relationship between performance-based assessment and the development of collaboration skills) is rejected. Therefore, there is a significant positive relationship between performance-based assessment and collaboration.

H_{05}: There is no significant relationship between performance-based assessment and the development of 21st century skills among university students

Table 4.9

Relationship between performance-based assessment and 21st century skills

Variables	N	Pearson Coefficient (r)	*p*-value
Performance-based Assessment	234		
		.698	.000
21st Century Skills	234		

Table 4.16 illustrates the correlation between Performance-Based Assessment (PBA) and the development of 21st Century Skills among university students. The Pearson r value between Performance-based Assessment and 21st Century Skills is 0.698, indicating a strong positive correlation. The p-value is 0.000, which is less than the significance level of 0.05. This indicates that the correlation is statistically significant. Hence, the null hypothesis (H_{05}: There is no significant relationship between Performance-based Assessment and the development of 21st Century Skills) is rejected. Therefore, there is a significant positive relationship between performance-based assessment and 21st century skills.

CHAPTER 5

SUMMARY, FINDINGS, DISCUSSION, CONCLUSIONS AND RECCOMMENDATIONS

This chapter includes, summary of the study, findings based on analysis of data, conclusions based on results and findings and finally recommendations.

5.1 Summary

The current study "Relationship between Performance-based Assessment and Development of 21st Century Skills among University Students" is aimed to find out performance-based assessment implementation at university level and to measure 21st century skills among university students. Additionally, the study is focused on finding out on the relationship between performance-based assessment and the development 21st century skills among university students. The study was quantitative in nature and a correlational design was used to find the correlation between performance-based assessment implementation and 21st century skills among university students. The population of the study included 600 students from BS 5th, 6th, 7th and 8th semesters from the Faculty of Education at the International Islamic University, Islamabad, and the Department of Educational Sciences at the National University of Modern Languages. The Simple Random Sampling technique was used to select 234 students as sample of the study. To collect data two close-ended questionnaires were administered. A self-structured closed-ended questionnaire on performance-based assessment was used for university students. Another close-ended questionnaire adapted from Amir (2018) on 21st century skills was employed to collect data from students. Both the questionnaire consisted of a 5-point Likert scale from Strongly Agree Strongly Disagree. The validity of the instruments was verified by seeking expert opinions and suggestions. The experts were from the Faculty of Education, International Islamic University, Islamabad. A few items of the instruments were changed and a few grammatical and language mistakes were highlighted. Moreover, the pilot test was conducted before administering the questionnaire as a pretest to check the instruments' reliability and clarity. The reliability of the instrument was measured using Cronbach alpha. The reliability coefficient of the instrument on performance-based assessment was .949 and the reliability coefficient of the instrument on 21st

century skills was .947. The researcher personally visited the universities to collect data through two close-ended questionnaires. The questionnaires were administered to the students. The collected data were added to SPSS version 21. The descriptive and inferential statistics were applied to analyze the collected data based on the objectives of the study. For descriptive statistics, mean, percentage and standard deviation were used to analyze data. For inferential statistics, Pearson Product-Moment correlation (r) was used to analyze the relationship between performance-based assessment and 21st century skills among university students

5.2 Findings

Following are the findings based on analysis of data:

1. It is found that performance-based assessments are generally well-implemented and positively regarded by students, with an overall mean score of 4.0168. Presentations received the highest mean score of 4.0494. Group discussions received a mean score of 4.0218. Group projects (4.0085) and portfolios (4.0057) were also highly implemented. Demonstrations had the lowest mean score of 3.9984. (Table 4.3)
2. The results showed that 21st century skills are well-developed among students, with an overall mean score of 4.0496. The collaboration received the highest mean score of 4.1197. Students also had high critical thinking (4.0377), creativity (4.0207) and communication skills (4.0203). (Table 4.4)
3. The results showed that there is a significant positive relationship between performance-based assessment and critical thinking skills, with a *p*-value of 0.000 and r=0.621. Hence, the null hypothesis (H_{01}) is rejected. (Table 4.5)
4. It is found that there is a significant positive relationship between performance-based assessment and creativity, with a *p*-value of 0.000 and r=0.684. Therefore, the null hypothesis (H_{02}) is rejected. (Table 4.6)
5. The results illustrated there is a significant positive relationship between performance-based assessment and communication skills, with a *p*-value of 0.000 and r=0.615. Hence, the null hypothesis (H_{03}) is rejected. (Table 4.7)
6. It is found that there is a significant positive relationship between performance-based assessment and collaboration skills, with a *p*-value of 0.000 and r=0.579. Consequently, the null hypothesis (H_{04}) is rejected. (Table 4.8)

7. The results indicated a significant positive relationship between performance-based assessment and the development of 21st century skills, with a *p*-value of 0.000 and r=0.698. This indicates that greater implementation of performance-based assessment strongly supports the development of critical thinking, creativity, communication, and collaboration skills among students. Hence, the null hypothesis (H_{05}) is rejected. (Table 4.9)

5.3 Discussion

The current study is aimed to find out the performance-based assessment implementation and the relationship between performance-based assessment and the development of 21st century skills.

The findings of this study revealed that performance-based assessments were well-implemented. Students generally agreed that they were provided with clear guidelines and constructive feedback, enabling them to enhance their performance. This finding contrasts with the results of Latipah & Purnawarman (2019), where it was reported that performance-based assessment was not effectively implemented. In their study, criteria for assessment were deemed insufficient, and individual feedback was rarely provided due to time constraints (Latipah & Purnawarman, 2019). Latipah and Purnawarman emphasized that clear criteria and regular feedback are essential for the effective implementation of performance-based assessment.

Moreover, the current study's results align with findings from Salma & Prastikawati (2021a), who highlighted the importance of performance-based assessment in identifying students' strengths and weaknesses. They found that well-implemented performance-based assessment provide teachers with valuable insights into students' actual mastery of course material. Students appreciated that the clear assessment criteria allowed them to focus on specific areas for improvement, leading to a deeper engagement with learning tasks (Salma & Prastikawati, 2021a). Additionally, the results of the current study demonstrated that performance-based assessment fostered a more structured learning process including the incorporation of clear criteria, evaluation methods, and feedback.

Moreover, the study revealed that tasks such as projects and demonstrations encouraged students to think critically about their approaches. This resonates with the

findings of Makmuroh & Pratama (2022), who emphasized that a process-oriented approach in performance-based assessment not only evaluates students' skills but also encourages higher-order thinking skills such as critical thinking and analytical abilities. This aligns with the findings of Makmuroh and Pratama (2022), who highlighted the use of probing questions and discussions in performance-based assessment as mechanisms for enhancing higher-order thinking skills (HOTS) (Makmuroh & Pratama, 2022.

The findings of this study underscore the value of performance-based assessment in promoting authentic learning experiences. Students reported that the assessments not only reflected their skills more accurately but also motivated them to engage with learning materials more deeply. This aligns with the perspective of Chinda (2014), who argued that performance-based assessments provide opportunities for students to demonstrate real-world skills, bridging the gap between theoretical knowledge and practical application. The current study also revealed the diagnostic capability of performance-based assessment in highlighting the students' strengths and weaknesses. Similarly, Chinda (2014) emphasized the diagnostic power of performance-based assessments in language learning, noting that they allow teachers to evaluate students' language abilities comprehensively. Performance-based assessment aid in highlighting individual strengths and weaknesses (Chinda, 2014).

In relation to the development of 21st century skills, the current study found that performance-based assessment had a significant role in fostering critical thinking, collaboration, communication, and creativity among students. These findings align with the study by Diastuti et al. (2024), which reported strong positive impacts on critical thinking, creativity, and problem-solving skills through blended projects. The use of performance-based tasks, such as presentations, discussions, and physical demonstrations, was reported to be effective in developing students' communication skills. Salendab & Dapitan (2021) found that these tasks contributed to high levels of student advancement in target communication skills, with a mean effectiveness rating of 3.63, described as "very effective.".

Collaborative performance-based assessments, such as group discussions and group projects, develop teamwork and interpersonal skills. The findings of this study underscored the value of collaborative tasks in fostering mutual respect, adaptability,

and effective communication among peers. This is consistent with Kirmizi and Komec (2016), who found that performance-based assessments create opportunities for students to participate actively and collaboratively, enhancing their ability to work in diverse teams. Moreover, it is reported that performance-based assessments such as oral presentations and discussions were effective in developing communication skills. The study supports these findings by highlighting that performance-based assessments enable students to articulate their ideas confidently and effectively, both orally and in writing (Salendab & Dapitan, 2021).

The relationship between performance-based assessment and 21st century skills was further supported by Salma & Prastikawati (2021a), who noted that performance-based assessment provides opportunities for authentic learning experiences. They found that performance-based assessment encourages students to engage in tasks that require the practical application of knowledge, fostering skills such as critical thinking and creativity. Teachers in their study acknowledged the value of performance-based assessment in identifying students' strengths and weaknesses, which aligns with the current study's emphasis on the formative nature of performance-based assessment.

5.4 Conclusion

The following conclusions are made based on the findings:

1. Based on the findings of the study, it is concluded that performance-based assessments are highly implemented and positively regarded by the students. Presentations, group discussions, group projects, portfolios, and demonstrations were well implemented (Finding 1).
2. It is concluded, based on the results, that students have high 21st century skills, including critical thinking, creativity, communication and collaboration skills (Finding 2).
3. The study revealed a significant positive relationship between performance-based assessment and 21st century skills. A significant positive relationship was identified between performance-based assessment and critical thinking, creativity, communication skills and collaboration skills (Findings 3-7).

5.5 Recommendations

1. The findings indicate that the mean score for demonstration is lower, suggesting a need for improvement. Educational institutions may develop targeted professional development initiatives aimed at enhancing this method. This may involve mandatory training programs and workshops on the effective execution of this method. Additionally, implementing a peer mentoring system where experienced faculty observe and provide feedback on each other's assessment practices can foster continuous improvement. Institutions may also set measurable performance benchmarks and conduct regular evaluations.

2. Universities may actively involve external stakeholders such as industry experts and alumni to provide insights into the relevance and effectiveness of the skills developed through performance-based assessments. Their practical feedback can help adjust assessment strategies to better align with both current and future job market demands. This collaborative approach ensures that the 21st century skills cultivated in students remain robust, relevant, and directly applicable to real-world professional environments.

3. Additionally, based on the significant positive correlation between performance-based assessment and the development of 21st century skills, universities may scale performance-based assessment implementation. Therefore, it is recommended that universities adopt these assessments across a wider range of courses. Universities may develop a standardized framework for integrating these assessments across the curriculum. This can be achieved by establishing comprehensive guidelines and standardized rubrics that clearly define expectations for performance-based tasks. To ensure consistency across different departments, institutions may organize inter-departmental workshops where faculty can share best practices and collaboratively refine assessment strategies.

4. Moreover, it is recommended that teacher training programs emphasize the use of these assessments to better prepare future teachers in fostering critical thinking, creativity, communication, and collaboration in their own classrooms. It is therefore recommended that teacher training programs include specialized modules on performance-based assessment strategies. Partnering with experienced educators

and industry professionals to develop and deliver these modules will further ensure that the training is relevant and aligned with contemporary educational demands.

5.6 Recommendations for Future Researches

1. The current study focused on five performance-based assessment methods including portfolios, presentations, group projects, demonstrations and group discussions. Future research may focus on investigating the effectiveness of various performance-based assessment methods beyond those examined in this study, such as simulations, case studies, and digital-based assessments, in developing 21st century skills.
2. Future researchers may conduct longitudinal studies to provide deeper insights into the long-term relationship between performance-based assessments and students' critical thinking, creativity, communication, and collaboration skills.
3. Future research may be conducted to find a relationship between performance-based assessment and 21st century skills other than the one found in this study
4. Future research may compare the effectiveness of performance-based assessments in different academic disciplines to determine their adaptability and outcomes across various fields of study.
5. The current study focused on finding the relationship between performance-based assessment and the development of 21st century skills among university students. Future research may investigate the correlation between performance-based assessments and the development of 21st century skills at school and college levels to help identify the relationship at various stages of education. By examining these relationships, researchers can determine the extent to which performance-based assessments support skill acquisition and identify any differences across educational levels.
6. The current study was quantitative. A qualitative study may be conducted to explore students' and teachers' lived experiences with performance-based assessments, focusing on how these methods contribute to the development of 21st century skills such as critical thinking, creativity, communication, and collaboration.

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APPENDIX A

Questionnaire for Students

Performance-Based Assessment

Demographic Information

Name (optional) _____

Department_____

Program _____ **Semester_____**

University ☐ **IIUI**

☐ **NUML**

Note: Carefully read the statements and tick the box against each statement according to your level of agreement.

S.A	A	N	D	S.D
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

S.no	Performance-based Assessment	S.A	A	N	D	S.D
	Portfolio					
1.	I have been engaged in creating portfolio as part of my coursework.					
2.	Creating a portfolio allows me to comprehensively showcase my skills and knowledge.					
3.	The portfolio requirements are clearly explained, with guidelines on what to include.					
4.	Creating a portfolio challenges me to think creatively.					
5.	I learn effective decision-making skills through creating a portfolio.					
6.	Working on a portfolio enhances my critical thinking skills.					

7.	Creating a portfolio enables me to organize my work and present it in a structured manner for effective presentation.					
8.	The portfolio assignment encourages me to reflect on my strengths and areas for improvement.					
9.	The feedback I receive from my teachers on my portfolio submissions is helpful for my academic growth.					
Presentations						
10.	I receive clear guidelines and expectations for preparing presentations.					
11.	I receive constructive feedback from my teachers that helps me to improve my presentation skills.					
12.	Presentations on a topic enhance my confidence in public speaking and conveying information.					
13.	The presentation tasks reflect real-world skills that are useful for my future career.					
14.	The topics chosen for presentations are relevant and aligned with the course objectives.					
15.	Presentations require me to synthesize information from different sources to reach conclusions.					
16.	Presentations enhance my communication skills.					
17.	Preparing for presentations helps me to understand the depth of course content.					
18.	The presentation format allows me to creatively express my understanding of the topic.					
Group Projects						
19.	Working on group projects help me to develop teamwork and collaboration skills.					
20.	The workload for group projects is distributed fairly among team members.					
21.	The projects are challenging and improves my critical thinking abilities.					
22.	Working on group projects helps me to develop problem-solving skills.					
23.	I am encouraged to analyze and evaluate complex ideas during projects.					

24.	The feedback I receive on my project work helps me to improve my future performance.					
25.	I feel comfortable expressing and demonstrating my ideas during projects.					
26.	Project tasks are aligned with the course objectives and learning outcomes.					
27.	The project tasks allow me to connect theoretical concepts with real-world applications.					
28.	I am provided with clear instructions and objectives for completing projects.					
29.	I am given timely and consistent feedback throughout the project development process.					
Group Discussions						
30.	I feel comfortable expressing my ideas during group discussions.					
31.	Group discussions help me to critically analyze different perspectives.					
32.	Group discussions provide opportunities for everyone to participate.					
33.	I receive constructive feedback from instructors during group discussions.					
34.	I receive constructive feedback from peers during group discussions.					
35.	The group discussions are aligned with the learning objectives of the course.					
36.	Engaging in group discussions improves my communication skills.					
37.	Engaging in discussions helps me form well-reasoned arguments.					
38.	Engaging in group discussions improves my collaboration skills.					
Demonstrations						
39.	I receive clear guidelines and expectations on how to prepare and perform demonstrations from my teachers.					
40.	Demonstrating tasks or skills helps me to better understand and apply theoretical knowledge.					

41.	I receive constructive feedback on my demonstrations that helps me improve my practical skills.					
42.	The demonstrations allow me to showcase my understanding and abilities in a hands-on manner.					
43.	Engaging in demonstrations increases my confidence in performing tasks or skills related to the subject.					
44.	The skills I develop through demonstrations are valuable for my future career.					
45.	I am challenged to think creatively during demonstrations.					
46.	I am encouraged to select various methods and resources for demonstrations.					

APPENDIX B

Questionnaire for Students

21st Century Skills

Demographic Information

Name (optional) _____

Department_____

Program _____ **Semester_____**

University ☐ **IIUI**

☐ **NUML**

Note: Carefully read the statements and tick the box against each statement according to your level of agreement.

S.A	A	N	D	S.D
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

	21st Century Skills	S.A	A	N	D.A	S.D
	Critical Thinking Skills					
1.	I carefully evaluate whether my ideas are practical and can be implemented within the resources.					
2.	I evaluate the work regularly even if there are no active problems to identify potential improvements.					
3.	When I encounter an issue, I look back to the solution that worked last time.					
4.	When I come up with new ideas, I assess them critically before moving forward.					
5.	I solve problems in a conventional way using traditional methods.					
6.	I identify key questions for given problems so that I can come out of the situation effectively.					

7.	I prefer using innovative methods to solve problems.					
8.	I analyze situations thoroughly to gain clear understanding.					
9.	I consider and analyze alternative points of view before drawing a conclusion.					
10.	I effectively synthesize information to form a comprehensive understanding.					
11.	I draw conclusions based on analysis of the information I have available.					
12.	I use a variety of reasoning strategies that are suitable for the situation.					
Creativity						
13.	Whenever I encounter a problem, I think about all of its aspects.					
14.	I linked the things learned in the classroom to the practical situation.					
15.	I can generate different and unique ideas.					
16.	I try to explore the study materials to enhance my learning.					
17.	I search for the necessary and required information whenever I face a problem.					
18.	I see problems as learning opportunity to rethink and make things better.					
19.	When I face a problem, I find a solution and take the necessary actions in an orderly manner.					
20.	I take steps to avoid future problems and improve my ideas.					
21.	I often provide feedback to others.					
22.	I am open to new and innovative ideas and approaches in my learning.					
23.	If something goes wrong, I think about the possible reasons.					
24.	I have a habit of questioning to clarify my ideas.					
25.	I seek feedback from others to improve my work.					
Communication Skills						
26.	I can communicate effectively and appropriately on one-to-one basis.					

27.	I can write well-structured and grammatically correct reports to effectively convey information.					
28.	I can express my thoughts and ideas effectively using appropriate words.					
29.	I can verbally express my thoughts and ideas effectively.					
30.	I can effectively convey my thoughts and ideas using non-verbal communication skills.					
31.	I can communicate to inform and instruct others.					
32.	I can communicate to motivate others.					
33.	I can communicate effectively in diverse settings.					
Collaboration Skills						
34.	I look for common points of agreement while working in a group.					
35.	I appreciate differences of opinion in group tasks.					
36.	I share materials and resources with my group members.					
37.	I acknowledge and appreciate group members' contributions in studies.					
38.	I like to summarize discussions and reach conclusions before moving on in the group work.					
39.	I ask for help and clarification when needed during group work.					
40.	I make sure others understand the issues during group work.					
41.	I enjoy working with diverse fellows.					
42.	I am willing to compromise to achieve the group's common goals.					
43.	I take shared responsibility when working in a group.					
44.	I value the individuals' contribution of each group member.					

APPENDIX C

Experts who validated research instruments

S.no	Experts	Designations
1.	Dr. Zarina Akhtar	Assistant Professor, Department of Teacher Education, IIUI
2.	Dr. Humaira Akram	Assistant Professor, Department of Teacher Education, IIUI
3.	Dr. Fatima Batool	Assistant Professor, Department of Teacher Education, IIUI
4.	Dr. Fatima Maqsood	Assistant Professor, Department of ELM, IIUI
5.	Dr. Shamsa Aziz	Secretary, National Accreditation Council for Teacher Education Pakistan (NACTE)
6.	Ma'am Sumaira Batool	Teaching/Research Associate, Department of ELM, IIUI