CONTRIBUTION OF AUTHENTIC ASSESSMENT TASKS IN DEVELOPING CRITICAL AND INNOVATIVE THINKING SKILLS IN OPEN AND DISTANCE LEARNING ENVIRONMENT

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Abstract

In 21st century, the development and assessment of critical and innovative thinking skills is at the core of higher education level programs. For academic institutions, charged with equipping graduates to compete in today's knowledge economy with growing recognition that individuals need a wide array of skills in order to meet the needs of the modern workplace. In this context, our existing assessment procedures are unable for developing measuring these above mentioned skills and traits with traditional assessment procedures. In this context, a panel survey study was designed to examine the development of critical and innovative thinking skills through an intervention of authentic assessment tasks using learning management system (LMS). A cohort of MPhil students (N=38) was pretested and went through an intervention of two semesters in which ten different tasks were given to students for developing critical and innovative thinking skills. At the end of course assessment tasks were evaluated against a rubric to find the evidence of critical and innovative thinking skills in completing tasks and a post-test of skills was taken. Internal validity threats were controlled during intervention and reliability of scale was ensured (α=.965). The findings of the study highlighted a significant positive change in the development of students ability to draw conclusions (p= .004), decision making (p=.013) and Implementing new ideas (p=.000). The space for creativity and implementing new ideas in given assignment tasks helped students to enhance critical and innovative thinking skills using learning management system at Allama Iqbal Open University.

Key words: Look for evidence, Draw conclusions, Decision making, Implementing new ideas

Introduction

Critical thinking is goal-oriented, rational, and intentional. It is the type of thinking that goes into problem solving, drawing conclusions, estimating probabilities, and coming to conclusions (Halpern, 1998). A competent problem solver uses expert reasoning to analyze a wide range of data, identify trends, and refine the data to arrive at a problem diagnosis. Going beyond a diagnosis to a solution necessitates understanding the conceptual connections between the data and metacognition, which is the capacity to evaluate the effectiveness of a problem-solving approach and to adopt a different one if necessary (Levy and Murnane, 2004).
It involves using imagination to come up with fresh and creative ideas, including facts that doesn't app ear connected, and considering options that others might overlook (Houston, 2007).

The ability to comprehend how an entire system operates is a crucial skill in various professional and academic contexts. This competency involves recognizing the interconnectedness of various components within a system and understanding that an action, change, or malfunction in one part can significantly impact the rest of the system. Adopting a "big picture" perspective, as noted by Houston (2007), allows individuals to see beyond immediate tasks and consider how their work fits into larger processes and objectives. This holistic view is essential for effective problem-solving and strategic planning.

Furthermore, this competency encompasses several key elements, including judgment and decision-making, systems analysis, and systems evaluation. Judgment and decision-making refer to the ability to assess situations critically and make informed choices based on the available information. This requires not only knowledge of the specific system but also an understanding of broader contextual factors that may influence outcomes (Peterson et al., 1999).

Literature Review

Critical thinking is increasingly recognized as a crucial skill in the 21st century, enabling individuals to navigate complex information environments, make informed decisions, and implement innovative ideas. This literature review explores key components of critical thinking: looking for evidence, drawing conclusions, decision-making, and implementing new ideas, highlighting recent scholarly contributions to these areas.

Looking for Evidence

The ability to look for evidence is foundational to critical thinking. Facione (2022) emphasizes that critical thinkers actively seek out credible sources of information, assess the validity of arguments, and differentiate between fact and opinion. This skill is particularly vital in an age where misinformation is rampant. Research by Tindale and Baird (2023) underscores the importance of evaluating the reliability and relevance of evidence, arguing that critical thinkers employ systematic approaches to source evaluation, which leads to more informed conclusions.

Drawing Conclusions

Drawing conclusions based on evidence is another vital aspect of critical thinking. Ennis (2020) defines this process as one that involves synthesizing information and making judgments based on careful analysis. A recent study by Liu et al. (2023) found that students who engage in reflective

practices—such as journaling and group discussions—exhibit improved skills in drawing conclusions from complex data sets. This suggests that educational interventions aimed at fostering reflective thinking can enhance students' abilities to derive meaningful insights from the information they encounter.

Decision Making

Decision-making is an essential application of critical thinking skills. According to Halpern (2019), effective decision-making requires not only the ability to analyze information but also the courage to act on that analysis. A study by Andrade et al. (2022) explored the impact of critical thinking training on decision-making processes in business contexts, revealing that individuals who received such training made more informed and effective decisions. This finding highlights the significance of integrating critical thinking into professional development programs to improve decision-making capabilities.

Implementing New Ideas

The final component of critical thinking involves the implementation of new ideas based on sound reasoning and evidence. Kegan and Lahey (2020) argue that critical thinkers are not only adept at generating innovative solutions but also possess the skills necessary to implement these ideas effectively within their organizations. Recent research by McKinsey & Company (2023) indicates that organizations that foster a culture of critical thinking see higher rates of successful implementation of new initiatives, suggesting that critical thinking is essential for organizational innovation and adaptability.

The literature indicates that critical thinking encompasses several interconnected skills, including the ability to seek out and evaluate evidence, draw well-supported conclusions, make informed decisions, and implement new ideas effectively. As the information landscape continues to evolve, fostering these skills is essential for individuals and organizations alike. Educational programs and professional development initiatives must prioritize critical thinking to prepare learners for the complexities of the modern world.

Table 1

Authentic Assessment Techniques for Measuring 21st Century Skills

21st century skills*	Authentic Assessment techniques
Cognitive skill	
Non routine problem solving	Problem Based Learning(term paper and open test)
Critical thinking	Discussion boards(blogs)
Systems thinking	Quizzes

*(National Research Council, 2008).

The above presented framework was used to develop authentic assessment tasks in accordance with the critical thinking skills and its subscales.

Research Methodology

The study was quantitative in nature. A panel survey study was designed to examine the development of critical and innovative thinking skills through an intervention of authentic assessment tasks using learning management system (LMS). A cohort of MPhil students (N=38) was pretested and went through an intervention of two semesters in which ten authentic assessment tasks were given to students for developing critical and innovative thinking skills. At the end of course assessment tasks were evaluated against a rubric to find the evidence of critical and innovative thinking skills in completing tasks and a post-test of skills was taken. Internal validity threats were controlled during intervention and reliability of scale was ensured (α=.965).

Table 2

Reliability of Critical and Innovative Thinking Assessment Scale

Scales	Items (N)	Reliability (α)	Sample item
Critical and Innovative Assessment Scale	66	.965	1.I ask questions regularly in the class

Data Analysis and Results

Table 3

Descriptive and Psychometric Properties of Critical and Innovative Thinking Skills

Subscales (Number of items)	n	Min.	Max.	M	SD	Skewness	Kurtosis
1.Look for Evidence (9)	23	36.00	54.00	43.608	5.158	.112	-1.015
2.Draw Conclusion (23)	23	93.00	133.00	110.304	9.280	.655	.767
3.Decision Making (15)	23	53.00	86.00	72.652	6.945	-1.012	1.418
4. Implementing New Ideas (19)	23	78.00	108.00	91.173	8.032	.448	-.323

The results were found in the acceptable range of skewness and kurtosis for the normal data.
Inferential statistics were used to compare the pre-test and post-test mean scores of students on the critical and innovative thinking scale.

Table 4

Pre-test Post-test Mean Score Differences on the Basis of Critical and Innovative Thinking Skills of MPhil Students

Subscale	Groups	n	*M*	SD	*t*	*df.*	*p*
1.Look for Evidence	Pretest	21	40.0952	5.35235	1.913	20	.070
	Post-test	21	43.6190	8.44337			
2.Draw Conclusion	Pretest	21	98.3810	9.58893	2.902	20	**.004**
	Post-test	21	110.6190	17.02491			
3.Decision Making	Pretest	20	64.2000	7.20088	2.622	19	**.013**
	Post-test	20	72.8000	13.18931			
4. Implementing New Ideas	Pretest	20	83.0000	8.14087	2.228	19	**.000**
	Post-test	20	90.8000	14.48774			

Paired sample t-test was conducted to measure change in the level of critical and innovative thinking skills after going through an intervention of completing authentic assessment tasks. The findings of the study highlighted a significant positive change in the development of students ability to draw conclusions (p= .004), decision making (p=.013) and Implementing new ideas (p=.000). The space for creativity and implementing new ideas in given assignment tasks helped students to enhance critical and innovative thinking skills using learning management system at Allama Iqbal Open University, Islamabad.

Discussion

The findings from the research on authentic assessment tasks provide compelling evidence for the efficacy of these tasks in enhancing critical and innovative thinking skills among students. The results, obtained through a paired sample t-test, indicate significant improvements in students' abilities to draw conclusions (p = .004), make decisions (p = .013), and implement new ideas (p = .000) after engaging in authentic assessment interventions. These findings underscore the importance of incorporating authentic assessments into educational practices, particularly in a digital learning environment like that at Allama Iqbal Open University, Islamabad.

Enhancing Conclusion Drawing Skills

The significant improvement in students' capacity for inference indicates that authentic assessment assignments successfully stimulate higher-order thinking in kids. Before reaching well-reasoned conclusions, students must frequently study difficult situations, synthesize data from multiple sources, and assess supporting evidence. Students seem to be able to practice and hone these skills in an atmosphere that is both organized and flexible, thanks to authentic assessments. This is consistent with previous research that highlights how realistic assessments foster critical thinking and deeper learning (Gulikers, Bastiaens, & Kirschner, 2009). By actively engaging with real-world problems, students can develop the analytical skills necessary for drawing sound conclusions, which are vital for academic success and professional readiness.

Improved Decision-Making Abilities

Effective decision-making is a crucial skill in both academic and professional situations, thus the positive change in decision-making abilities (p =.013) is especially significant. Real-life circumstances are frequently simulated in authentic assessment activities, which force students to weigh several options and think through the consequences of their decisions. In addition to improving decision-making abilities, this experiential learning strategy cultivates a sense of responsibility for the results of their choices. The chance to consider their decisions and gain knowledge from the outcomes is priceless, especially in a learning management system that encourages iteration and feedback. According to Facione (2022), developing critical thinking skills requires partaking in such reflective activities.

Creativity and Implementation of New Ideas

The significant improvement in students' capacity to apply novel concepts is arguably the most remarkable discovery (p =.000). This suggests that there was room for creativity and innovation in the authentic assessment activities. The assignments create an atmosphere where creativity can thrive by pushing students to investigate and use their concepts in real-world situations. This experience was probably improved by the learning management system's incorporation of technology and collaboration capabilities, which allowed students to exchange ideas and get helpful criticism from teachers and peers. The capacity to create and put new ideas into practice is a skill that schools need to emphasize since creativity is becoming more and more crucial in today's workforce.

Implications for Teaching Practice

The research's conclusions have important ramifications for Allama Iqbal Open University's and other educational institutions' instructional strategies. More real assessment problems should be included in curriculum since they not only support critical thinking objectives but also increase student enthusiasm and engagement. Moreover, the utilization of digital platforms for evaluation might offer chances for cooperation and creativity, which are crucial elements in cultivating 21st-century abilities. The beneficial results of this study demonstrate the importance of real-world assessment tasks in fostering critical and creative thinking abilities. Fostering these abilities through real-world learning experiences will be essential for equipping students to handle challenging situations in their futures as education continues to change in response to employment demands and technological improvements. As education continues to evolve in response to technological advancements and changing workforce demands, fostering these skills through authentic learning experiences will be crucial for preparing students to navigate complex challenges in their academic and professional lives.

It can be concluded from the results that authentic assessment tasks may help the students to improve their critical and creative thinking skills. Learning management system provides the space to use 21st century tools to gather and interpret information and use it in more creative way. But Sometimes the lack of having appropriate ICT skills create hindrance to exhibit critical and creative abilities while working on learning management system or working online.

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