


Chapter 10

Artificial Intelligence (AI) and Critical Thinking Endorsement: Investigating Higher Education Institutional Tools and Strategies

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ABSTRACT

In the aftermath of COVID-19, colleges and universities have faced many challenges that negatively impacted students' Critical Thinking (CR). Integrating Artificial Intelligence (AI) into learning and teaching processes positively affects learners' self-efficacy, motivation, and regulated learning abilities. Artificial Intelligence (AI) has increasingly become a transformative educational power, offering unprecedented opportunities to enhance learning experiences and outcomes. This literature review examines the effects of AI-assisted learning applications on Critical Thinking skills in higher education. It provides valuable presentations of AI tools, Critical Thinking elements, and research-based strategies to integrate AI technologies properly into higher education classrooms. The review also addresses the negative impact of excessive use of AI on developing learners' independent problem-solving abilities. Therefore, balanced integration is crucial to ensure the use of AI as a complement in the teaching process. The report, therefore, suggests a more robust framework promoting CR skills in synthesizing AI-generated information. The implications of the findings were discussed, and pedagogical strategies were recommended to

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prepare students for the challenges of AI-driven knowledge. Additionally, educators' guided grids were shared to stimulate self-reflection, increase awareness of learning progress, and make performance levels visible.

INTRODUCTION

Technology has hit its boiling point, yet students are yearning for more—empathy, understanding, and connections that make them feel seen, heard, and understood. For competitiveness in the midst of rapid changes in societies, students require core academic knowledge and an understanding of twenty-first-century skills such as critical thinking, problem-solving, creativity, innovation, communication, and collaboration. Critical thinking is at the heart of the educational curriculum and is understood to mean reasonable reflective thinking focused on deciding what to believe or do. Norris and Ennis classified CR into six elements: 1) determining the credibility of sources and observations, 2) inferring and judging deductive conclusions, 3) definitions and identification of assumptions, 4) planning induction experiments and predicting probable consequences, 5) inferring and judging inductive conclusions and 6) semantics (Wannapiroon, 2008). Developing CR skills in higher education classes is an indicator of the program's effectiveness and success toward quality education.

Researchers investigate a variety of pedagogical teaching tools to deepen CR teaching. Research has revealed that students' critical thinking abilities are significantly higher when taught through inquiry-based learning than traditional teaching methods (Wongkam et al., 2014). Additionally, the institutional instructional model shapes the effectiveness of CR in teaching and learning. For example, the model provides educators with the tools to foster the whole student body. It includes five stages: First, engagement: Teachers assess their students' prior knowledge and engage them in new conceptual discussions to promote curiosity and elicit new knowledge. Second, Exploration: The teachers provide students with several cooperative exploration activities designed to help them use their prior knowledge in different contexts to generate new related ideas, explore new questions, and conduct new investigations. Third, Explanation: During this stage, students focus on new explorations and opportunities to demonstrate conceptual understanding and processing skills with the teachers' guidance and scaffolding. Fourth, elaboration: Teachers challenge their students with a new conceptual understanding of Thoreau's new related experiences, such as using case studies reflecting the context of the content in practicality. Fifth, evaluation, teachers encourage their students to assess their understanding and abilities and provide opportunities for assessing the progress of their students' achievement toward educational objectives (Bybee et al., 2014).

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