Linking Higher Education to Workplace Competence: The Impact of Critical Thinking and Problem-Solving Skills on Decision-Making Effectiveness

Respect Vudzijena*, Tawanda Prosper Mushayavanhu, Agatha Kunzekwenyika

Technopreneurship Development Centre
School of Business and Management Sciences
Harare Institute of Technology, Zimbabwe

Abstract:
The transition from higher education to the workplace continues to expose a persistent skills gap between academic preparation and professional practice. Although universities emphasise critical thinking and problem-solving as essential twenty-first-century competencies, questions remain regarding how effectively graduates retain and apply these skills in real-world decision-making contexts. This study investigates the relationship between critical thinking, problem-solving ability, and workplace decision-making effectiveness among 350 participants, including undergraduate and postgraduate students, academic staff, and industry professionals across various economic sectors in Zimbabwe. Employing two validated instruments, the Critical Thinking and Problem-Solving Skills Questionnaire (CTPSSQ) and the Decision-Making Competency Questionnaire (DMCQ), the study reveals strong positive correlations between critical thinking and decision-making effectiveness and between problem-solving skills and decision-making effectiveness. Regression analysis indicates that critical thinking significantly predicts workplace decision-making effectiveness, accounting for 41% of the variance in outcomes. Participants affirmed that employers highly value these competencies, yet emphasised the need for continuous reinforcement through workplace learning. The findings suggest that while higher education establishes a strong foundation for critical thinking, its sustained effectiveness depends on collaborative efforts between academia and industry. The study recommends embedding inquiry-based, project-oriented, and interdisciplinary pedagogies across curricula and fostering structured academic–industry partnerships to strengthen graduate employability and adaptive decision-making in complex professional environments.

1.0 Introduction and background

The acquisition of critical thinking and problem-solving skills in higher education is increasingly recognised as essential for effective decision-making in both personal and professional contexts. This educational focus is driven by the need for graduates to navigate complex global challenges, adapt to rapid changes and make informed choices in uncertain environments. In a world characterised by information overload and swift technological advancements, the ability to critically evaluate information and devise effective solutions has become indispensable. Kocsis and Pusztai (2025) emphasise that critical thinking encompasses not only the ability to analyse and synthesise information but also the disposition to engage in reflective thinking, which is vital for making sound judgments. As such, educational institutions are tasked with equipping students with these essential skills to ensure their success and adaptability in an increasingly complex landscape. Critical thinking is defined by Francis, Jones and Smith (2024) as a reflective, metacognitive process that involves reasoning, analysis and judgment, enabling individuals to evaluate information and arrive at sound conclusions critically. This process includes key components such as analysis, which involves breaking down complex information into manageable parts; evaluation, which assesses the credibility and relevance of information; inference, which draws logical conclusions from available evidence and synthesis, which

integrates diverse viewpoints and data to form a coherent understanding. These skills empower individuals to engage effectively with information and arguments, making them invaluable in both academic and professional settings. Research by Zhao (2025) has shown that students who are trained in critical thinking are better equipped to face the demands of the modern workforce, as they can navigate ambiguity and complexity more efficiently. Moreover, the ability to think critically enhances students' capacity for lifelong learning, enabling them to adapt to changing circumstances and continue growing throughout their careers. Problem-solving skills are defined as the abilities that enable individuals to identify, analyse, and develop solutions to various challenges. This systematic approach involves several stages, including problem identification, where one recognises and defines the issue; analysis, which seeks to understand the root causes and context of the problem; solution generation, which entails brainstorming potential solutions based on evidence and creativity; and implementation, where the chosen solution is executed and its effectiveness monitored. Effective problem solvers combine logical reasoning with creativity, allowing them to tackle real-world issues more effectively (Doris M. and Brennan, 2018). The interdependence of critical thinking and problem-solving skills is evident, as successful problem-solving requires the application of critical thought to analyse potential solutions and assess their implications. This synergy is particularly important in professional domains such as healthcare, engineering, and business, where decision-making often necessitates a blend of analytical and creative thinking.

According to Brundiers et al. (2021), decision-making is a vital outcome of both critical thinking and problem-solving. It involves making choices by identifying a decision, gathering relevant information and evaluating alternative solutions. Informed decision-making heavily depends on the ability to analyse situations and consider the potential consequences of different actions. This trio of skills, critical thinking, problem-solving and decision-making, forms the foundation for effective leadership and responsible citizenship. Researchers have observed that developing these skills in students not only prepares them for immediate academic challenges but also equips them to assume leadership roles in their future careers. For example, Sailer et al. (2021) indicate that professionals who practice reflection are better prepared to lead teams, make strategic decisions, and foster innovative solutions within their organisations. Educational frameworks are increasingly designed to promote critical thinking through various teaching methods. For instance, incorporating inquiry-based learning encourages students to ask questions, seek answers and deeply engage with the material, thereby promoting higher-order thinking skills (Hwang and Oh, 2021). This pedagogical shift is supported by educational theorists who argue that active learning environments facilitate deeper cognitive engagement, enabling students to build their understanding and apply knowledge practically. Such approaches not only improve academic performance but also prepare students for lifelong learning, an essential skill in today's fast-paced and constantly changing job market. The emphasis on critical thinking in curricula reflects a broader recognition of these skills' importance in promoting educational equity and social responsibility. Problem-solving skills are inherently linked to critical thinking, as both involve cognitive processes needed to overcome challenges. Effective problem solvers utilise critical thinking to analyse issues, consider alternatives and anticipate potential outcomes (Schei et al., 2024). This synergy is crucial across various professional fields, where decision-making often combines analytical and creative thinking. Research shows that fostering problem-solving skills in education correlates with better academic results and workforce readiness. Educators play a vital role in developing students' critical thinking and problem-solving abilities. Effective teaching strategies that encourage inquiry, discussion and reflection can significantly improve students' cognitive skills. Collaborative learning environments, for example, improve critical thinking by allowing students to engage with diverse perspectives and challenge their assumptions. Consequently, the role of teachers shifts from being mere knowledge providers to facilitators who guide students in their exploration of ideas. This change requires rethinking teaching methods, emphasising the creation of inclusive and supportive environments that foster active participation and meaningful dialogue.

Despite the growing emphasis on critical thinking and problem-solving skills in tertiary education, there is limited empirical evidence demonstrating how these skills directly influence students' decision-making effectiveness. While critical thinking is widely promoted as a key educational outcome, its practical contribution to effective decision-making remains underexplored, particularly within structured educational settings. Existing studies tend to discuss critical thinking and decision-making as conceptually related constructs, yet few have systematically examined the strength and significance of the relationship between

them. As a result, assumptions about the role of critical thinking in enhancing decision-making effectiveness are often based on theoretical arguments rather than empirical validation.

Furthermore, although educational frameworks increasingly aim to foster critical thinking, there is insufficient clarity on whether improvements in critical thinking skills translate into measurable gains in students' ability to make informed, rational, and effective decisions. This gap limits educators' and policymakers' ability to design evidence-based interventions that explicitly link instructional practices to decision-making outcomes. Addressing this gap is essential for understanding whether the development of critical thinking skills meaningfully contributes to effective decision-making in educational contexts.

Accordingly, the broad aim of this study was to examine the relationship between critical thinking skills and decision-making effectiveness. The study specifically sought to determine whether a statistically significant association exists between these two constructs, thereby providing empirical evidence to support or refute the assumed role of critical thinking in effective decision-making. The following hypotheses were therefore tested:

H1: There is a positive and significant relationship between critical thinking skills and decision-making effectiveness.

H2: There is a positive and significant relationship between problem-solving skills and decision-making effectiveness.

2. Literature Review
2.1 Critical thinking and problem-solving skills
The two skills are foundational competencies essential for success in the rapidly evolving landscape of the 21st century. Critical thinking and problem-solving skills not only enhance academic performance but also empower graduates to navigate complex life situations and make informed decisions in the workplace. Various theoretical and pedagogical approaches underpin the development of these skills, each contributing to a comprehensive understanding of how they can be fostered in tertiary education.

2.2 Pedagogical approaches that enhance critical thinking and problem-solving skills
2.2.1 Project-Based Learning (PBL)
Numerous studies have demonstrated that project-based learning significantly enhances students' critical thinking abilities. Thomas (2000) conducted a comprehensive review of research on PBL and found that students engaged in this method exhibited higher levels of critical thinking compared to their peers in traditional learning environments. PBL immerses students in real-world problems, requiring them to investigate, collaborate, and create solutions. A recent study by Mohamed et al. (2022) highlighted that PBL not only improves critical thinking but also fosters a sense of ownership and responsibility among students, further enhancing their problem-solving capabilities.

2.2.2 Collaborative Learning
Collaborative learning strategies have also been shown to promote critical thinking and problem-solving skills. Johnson et al. (2014) conducted a meta-analysis highlighting the benefits of cooperative learning environments. Their findings revealed that students working in groups outperformed those who learned individually in terms of critical thinking and problem-solving abilities. More recent research by Hsu and Shiue (2017) supports these findings, showing that structured collaborative activities significantly enhance students' analytical skills and their ability to approach complex problems from various perspectives.

2.2.3 Assessment Techniques
The role of assessment in fostering critical thinking and problem-solving skills cannot be understated. Formative assessment strategies, such as peer review and reflective journals, have been shown to enhance students' critical thinking abilities. Sadler (1989) emphasised that feedback mechanisms facilitate self-regulation and metacognition, essential components of developing problem-solving skills. A recent study by Wilkerson (2024) further supports the notion that timely and constructive feedback significantly boosts students' critical thinking skills, leading to improved decision-making in academic contexts.

2.2.4 Technology-Enhanced Learning

The integration of technology in education has emerged as a powerful tool for enhancing critical thinking and problem-solving skills. Kay and LeSage (2009) found that the use of digital tools, such as simulations and interactive learning environments, fosters higher-order thinking skills. Recent research by Chai et al. (2021) demonstrated that technology-enhanced learning environments, including virtual and augmented reality, provide immersive experiences that challenge students to think critically and solve complex problems in innovative ways. This aligns with the growing recognition of technology's role in modern education, especially in developing critical thinking skills among digital natives.

2.2.5 Interdisciplinary Approaches

Recent studies have also highlighted the importance of interdisciplinary approaches in developing critical thinking and problem-solving skills. A study by Murray and Doe (2025) found that integrating disciplines such as science, technology, engineering, and mathematics (STEM) with the humanities not only enhances critical thinking but also prepares students for real-world challenges by encouraging them to draw connections across various fields. This holistic approach promotes a broader understanding of complex problems and fosters innovative solutions.

2.3 Theoretical foundations

2.3.1 Bloom's Taxonomy

Initially created by Benjamin Bloom and his colleagues in the mid-20th century, Bloom's Taxonomy classifies cognitive skills into a hierarchy, ranging from lower-level skills such as remembering and understanding to higher-order skills like applying, analysing, evaluating, and creating (Bloom, 1956). This framework highlights the importance of fostering critical thinking skills as students advance through their education. By designing curricula that challenge students to engage in higher-order thinking tasks, educators can support the development of critical thinking skills essential for effective decision-making. For example, assignments that require students to evaluate arguments or develop innovative solutions to problems can greatly enhance their analytical capacities.

2.3.2 Constructivist Learning Theory

Rooted in the works of theorists like Jean Piaget and Cole, constructivist learning theory posits that learners construct knowledge through their experiences and reflections (Piaget, 1976; Cole and Scribner, 1978). This approach fosters an environment where students are encouraged to actively engage with content, collaborate with peers, and reflect on their learning processes. Constructivism emphasises the importance of social interactions and cultural context in shaping cognitive development, which is critical for cultivating both critical thinking and problem-solving skills. In a constructivist classroom, students work on real-world problems, allowing them to apply theoretical knowledge in practical situations, thereby enhancing their decision-making capabilities.

2.3.3 Cognitive Load Theory

Introduced by John Sweller in the late 1980s, cognitive load theory suggests that the effectiveness of learning is influenced by the amount of information that learners can process at one time (Sweller, 1988). This theory has significant implications for instructional design, as it highlights the need to minimise extraneous cognitive load to maximise the cognitive resources available for learning. Effective teaching strategies that align with cognitive load theory can enhance students' critical thinking and problem-solving skills by promoting deeper understanding and retention of complex information. For example, breaking down complex tasks into manageable components can help students focus on critical aspects of problem-solving, leading to more effective decision-making.

4. Methodology

This study employed a quantitative research design to assess the acquisition of critical thinking and problem-solving skills in tertiary education and its impact on effective decision-making in the workplace. The participants in this study included academic staff, undergraduate and postgraduate students from diverse academic disciplines at tertiary institutions in Zimbabwe and industry experts from various sectors of the economy. Random and stratified random sampling techniques were used to ensure representation across fields of study, study levels, demographics, institutions and industries. According to Brundiers et al. (2021), this approach enhances the generalizability of the findings. A sample size of 200 students, 100 lecturers and

50 industry experts was used in the study. Standardised Critical Thinking and Problem-Solving Skills (CTPSSQ) and a Decision-Making Competency Questionnaire (DMCQ) were administered electronically to assess participants' self-reported critical thinking and problem-solving abilities and to evaluate participants' decision-making effectiveness. The questionnaire included Likert-scale items measuring various dimensions of these skills. The descriptive and inferential statistics were analysed using IBM SPSS version 27. Correlation analysis and regression analysis to determine the relationships between critical thinking, problem-solving skills, and decision-making effectiveness. As Mitchell et al. (2018) suggest, these statistical methods provide a robust framework for understanding complex interactions among variables. This study adhered to ethical guidelines to ensure the protection of participants' rights and well-being. Informed consent was obtained from all participants, and their anonymity and confidentiality were maintained throughout the research process. According to Mitchell et al. (2018), maintaining ethical standards is paramount in educational research to protect participants and uphold the integrity of the study.

This study employed a structured data collection process to assess the relationship between critical thinking skills acquired in higher education and decision-making effectiveness in the workplace. Three categories of participants were engaged: undergraduate students (n=200), lecturers (n=100) and industry experts (n=50). Stratified random sampling ensured that participants represented diverse academic disciplines, levels of study, and professional backgrounds. Two primary research instruments were administered electronically.

Critical Thinking and Problem-Solving Skills Questionnaire (CTPSSQ): This standardised tool captured participants' perceptions of their critical thinking abilities across dimensions such as analysis, evaluation, inference, and synthesis. Decision-Making Competency Questionnaire (DMCQ): This measured decision-making effectiveness in professional and academic contexts, focusing on information processing, option evaluation, and outcome monitoring. Both questionnaires utilised 5-point Likert-scale items ranging from *strongly disagree (1)* to *strongly agree (5)*. The instruments were validated through pilot testing, and Cronbach's alpha reliability coefficients exceeded the acceptable threshold of 0.70. The quantitative data collected were processed using IBM SPSS Statistics Version 27. The analysis followed three steps: Descriptive Statistics were computed to summarise demographic variables, mean scores, and standard deviations for critical thinking and decision-making measures. Correlation Analysis was conducted to test the strength and direction of the relationship between critical thinking skills and decision-making effectiveness. Regression analysis was employed to determine the predictive power of critical thinking skills on decision-making effectiveness while controlling for demographic characteristics such as age, gender, and field of study. Additionally, factor analysis confirmed the construct validity of the measurement scales, and reliability analysis ensured internal consistency.

5. Results
5.1 Demographic Characteristics
Table 1 presents the demographic profile of the respondents. The sample was diverse in terms of gender, academic background, and professional experience.

Table 1: Demographic Characteristics of Respondents

Characteristic	Category	Frequency (n=350)	Percentage (%)
Gender	Male	198	56.6
	Female	152	43.4
Age	20–24	120	34.3
	25–29	96	27.4
	30–34	80	22.9
	35 and above	54	15.4
Role	Undergraduate student	200	57.1
	Lecturer	100	28.6
	Industry expert	50	14.3

Descriptive Statistics
The descriptive statistics of the key study variables are presented in Table 2. The table presents the descriptive statistics of the study variables. Respondents reported relatively high levels of critical thinking

skills (M = 3.89, SD = 0.74), problem-solving skills (M = 3.95, SD = 0.70), and decision-making effectiveness (M = 4.02, SD = 0.71). These results suggest that participants generally perceive themselves as competent in critical thinking and problem-solving, and as effective in making decisions. Reliability analysis indicated strong internal consistency for all three scales, with Cronbach's alpha coefficients exceeding the recommended threshold of 0.70.

Table 2: Descriptive Statistics and Reliability of Study Variables

Variable	N	Mean	Std. Deviation	Std. Error Mean	Cronbach's α
Critical Thinking Skills	350	3.89	0.74	0.04	0.84
Problem-Solving Skills	350	3.95	0.70	0.04	0.81
Decision-Making Effectiveness	350	4.02	0.71	0.04	0.86

Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships among the study variables. Results, presented in Table 3, indicate strong positive correlations between critical thinking skills and decision-making effectiveness (r = 0.642, p < 0.01), as well as between problem-solving skills and decision-making effectiveness (r = 0.601, p < 0.01). Critical thinking skills also showed a significant positive correlation with problem-solving skills (r = 0.587, p < 0.01). These findings provide initial support for the study hypothesis (H1).

Table 3: Correlation Matrix, Descriptive Statistics and Reliability Estimates

Variable	Mean	SD	α	1	2	3
Critical Thinking Skills	3.89	0.74	0.84	1		
Problem-Solving Skills	3.95	0.70	0.81	0.587**	1	
Decision-Making Effectiveness	4.02	0.71	0.86	0.642**	0.601**	1

*N = 350; ** Correlation is significant at the 0.01 level (2-tailed).*

Regression Analysis

To further test the predictive relationship between critical thinking skills and decision-making effectiveness, a linear regression analysis was conducted. As shown in Table 4, critical thinking skills significantly predicted decision-making effectiveness ($\beta = 0.642$, t = 16.66, p < 0.001), accounting for 41% of the variance in decision-making outcomes ($R^2 = 0.41$). These results confirm the study hypothesis (H1), demonstrating that higher levels of critical thinking acquired in higher education leads to more effective workplace decision-making. Regression analysis was conducted to test whether critical thinking skills predict decision-making effectiveness. The results are presented in Table 4.

Table 4: Regression Analysis of Critical Thinking on Decision-Making Effectiveness

Model	Unstandardized Coefficients (B)	Std. Error	Standardised Coefficients (Beta)	t	Sig.

(Constant)	1.214	0.187	–	6.49	0.000
Critical Thinking Skills	0.683	0.041	0.642	16.66	0.000

$R^2 = 0.41$; Adjusted $R^2 = 0.41$; $F (1, 348) = 277.55$, $p < 0.001$

Table 5: Regression Analysis of Problem Solving on Decision-Making Effectiveness

Model	Unstandardized Coefficients (B)	Std. Error	Standardised Coefficients (Beta)	t	Sig.
(Constant)	1.276	0.194	–	6.58	0.000
Problem-Solving Skills	0.659	0.043	0.624	15.23	0.000

$R^2 = 0.39$; Adjusted $R^2 = 0.39$; $F (1, 348) = 231.84$; $p < 0.001$

A simple linear regression analysis was conducted to examine the effect of problem-solving skills on decision-making effectiveness. The results shown in table 5 indicate that problem-solving skills significantly and positively predict decision-making effectiveness. The regression model was statistically significant, $F (1, 348) = 231.84$, $p < 0.001$, explaining 39% of the variance in decision-making effectiveness ($R^2 = 0.39$; Adjusted $R^2 = 0.39$). Problem-solving skills had a positive and statistically significant effect on decision-making effectiveness ($B = 0.659$, $\beta = 0.624$, $t = 15.23$, $p < 0.001$). This implies that an increase in problem-solving skills is associated with a corresponding increase in decision-making effectiveness

Respondents' Perception of Critical Thinking and Workplace Decision-Making
Participants were asked to rate their perceptions of how critical thinking skills acquired in higher education contribute to workplace readiness and effective decision-making. A 5-point Likert scale was used (1 = Strongly Disagree (SD), 2 = Disagree (D), 3= Neutral (N), 4=Agree (A) and 5 = Strongly Agree (SA).

Table 6: Respondents' Perceptions on Critical Thinking and Workplace Decision-Making

Statement	(1) SD	(2) D	(3) N	(4) A	(5) SA	Mean	Std. Dev.
Critical thinking skills acquired at university are relevant to workplace decision-making.	12 (3.4%)	18 (5.1%)	42 (12.0%)	168 (48.0%)	110 (31.4%)	3.99	0.92
Problem-solving training during higher education improves graduates' confidence in making workplace decisions.	10 (2.9%)	15 (4.3%)	38 (10.9%)	172 (49.1%)	115 (32.9%)	4.06	0.88
Exposure to project-based and collaborative learning enhances decision-making effectiveness in real job contexts.	8 (2.3%)	20 (5.7%)	47 (13.4%)	160 (45.7%)	115 (32.9%)	4.01	0.90
Continuous reinforcement of critical thinking in the	14 (4.0%)	22 (6.3%)	51 (14.6%)	150 (42.9%)	113 (32.3%)	3.93	0.96

workplace sustains effective decision-making.							
Employers value graduates with strong critical thinking and problem-solving skills.	9 (2.6%)	12 (3.4%)	35 (10.0%)	162 (46.3%)	132 (37.7%)	4.13	0.83

N = 350 respondents.

The Likert evaluation indicates that most respondents agreed or strongly agreed that critical thinking and problem-solving skills acquired in higher education are vital for workplace competence. The highest-rated statement (Mean = 4.13, SD = 0.83) highlights those employers strongly value these skills, while the lowest-rated (Mean = 3.93, SD = 0.96) still indicated general agreement, emphasising the need for continuous reinforcement in the workplace.

Table 7: Respondents' Perception of the Impact of Critical Thinking on Decision-Making Effectiveness

Area of Evaluation	N	Minimum	Maximum	Mean	Std. Deviation
Relevance of critical thinking skills to workplace decision-making	350	2.00	5.00	3.987	0.684
Confidence in making workplace decisions due to problem-solving training	350	2.00	5.00	4.136	0.612
Effectiveness of project-based and collaborative learning in preparing students for workplace decision-making	350	2.00	5.00	4.041	0.657
Importance of continuous reinforcement of critical thinking in the workplace	350	2.00	5.00	3.928	0.702
Employers' valuation of graduates with strong critical thinking and problem-solving skills	350	3.00	5.00	4.257	0.595
Overall satisfaction with the critical thinking preparation received in higher education	350	2.00	5.00	4.110	0.641

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

Based on Table 7, a mean value of 3.99 suggests that respondents generally agreed that critical thinking skills acquired in higher education are relevant to workplace decision-making. This alignment reflects participants' recognition that the ability to analyse, evaluate, and synthesise information is crucial for making informed professional choices. With an average rating of 4.13, participants strongly agreed that problem-solving training during higher education enhances their confidence in making workplace decisions. This result suggests that pedagogical methods emphasising case studies, projects, and real-world problem-solving scenarios provide students with transferable competencies.

An average score of 4.04 indicated broad consensus that project-based and collaborative learning methods effectively prepare students for workplace decision-making. This reflects the benefits of teamwork and peer engagement in developing practical decision-making skills. The mean of 3.93 showed that respondents agreed on the importance of continuous reinforcement of critical thinking in the workplace. While higher education lays the foundation, ongoing professional practice is necessary for sustained competence. Employers' valuation of graduates with strong critical thinking and problem-solving skills recorded the highest mean (4.26), confirming that industry stakeholders prioritise these competencies. This underscores the alignment between academic preparation and workplace demands. Finally, with a mean of 4.11, respondents expressed high satisfaction with the preparation they received in higher education for decision-

making roles. This satisfaction stems from the combination of theory and practice provided during their academic programs.

Discussion

This study examined the relationship between critical thinking skills and problem-solving skills acquired in higher educzion and decision-making effectiveness in the workplace. A total of 350 respondents, comprising students, lecturers, and industry experts, participated in the study. Standardised instruments were employed to measure critical thinking, problem-solving and decision-making competencies. The results revealed a significant positive relationship between critical thinking, problem solving skills and decision-making effectiveness, with regression analysis showing that critical thinking skills accounted for 41% of the variance in decision-making outcomes. This finding supports the work of Zhao et al. (2025), who emphasised that higher education must equip students with critical reasoning to enable effective navigation of workplace challenges. Similarly, Brundiers et al. (2021) argued that decision-making, as a vital professional outcome, depends heavily on the acquisition of critical thinking and problem-solving skills during the academic phase.

Several factors may explain the strong predictive power of critical thinking on workplace decision-making. According to Kocsis and Pusztai (2025), higher education environments that emphasise reflective analysis, inquiry-based learning, and problem-based projects foster deeper cognitive engagement, which students later transfer to professional contexts. The findings of this study confirm that exposure to project-based and collaborative learning significantly prepares graduates to address complex workplace decisions. This aligns with Murray and Doe (2025), who noted that interdisciplinary, practice-oriented approaches strengthen students' analytical capabilities and decision-making competence.

The perception analysis further reinforced these results. Respondents strongly agreed that employers value graduates with well-developed critical thinking and problem-solving skills (M = 4.26). This perception confirms prior research by Sailer et al. (2021), who emphasised that organisations increasingly demand employees capable of reflective judgment, innovative thinking, and sound decision-making under uncertain conditions. Likewise, Dean and Wright (2017) highlighted that structured collaborative learning enhances critical analysis and prepares students for professional problem-solving.

Interestingly, while respondents acknowledged the foundational role of higher education, they also agreed (M = 3.93) that continuous reinforcement of critical thinking in the workplace is essential. This suggests that while universities initiate the development of critical competencies, employers and professional environments must sustain and build upon these skills to ensure long-term effectiveness. This observation resonates with the findings of Schei et al (2024), who emphasised that critical thinking deteriorates if not consistently practised in authentic contexts.

The satisfaction expressed by participants with their higher education preparation (M = 4.11) highlights the adaptability of pedagogical strategies in developing critical thinking. As Leijon et al. (2022) argue, active learning strategies appeal to diverse learning styles and ensure comprehensive development of competencies that extend beyond academic performance into workplace application.

Study Limitations

This study has several limitations that warrant acknowledgement. First, although the sample size of 350 participants provided sufficient data for analysis, the study was confined to selected universities and industries in Zimbabwe. This may limit the generalizability of the findings to other higher education systems or professional contexts with different institutional practices and workplace dynamics. Future studies with larger, more diverse samples across multiple regions and disciplines would enhance external validity.

Second, the reliance on self-reported questionnaires may have introduced response bias, as participants could have overestimated or underestimated their critical thinking and decision-making competencies. Complementary methods such as direct performance assessments, workplace observations, or longitudinal tracking of graduates would provide a more comprehensive picture of how these skills are retained and applied in real-life contexts.

Third, the cross-sectional research design restricted the ability to establish causality between critical thinking development in higher education and decision-making effectiveness in the workplace. A longitudinal approach would be better suited to examine how skills evolve and how consistently they influence professional outcomes.

Fourth, while the study included students, lecturers, and industry experts, it did not account for sector-specific variations in decision-making demands. For instance, decision-making in healthcare, engineering, and business may require different forms of critical thinking, which could have enriched the analysis.

Finally, contextual constraints such as limited access to technological resources, variability in teaching quality across institutions, and differences in workplace cultures may have influenced the findings. These factors highlight the need for future research to consider both structural and contextual influences on the development and application of critical thinking and problem-solving skills.

8. Conclusion

The educational perspective on critical thinking and problem-solving skills, linked with workplace decision-making effectiveness, served as the foundational framework for this study. Specifically, the research investigated how critical thinking competencies and problem-solving skills acquired in higher education translate into effective decision-making in professional environments. A sample of 350 participants, including students, lecturers, and industry experts, provided a comprehensive understanding of how academic preparation influences workplace competence. Findings from descriptive, correlation, and regression analyses confirmed that critical thinking skills and problem-solving skills acquired in higher education have a positive and significant relationship with workplace decision-making effectiveness. Regression results showed that critical thinking predicted 41% of the variance in decision-making outcomes, underscoring its central role in equipping graduates for professional challenges. Perception analysis further revealed that respondents strongly agreed on the relevance of critical thinking training, the confidence gained from problem-solving instruction, and the value employers place on graduates with these competencies.

These findings align with global evidence suggesting that higher education must go beyond imparting theoretical knowledge to embedding active learning, collaborative approaches, and real-world problem-solving experiences that foster sustainable critical thinking. Respondents also emphasised the need for continuous reinforcement of these skills within professional environments, highlighting the shared responsibility of both academic institutions and employers in cultivating long-term competence. Overall, the study concludes that critical thinking and problem-solving skills are not only essential for academic success but are also indispensable for effective workplace decision-making. Strengthening these competencies within higher education curricula will ensure that graduates are better prepared to navigate complex professional environments, assume leadership roles, and adapt to rapidly changing global contexts. It is therefore recommended that higher education institutions in Zimbabwe and beyond strategically enhance teaching and learning practices by embedding critical thinking into all disciplines, adopting active and collaborative pedagogies, and partnering with industry to provide authentic problem-solving experiences. Such measures will bridge the gap between education and professional practice, ensuring that graduates transition into the workforce with the decision-making effectiveness required in today's dynamic world.

9. Further research

Based on the findings of this study, several avenues for future research are proposed to deepen understanding of the relationship between critical thinking skills acquired in higher education, their long-term retention, and their influence on workplace decision-making effectiveness. While the present study establishes an association between critical thinking and decision-making, further investigation is required to understand how these skills are sustained, reinforced, or diminished over time and across varying professional contexts.

In addition, this study employed a cross-sectional design that provided a snapshot of the relationship between critical thinking and decision-making effectiveness at a single point in time. Future research should adopt longitudinal methodologies to track graduates over extended periods (five to ten years post-graduation) to examine how critical thinking competencies are retained, reinforced, or decline as individuals progress through their professional careers.

Furthermore, it focused exclusively on tertiary institutions and industry sectors in Zimbabwe. Expanding future research to include cross-cultural comparisons would enhance understanding of how cultural, institutional, and organisational contexts influence not only the development of critical thinking skills but

also their long-term retention and application in the workplace. Cross-cultural investigations could explore whether educational practices that promote critical thinking retention in one context yield similar outcomes in other regions

Moreover, this study aggregated data across diverse academic disciplines and economic sectors, which may obscure sector-specific patterns in the retention and application of critical thinking skills. Future research should disaggregate critical thinking competencies by professional sector to examine how long-term skill retention varies across different occupational environments and job demands.

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