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Research Article

CRITICAL THINKING SKILLS AND DISPOSITIONS: PERCEPTIONS OF HIGHER EDUCATION STUDENTS IN THAILAND

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Keerthi Prabhakar Padmarudram Sasidharan Thampi[1*]
Chakrit Ponathong[2] and Chatupol Yongsorn[3]

[1,2,3]Faculty of Education, Srinakharinwirot University

*Corresponding Author, E-mail: pskp83@gmail.com

Abstract

This study explores the perceptions of critical thinking skills and dispositions among higher education students in Thailand. A sample of 400 students from four international programs across four universities representing different regions in Thailand participated in this research. The study aimed to assess whether students understand the importance of critical thinking skills in their daily lives, whether they can identify critical thinking skills and dispositions, and whether there are differences in perceptions based on gender, field of study, or institution. The findings reveal that students in Thailand generally recognize the significance of critical thinking skills, with a mean score of 79.45%, indicating a solid understanding of their importance. However, their understanding of critical thinking dispositions is somewhat lower, as reflected in a mean score of 58%. Furthermore, students' ability to identify specific critical thinking skills and dispositions is modest, with a mean score of 51%, suggesting a gap between recognizing the importance and practical application.

Interestingly, the study did not find significant differences in perceptions based on gender, field of study, or institution, indicating a consistent understanding of critical thinking skills and dispositions among the sampled students. These findings underscore the importance of integrating explicit instruction on critical thinking skills and dispositions into the curriculum to bridge the gap between recognizing their significance and applying them effectively. By doing so, higher education institutions in Thailand can better equip their students with the essential skills and attitudes needed for success in the 21st century. This research contributes to the ongoing discourse on critical thinking in higher education and provides valuable insights for curriculum development and educational practice in Thailand and beyond.

Keywords: Perception, Critical Thinking Skills, Critical Thinking Dispositions, Higher Education, Thailand

Introduction

Critical thinking is a cognitive skill characterized by systematically analyzing, evaluating, and synthesizing information and ideas to make reasoned and informed decisions. It involves a reflective and independent thinking process beyond simply accepting information at face value. Instead, critical thinkers actively inquire, question assumptions, and consider alternative viewpoints and evidence. In an era characterized by rapid technological advancements, complex global challenges, and a constant influx of information, critical thinking has become an indispensable skill for individuals and societies alike.

Critical thinking is not a new concept; it has roots in ancient philosophical traditions and has been a subject of scholarly inquiry for centuries (Ennis, 1962). However, its prominence in contemporary education, problem-solving, and decision-making discussions has grown significantly. Critical thinking encompasses various dimensions, including logical reasoning, analysis of arguments, problem-solving, creativity, and effective communication (Paul & Elder, 2006; Yennita & Zukmadini, 2021; Abdurrahman et al., 2019). It equips individuals with the tools to navigate an increasingly complex and information-rich world.

Critical thinking skills and dispositions have emerged as an essential educational goal in higher education, transcending national boundaries and cultural contexts. The ability to think critically, characterized by adeptness in analyzing, evaluating, and synthesizing information, is widely acknowledged as a cornerstone of academic excellence and a vital competency for lifelong learning (Paul & Elder, 2006). Critical thinking enriches the academic experience (Peng & Kievit, 2020) and equips individuals with the tools to navigate an increasingly complex and dynamic global landscape.

The significance of this study lies in its potential to shed light on the perceptions of critical thinking skills and dispositions among Thai higher education students. Thailand's higher education landscape, characterized by diverse institutions and a rapidly changing socio-economic environment, offers a unique setting for exploring how students from various backgrounds interpret and value critical thinking. As a fast-emerging economy, Thailand has the potential to be a high-income economy by 2037 (OECD, 2019). This growth needs a workforce generation that can think critically. More about this has been discussed in the literature review of this article.

This article explores the perceptions of critical thinking skills and dispositions among higher education students in Thailand. The study employs a mixed-methods approach, incorporating surveys and interviews to gather comprehensive data. The subsequent sections of this article will delve into the research methodology, present and analyze the findings, discuss their implications for higher education in Thailand, and conclude with recommendations for educational practitioners and policymakers.

Research Questions and Objectives

1. Do the higher education students in Thailand understand the importance of critical thinking skills?

1.1 To assess the level of awareness among higher education students in Thailand regarding the importance of critical thinking skills.

2. Do the higher education students in Thailand know the significance of critical thinking dispositions?

2.1 To investigate the extent to which higher education students in Thailand are familiar with critical thinking dispositions.

2.2 To identify variations in awareness or knowledge of critical thinking dispositions among higher education students.

3. To what extent can higher education students in Thailand identify critical thinking skills and dispositions and apply them in practical contexts?

3.1 To measure the proficiency of higher education students in Thailand in recognizing and applying critical thinking skills.

3.2 To analyze the practical contexts in which higher education students in Thailand can effectively utilize critical thinking skills and dispositions.

4. Is there a significant difference between perceptions of critical thinking skills and dispositions among higher education students regarding gender, stream of study, or institution they study?

4.1 To examine the perceptions of critical thinking skills and dispositions among higher education students in Thailand, considering factors such as gender.

4.2 To investigate potential differences in understanding critical thinking skills and dispositions based on the students' stream of study and the institution they attend.

5. What do the higher education students in Thailand think they need from their institutions to improve their critical thinking skills and dispositions?

5.1 To explore the expectations and needs of higher education students in Thailand concerning enhancing their critical thinking skills and dispositions.

5.2 Identify specific recommendations or support systems students believe would improve their critical thinking abilities.

These questions are designed to inquire about the understanding of critical thinking, both in terms of skills and dispositions, among higher education students in Thailand and to explore potential variations in their perceptions based on demographic factors.

Literature Review

Critical thinking as a concept

Critical thinking transcends the mere acquisition of knowledge or memorization of facts; it focuses on developing intellectual skills and dispositions essential for critical thinking in diverse contexts (Halpern, 1998). These skills encompass identifying biases, analyzing and interpreting data, evaluating evidence, and constructing well-reasoned arguments. Critical thinking dispositions, integral to this process, include intellectual curiosity, open-mindedness, intellectual courage, and a willingness to revise beliefs based on new information (Facione, 2015). These attributes collectively empower individuals to engage with complex issues, make informed decisions, and contribute meaningfully to societal progress (Burbules & Berk, 1999). Critical thinking dispositions,

representing habitual mental attitudes or character traits, are crucial in developing the capacity to reason, evaluate information, and make informed decisions. Critical dispositions, such as open-mindedness, intellectual humility, courage, empathy, and perseverance, foster a culture of critical thinking (Paul & Elder, 2020). Open-mindedness involves receptivity to new ideas and diverse perspectives, while intellectual humility recognizes the limits of one's knowledge. Intellectual courage entails exploring challenging issues, and intellectual empathy involves understanding and considering others' viewpoints. Intellectual perseverance requires a commitment to reasoned analysis and problem-solving despite difficulties (Facione, 2015).

Cultivating these dispositions is vital for fostering a culture of critical thinking in education and beyond, enabling individuals to approach complex problems with intellectual integrity and a commitment to sound reasoning (Halpern, 2014). Jennifer Moon underscores the significance of critical thinking dispositions, highlighting their role as foundational attitudes and habits that drive practical critical thinking. Dispositions like curiosity, open-mindedness, and a willingness to engage with diverse perspectives are crucial for nurturing lifelong learners with reflective and analytical mindsets (Moon, 2008).

The societal significance of critical thinking extends beyond individual cognitive development. In an era of information overload and rapid technological change, critical thinking is indispensable for responsible citizenship and active participation in a democratic society (Paul & Elder, 2006). Moreover, critical thinking is closely tied to innovation and problem-solving, essential for fostering economic growth and competitiveness (Sternberg & Kaufman, 2010).

Defining Critical thinking

The challenge of establishing a universally accepted definition for critical thinking skills and dispositions is significant within education and cognitive psychology (Ennis, 1996). Critical thinking, often defined as the ability to engage in reflective and independent thinking for informed decision-making and complex problem-solving, proves elusive due to its multifaceted nature and inherent subjectivity (Ennis, 1996). This challenge stems from critical thinking being a heterogeneous set of cognitive and dispositional attributes. Cognitive elements involve reasoning, argumentation, and logical analysis, while dispositional aspects include open-mindedness and intellectual curiosity (Facione, 2015).

Different stakeholders, such as educators, researchers, and institutions, may emphasize specific facets of critical thinking based on their perspectives and objectives, contributing to the need for more consensus (Ennis, 2018). For instance, a philosophy professor may prioritize sound argumentation skills, while an educator in a diverse cultural context may focus on open-mindedness and cultural sensitivity. Examining the context in which critical thinking is applied reveals further complexity in defining it. Critical thinking varies across disciplines like science, humanities, and ethics, complicating efforts to formulate a universally applicable definition (Paul & Elder, 2020). Cultural differences influence the emphasis on critical thinking in different parts of the world, with some educational systems valuing rote memorization over critical inquiry or vice versa. These cultural and contextual disparities underscore the challenge of achieving consensus on a single, universally accepted definition. The need for a universal definition reflects the intricate nature of critical thinking, emphasizing the

ongoing necessity for dialogue and research to refine our understanding of this vital skill and its practical implications across diverse learning environments (Paul & Elder, 2020).

Critical thinking in emerging economies

In emerging economies undergoing rapid development and transformation, the significance of critical thinking is highly emphasized (Niu, 2016). These economies, characterized by dynamic landscapes and complex challenges ranging from economic disparities to technological integration, benefit from the pivotal role of critical thinking. It empowers individuals to analyze problems, evaluate solutions, and make socially and environmentally responsible decisions (Niu, 2016). Adaptability, crucial in such economies, is closely linked to critical thinking, enabling individuals and organizations to navigate uncertainty and embrace change (Facione, 2015). The demand for a highly skilled and adaptable workforce in emerging economies is rising as industries diversify and move up the value chain (World Economic Forum, 2018). Critical thinking skills align closely with these demands, allowing individuals to approach challenges with a solution-oriented mindset and collaborate across disciplines (World Economic Forum, 2018).

In education, cultivating critical thinking skills is integral for preparing the future workforce of emerging economies (Halpern, 2010). Education systems must adapt by revising curricula and fostering pedagogical approaches encouraging active learning and inquiry-based instruction (Halpern, 2010). Educators play a vital role in modelling critical thinking and creating classroom environments that value intellectual engagement, curiosity, and open-mindedness (Ennis, 1991). Examining China as an example, one of the world's fastest-growing economies, reveals a recognition of the need for a highly skilled workforce capable of driving innovation and adapting to changing economic conditions (Zhou & Li, 2012). Educational reforms in China focus on promoting critical thinking and creativity in schools and universities, acknowledging the role of these skills in fostering innovation, entrepreneurship, and economic growth (Zhou & Li, 2012).

Critical thinking, a multifaceted skill, holds pronounced importance in emerging economies, where it is essential for addressing complex challenges, fostering adaptability, and driving economic growth. By recognizing and prioritizing the development of critical thinking skills and dispositions, emerging economies can thrive in a dynamic and competitive global landscape. Cultivating critical thinking becomes an educational imperative and a strategic investment in these economies' future prosperity and sustainability as education systems adapt to meet these demands (Niu, 2016; World Economic Forum, 2018; Halpern, 2010; Ennis, 1991; Zhou & Li, 2012).

Research Methodology

Population and Samples

The study focuses on approximately 1.4 million undergraduate students in higher education institutions throughout Thailand. Specifically, four international programs conducted in English were chosen from distinct universities in different regions of Thailand. The selection of these programs was based on the QS Ranking system’s evaluation of universities in Thailand, ensuring representation from four geographically diverse

regions. A purposive sampling strategy was employed to select 100 students exclusively from each of these international programs, thereby with a sample size of 400. This approach aims to capture diverse perspectives and experiences among Thai higher education students while maintaining a manageable sample size for in-depth data collection and analysis (Creswell & Creswell, 2017; Denscombe, 2014). The chosen universities in different regions provide a comprehensive perspective on how critical thinking skills and dispositions are perceived in higher education across Thailand. This geographic diversity enhances the study's ability to generalize findings and understand variations in attitudes and practices related to critical thinking skills and dispositions in the broader context of the country's higher education landscape.

Research Instrument

In the conducted study, a comprehensive self-evaluation scale was employed as the research instrument to assess the critical thinking skills and dispositions of the participating Thai higher education students. The self-evaluation scale was designed to capture a wide range of insights and perceptions from the students regarding their critical thinking abilities and dispositions. The development of the self-evaluation instrument used in this study was a meticulous process that drew upon the expertise of five prominent academics in critical thinking. These experts, known for their research and contributions to the understanding of critical thinking, were actively involved in shaping the instrument to ensure its validity and reliability. The development process included extensive consultations and discussions with these experts, who provided valuable insights into formulating items related to critical thinking skills, dispositions, and their assessment. Their expertise and guidance were instrumental in crafting an instrument that accurately captured the nuanced dimensions of critical thinking (Facione, 2015; Ennis, 2011).

A multi-pronged approach was used to guarantee the self-evaluation instrument's reliability and validity. Initially, a small group of students was invited to participate in a pilot test of the instrument to detect and resolve any ambiguities or issues arising from item phrasing and comprehension. Subsequently, a thorough content validation was undertaken, involving experts who scrutinized the instrument's content to ensure it adequately measured the intended constructs (Creswell & Creswell, 2017). Additionally, a test-retest reliability analysis was carried out to assess the instrument's consistency over time, further establishing its reliability (Pallant, 2021). The collaborative efforts of these academic experts, alongside rigorous validation and reliability procedures, culminated in an instrument well-grounded in the principles of critical thinking assessment, enhancing the robustness and credibility of the study's findings. There are four sections to this instrument. The details of these sections and their relevance are discussed along with the results.

Collection of Data

Data collection for this study involved a multi-stage process. Initially, informed consent was obtained from the participants, ensuring their voluntary participation in the study (American Psychological Association, 2017). Subsequently, the instrument was administered to 400 students from the four international programs across the selected universities. The test was conducted under controlled and standardized conditions to maintain consistency and reliability in data collection (Creswell & Creswell, 2017). In addition to the quantitative

data obtained through the test, qualitative data were gathered through group discussions with a subset of participants. Four groups of volunteers consisting of 12 students from four different universities participated in these group discussions. These discussions aimed to elicit nuanced insights into the students' perceptions of critical thinking skills and dispositions (Denscombe, 2014)—the combination of quantitative and qualitative data collection methods allowed for a comprehensive exploration of the research questions.

Data Analysis

Data analysis for this study encompassed several stages. Initially, the quantitative data obtained from the instrument were subjected to statistical analysis, including descriptive statistics such as mean scores and standard deviations (Pallant, 2021). This quantitative analysis provided an overview of the participants' performance on critical thinking assessments. Subsequently, qualitative data from the group discussions were analyzed thematically (Braun & Clarke, 2006). The qualitative analysis involved identifying recurring themes and patterns in the students' responses regarding their perceptions of critical thinking. Integrating quantitative and qualitative findings facilitated a holistic understanding of the critical thinking skills and dispositions among Thai higher education students, yielding insights into their perceptions, challenges, and potential areas for improvement.

Results and Discussion

Quantitative Analysis

The study aimed to explore the perceptions of Thai higher education students regarding the importance of critical thinking skills and dispositions. The self-evaluation instrument consisted of four sections: Section A assessed the recognition of the importance of critical thinking skills, Section B examined the rating of the significance of critical thinking dispositions, and Section C evaluated the ability to identify critical thinking skills and dispositions.

Section A: Recognition of the Importance of Critical Thinking Skills

In the self-evaluation scale, students used a quantitative scale ranging from 1 to 5 to assess their understanding of the significance and relevance of critical thinking skills in academic pursuits and daily lives, addressing research question number 1. The section included 10 items related to the importance of critical thinking skills, and the overall mean score was 79.45%, indicating a high level of recognition among students. Table 1 displays the mean scores for each item, reinforcing the conclusion that a substantial majority of students comprehend the importance of critical thinking skills, aligning with the study's overarching objective.

Table 1 Statistical Summary of Section A: Lowest, Highest, Mean, and Standard Deviation

	Lowest	Highest	Mean	SD
Institution A	20	90	78	12.3
Institution B	20	100	81.4	13.6
Institution C	30	90	79.1	11.9
Institution D	30	100	79.3	13.4

Section B: Rating of the Significance of Critical Thinking Dispositions

In Section B of the self-evaluation scale, students used a 1 to 5 scale to rate their understanding of the significance of critical thinking dispositions, capturing their self-assessment of character traits and attitudes associated with critical thinking, such as open-mindedness and intellectual curiosity (Paul & Elder, 2006). This quantifiable assessment provided valuable data on how students perceived their disposition towards critical thinking, addressing research question number 2. This section, consisting of 10 items, yielded an overall mean score of 58%, as indicated in Table 2. While this score reflects a generally positive recognition of the importance of critical thinking dispositions, it is notably lower than the mean score for critical thinking skills in Section A. The table 2 below provides each institution's statistical summary for items in Section B.

Table 2 Statistical Summary of Section B: Lowest, Highest, Mean, and Standard Deviation

	Lowest	Highest	Mean	SD
Institution A	10	100	59.3	22.3
Institution B	0	100	57.0	16.7
Institution C	20	90	61.4	13.5
Institution D	0	100	54.3	18.4

Section C: Identification of Critical Thinking Skills and Dispositions

In Section C of the self-evaluation scale, students engaged with lists of critical thinking skills and character traits associated with critical thinking dispositions, aiming to answer research question number 3. This qualitative approach allowed students to actively identify and select the skills and dispositions they believed they possessed, providing a more nuanced assessment of their critical thinking abilities and orientations (Halpern, 1998; Moon, 2008).

Section C, addressing research questions 3 and 4, consisted of items assessing students' ability to identify critical thinking skills and dispositions from the provided lists. The overall mean score for this section was 51%, as detailed in Table 3. The table presents the highest and lowest scores for identifying critical thinking skills in the second column, with the mean score in the fourth column. Additionally, the fifth column indicates the highest and lowest scores in identifying critical thinking dispositions, and the mean score is provided in

the sixth column. This section offers insights into students' self-perceived identification of critical thinking components, contributing valuable qualitative data to the overall evaluation.

Table 3 Highest, Lowest and Mean scores for identifying skills and dispositions (in percentage) in Section C of the instrument

	Skills Mean			Dispositions Mean		
Institution A	Highest	80	54	Highest	60	42
	Lowest	10		Lowest	10	
Institution B	Highest	70	58	Highest	100	42
	Lowest	10		Lowest	10	
Institution C	Highest	80	58	Highest	80	47
	Lowest	10		Lowest	0	
Institution D	Highest	100	62	Highest	100	45
	Lowest	10		Lowest	10	

As part of the quantitative analysis, t-tests were employed to investigate the potential differences in mean scores based on institutional affiliation, gender, and field of study. However, the results of these tests did not indicate any statistically significant differences in mean scores across these demographic variables. It can be concluded that students, regardless of their institutional background, gender, or chosen field of study, exhibited similar levels of understanding and recognition of critical thinking skills and dispositions.

Institutional Affiliation: The lack of statistically significant differences in mean scores among students from different institutions suggests that recognizing critical thinking skills and dispositions is not significantly influenced by the specific educational context in which students are enrolled. Regardless of whether students are attending public or private institutions, they generally perceive the importance of critical thinking in a similar manner. This finding aligns with previous research that suggests the universality of critical thinking across different educational settings (Paul & Elder, 2006).

Gender: The absence of significant differences based on gender indicates that both male and female students exhibited similar levels of understanding and recognition of critical thinking skills and dispositions. This finding contradicts previous studies that suggested potential gender differences in critical thinking abilities (Eccles, 2011). However, in the context of this study, gender did not emerge as a significant factor influencing students' perceptions of critical thinking.

Field of Study: The non-significant results based on the field of study imply that students across various academic streams, such as humanities, sciences, and social sciences, demonstrated comparable levels of recognition of critical thinking skills and dispositions. This reading indicates that the relevance of critical thinking is not confined to specific disciplines and is acknowledged uniformly across diverse academic fields.

This finding resonates with the idea that critical thinking is a transdisciplinary skill applicable across various domains (Halpern, 1998).

These results underscore the universality and cross-disciplinary nature of critical thinking. While the study focused on students from diverse backgrounds, it found that their perceptions of the importance of critical thinking remained consistent. This result also suggests that educational interventions to enhance critical thinking can be implemented universally, with the expectation of similar benefits for students regardless of their institutional affiliation, gender, or field of study.

Qualitative analysis – Section D

The final section of the instrument prompted students to offer suggestions and recommendations for enhancing critical thinking skills and dispositions. This qualitative approach aimed to gather valuable information on potential strategies and interventions to foster critical thinking within the higher education context. The qualitative analysis of the suggestions provided by students in Section D and group discussions involving four groups of 12 students each yielded valuable insights into students' perspectives on effective strategies for enhancing critical thinking.

By combining quantitative and qualitative approaches, the self-evaluation scale facilitated a comprehensive assessment of Thai higher education students' perceptions of critical thinking skills and dispositions. This multifaceted exploration enriched the depth and breadth of the study's findings, offering a holistic view of students' self-perceptions and potential avenues for improvement in critical thinking education. This result answers the research question, ‘What do the higher education students in Thailand think they need from their institutions to improve their critical thinking skills and dispositions?’. Several recurring thematic patterns emerged from the discussions, reflecting students’ perspectives on effective strategies for enhancing critical thinking:

1. Self-Awareness and Reflection: A prominent theme in the discussions was the importance of self-awareness and reflection. Students acknowledged that developing critical thinking skills begins with individuals being aware of their thought processes, biases, and assumptions. They stressed the need for self-reflection as a foundational step in becoming better critical thinkers.

2. Evaluation of Evidence: Students consistently highlighted the significance of teaching individuals how to evaluate evidence and information critically. They emphasized the need for educational interventions that equip students with the skills to discern reliable sources from unreliable ones and assess the credibility of arguments and claims.

3. Academic Assertiveness: An important suggestion put forth by students was the encouragement of academic assertiveness within higher education institutions. This concept empowered students to question, challenge, and engage in constructive debates. Participants believed that fostering a culture of assertiveness would enhance critical thinking and contribute to a more dynamic and intellectually stimulating learning environment.

4. Creation of a Supportive Learning Environment: Students consistently emphasized the role of the learning environment in nurturing critical thinking. They advocated creating a supportive atmosphere within universities and colleges that encourages curiosity, intellectual exploration, and open dialogue. This learning environment was seen as instrumental in fostering critical thinking skills and dispositions.

5. Interdisciplinary Learning: Some students recommended promoting interdisciplinary learning to enhance critical thinking. They believed that exposure to diverse academic disciplines and perspectives could broaden students' thinking, encourage them to connect across fields and promote a holistic approach to problem-solving.

6. Questioning and Curiosity: Participants stressed the importance of fostering a questioning mindset and intellectual curiosity among students. Encouraging students to ask probing questions and explore the underlying reasons behind concepts and phenomena was seen to stimulate critical thinking.

7. Guidance and Feedback: Students recognized the need for guidance and feedback from educators. They suggested that instructors actively support students' critical thinking by providing structured guidance and constructive feedback on their analyses and thought processes.

8. Real-World Applications: Several students advocated integrating real-world applications and problem-solving exercises into the curriculum. They believed connecting critical thinking to practical, real-life scenarios would help students appreciate their skills' immediate relevance and applicability.

These thematic patterns provide a comprehensive overview of students' suggestions for improving critical thinking in higher education. They underscore the importance of self-awareness, evidence evaluation, academic assertiveness, a supportive learning environment, interdisciplinary learning, curiosity, guidance, and real-world relevance in fostering students' critical thinking skills and dispositions.

Conclusions

1. Understanding of the Importance of Critical Thinking Skills: Higher education students in Thailand generally understand the importance of critical thinking skills, as evidenced by a mean score of 79.45%. This score indicates a relatively high level of recognition among students regarding the significance of these skills for their academic and personal development.

2. Understanding of Critical Thinking Dispositions: While students do have some understanding of critical thinking dispositions, the mean score of 58% suggests that they may not fully grasp the significance of character traits and attitudes related to critical thinking to the same extent as they understand the importance of skills. This difference in scores indicates a potential gap in students' comprehension of dispositions.

3. Identification of Critical Thinking Skills and Dispositions: Students' ability to identify critical thinking skills and dispositions, as reflected in the mean score of 51%, is lower than their understanding of the importance of these components. This finding suggests that while students recognize the value of critical thinking, they may face challenges in identifying and articulating specific skills and dispositions associated with critical thinking.

4. There is no significant difference between students' mean scores regarding gender, institutional affiliation or stream of study. This result resonates with some previous studies (Bećirović et al., 2019; Liu et al., 2018; Nazila et al., 2019) and contradicts other studies claiming gender-based differences in critical thinking abilities (Al-Mahrooqi & Denman, 2020; Kumar & James, 2015; Dilekli, 2017).

Limitations

Limited Sample Size: One significant limitation of this study is the relatively small sample size for data collection. The study may need to capture the full diversity of perspectives and experiences among higher education students in Thailand. A more extensive and diverse sample could have provided a more comprehensive understanding of this population's critical thinking skills and dispositions.

1. Language and Cultural Context: The instrument used for data collection was in English, which limited the sample. This instrument can be translated and used among students who want to attempt it in Thai.

2. Exclusion of Technical Institutions: The study focused on students from traditional higher education institutions, potentially excluding a significant portion of the student population from technical institutions. Critical thinking skills and dispositions may vary among students in different types of institutions, and their perspectives were not included in this study. Future research could include a more diverse range of institutions for a comprehensive analysis.

3. Self-Reported Data: The data collected in this study relied primarily on self-reported responses from students. Self-reporting can be influenced by social desirability bias, where participants may provide responses, they perceive as favorable rather than reflecting their true beliefs or behaviors. Future research could incorporate additional methods, such as observations or interviews, to triangulate findings.

4. Generalizability: While the study provides valuable insights into critical thinking skills and dispositions among higher education students in Thailand, caution should be exercised when generalizing the findings beyond this specific context. The results may not be directly applicable to other countries or educational systems.

Suggestions

Implications and Recommendations for Curriculum Enhancement, Professional Development, Interdisciplinary Opportunities, and Promoting Curiosity

1. Providing Clear Definitions: Clear and concise definitions of critical thinking skills and dispositions should be integrated into the curriculum materials to form the foundation for students' development (Ennis, 2018).

2. Structured Critical Thinking Courses: Higher education institutions should offer dedicated courses or modules focused on critical thinking, providing students with a systematic framework aligned with specific academic disciplines (Facione & Gittens, 2015).

3. Training on Critical Thinking Pedagogy: Educators should undergo professional development training in critical thinking pedagogy, focusing on techniques for promoting self-awareness, evidence evaluation, and the cultivation of critical thinking dispositions (Bailin et al., 1999).

4. Creating Inclusive Learning Environments: Educators should receive training to create inclusive and supportive learning environments, fostering an atmosphere of academic assertiveness and curiosity among students (Tinto, 2017).

5. Interdisciplinary Collaborations: Institutions should actively promote interdisciplinary collaborations, involving joint courses or projects that require students from different disciplines to work together (Klein, 2010).

6. Question-Centric Teaching Strategies: Educators should incorporate question-centric teaching strategies, encouraging students to ask questions and explore the "why" behind concepts to stimulate curiosity and deepen critical thinking (Brookfield & Preskill, 2016).

7. Integration of Case Studies: Curriculum design should integrate real-world case studies and problem-solving exercises reflecting practical scenarios to bridge the gap between theory and practice (Herreid & Schiller, 2013).

8. Promoting Inclusive Dialogue: Educational institutions should actively promote inclusive dialogue that values diverse perspectives and encourages the free exchange of ideas, fostering a supportive learning environment (Freire, 2000).

Incorporating these recommendations into curriculum enhancement and educator professional development will contribute to a more comprehensive approach in nurturing critical thinking skills and dispositions within higher education. Providing a clear roadmap for institutions, these strategies empower students to become adept critical thinkers.

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