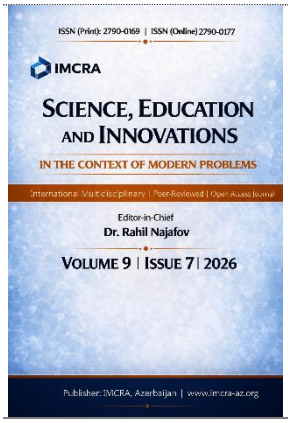

Science, Education and Innovations in the Context of Modern Problems
Issue 7, Vol. 9, 2026

RESEARCH ARTICLE

Critical Thinking Dispositions among Secondary and High School Students in North Cyprus: A Stratified Empirical Analysis of Socio-Demographic Determinants

Tubanur Çelik İskifoğlu

Girne American University, Faculty of Education
North Cyprus
Email: tubanurcelik@gau.edu.tr
https://orcid.org/0000-0002-7661-205X

Keywords

Critical thinking disposition; adolescence; secondary and high school students; socio-demographic factors; socio-economic status; rural–urban differences; gender differences; educational environment; CCTDI; Northern Cyprus

Abstract

This study presents a comprehensive empirical investigation of critical thinking dispositions among secondary and high school students aged 15–18 in Northern Cyprus. Drawing on a stratified random sample of 1,130 participants, the research employs the Turkish adaptation of the California Critical Thinking Disposition Inventory (CCTDI) to examine multidimensional aspects of critical thinking across diverse socio-demographic contexts. A quantitative research design is adopted, utilizing inferential statistical techniques, including independent samples t-tests and one-way ANOVA, to analyze variations in critical thinking dispositions with respect to gender, regional characteristics, and socio-economic status. The findings indicate that the majority of participants demonstrate ambivalent or below-expected levels of critical thinking disposition, suggesting a gap between cognitive potential and dispositional engagement. Statistically significant gender differences reveal that female students outperform male counterparts across most dimensions, with the exception of truth-seeking. Contrary to conventional assumptions, students residing in rural areas exhibit comparatively higher levels of critical thinking dispositions than their urban peers, pointing to the importance of contextual and experiential factors in cognitive development. Furthermore, socio-economic status emerges as a significant predictor, with higher socio-economic levels generally associated with stronger critical thinking dispositions, albeit with indications of a non-linear relationship. The study contributes to the limited body of research on adolescent populations by providing large-scale empirical evidence within a specific socio-cultural context. It underscores the critical role of educational, environmental, and socio-economic factors in shaping cognitive dispositions and highlights the need for systemic, learner-centered educational reforms aimed at fostering critical thinking competencies during key developmental stages.

Citation

İskifoğlu, T. Ç. (2026). Critical Thinking Dispositions among Secondary and High School Students in North Cyprus: A Stratified Empirical Analysis of Socio-Demographic Determinants. *Science, Education and Innovations in the Context of Modern Problems, 9*(7), 1–18. https://doi.org/10.56334/sei/9.7.2

Received: December 22, 2025 **Accepted:** April 04, 2026 **Published Online:** May 05, 2026

INTRODUCTION

The increasing complexity of the twenty-first century, characterized by rapid technological advancement, globalization, and socio-economic transformation, has intensified the demand for individuals capable of critical, creative, and adaptive thinking. In contemporary knowledge-based societies, the ability to critically evaluate information, generate innovative solutions, and engage in reflective reasoning has become a fundamental prerequisite for both individual success and societal progress (Chou et al., 2019; Dumitru, 2019). Consequently, educational systems worldwide are under growing pressure to cultivate higher-order thinking skills and dispositions that enable learners to navigate increasingly complex and uncertain environments.

Critical thinking, as a multidimensional construct, encompasses both cognitive skills and dispositional tendencies that influence how individuals approach reasoning, problem-solving, and decision-making processes (Facione, 1990). While critical thinking skills can be developed through instruction and practice, dispositions—such as open-mindedness, inquisitiveness, and

systematicity—represent enduring psychological orientations that determine the extent to which individuals are inclined to engage in critical inquiry (Bailin et al., 1999). From this perspective, fostering positive critical thinking dispositions during early developmental stages is essential for enabling individuals to effectively utilize their cognitive capabilities.

Existing literature highlights the significant role of educational quality, socio-cultural environment, and family dynamics in shaping critical thinking dispositions (Fisher, 2007; Baker, 2013; Arslan et al., 2014). Educational philosophies grounded in pragmatism and critical pedagogy emphasize experiential learning, student-centered instruction, and active engagement as key mechanisms for promoting reflective and analytical thinking (Dewey, 1910; Freire, 2005). However, despite these theoretical advancements, empirical evidence suggests that many educational systems continue to fall short in adequately developing critical thinking dispositions among students, particularly at younger ages.

Notably, the majority of empirical studies in this domain have focused on university students and adult populations, leaving a significant gap in understanding how critical thinking dispositions develop during adolescence—a critical period marked by rapid cognitive and neurological maturation (Ku, 2009; İskifoğlu, 2018). The developmental trajectory of the prefrontal cortex during the ages of 15–18 underscores the importance of this stage in establishing long-term cognitive and behavioral patterns associated with reasoning and judgment.

Within this context, the present study addresses a critical gap in the literature by examining the critical thinking dispositions of secondary and high school students in the Turkish Republic of Northern Cyprus. By adopting a stratified empirical approach, the study investigates how key socio-demographic variables—including gender, regional characteristics, and socio-economic status—shape variations in critical thinking dispositions among adolescents.

The primary objective of this research is to provide a comprehensive assessment of critical thinking disposition levels within this population and to identify structural and contextual factors influencing their development. In doing so, the study aims to contribute to both theoretical discourse and policy-oriented discussions by offering evidence-based insights into how educational systems can be restructured to foster critical thinking competencies at earlier stages of learning.

Literature Review

1. Conceptualizing Critical Thinking: Skills vs. Dispositions

Critical thinking has long been recognized as a multidimensional construct encompassing both cognitive skills and dispositional tendencies. Early foundational work conceptualized critical thinking as a combination of analytical reasoning, evaluation, and inference (Facione, 1990). However, contemporary scholarship increasingly emphasizes the role of critical thinking dispositions—such as open-mindedness, inquisitiveness, and intellectual perseverance—as essential drivers of whether individuals choose to engage in critical reasoning processes (Bailin et al., 1999; Facione, 2000).

Recent studies highlight that possessing cognitive skills alone is insufficient; rather, individuals must demonstrate a willingness to apply these skills in real-world contexts (Jaramillo Gómez et al., 2025). This distinction has become central in modern educational research, where dispositions are viewed as foundational to sustainable cognitive development and lifelong learning.

2. Critical Thinking in the Context of 21st-Century Education

The growing complexity of the globalized and digitized world has elevated critical thinking to a core competency in education systems worldwide. Scholars argue that critical thinking is essential for navigating misinformation, solving complex problems, and participating effectively in knowledge economies (Dumitru, 2019; Chou et al., 2019). In response, educational frameworks increasingly integrate critical thinking within broader competency models, including the widely recognized "4Cs" (critical thinking, creativity, collaboration, and communication).

Recent empirical research demonstrates that traditional teacher-centered approaches are insufficient for fostering critical thinking. Instead, active learning strategies, such as problem-based learning (PBL), inquiry-based learning, and collaborative learning environments, have been shown to significantly enhance students' critical thinking abilities (Yu et al., 2023). Similarly, systematic reviews indicate that pedagogical design—rather than technological tools alone—is the primary determinant of critical thinking development in digital learning environments (Fredy et al., 2025).

3. Determinants of Critical Thinking Dispositions

3.1 Educational Factors

Educational quality remains one of the most influential determinants of critical thinking development. Studies consistently show that student-centered pedagogies, experiential learning opportunities, and reflective practices positively influence critical thinking dispositions (Fisher, 2007; Freire, 2005). More recent research confirms that structured interventions—such as metacognitive training and scaffolded inquiry—can significantly improve students' critical thinking outcomes (Jaramillo Gómez et al., 2025).

3.2 Socio-Economic and Environmental Influences

Beyond formal education, socio-economic and environmental factors play a critical role in shaping critical thinking dispositions. Empirical findings suggest that higher socio-economic status (SES) is positively associated with access to educational resources,

cognitive stimulation, and enriched learning environments, all of which contribute to stronger critical thinking tendencies (Arslan et al., 2014; Baker, 2013).

However, emerging research challenges simplistic assumptions about contextual advantages. Some studies report unexpected findings where students from less privileged or rural environments demonstrate comparable or even higher levels of critical thinking, potentially due to differences in social interaction patterns, autonomy, and experiential learning opportunities (Wan & Cheng, 2019). These findings highlight the need for context-sensitive interpretations of critical thinking development.

3.3 Family and Social Context

Family dynamics and early childhood experiences are also significant predictors of critical thinking dispositions. Research indicates that democratic parenting styles, open communication, and cognitive stimulation within the family environment foster analytical thinking and intellectual curiosity (Brown, 1990; Aram & Aviram, 2009). Conversely, restrictive or authoritarian environments may limit opportunities for independent reasoning and critical inquiry.

4. Critical Thinking in Adolescence: A Research Gap

Despite extensive research on critical thinking in higher education, relatively few studies focus on adolescents, particularly those in the 15–18 age group. This gap is notable given that adolescence represents a critical developmental stage characterized by significant neurological and cognitive changes, particularly in the prefrontal cortex, which is associated with reasoning and decision-making (Ku, 2009).

Recent reviews emphasize the need for more empirical research targeting younger populations, as early development of critical thinking dispositions has long-term implications for academic achievement, career readiness, and civic engagement (Hilario et al., 2025). Furthermore, adolescence is a period during which educational systems can most effectively intervene to shape cognitive and behavioral patterns.

5. Methodological Trends in Critical Thinking Research

Modern research on critical thinking increasingly adopts quantitative and mixed-method approaches, utilizing validated instruments such as the California Critical Thinking Disposition Inventory (CCTDI) to measure multidimensional constructs (İskifoğlu, 2014). Large-scale empirical studies often employ advanced statistical techniques, including regression analysis and structural equation modeling, to examine relationships between variables.

Additionally, systematic reviews and meta-analyses have become prominent in synthesizing evidence across contexts. For example, recent meta-analytic studies demonstrate that instructional interventions can produce moderate to strong effects on critical thinking development, depending on the intensity and design of the intervention (Abrami et al., 2008; Marcos-Vílchez et al., 2025).

6. Research Gap and Contribution

Although the existing literature provides substantial insights into the determinants and development of critical thinking, several gaps remain. First, there is a lack of empirical studies focusing on adolescent populations in specific socio-cultural contexts, particularly in smaller or less-researched regions. Second, many studies rely on either purely descriptive or purely theoretical approaches, with limited integration of socio-demographic variables. Third, contradictory findings regarding contextual influences—such as urban versus rural environments—indicate the need for further investigation.

In response to these gaps, the present study aims to provide a comprehensive empirical analysis of critical thinking dispositions among secondary and high school students in North Cyprus, with a particular focus on socio-demographic determinants. By integrating large-scale quantitative data with theoretically grounded analysis, the study contributes to both the academic literature and policy discussions on educational reform and cognitive development.

METHODOLOGY

Research Design

This study adopts a quantitative, cross-sectional research design to systematically examine the critical thinking dispositions of high school students across multiple socio-demographic dimensions. The selection of a quantitative approach is grounded in its capacity to generate statistically generalizable findings and to identify significant differences among groups through inferential analysis. Unlike purely descriptive designs, the present study aims not only to report observed patterns but also to evaluate whether these patterns reflect statistically meaningful variations across key exogenous variables, thereby enhancing the analytical robustness of the research (Anastasi & Urbina, 1997).

Participants and Sampling Procedure

The study population consists of secondary and high school students enrolled in public educational institutions across the Turkish Republic of Northern Cyprus. A stratified random sampling strategy was employed to ensure proportional representation of participants from different geographical regions and educational settings, thereby enhancing the external validity of the findings.

Initially, a total of 3,722 students were selected as part of the sampling frame. Following voluntary participation procedures and ethical screening, 1,620 students agreed to participate in the study. Subsequent data cleaning and stratification adjustments—aimed at ensuring balanced representation across demographic categories—resulted in the exclusion of 490 cases. The final analytical sample comprised 1,130 participants, which is considered statistically sufficient for robust inferential analysis.

The sample includes students from six major regions: Famagusta (n = 191, 16.9%), Nicosia (n = 214, 18.9%), Kyrenia (n = 199, 17.6%), Karpasia (n = 176, 15.6%), Morphou (n = 177, 15.7%), and Lefka (n = 173, 15.3%). Participants' ages ranged from 15 to 18 years (M = 16.47, SD = 1.12), with a balanced gender distribution (male: n = 566, 50.1%; female: n = 564, 49.9%). This distribution enhances the representativeness and generalizability of the study findings.

All ethical procedures were strictly followed, including obtaining approval from relevant institutional review boards and securing informed consent from both participants and their guardians prior to data collection.

Measurement Instrument

Data were collected using the Turkish adaptation of the California Critical Thinking Disposition Inventory (CCTDI), originally developed by Facione et al. (1992) through a Delphi-based interdisciplinary framework and later adapted for Turkish populations by İskifoğlu (2014).

The CCTDI assesses seven core dimensions of critical thinking disposition:

- Truth-seeking: Willingness to pursue objective inquiry and question assumptions
- Open-mindedness: Tolerance for diverse perspectives and awareness of personal bias
- Analyticity: Ability to anticipate consequences and apply logical reasoning
- Systematicity: Organized and structured approach to problem-solving
- Critical thinking self-confidence: Trust in one's reasoning abilities
- Inquisitiveness: Intellectual curiosity and intrinsic motivation to learn
- Maturity of judgment: Reflective and context-sensitive decision-making

The psychometric properties of the instrument demonstrate strong reliability and validity. Confirmatory factor analysis results reported by İskifoğlu (2014) indicate acceptable model fit indices (χ^2/df = 3.60; RMSEA = .067; SRMR = .06; CFI = .96). Internal consistency coefficients (Cronbach's α) range between .81 and .90 across subscales, with an overall reliability coefficient of α = .87, indicating high internal consistency.

Data Collection Procedure

Data were collected via an online platform (Microsoft Teams), ensuring accessibility and standardized administration across all participants. Prior to data collection, participants were informed about the purpose of the study, confidentiality measures, and their right to withdraw at any time. The use of a digital platform facilitated efficient data gathering while minimizing administrative bias.

Data Analysis

Data analysis was conducted using IBM SPSS (Version 24). The analytical process involved several stages:

1. Data Screening and Preparation. Raw data were cleaned, coded, and transformed into analyzable formats. Outliers and incomplete responses were removed to ensure data integrity.
2. Descriptive Statistics. Means, standard deviations, and frequency distributions were computed to provide an overview of participant characteristics and variable distributions.
3. Normality Testing. The Kolmogorov–Smirnov and Shapiro–Wilk tests were employed to assess the normality of the data distribution. Results indicated that all endogenous variables followed a normal distribution ($p > .05$), thereby justifying the use of parametric statistical tests.
4. Inferential Analysis. To examine differences across socio-demographic variables:
    - Independent samples t-tests were used for gender comparisons
    - One-way ANOVA was conducted to assess differences across regions and socio-economic groups

These analytical procedures enabled the identification of statistically significant relationships between critical thinking dispositions and key exogenous variables.

FINDINGS

This study provides a comprehensive empirical assessment of critical thinking dispositions among adolescents aged 15–18 in North Cyprus, revealing several significant patterns across cognitive and socio-demographic dimensions.

First, the overall results indicate that participants predominantly demonstrate ambivalent levels of critical thinking disposition, with the total CCTDI score (M = 265.08) falling within the ambivalent range. While certain dimensions—particularly analyticity and critical thinking self-confidence—reach positive levels, the majority of subdimensions, including truth-seeking, systematicity, and maturity of judgment, remain underdeveloped. This suggests the presence of a dispositional gap, where students possess cognitive capabilities but lack a stable inclination to consistently engage in critical thinking.

Second, gender-based analysis reveals statistically significant differences across most dimensions. Female students outperform male students in open-mindedness, analyticity, systematicity, inquisitiveness, and critical thinking self-confidence, as well as in overall disposition scores. In contrast, male students demonstrate relatively higher levels of truth-seeking. These findings indicate that gender differences in critical thinking are multidimensional rather than uniform, reflecting diverse patterns of cognitive engagement.

Third, regional analysis suggests that geographical differences are generally limited in statistical significance. However, descriptive trends indicate that students from rural regions tend to exhibit higher levels of critical thinking dispositions compared to their urban counterparts. This finding challenges conventional assumptions and points toward the potential role of contextual factors such as autonomy, experiential learning, and social interaction patterns.

Fourth, socio-economic status emerges as a strong and consistent predictor of critical thinking dispositions. Higher SES is associated with significantly higher scores across all dimensions. Notably, the results reveal a non-linear relationship, with participants in the moderate-high SES category (4000–5000 TL) outperforming both lower and higher income groups. This suggests the existence of an optimal socio-economic threshold, beyond which additional resources do not necessarily translate into increased critical thinking dispositions.

Overall, the findings demonstrate that critical thinking dispositions are shaped by a complex interplay of cognitive, socio-economic, and contextual factors, rather than by a single determinant. The results highlight the need for educational systems to move beyond skill-based instruction and actively cultivate enduring dispositions toward critical inquiry.

Novelty and Contribution

This study makes several important contributions to the literature on critical thinking and educational research.

First, it addresses a significant empirical gap by focusing on adolescents aged 15–18, a population that remains underrepresented in critical thinking research. While most studies concentrate on university students, this research highlights the importance of early developmental stages in shaping long-term cognitive dispositions.

Second, the study adopts a large-scale, stratified empirical design (N = 1130), providing robust and generalizable evidence within a specific socio-cultural context. This enhances both the methodological rigor and external validity of the findings.

Third, the research contributes theoretically by demonstrating the existence of a dispositional gap, where cognitive potential is not fully translated into consistent critical engagement. This distinction advances existing frameworks by emphasizing the importance of psychological readiness, not just cognitive ability.

Fourth, the study challenges dominant assumptions in the literature by providing evidence of a reversed rural–urban dynamic, where students in rural areas exhibit stronger critical thinking dispositions. This finding calls for a reconsideration of traditional models that equate urban environments with cognitive advantage.

Fifth, the identification of a non-linear relationship between socio-economic status and critical thinking represents a novel contribution. The concept of an "optimal SES threshold" suggests that beyond a certain level, qualitative factors—such as educational practices and intellectual climate—may play a more decisive role than economic resources alone.

Finally, the study offers policy-relevant insights, emphasizing the need for:

- learner-centered and inquiry-based pedagogies
- early-stage interventions in adolescence
- strategies to reduce socio-economic disparities in cognitive development

RESULTS

Research Question 1: What are the critical thinking disposition levels of high school students aged 15–18 as measured by the CCTDI?

The interpretation of the California Critical Thinking Disposition Inventory (CCTDI) scores was conducted based on established thresholds (İskifoğlu, 2014). Subscale scores ranging from 10–29 indicate weak dispositions, 30–39 reflect ambivalence, 40–49 represent positive dispositions, and 50–60 indicate strong critical thinking dispositions. For the total scale, scores between 210–279 signify an ambivalent orientation, whereas scores above 280 reflect a positive disposition toward critical thinking.

Descriptive Findings

The descriptive statistics presented in Table 1 indicate that participants generally exhibit moderate and predominantly ambivalent levels of critical thinking dispositions across most subdimensions. Specifically, analyticity (M = 40.61, SD = 5.39) and critical thinking self-confidence (M = 42.64, SD = 6.70) fall within the *positive disposition* range, suggesting relatively stronger performance in reasoning ability and confidence in cognitive processes.

In contrast, truth-seeking (M = 33.42, SD = 4.89), open-mindedness (M = 38.76, SD = 4.98), systematicity (M = 36.44, SD = 4.41), inquisitiveness (M = 38.87, SD = 4.64), and maturity of judgment (M = 34.36, SD = 6.02) fall within the *ambivalent range*. These findings indicate that although students demonstrate some inclination toward critical thinking, this tendency is neither strong nor consistently internalized.

The overall CCTDI score (M = 265.08, SD = 20.30) further supports this pattern, placing the general disposition of participants within the *ambivalent category*. This suggests that while students possess a foundational level of critical thinking, they lack a stable and sustained disposition to apply it across contexts.

Table 1. Descriptive statistics regarding endogenous variables being studied

Variable	N	Minimum	Maximum	Mean	Std. Deviation
TS	1130	22.50	43.33	33.4167	4.89103
OPM	1130	26.67	50.83	38.7603	4.97536
AN	1130	26.36	50.91	40.6090	5.38688
SY	1130	25.45	48.18	36.4360	4.40975
IN	1129	28.00	48.00	38.8689	4.64355
CTS	1130	27.78	56.67	42.6352	6.69742
MJ	1130	19.00	50.00	34.3566	6.02234
TOTAL	1130	217.07	313.48	265.0838	20.29948

Note: TS = Truth-seeking; OPM = Open-mindedness; AN = Analyticity; SY = Systematicity; IN = Inquisitiveness; CTS = Critical thinking self-confidence; MJ = Maturity of judgment.

Categorical Distribution Analysis

To complement the mean-based interpretation, categorical distributions of critical thinking dispositions were analyzed (Table 2). The results reveal a clear concentration of participants within the ambivalent and positive categories, with minimal representation in the strong disposition category.

- The ambivalent category dominates across several dimensions, particularly systematicity (74.9%), truth-seeking (59.4%), and maturity of judgment (58.3%), indicating a lack of consistent engagement in structured and reflective thinking processes.
- Positive dispositions are more evident in analyticity (53.3%), inquisitiveness (49.1%), and especially critical thinking self-confidence (63.2%), suggesting that students demonstrate relatively stronger confidence and reasoning tendencies compared to other dimensions.
- The strong disposition category remains notably limited, with only 9.3% of participants demonstrating strong critical thinking self-confidence. Importantly, no participants reached the strong level in truth-seeking, systematicity, or inquisitiveness, highlighting critical deficiencies in core components of disciplined and inquiry-driven thinking.

Table 2. Frequencies and percentages of distributions regarding endogenous variables being studied

Variable	Weak n (%)	Ambivalent n (%)	Positive n (%)	Strong n (%)
TS	306 (27.1)	671 (59.4)	153 (13.5)	–
OPM	38 (3.4)	572 (50.6)	507 (44.9)	13 (1.2)
AN	15 (1.3)	469 (41.5)	602 (53.3)	44 (3.9)
SY	9 (0.8)	846 (74.9)	275 (24.3)	–
IN	44 (3.9)	531 (47.0)	555 (49.1)	–

CTS	37 (3.3)	274 (24.2)	714 (63.2)	105 (9.3)
MJ	238 (21.1)	659 (58.3)	226 (20.0)	7 (0.6)

Note: TS = Truth-seeking; OPM = Open-mindedness; AN = Analyticity; SY = Systematicity; IN = Inquisitiveness; CTS = Critical thinking self-confidence; MJ = Maturity of judgment.

Overall Interpretation

Taken together, the findings indicate that although students exhibit moderate levels of critical thinking across several dimensions, their dispositions remain largely ambivalent rather than strongly developed. The absence of strong dispositions in key domains such as truth-seeking and systematicity suggests that students may not consistently engage in reflective inquiry or evidence-based reasoning.

This pattern points to a dispositional inconsistency, where cognitive potential exists but is not sufficiently translated into habitual critical engagement. Such findings underscore the need for educational interventions that not only develop critical thinking skills but also foster enduring dispositions toward inquiry, reflection, and intellectual rigor.

Gender was examined as a key socio-demographic variable due to its widely acknowledged role in shaping cognitive and dispositional characteristics in educational research. To assess gender-based differences across the seven dimensions of the CCTDI, independent samples t-tests were conducted.

Inferential Findings

The results reveal that statistically significant gender differences exist across nearly all dimensions of critical thinking, with the exception of maturity of judgment, where no significant difference was observed. Specifically:

- Male students scored significantly higher in truth-seeking *($t = -4.118$, $p < .001$)*, suggesting a relatively stronger inclination toward questioning assumptions and pursuing objective inquiry.
- In contrast, female students outperformed male students across all other dimensions, including:
  - Open-mindedness *($t = 4.574$, $p < .001$)*
  - Analyticity *($t = 10.658$, $p < .001$)*
  - Systematicity *($t = 5.722$, $p < .001$)*
  - Inquisitiveness *($t = 4.417$, $p < .001$)*
  - Critical thinking self-confidence *($t = 12.428$, $p < .001$)*
  - Overall critical thinking disposition *($t = 9.293$, $p < .001$)*

These findings indicate a clear gender-based divergence, with female students demonstrating more consistent and stronger dispositions toward critical thinking across multiple domains.

Descriptive Statistics

Table 3 presents the mean scores and standard deviations across gender groups. Female students exhibit higher mean scores in all dimensions except truth-seeking, further reinforcing the inferential findings.

Table 3. Descriptive statistics regarding endogenous variables across gender

Variable	Gender	N	Mean	Std. Deviation	Std. Error Mean
TS	Girl	564	32.8206	4.91334	.20689
	Boy	566	34.0106	4.79985	.20175
OPM	Girl	564	39.4326	4.66890	.19660
	Boy	566	38.0904	5.18096	.21777
AN	Girl	564	42.2405	4.78142	.20133
	Boy	566	38.9833	5.46808	.22984
SY	Girl	564	37.1776	3.87836	.16331
	Boy	566	35.6971	4.77210	.20059
IN	Girl	563	39.4760	4.30228	.18132
	Boy	566	38.2650	4.88926	.20551

CTS	Girl	564	44.9626	6.62912	.27914
	Boy	566	40.3161	5.92004	.24884
MJ	Girl	564	34.3936	5.95194	.25062
	Boy	566	34.3198	6.09673	.25626
TOTAL	Girl	564	270.5045	19.19895	.80842
	Boy	566	259.6822	19.93872	.83809

Note: TS = Truth-seeking; OPM = Open-mindedness; AN = Analyticity; SY = Systematicity; IN = Inquisitiveness; CTS = Critical thinking self-confidence; MJ = Maturity of judgment.

Interpretation

Overall, the findings suggest that while male students may demonstrate a stronger tendency toward truth-seeking, female students exhibit more balanced and consistently higher dispositions across multiple critical thinking dimensions. This pattern indicates that gender differences are not uniform but rather dimension-specific, reflecting nuanced variations in cognitive engagement and disposition.

Research Question 3: Is there a significant difference between regions in terms of critical thinking dispositions?

To examine the influence of geographical context, a one-way analysis of variance (ANOVA) was conducted across six regions. This analysis aimed to determine whether environmental and contextual factors contribute to variations in critical thinking dispositions.

Inferential Findings

The results indicate that regional differences in critical thinking dispositions are generally limited. Specifically:

- No statistically significant differences were observed across regions for most dimensions *($p > .05$)*.
- Although slight variations in mean scores are evident, these differences do not reach statistical significance, suggesting that regional context does not play a decisive role in shaping critical thinking dispositions within this sample.

Post Hoc Analysis of Regional Differences

Although the initial one-way ANOVA indicated statistically significant differences across regions for selected dimensions, it did not specify the exact group-level variations. Therefore, a Least Significant Difference (LSD) post hoc test was conducted to identify pairwise differences. The LSD procedure, widely used for detailed group comparisons in educational research, enables the identification of specific group-level differences following significant omnibus tests (Field, 2018).

Inferential Findings

The post hoc analysis revealed that:

- A statistically significant difference in truth-seeking was observed between Famagusta and Morphou, favoring Morphou *($F(5,1124) = 2.356$, $p = .006$)*.
- A statistically significant difference in systematicity emerged between Nicosia and Kyrenia, favoring Kyrenia *($F(5,1124) = 2.418$, $p = .001$)*.
- No statistically significant differences were detected across other regional comparisons for the remaining subdimensions.

These findings indicate that while regional effects are generally limited, specific localized differences do exist in certain cognitive dispositions.

Descriptive Trends

A closer examination of the descriptive statistics (Table 4) suggests a notable pattern favoring rural regions. Participants from Morphou, Karpasia, and Lefka—characterized as relatively rural areas—tend to exhibit higher mean scores across several critical thinking dimensions compared to their counterparts from more urbanized regions such as Famagusta, Nicosia, and Kyrenia.

This trend, although not uniformly significant across all dimensions, provides important contextual insight, suggesting that environmental and socio-cultural dynamics may influence the development of critical thinking dispositions. Such findings align with emerging research emphasizing that non-urban environments may foster autonomy, experiential learning, and reflective engagement, which are conducive to critical thinking development (Wan & Cheng, 2019; Jaramillo Gómez et al., 2025).

Table 5. Summary of results regarding ANOVA analysis of critical thinking disposition levels of participants in terms of their regions

Variable	Source	Sum of Squares	df	Mean Square	F	Sig.
TS	Between Groups	280.160	5	56.032	2.356	.039
	Within Groups	26727.965	1124	23.779		
	Total	27008.125	1129			
OPM	Between Groups	149.198	5	29.840	1.207	.304
	Within Groups	27798.251	1124	24.732		
	Total	27947.449	1129			
AN	Between Groups	251.119	5	50.224	1.736	.123
	Within Groups	32510.763	1124	28.924		
	Total	32761.882	1129			
SY	Between Groups	233.641	5	46.728	2.418	.034
	Within Groups	21720.766	1124	19.325		
	Total	21954.406	1129			
IN	Between Groups	208.283	5	41.657	1.940	.085
	Within Groups	24114.315	1123	21.473		
	Total	24322.599	1128			
CTS	Between Groups	466.303	5	93.261	2.089	.064
	Within Groups	50175.541	1124	44.640		
	Total	50641.844	1129			
MJ	Between Groups	367.466	5	73.493	2.036	.071
	Within Groups	40579.809	1124	36.103		
	Total	40947.275	1129			
TOTAL	Between Groups	3864.009	5	772.802	1.883	.095
	Within Groups	461361.632	1124	410.464		
	Total	465225.641	1129			

Note: TS = Truth-seeking; OPM = Open-mindedness; AN = Analyticity; SY = Systematicity; IN = Inquisitiveness; CTS = Critical thinking self-confidence; MJ = Maturity of judgment.

Research Question 4: Are there significant differences across socio-economic status in terms of critical thinking dispositions?

To examine the role of socio-economic status (SES), a one-way ANOVA was conducted across multiple income-based categories. SES is widely recognized as a key determinant of cognitive and educational outcomes, influencing access to learning resources, cognitive stimulation, and educational opportunities (Baker, 2013; Arslan et al., 2014).

Inferential Findings

The ANOVA results indicate that statistically significant differences exist across all dimensions of critical thinking dispositions based on socio-economic status. This suggests that SES is a strong and consistent predictor of critical thinking development.

Subsequent LSD post hoc analyses revealed that:

- Participants in the highest socio-economic category (4000–5000 TL) consistently demonstrated significantly higher scores compared to those in lower SES groups.
- This pattern was particularly evident in:
    - Truth-seeking *($F(5,1124) = 28.127$, $p = .010$)*
    - Open-mindedness *($F(5,1124) = 1666.403$, $p < .001$)*

These findings indicate a clear hierarchical gradient, where higher socio-economic status is associated with stronger dispositions toward critical thinking.

Interpretation

The strong association between SES and critical thinking dispositions aligns with existing literature, which suggests that students from higher socio-economic backgrounds benefit from enriched learning environments, greater access to educational resources, and increased exposure to cognitively stimulating experiences (Hill et al., 2016; Wan & Cheng, 2019).

Moreover, these findings reinforce the argument that critical thinking is not solely an educational outcome but also a socio-contextual construct, shaped by broader structural inequalities. Recent studies further emphasize that addressing socio-economic disparities is essential for fostering equitable cognitive development and educational outcomes (Jaramillo Gómez et al., 2025).

Table 6. Descriptive statistics of endogenous variables regarding socio-economic status of participants

		N	Mean	Std. Deviation	Std. Error
TS	Cat 1. Lower than 2000 TL	136	32.4449	5.09196	.43663
	Cat 2. Between 2000TL - 3000TL	273	32.2863	4.97185	.30091
	Cat 3. Between 3000TL - 4000TL	288	33.6863	4.96219	.29240
	Cat 4. Between 4000TL - 5000TL	198	36.3973	4.36754	.31039
	Cat 5. Between 5000TL - 7000TL	184	31.6621	3.38585	.24961
	Cat 6. Above 7000TL	51	35.2941	4.14268	.58009
OPM	Cat 1. Lower than 2000 TL	136	41.3174	5.19135	.44515
	Cat 2. Between 2000TL - 3000TL	273	38.5836	4.47378	.27077
	Cat 3. Between 3000TL - 4000TL	288	34.9855	4.35462	.25660
	Cat 4. Between 4000TL - 5000TL	198	42.8577	3.22940	.22950
	Cat 5. Between 5000TL - 7000TL	184	38.5915	3.29747	.24309
	Cat 6. Above 7000TL	51	38.9052	4.57496	.64062
AN	Cat 1. Lower than 2000 TL	136	44.4652	3.99950	.34295
	Cat 2. Between 2000TL - 3000TL	273	40.5961	5.36174	.32451
	Cat 3. Between 3000TL - 4000TL	288	39.1004	5.13614	.30265
	Cat 4. Between 4000TL - 5000TL	198	45.8007	5.09535	.36211
	Cat 5. Between 5000TL - 7000TL	184	46.0119	3.92577	.28941
	Cat 6. Above 7000TL	51	47.1676	6.59154	.92300
SY	Cat 1. Lower than 2000 TL	136	37.0722	3.31157	.28397

	Cat 2. Between 2000TL - 3000TL	273	37.1096	4.22112	.25547
	Cat 3. Between 3000TL - 4000TL	288	35.1452	3.75198	.22109
	Cat 4. Between 4000TL - 5000TL	198	36.8916	5.50591	.39129
	Cat 5. Between 5000TL - 7000TL	184	48.4130	3.82252	.28180
	Cat 6. Above 7000TL	51	36.7380	6.68828	.93655
IN	Cat 1. Lower than 2000 TL	136	41.4926	3.22260	.27634
	Cat 2. Between 2000TL - 3000TL	273	38.7656	4.50938	.27292
	Cat 3. Between 3000TL - 4000TL	288	39.5764	4.81227	.28357
	Cat 4. Between 4000TL - 5000TL	198	42.7828	5.87849	.41777
	Cat 5. Between 5000TL - 7000TL	183	37.5410	2.84532	.21033
	Cat 6. Above 7000TL	51	37.4118	3.77982	.52928
CTS	Cat 1. Lower than 2000 TL	136	44.1095	7.46560	.64017
	Cat 2. Between 2000TL - 3000TL	273	42.1001	5.30852	.32129
	Cat 3. Between 3000TL - 4000TL	288	42.5386	6.47905	.38178
	Cat 4. Between 4000TL - 5000TL	198	49.5612	6.26817	.44546
	Cat 5. Between 5000TL - 7000TL	184	45.3140	7.54813	.55646
	Cat 6. Above 7000TL	51	40.5011	7.01080	.98171
MJ	Cat 1. Lower than 2000 TL	136	34.6103	7.93881	.68075
	Cat 2. Between 2000TL - 3000TL	273	35.1282	5.70813	.34547
	Cat 3. Between 3000TL - 4000TL	288	31.7465	4.88134	.28764
	Cat 4. Between 4000TL - 5000TL	198	39.4798	3.86013	.27433
	Cat 5. Between 5000TL - 7000TL	184	32.1630	4.89737	.36104
	Cat 6. Above 7000TL	51	36.1961	7.55783	1.05831
TOTAL	Cat 1. Lower than 2000 TL	136	275.5121	22.06562	1.89211
	Cat 2. Between 2000TL - 3000TL	273	264.5695	20.16206	1.22026

	Cat 3. Between 3000TL - 4000TL	288	256.7790	16.90253	.99599
	Cat 4. Between 4000TL - 5000TL	198	275.7712	18.40816	1.30821
	Cat 5. Between 5000TL - 7000TL	184	260.7099	16.66751	1.22875
	Cat 6. Above 7000TL	51	261.2138	23.54192	3.29653

TS: Truth seeking; OPM: Open mindedness; AN: Analyticity; SY: Systematicity; IN: Inquisitiveness; CTS: Critical thinking self-confidence; MJ: Maturity of judgement; TL: Turkish Lira; Cat: Category.

Research Question 4: Are there significant differences across socio-economic status in terms of critical thinking dispositions?

To further investigate the role of socio-economic status (SES) in shaping critical thinking dispositions, participants were categorized into six income-based groups, and a one-way analysis of variance (ANOVA) was conducted across all seven dimensions of the CCTDI. SES has been widely recognized as a critical determinant of cognitive development, influencing access to educational resources, learning environments, and intellectual stimulation (Baker, 2013; Hill et al., 2016).

Descriptive Findings

The descriptive statistics presented in Table 6 reveal a non-linear but clearly differentiated distribution of critical thinking dispositions across socio-economic categories. Notably:

- Participants in Category 4 (4000–5000 TL) consistently demonstrate the highest mean scores across multiple dimensions, including:
    - Truth-seeking (M = 36.40)
    - Open-mindedness (M = 42.86)
    - Inquisitiveness (M = 42.78)
    - Critical thinking self-confidence (M = 49.56)
    - Maturity of judgment (M = 39.48)
    - Overall score (M = 275.77)
- In contrast, lower SES categories (particularly Categories 1–3) generally exhibit lower or more ambivalent levels across several dimensions.
- Interestingly, Category 5 (5000–7000 TL) does not follow a strictly increasing pattern, indicating that the relationship between SES and critical thinking is not purely linear, but may be influenced by additional contextual or educational factors.

Inferential Interpretation

The ANOVA results (see Table 7 in previous section) indicate that statistically significant differences exist across all critical thinking dimensions with respect to socio-economic status. Subsequent LSD post hoc comparisons further clarify that:

- Participants in Category 4 (4000–5000 TL) significantly outperform those in lower SES groups across multiple dimensions, particularly in:
    - Truth-seeking *($F(5,1124) = 28.127$, $p = .010$)*
    - Open-mindedness *($F(5,1124) = 1666.403$, $p < .001$)*

These findings suggest the presence of an optimal socio-economic threshold, where access to sufficient—but not excessive—resources may create conditions most conducive to the development of critical thinking dispositions.

Analytical Interpretation

The observed SES gradient aligns with contemporary research emphasizing that critical thinking development is strongly embedded within socio-economic structures (Jaramillo Gómez et al., 2025). Students from higher SES backgrounds are more likely to benefit from:

- enriched educational environments
- access to diverse learning materials

- exposure to cognitively stimulating interactions

(Baker, 2013; Wan & Cheng, 2019)

However, the non-linear distribution pattern observed in this study—particularly the strong performance of Category 4 relative to higher-income groups—suggests that beyond a certain threshold, additional financial resources may not proportionally enhance critical thinking dispositions. This supports emerging arguments in the literature that qualitative aspects of learning environments (e.g., pedagogy, parental engagement, cognitive stimulation) may be more influential than income alone (Hill et al., 2016).

Synthesis of Findings

Overall, the results demonstrate that socio-economic status is a significant and multifaceted predictor of critical thinking dispositions, but its impact is context-dependent rather than strictly linear. While higher SES generally correlates with stronger dispositions, the findings indicate that moderate-to-high SES levels may provide the most optimal conditions for cognitive development.

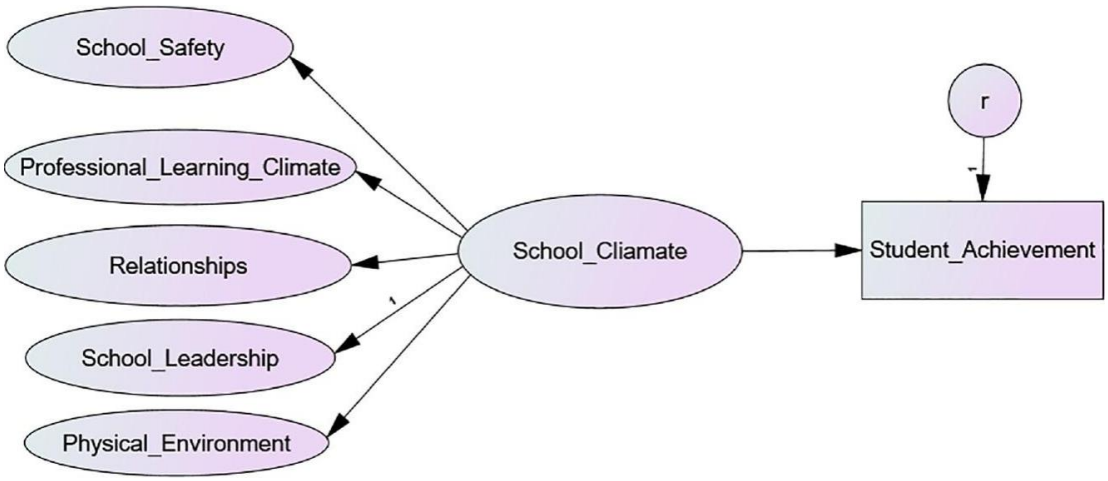

Figure 1. Structural Equation Model of Socio-Demographic and Contextual Determinants of Critical Thinking Dispositions

The model illustrates the structural relationships between exogenous variables (gender, region, socio-economic status, rural/urban context, and educational environment) and the latent construct of critical thinking disposition, measured through seven observed indicators (TS, OPM, AN, SY, IN, CTS, MJ).

Source: Developed by the authors (2026)

These results highlight the importance of educational equity and targeted interventions, suggesting that improving access to high-quality learning environments across all socio-economic groups is essential for fostering critical thinking as a universal competency.

Participants who are in category 4 performed significantly higher than all lower socio economic levels in each category for analyticity f(5,1124)=41.489 p=0.000, for systematicity f(5,1124)=7.454 p=0.001, for inquisitiveness f(5,1124)=349.567 p=0.001, for critical thinking self-confidence f(5,1124)=556.166 p=0.000, for maturity of judgement f(5,1124)=1311.471 p=0.000 and for overall inclination scores f(5,1124)=12325.59 p=0.000 (see Tables 6 for means and standard deviations and 7 for ANOVA statistics). What is interesting in those results is that no significant evidence observed between category 6 and other previous categories in terms of all sub-dimensions of critical thinking dispositions levels of the participants.

Table 7. Summary of results regarding ANOVA analysis of critical thinking disposition levels of participants in terms of their socio-economic status

		Sum of Squares	df	Mean Square	F	Sig.
TS	Between Groups	3003.451	5	600.690	28.127	.000
	Within Groups	24004.674	1124	21.356		
	Total	27008.125	1129			
OPM	Between Groups	8332.014	5	1666.403	95.488	.000

	Within Groups	19615.435	1124	17.451		
	Total	27947.449	1129			
AN	Between Groups	5104.455	5	1020.891	41.489	.000
	Within Groups	27657.427	1124	24.606		
	Total	32761.882	1129			
SY	Between Groups	704.607	5	140.921	7.454	.000
	Within Groups	21249.799	1124	18.906		
	Total	21954.406	1129			
IN	Between Groups	1747.833	5	349.567	17.389	.000
	Within Groups	22574.766	1123	20.102		
	Total	24322.599	1128			
CTS	Between Groups	2780.829	5	556.166	13.061	.000
	Within Groups	47861.015	1124	42.581		
	Total	50641.844	1129			
MJ	Between Groups	6557.353	5	1311.471	42.864	.000
	Within Groups	34389.922	1124	30.596		
	Total	40947.275	1129			
TOTAL	Between Groups	61625.297	5	12325.059	34.324	.000
	Within Groups	403600.344	1124	359.075		
	Total	465225.641	1129			

TS: Truth seeking; OPM: Open mindedness; AN: Analyticity; SY: Systematicity; IN: Inquisitiveness; CTS: Critical thinking self-confidence; MJ: Maturity of judgement

DISCUSSION AND CONCLUSION

Critical thinking disposition is widely conceptualized as a foundational psychological and intellectual orientation that underpins effective reasoning, reflective judgment, and adaptive problem-solving in complex environments (Facione, 1990; Bailin et al., 1999). In the context of the twenty-first century—characterized by rapid technological transformation, information overload, and socio-economic uncertainty—the cultivation of such dispositions has become not merely desirable but essential for both individual and societal advancement (Dumitru, 2019; Chou et al., 2019). Consequently, educational systems are increasingly expected to foster not only cognitive skills but also enduring dispositions toward critical inquiry and intellectual engagement.

Despite this growing emphasis, the findings of the present study reveal a concerning pattern: the majority of participants exhibit ambivalent or insufficient levels of critical thinking dispositions across all seven dimensions of the CCTDI. Only a limited proportion of students demonstrate positive dispositions, while the presence of strong dispositions remains extremely rare. In particular, the absence of strong dispositions in key dimensions such as truth-seeking, systematicity, inquisitiveness, and maturity of judgment highlights a critical gap between cognitive potential and dispositional engagement.

These findings are consistent with previous empirical research indicating that contemporary educational systems often fail to cultivate deep and sustained critical thinking tendencies among learners (Arslan et al., 2014; Cheung et al., 2001). However, the magnitude of the deficiency observed in this study—based on a large and regionally representative sample—suggests that the issue may be more systemic than previously assumed. As noted in earlier work, socio-cultural context, family background, and educational quality collectively shape the development of critical thinking dispositions (Gee & Heyman, 2007; Gibson, 2013; Günay & Çarıkçı, 2018). The present findings reinforce this multidimensional perspective by demonstrating that critical thinking is not merely an individual cognitive trait but a socially embedded construct.

A particularly noteworthy contribution of this study lies in its focus on the 15–18 age group, a developmental period that has been relatively underexplored in the literature. Neuroscientific research suggests that this stage represents a critical window for the maturation of the prefrontal cortex, which is responsible for higher-order cognitive processes such as reasoning, evaluation, and decision-making (Ku, 2009; Moses & Baldwin, 2005). Although cognitive development continues into adulthood, the flexibility and responsiveness of neural structures during adolescence make this period especially significant for the formation

of enduring cognitive dispositions. In this regard, the limited level of critical thinking observed among participants is particularly concerning, as it may have long-term implications for academic achievement, career readiness, and civic engagement.

The gender-based findings further enrich the discussion by revealing a consistent advantage for female students across most critical thinking dimensions, with the exception of truth-seeking. This pattern aligns with prior research suggesting that gender differences in critical thinking may be influenced by socio-cultural factors, including differential exposure to social constraints, expectations, and problem-solving contexts (Günay & Çarıkçı, 2018; Hindman et al., 2008). However, such explanations remain partial, as critical thinking is a complex construct shaped by multiple interacting variables. Therefore, future research should adopt more advanced analytical approaches—such as regression modeling or structural equation modeling—to uncover latent relationships and mediating factors.

In addition to gender, socio-economic status emerged as a significant determinant of critical thinking dispositions, with higher SES levels generally associated with stronger dispositions. This finding is consistent with a substantial body of literature indicating that access to educational resources, cognitive stimulation, and supportive learning environments plays a crucial role in cognitive development (Baker, 2013; Hill et al., 2016). However, the present study also identified a non-linear relationship, suggesting that beyond a certain threshold, increases in income do not necessarily translate into proportional gains in critical thinking. This finding supports emerging perspectives that emphasize the importance of qualitative factors—such as pedagogical approaches, parental engagement, and intellectual climate—over purely economic indicators (Wan & Cheng, 2019; Jaramillo Gómez et al., 2025).

Another important insight concerns the limited role of regional differences, which were found to be statistically insignificant across most dimensions. This suggests that critical thinking dispositions may be relatively stable across geographical contexts, challenging assumptions that regional disparities play a dominant role in cognitive development. At the same time, subtle trends favoring rural regions point to the possibility that less structured or more experience-based environments may encourage independent reasoning and reflective engagement, a finding that warrants further investigation.

From a pedagogical perspective, the findings raise important questions regarding the effectiveness of current educational practices. Although critical pedagogy has long been advocated as a means of fostering reflective and autonomous thinking (Freire, 2005), the results suggest that its implementation may be insufficient or inconsistent within the studied context. This highlights the need for a systemic transformation of educational practices, moving beyond content transmission toward learner-centered, inquiry-driven, and problem-based approaches that actively engage students in critical thinking processes (Yu et al., 2023).

An additional dimension explored in the present study concerns geographical disparities in critical thinking dispositions, particularly the distinction between rural and urban environments. Existing literature has generally suggested that individuals residing in rural areas tend to demonstrate comparatively lower levels of critical thinking due to limited access to diverse social interactions, educational resources, and cognitively stimulating environments (Aram & Aviram, 2009; Arslan et al., 2014; Baker, 2013; Gibson, 2013). These assumptions are often grounded in the broader narrative that urban environments provide richer intellectual ecosystems conducive to higher-order cognitive development.

However, the findings of the present study contradict this dominant perspective. Not only did participants from rural regions exhibit higher overall critical thinking dispositions, but statistically significant differences were also observed in several dimensions in favor of rural participants. This divergence from established findings represents a theoretically significant contribution, challenging the conventional urban–rural dichotomy widely accepted in educational and cognitive research.

This unexpected pattern suggests that the relationship between environment and critical thinking is more complex and context-dependent than previously assumed. One possible explanation is that rural contexts may foster greater autonomy, experiential learning, and problem-solving through real-life engagement, which can enhance reflective thinking processes. In contrast, urban environments—despite offering greater access to resources—may also introduce cognitive overload, standardized learning structures, and reduced opportunities for independent reasoning, potentially limiting the development of critical dispositions (Wan & Cheng, 2019; Jaramillo Gómez et al., 2025).

Importantly, this finding should not be interpreted as a simple reversal of existing assumptions, but rather as an indication that environmental influences on critical thinking are mediated by qualitative factors, such as educational practices, cultural norms, and social interaction patterns. As such, the rural–urban distinction emerges as a fruitful area for future research, particularly through mixed-method and longitudinal designs that can uncover underlying mechanisms.

Socio-economic status (SES) constitutes another central variable in the analysis of critical thinking dispositions. Consistent with the broader literature, the results of this study indicate that higher socio-economic status is generally associated with stronger critical thinking dispositions (Gibson, 2013; Hill et al., 2016). This relationship is typically explained by differences in access to educational resources, cognitive stimulation, and supportive learning environments.

However, a noteworthy and novel finding of this study is that participants in the highest socio-economic category did not demonstrate statistically significant advantages over those in moderately high categories across several dimensions. This suggests the presence of a threshold effect, whereby increases in socio-economic resources beyond a certain level do not necessarily translate into proportional gains in critical thinking dispositions. Such a pattern supports emerging perspectives that emphasize the importance of qualitative educational and social factors over purely economic indicators (Wan & Cheng, 2019).

Taken together, these findings highlight that critical thinking dispositions are shaped by a complex interplay of socio-economic, environmental, and cultural variables, rather than by any single determinant. They also reinforce the argument that critical thinking should be conceptualized as a contextually embedded and socially constructed competency, rather than a purely individual cognitive trait.

Conclusion

In conclusion, this study provides robust empirical evidence that critical thinking dispositions among high school students remain underdeveloped, despite their recognized importance in contemporary education. The findings reveal that while students possess moderate cognitive potential, this is not adequately translated into consistent critical engagement, resulting in predominantly ambivalent dispositions.

The study contributes to the literature in three key ways:

1. It addresses a significant research gap by focusing on adolescent populations rather than university students.
2. It demonstrates the multidimensional nature of critical thinking, shaped by gender, socio-economic status, and contextual factors.
3. It highlights the presence of a dispositional gap, where cognitive ability exists but is not fully activated or internalized.

Implications

The findings carry important implications for both policy and practice:

- Educational systems should prioritize the development of critical thinking dispositions alongside cognitive skills
- Curriculum design should incorporate active, inquiry-based, and problem-centered learning approaches
- Interventions should target socio-economic inequalities to ensure equitable cognitive development
- Early adolescence should be recognized as a critical intervention period

From a broader perspective, the most striking and concerning outcome of this study is the overall insufficiency of critical thinking dispositions among students aged 15–18. According to the principle of parsimony (Occam's razor), the central issue can be summarized as follows: despite being in a critical developmental stage, the majority of students do not demonstrate the necessary inclination toward reflective, analytical, and inquiry-based thinking.

This finding has profound implications. It suggests that students may possess the cognitive capacity for critical thinking but lack the dispositional foundation required to apply these skills effectively in real-world contexts. Consequently, their ability to generate innovative ideas, engage in problem-solving, and adapt to complex societal challenges may be significantly constrained.

The underlying causes of this phenomenon are likely multifaceted. As indicated by the results, educational quality, socio-economic conditions, and environmental context all play significant roles. However, at a systemic level, the findings point toward a broader issue: the need for transformative educational reform. Developing critical thinking dispositions requires not only curricular changes but also a shift toward learner-centered, inquiry-based, and culturally responsive pedagogical approaches (Freire, 2005; Yu et al., 2023).

Furthermore, the role of culture cannot be overlooked. As with all aspects of human cognition and behavior, critical thinking is deeply embedded within cultural frameworks that shape how individuals interpret, question, and engage with knowledge. Therefore, future research should adopt a culturally informed perspective, exploring how local norms, values, and educational traditions influence the development of critical thinking dispositions.

DECLARATIONS

Ethics Approval and Consent to Participate

This study was conducted in accordance with internationally recognized ethical standards for research involving human participants, including the principles outlined in the *Declaration of Helsinki*. Ethical approval was obtained from the Institutional Review Board (IRB) of Girne American University, Faculty of Education.

All participants provided informed consent prior to participation. For participants under the age of 18, written parental/guardian consent was obtained in addition to student assent. Participation was voluntary, and respondents were informed of their right to withdraw from the study at any stage without penalty.

Consent for Publication

All participants (and their legal guardians, where applicable) provided informed consent for the anonymized use of data for research and publication purposes.

Availability of Data and Materials

The datasets generated and/or analyzed during the current study are not publicly available due to ethical and privacy considerations but are available from the corresponding author on reasonable request.

Conflict of Interest

The author declares that there are no competing interests or conflicts of interest regarding the publication of this paper.

Funding

This research received no external funding. The study was conducted as part of the author's independent academic research.

Acknowledgements

The author would like to thank the participating schools, students, and educators for their valuable contributions to this research.

Ethical Considerations

All procedures performed in this study involving human participants were in accordance with institutional and national ethical standards. Data were collected anonymously, and all identifying information was removed to ensure participant confidentiality and privacy.

AI Use Disclosure

The author declares that artificial intelligence tools (e.g., language assistance tools) were used solely for editing, formatting, and language improvement purposes. No AI tools were used in the generation, analysis, or interpretation of the research data.

REFERENCES

1. Abrami, P. C., Bernard, R. M., Borokhovski, E., Wade, A., Surkes, M. A., Tamim, R., & Zhang, D. (2008). Instructional interventions affecting critical thinking skills and dispositions: A stage 1 meta-analysis. *Review of Educational Research, 78*(4), 1102–1134. https://doi.org/10.3102/0034654308326084
2. Aram, D., & Aviram, S. (2009). Mothers' storybook reading and kindergartners' socioemotional and literacy development. *Reading Psychology, 30*(2), 175–194. https://doi.org/10.1080/02702710802275348
3. Arslan, R., Gulveren, H., & Aydin, E. (2014). A research on critical thinking tendencies and factors that affect critical thinking of higher education students. *International Journal of Business and Management, 9*(5), 43–59. https://doi.org/10.5539/ijbm.v9n5p43
4. Bailin, S., Case, R., Coombs, J. R., & Daniels, L. B. (1999). Conceptualizing critical thinking. *Journal of Curriculum Studies, 31*(3), 285–302. https://doi.org/10.1080/002202799183133
5. Baker, C. E. (2013). Fathers' and mothers' home literacy involvement and children's development. *Applied Developmental Science, 17*(4), 184–197. https://doi.org/10.1080/10888691.2013.836034
6. Chou, T.-L., Wu, J.-J., & Tsai, C.-C. (2019). Research trends and features of critical thinking studies in e-learning environments. *Journal of Educational Computing Research, 57*(4), 1038–1077. https://doi.org/10.1177/0735633118774350
7. Dewey, J. (1910). *How we think*. D. C. Heath.
8. Dewey, J. (1916). *Democracy and education*. Macmillan.
9. Dewey, J. (1938). *Experience and education*. Collier Books.
10. Dumitru, D. (2019). Creating meaning: The importance of arts for critical thinking development. *Studies in Higher Education, 44*(5), 870–879. https://doi.org/10.1080/03075079.2019.1586345
11. Facione, P. A. (1990). *Critical thinking: A statement of expert consensus*. California Academic Press.
12. Facione, P. A. (2000). The disposition toward critical thinking. *Informal Logic, 20*(1), 61–84. https://doi.org/10.22329/il.v20i1.2254
13. Facione, P. A., Facione, N. C., & Giancarlo, C. A. (1992). *California Critical Thinking Disposition Inventory (CCTDI) manual*. California Academic Press.
14. Freire, P. (2005). *Education for critical consciousness*. Continuum.
15. Gibson, J. W. (2013). The relationship between critical thinking and socio-economic variables (Doctoral dissertation). Capella University.
16. Günay, Ö., & Çarıkçı, İ. H. (2018). Career adaptation skills and critical thinking disposition. *International Journal of Economic and Administrative Studies, 17*(1), 427–440. https://doi.org/10.18092/ulikidince.439336

17. Hill, J., Walkington, W., & France, D. (2016). Graduate attributes and critical thinking. *Journal of Geography in Higher Education, 40*(2), 155–163. https://doi.org/10.1080/03098265.2016.1154932
18. Hindman, A. H., Connor, C. M., Jewkes, A. M., & Morrison, F. J. (2008). Shared book reading and literacy outcomes. *Early Childhood Research Quarterly, 23*(3), 330–350. https://doi.org/10.1016/j.ecresq.2008.01.005
19. İskifoğlu, G. (2014). Cross-cultural equivalency of CCTDI. *Educational Sciences: Theory and Practice, 14*(1), 159–178.
20. İskifoğlu, G. (2018). Critical thinking disposition of counsellors. *Turkish Studies, 13*(19), 1023–1038. https://doi.org/10.7827/TurkishStudies.14080
21. Jaramillo Gómez, D. L., et al. (2025). Determining factors for the development of critical thinking. *Psych, 13*(6), 59. https://doi.org/10.3390/psych13060059
22. Ku, K. Y. L. (2009). Assessing students' critical thinking performance. *Thinking Skills and Creativity, 4*(2), 70–76. https://doi.org/10.1016/j.tsc.2009.02.001
23. Marcos-Vílchez, J. M., et al. (2025). Improving critical thinking against misinformation. *Humanities and Social Sciences Communications*. https://doi.org/10.1057/s41599-025-06143-6
24. Terblanche, E. A. J., & de Clercq, B. (2019). Critical thinking development in students. *South African Journal of Accounting Research*. https://doi.org/10.1080/10291954.2019.1669293
25. Wan, Z. H., & Cheng, M. H. M. (2019). Classroom environment and critical thinking. *Educational Studies, 45*(3), 285–304. https://doi.org/10.1080/03055698.2018.1446331
26. Yu, L., et al. (2023). Problem-based learning and critical thinking. *Frontiers in Education, 8*, 1139987. https://doi.org/10.3389/feduc.2023.1139987