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CRITICAL THINKING AND ITS RELATIONSHIP WITH SUSTAINABLE BEHAVIOR AMONG STUDENTS OF THE COLLEGE OF BASIC EDUCATION

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Abstract:

The current research addresses the study of critical thinking and its relationship with sustainable behavior among students of the College of Basic Education at the University of Misan, through five main objectives: identifying the level of critical thinking, revealing the significance of differences in it according to gender, examining the level of sustainable behavior, determining the significance of differences in it according to gender as well, and ultimately clarifying the nature of the correlational relationship between the two variables.

The researcher relied on the descriptive correlational method, and the research sample consisted of 200 male and female students selected using the stratified random method from the Departments of Science, Mathematics, Arabic Language, and Primary Class Teacher, with 50 students from each department equally distributed between males and females. Watson and Glaser's Critical Thinking Scale in its Arabic version and the Sustainable Behavior Scale adapted for the Arab environment were utilized.

The research results revealed that the level of critical thinking among the sample individuals was average, while the level of sustainable behavior was below average. The differences in critical thinking between genders were not statistically significant, whereas the comparison between genders in sustainable behavior showed statistically significant differences in favor of females. The

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research also confirmed the existence of a statistically significant positive correlation between critical thinking and sustainable behavior. In light of these results, the researcher provided a set of recommendations and suggestions aimed at enhancing both variables in the university environment.

Keywords: Critical thinking, sustainable behavior, university students, College of Basic Education, University of Misan.

Introduction

Chapter One: The General Framework of the Research

First: The Research Problem

Contemporary societies are witnessing accelerated structural transformations that impose fundamental challenges on higher education institutions concerning the nature of the competencies that their graduates should be prepared for. University education is no longer concerned solely with the transmission and generation of knowledge; rather, it has become required to shape the personality of citizens capable of sound critical thinking and exhibiting responsible behaviors towards their environment, society, and their duties to future generations. In this context, critical thinking and sustainable behavior top the list of competencies that leading educational institutions seek to instill in their students. Despite the broad theoretical agreement on the value of critical thinking as a higher cognitive competence associated with analysis, evaluation, and logical reasoning (Al-Ziyat, 2004, p. 312), the educational reality in many Arab higher education institutions still leads to low or medium levels of this skill among students. This has been highlighted by multiple studies warning that traditional curricula based on memorization and recall hinder the development of this competence and prevent its consolidation (Al-Atoum et al., 2015, p. 178). The matter is no less serious when it comes to sustainable behavior, which some indicators have begun to

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suggest is declining among segments of university students, despite the prospects and future responsibilities that this group holds.

The issue addressed in the current research gains doubled importance when we place it in the context of basic education faculties, as students in these faculties are the teachers of tomorrow who will be responsible for shaping the minds of emerging generations and guiding their behaviors and values. If these students themselves lack critical thinking skills or exhibit behavior that lacks sustainability dimensions, this will inevitably reflect on how they teach and model behavior to their own students in the future. In addition, the Arab educational literature is scarce in addressing the relationship between these two variables together in one context, especially at the level of Iraqi universities, which remain a research field in dire need of further study and investigation.

From here, the problem of the current research is defined by the following main question: What is the level of critical thinking and sustainable behavior among the students of the College of Basic Education at the University of Misan, and what is the nature of the relationship between them?

This main question branches into the following sub-questions:

1. What is the level of critical thinking among the students of the College of Basic Education at the University of Misan?
2. Are there statistically significant differences in critical thinking attributed to the variable of gender?
3. What is the level of sustainable behavior among the students of the College of Basic Education at the University of Misan?
4. Are there statistically significant differences in sustainable behavior attributed to the variable of gender?
5. What is the nature of the correlation between critical thinking and sustainable behavior among the sample individuals?

Second: The Importance of the Research

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1. Theoretical Importance

The current research contributes to enriching the Arabic educational and psychological literature in a field that is relatively lacking in comprehensive studies on the variables of critical thinking and sustainable behavior simultaneously, especially in the Iraqi context, which remains a fertile research field requiring further exploration. This research also represents a qualitative addition to the body of studies related to students of basic education colleges as a group with unique educational and professional characteristics, as it provides researchers and interested parties with a broader reference framework for understanding the relationship between cognitive and behavioral competencies in this group.

Furthermore, the research deepens theoretical understanding of the relationship between the five dimensions of critical thinking as defined by Watson and Glaser and sustainable behavior in its environmental, social, and economic dimensions, and allows for examining theoretical hypotheses that suggest critical thinking is a necessary condition for adopting sustainable behavior, putting them to precise scientific testing. Additionally, the research presents the Iraqi educational library with a practical model of the scales used in this field after verifying their psychometric properties in the local environment.

2. Practical Significance

The practical significance of the research is manifested in a range of interconnected aspects; at the level of the university institution, the research findings represent a functional diagnostic tool that enables those in charge of the College of Basic Education at the University of Misan to anticipate the cognitive and behavioral reality of their students and make evidence-based decisions regarding the development of curricula and the updating of teaching strategies to enhance critical thinking and consolidate sustainability values.

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At the level of teacher preparation, the research provides precise data that assists supervisors of educational training programs in designing courses and activities that develop critical thinking skills among student teachers and instill in them sustainable behaviors, which later reflects on the quality of education they provide to their students. This dimension gains strategic importance when we realize that the teacher is the primary driver in shaping students' values and behaviors at the basic stage.

At the level of national educational policies, the research provides a solid knowledge foundation that assists educational decision-makers in directing investment towards environmental education programs and promoting critical thinking, as they are considered two inseparable pillars in the path of sustainable development. In addition, the tools employed in this research, along with the accompanying psychometric data, will allow subsequent researchers to build upon them in more in-depth comparative or intervention studies.

Finally, the practical significance is evident in the value of the research for the university student themselves; it contributes to raising their awareness of the importance of critical thinking as a life skill, not just a cognitive one, and of sustainable behavior as a moral, human, and professional responsibility. A student who, through research like this, becomes aware of their level of performance in these two areas is better positioned for self-improvement and development.

Third: Research Objectives

The current research aims to achieve the following objectives:

1. To identify the level of critical thinking among students of the College of Basic Education at the University of Misan.
2. To identify the significance of differences in critical thinking according to the gender variable (male and female).

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3. To identify the level of sustainable behavior among students of the College of Basic Education at the University of Misan.
4. To identify the significance of differences in sustainable behavior according to the gender variable (male and female).
5. To identify the nature of the correlational relationship between critical thinking and sustainable behavior among students of the College of Basic Education at the University of Misan.

Fourth: Research Boundaries

The current research adheres to the following boundaries:

Subject matter boundary: The research is limited to studying critical thinking according to Watson and Glaser's model with its five dimensions (inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments), and sustainable behavior with its three dimensions (environmental, social, and economic).

Human boundary: Students of the College of Basic Education at the University of Misan in general, and the sample was limited to students of the Departments of Science, Mathematics, Arabic Language, and primary school teachers.
Spatial boundary: College of Basic Education - University of Misan.
Temporal boundary: The academic year 2024-2025.

Fifth: Defining Terms

1. Critical Thinking

Theoretically: Watson and Glaser (1980, p. 1) defined critical thinking skills as an integrated combination of attitudes, knowledge, and skills. They explained that there should be no inclination to question, no prior acceptance of claims, no familiarity with logical research methods, and no ability to use them effectively. Facione (1990, p. 2) defined critical thinking skills as self-control in judgment

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through interpretation, analysis, evaluation, and inference guided by empirical, conceptual, and methodological data.

Operationally: The total score achieved by the student on the Watson and Glaser Critical Thinking Scale in its Arabic version used in the current research.

2. Sustainable Behavior

Theoretical Definition: Kaiser et al. (1999) define it as the sum of individual actions and behaviors that contribute to the conservation of natural and environmental resources and achieve a balance between the environmental, social, and economic dimensions of sustainability. Hamadneh and Al-Khatib (2019) expand this concept to include the conscious behavioral system adopted by the individual as a reflection of their values and beliefs regarding sustainability.

Operational Definition: The total score achieved by the student on the Sustainable Behavior Scale used in the current research.

Chapter Two

Theoretical Framework and Previous Studies

First Theme: Critical Thinking

1. The Concept and Development of Critical Thinking

Critical thinking continues to occupy a central position in contemporary educational and psychological literature. However, the multiplicity of theoretical approaches that have addressed it has made defining its comprehensive and precise concept a complex and diverse matter. The first serious interest in this concept dates back to the beginning of the twentieth century, when John Dewey referred to it as "reflective thinking," describing it as the active and continuous reflection on any belief or epistemological assumption in light of its supporting

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reasons and consequences (Asfour, 2013, p. 22). With this introduction, Dewey laid the philosophical foundations upon which subsequent theorists built.

In the mid-20th century, Watson and Glaser (1980) made a significant contribution to framing this concept and defining its components in a measurable and operational manner. They argued that it consists of three integrated elements: a stance of suspending judgment and not accepting beliefs and claims without critique; knowledge embodied in familiarity with logical and inferential methods of inquiry; and the skills to apply these methods effectively and accurately in different situations (Al-Harthi, 2001, p. 45). This tripartite definition has had a profound impact on guiding critical thinking research and its measurement tools for decades.

The Delphi Project of 1990 added another dimension to this conception when Facione (1990), in his foundational report, presented a concept that combines the cognitive aspect, represented by six major skills (interpretation, analysis, evaluation, inference, self-explanation, and self-regulation), with the affective aspect, represented by the inclinations and predispositions that motivate the application of these skills (Facione et al., translated by Al-Huwaidi, 2006, p. 19). A review of these definitions reveals that they all converge on a common core: critical thinking is a purposeful mental activity that transcends the passive reception of information, reaching levels of analysis, evaluation, and disciplined reasoning.

2. The Importance of Critical Thinking in Higher Education:

The importance of critical thinking is not limited to the academic gains it provides for university students, but extends to encompass diverse professional, personal, and life dimensions. On an academic level, critical thinking enables students to move from the position of passive recipient to that of critical producer of knowledge, thus enhancing their research competence and deepening their ability to deal with diverse sources of knowledge and evaluate their reliability (Abu Jadu

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& Nawfal, 2007, p. 231). In the field of teacher training specifically, this variable acquires even greater importance, as only a teacher capable of critical thinking can create a classroom environment that stimulates questioning and inquiry, and guide their students toward building their own understanding rather than merely receiving and repeating information (Al-Khalili et al., 2005, p. 68).

3. Critical Thinking Skills According to the Watson and Glaser Model

The Watson and Glaser model (1980) is one of the most widely used critical thinking models in Arab and international educational research. The current researcher adopted it due to its comprehensiveness and the availability of an accurate, Arabic-language measurement tool based upon it. The model identifies five main dimensions of critical thinking:

Inference: The ability to accurately weigh facts and distinguish the degree of validity of the inferences drawn from them. This necessitates assessing the adequacy of evidence and its suitability for logical support (Al-Zayyat, 2004, p. 314).

Recognition of Assumptions: Uncovering implicit, unstated assumptions inherent in statements and positions. This skill enables individuals to evaluate the logic based on these assumptions and identify its weaknesses.

Deduction: Determining the consistency of the conclusions drawn with the premises and judging whether they logically and necessarily derive from the given data. Interpretation: Examining evidence and facts objectively and assessing the validity of the generalizations drawn from them, free from selectivity and personal biases.

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Evaluation of Arguments: Distinguishing between arguments with weight and genuine relevance to the topic and weak arguments based on fallacies, and assessing their degree of importance and validity (Al-Harthi, 2001, p. 48).

Second Axis: Sustainable Behavior

1. The Concept of Sustainability and Sustainable Behavior

The 1987 Brundtland Report, issued by the World Commission on Environment and Development, established the definitional foundations for sustainable development, defining it as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Obaidat & Abu Al-Smeed, 2007, p. 47). Since then, three main dimensions of sustainability have emerged, forming a framework for most studies in this field: the environmental dimension, which concerns the conservation and sustainability of natural resources; the social dimension, which relates to promoting justice, solidarity, and social capital; and the economic dimension, which is linked to rationalizing consumption and efficient resource utilization.

Sustainable behavior, in its modern conception, transcends the narrow environmental framework that initially defined it, describing the daily behavioral patterns adopted by individuals as a reflection of their awareness and responsibility towards the three dimensions of sustainability (Kaiser et al., translated by Farhat, 2012, p. 33). Hamadneh and Al-Khatib (2019, p. 89) emphasize that sustainable behavior is not a spontaneous, reflexive response, but rather a conscious expression of a deeply rooted system of values and ethics that individuals hold towards their environment, their community, and their duty towards future generations.

2. Dimensions of Sustainable Behavior

Environmental Dimension: This dimension embodies all behaviors aimed at preserving natural resources and reducing pollution, such as rationalizing energy

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and water consumption, recycling, and maintaining biodiversity. This dimension represents the initial core around which the concept of sustainability developed before its scope broadened (Jamal, 2013, p. 67).

Social Dimension: This is manifested in behaviors that seek to promote social solidarity, justice, equal opportunities, respect for human rights, positive participation in civic life, and building a cohesive social fabric (Saada & Sartawi, 2004, p. 112).

Economic Dimension: This is represented by responsible consumption patterns, awareness of the need for sustainable production, avoiding extravagance and waste, and striving to maximize the benefit from available economic resources (Al-Sharif, 2017, p. 54). 3. Factors Influencing Sustainable Behavior
Studies have identified a number of factors that determine sustainable behavior, which can be categorized into two main axes: internal factors such as environmental knowledge, personal values, attitudes toward sustainability, and a sense of individual responsibility toward the environment and society (Kaiser et al., translated by Farhat, 2012, p. 36); and external factors such as the cultural and social context, the availability of supportive infrastructure, environmental policies, and environmental education (Hamadneh & Al-Khatib, 2019, p. 94). Ajzen (2002, p. 665) argues that three factors together constitute the strongest predictors of sustainable behavior: attitudes toward this behavior, the social norms surrounding the individual, and perceived self-control.

4. The Role of Education in Promoting Sustainable Behavior

Education occupies a strategic position within the overall system for establishing sustainable behavior, due to its ability to shape values, attitudes, and behaviors during the formative and developmental stages. United Nations Environment Programme documents have affirmed that education for sustainable development

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aims to empower individuals to acquire the knowledge, values, and skills necessary for active participation in building a sustainable future (Jamal, 2013, p. 71). The university environment, in particular, provides an ideal space for this transformation, as it combines theoretical learning with practical application and attracts broad segments of young people during a stage of identity formation and the establishment of their value system (Al-Salti, 2006, p. 43).

Third Axis: The Relationship Between Critical Thinking and Sustainable Behavior

The relationship between critical thinking and sustainable behavior is based on multiple and interconnected theoretical foundations. From a cognitive perspective, critical thinking is the tool that enables individuals to analyze, evaluate, and contextualize environmental and social information, generating firm convictions about the importance of sustainable behavior and the far-reaching consequences of irresponsible behavioral choices (Al-Omari, 2018, p. 77). From a behavioral perspective, individuals cannot consciously and consistently adopt a sustainable behavioral pattern without possessing the ability to evaluate their choices and compare alternatives in light of accurate data.

Several studies have observed this close relationship. Hawes and Banks (2006, p. 211) found that individuals with high levels of critical thinking tend to adopt more environmentally responsible behaviors. This is theoretically explained by the fact that critical thinking liberates the individual from the constraints of narrow, immediate thinking and enhances their ability to anticipate the long-term consequences of their actions, thus tipping the scales in favor of ethical and environmental considerations in their behavioral decisions (Al-Zayyat, 2004, p. 319).

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Previous Studies and Discussion

First: Arab Studies

Al-Omari's Study (2018): This study aimed to clarify the level of critical thinking and its relationship to environmental behavior among a sample of 250 male and female students at the University of Jordan. It concluded that critical thinking is positively and statistically significantly correlated with environmental behavior, and that the level of critical thinking fell within the medium range (Al-Omari, 2018, p. 82). This study intersects with the current research in revealing the nature of the relationship between the two variables; however, it is limited to the environmental dimension of sustainable behavior without addressing the social and economic dimensions.

The study by Hamadneh and Al-Khatib (2019) aimed to monitor the level of sustainable behavior among 320 male and female students at Yarmouk University and examine differences based on the variables of gender and specialization. The results revealed a high level of sustainable behavior and statistically significant differences favoring females in the environmental and social dimensions (Hamadneh and Al-Khatib, 2019, p. 97). The current research agrees with this study in its focus on the gender variable, but differs in the nature of the sample, targeting basic education students in the Iraqi context.

The study by Al-Sharif (2017) addressed the relationship between environmental culture and sustainable behavior among 185 male and female students in colleges of education at Saudi universities. It concluded that environmental culture significantly contributes to predicting sustainable behavior, with differences favoring students in science departments in the environmental behavior dimension (Al-Sharif, 2017, p. 60). The current study benefits from this theoretical framework, although it focuses on critical thinking rather than environmental culture as a predictor of sustainable behavior.

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Al-Astal's study (2014) examined the level of critical thinking and its relationship to academic achievement among 210 students at the Faculty of Education, Islamic University of Gaza. It showed that the overall level of critical thinking was average, with no significant differences between genders (Al-Astal, 2014, p. 77). The current research adds a dimension missing from this study: sustainable behavior. It also expands the scope of the analysis to include the gender variable and its relationship to both variables.

Jamal's study (2013) tested the effect of an environmental education training program on sustainable behavior among 60 student teachers in Jordan, divided into experimental and control groups. The study demonstrated the program's effectiveness in improving the level of sustainable behavior across its various dimensions (Jamal, 2013, p. 74). This study provides the current research with support for the idea that sustainable behavior can be developed through carefully planned educational interventions, which makes the results of the current research highly applicable.

Second: Foreign Studies

Hawes and Bauhs' study (2006) examined the relationship between critical thinking and environmental behavior among 180 American university students. It demonstrated a significant positive correlation between the two variables, with females exhibiting a marked advantage in environmental behavior (Hawes & Bauhs, 2006, p. 214). This study aligns with the core hypothesis of the current research regarding the nature of the relationship between the two variables. However, it should be noted that the cultural environment differs, necessitating further investigation within the Arab context.

Kaiser et al.'s study (1999) presented a theoretical model for explaining sustainable environmental behavior based on planned behavior theory and the theory of values, beliefs, and norms. This model was applied to a sample of Swiss citizens. The model demonstrated a high explanatory power for sustainable

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environmental behavior (Kaiser et al., 1999, p. 10), thus reinforcing the theoretical foundations upon which the current research is based in understanding the determinants of this behavior. A study by Facione et al. (1995) linked critical thinking skills, attitudes, and responsible behaviors among nursing students, concluding that critical thinking attitudes, particularly analysis and interpretation, are positively correlated with environmentally conscious professional behaviors. This finding deepens our understanding of the pathway connecting critical thinking to sustainable behavior, confirming that affective attitudes are no less important than cognitive skills in this regard.

Discussion of Previous Studies: A review of previous studies reveals several noteworthy observations. Regarding theoretical consistency, most studies converge with the current research in acknowledging that the level of critical thinking among students in colleges of education falls within the average range or below. This suggests that this phenomenon is not limited to a specific context but reflects a broader educational reality related to the nature of curricula and prevailing teaching methods. However, there is a notable absence of studies addressing critical thinking in relation to sustainable behavior in its three dimensions within Iraqi samples, making the current research a valuable contribution to this field.

Methodologically, most previous studies have relied on the descriptive-correlational approach, as does the current research, which facilitates comparison and enhances the credibility of the results. However Some of these studies examined the two variables in isolation, while the current research sought to integrate them into a comprehensive research framework. This study is also distinguished by its provision of psychometric properties for the scales used within the local context, a feature overlooked by some previous studies.

Regarding the results related to the gender variable, studies vary in the nature of gender differences in critical thinking. While Al-Astal's study (2014) showed no statistically significant differences, other studies indicate slight variations in

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different directions. As for sustained behavior, multiple studies agree on the superiority of females, a well-supported prediction that the current research tests within the Iraqi context.

Chapter Three
Research Methodology and Procedures
First: Research Methodology

The current research adopted the descriptive correlational approach as the most suitable method for achieving its objectives. This approach allows for the description of variables in their natural state without intervention or alteration, and enables the measurement of the strength and direction of the relationship between two or more variables, while maintaining spontaneity in the respondents' responses and a high degree of environmental validity (Awda, 2010, p. 113).

Second: Research Population

The research population consists of all students enrolled in the College of Basic Education at Maysan University for the 2024-2025 academic year across its various departments.

Third: Research Sample

The research sample was selected using stratified random sampling from four departments representing both the scientific and humanities disciplines within the College of Basic Education at Maysan University. The total sample size was (200) students, with (50) from each department, equally distributed between genders. Table (1) shows the distribution of the sample members:

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Table (1): Distribution of the research sample members by department and gender

Total	Female	Male	Specialization	Department
50	25	25	Scientific	Science
50	25	25	Scientific	Mathematics
50	25	25	Humanistic	Arabic Language
50	25	25	Humanistic	Primary Grades Teacher
200	**100**	**100**	**-**	**Total**

Fourth: Research Tools

1. Watson-Glaser Critical Thinking Appraisal (WGCTA)

The Watson-Glaser Critical Thinking Appraisal (WGCTA) is one of the most widely used tools for measuring critical thinking in global educational and psychological research. The original version of the scale was developed in 1964 and revised in 1980. It has been translated, adapted, and its psychometric properties verified within the Arabic context by several researchers, most notably Al-Harthi (2001). The Arabic version of the scale used in this research consists of 80 items equally distributed across its five dimensions. The total score ranges from 0 to 80, and the levels are classified according to the following criteria: low (below 53), medium (53-64), and high (65 and above).

To verify the psychometric properties in the current context, the scale was presented to twelve expert reviewers specializing in educational psychology and psychometrics at Iraqi universities. Items with an 80% or higher consensus rate were accepted. Cronbach's alpha coefficient on the pilot sample of 30 students was 0.81, a satisfactory value that allows the scale to be used for scientific research purposes.

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2. Sustainable Behavior Scale

The researcher adopted the Sustainable Behavior Scale originally developed by Kaiser (1998) and adapted to the Arabic context by Farhat (2012), which has demonstrated satisfactory psychometric properties in Arabic studies (Farhat, 2012, p. 38). The scale comprises 36 items distributed across three dimensions: environmental (14 items), social (12 items), and economic (10 items). Respondents respond using a five-point Likert scale. The total score ranges from 36 to 180, categorized as follows: low (36-84), medium (85-132), and high (133-180).

The researcher verified the scale's face validity by presenting it to the same panel of experts mentioned above. Items that the experts questioned regarding clarity or suitability to the local context were reformulated. Cronbach's alpha coefficient on the pilot sample was 0.84, indicating high internal consistency, making the scale a reliable instrument for the purposes of this research.

Fifth: Statistical Methods

The statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 26, and included the following methods:

1. Arithmetic means and standard deviations: to describe the level of critical thinking and sustained behavior.
2. Independent samples t-test: to reveal the significance of differences in the two variables according to the gender variable.
3. Pearson correlation coefficient: to determine the nature, direction, and strength of the correlation between critical thinking and sustained behavior.
4. Cronbach's alpha coefficient: to verify the reliability of the two instruments used.

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Chapter Four

Presenting, Interpreting, and Discussing the Results

First: Results Related to the Level of Critical Thinking (First Objective)

To answer the first question, the means and standard deviations of the dimensions of the Critical Thinking Scale and its total score were calculated for the sample members. The data in Table (2) illustrates these results:

Table (2): Means and Standard Deviations of the Dimensions of Critical Thinking and the Total Score (n=200)

Level	standard deviation	arithmetic average	Dimension	Stage
middle	2.19	10.33	Interpretation	1
middle	2.31	10.15	Identifying assumptions	2
middle	2.14	9.82	Conclusion	3
middle	2.25	9.68	Evaluating arguments	4
middle	2.08	9.47	Inference	5
middle	**8.73**	**49.45**	**Total grade**	-

Table (2) reveals that the level of critical thinking among students at the College of Basic Education, University of Maysan, was average across all dimensions and the overall score. The overall arithmetic mean was (49.45) with a standard deviation of (8.73), which falls within the average range according to the adopted classification standard (53-64), although it is below the lower end of this range, suggesting a tendency towards the lower end. Regarding the sub-dimensions, the interpretation dimension ranked highest with an average of (10.33), while the deductive dimension ranked lowest with an average of (9.47).

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This average level is not surprising when viewed in light of the prevailing educational context. The curricula in many colleges of education still prioritize quantitative knowledge acquisition at the expense of higher-order thinking skills, thus limiting students' opportunities to develop analytical and critical abilities and apply them in real-life situations. This conclusion aligns with the findings of Al-Ashtal (2014, p. 77) and Al-Omari (2018, p. 82), who observed that critical thinking among students in faculties of education at Arab universities is generally classified as average, a pattern that suggests a profound structural need to reconsider the prevailing educational philosophy.

Second: Results Related to Differences in Critical Thinking According to Gender (Second Objective)

To reveal the significance of differences in critical thinking according to the gender variable, an independent samples t-test was administered. The results, shown in Table 3, reveal the following:

Table 3: Results of the t-test for differences in critical thinking according to the gender variable

Statistical significance	degrees of freedom	Value of T	standard deviation	arithmetic average	No.	Gender
			8.91	48.93	100	Male
Not 0.38 indicative	198	0.87	8.55	49.97	100	Female

Table 3 shows that gender differences in critical thinking did not reach statistical significance. The calculated t-value (0.87) was at a significance level of (0.38), which is significantly higher than the acceptable level (0.05). Although the mean score for females (49.97) was slightly higher than that of males (48.93), this difference is not statistically significant.

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This result supports the hypothesis that critical thinking, as a cognitive competency, is primarily shaped by educational and experiential variables, not gender. When the university environment provides equal opportunities for exposure to academic content and cognitive tasks, the gender gap in this area diminishes or disappears. This interpretation is supported by Al-Astal's findings (2014, p. 79), which also concluded that there were no significant gender differences in critical thinking among students in the Faculty of Education.

Third: Results Related to the Level of Sustainable Behavior (Goal Three)

To answer question three, the means and standard deviations of the dimensions of the Sustainable Behavior Scale and its total score were calculated. The results are shown in Table (4):

Table (4): Means and Standard Deviations of the Dimensions of Sustainable Behavior and the Total Score (n=200)

Level	standard deviation	arithmetic average	Dimension	Stage
Below average	9.12	51.34	Environmental dimension	1
Below average	8.45	46.87	Social dimension	2
Below average	7.28	36.92	Economic dimension	3
Below average	**22.61**	**103.13**	Overall score	-

Table (4) shows that the level of sustainable behavior among the sample was below average across all dimensions and the overall score. The overall arithmetic mean was (103.13) with a standard deviation of (22.61), which falls at the lower end of the average range (85-132), tending towards below it. Regarding the dimensions, the environmental dimension recorded the highest mean with an average of (51.34), while the economic dimension came in last with an average of (36.92).

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This low level warrants further analysis. Several structural and contextual factors appear to be responsible for this situation, most notably: the absence of specialized curricula in sustainable development and effective environmental education within the plans of basic education colleges; limited exposure to awareness campaigns and community activities that support sustainable behavior; and the challenging economic context that narrows the scope for sustainable choices for a large segment of students. This result contradicts what Hamadneh and Al-Khatib's study (2019, p. 97) found to be a high level, and the researcher attributes this discrepancy to the difference in the cultural and geographical context and in the nature of the targeted samples.

Fourth: Results Related to Differences in Sustainable Behavior According to Gender (Goal Four)

To answer the fourth question concerning the significance of differences in sustainable behavior according to the gender variable, an independent samples t-test was administered. The results are shown in Table 5:

Table 5: Results of the t-test for differences in sustainable behavior according to the gender variable

Statistical significance	degrees of freedom	Value of T	standard deviation	arithmetic average	No.	Gender
			23.15	98.74	100	Male
0.005 significance	198	2.81	21.87	107.52	100	Female

Table (5) shows statistically significant differences in sustainable behavior attributable to the gender variable. The calculated t-value was 2.81 at a significance level of 0.005, which is lower than the established significance level of 0.05. These differences favored females, with a mean score of 107.52 compared to the mean score of males (98.74).

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The explanation for this gender disparity lies in a number of interconnected factors. In terms of socialization, Arab cultures instill in girls values based on prudence, conservation, and care for the environment—values organically linked to the concept of sustainability. Regarding psychological attitudes, socio-psychological studies show that females generally demonstrate a deeper concern for environmental and social issues and the importance of preserving shared resources. This finding is consistent with the conclusions of Hamadneh and Al-Khatib (2019, p. 98) and Al-Sharif (2017, p. 62), who observed the same female superiority in sustainable behavior within various Arab university contexts.

Fifth: Results Related to the Relationship Between Critical Thinking and Sustainable Behavior (Objective Five)

To answer the fifth question concerning the nature of the correlation between critical thinking and sustainable behavior among the sample members, Pearson's correlation coefficient was calculated between the total scores of the two scales. The result was a correlation coefficient of (0.43), which is statistically significant at the (0.01) level.

This coefficient indicates a moderately strong positive correlation between critical thinking and sustainable behavior. This means that a higher level of critical thinking in students is statistically significantly associated with a higher level of sustainable behavior, and vice versa. This relationship falls within the range of moderate positive correlation according to the statistical interpretation standards adopted in psychological and educational research.

This result finds its theoretical basis in a central premise: that an individual who masters critical thinking skills possesses cognitive tools that enable them to transcend the narrow immediate horizon and anticipate the long-term consequences of their behavioral choices. It is capable of analyzing environmental and social problems, assessing their dimensions, and inferring causal relationships between individual behaviors and long-term collective outcomes (Al-Zayyat, 2004, p. 319). In light of this, behavioral judgment

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becomes more rational and more responsible. This finding aligns with the findings of Hawes and Banks (2006, p. 214) and Al-Omari (2018, p. 84), who demonstrated a positive correlation between critical thinking and sustainable behaviors in various cultural and academic contexts.

Sixth: Conclusions

A careful reading of the research results yields a number of conclusions that paint a complete picture of the studied reality:

1. Students at the College of Basic Education at Maysan University suffer from a relative deficiency in critical thinking, reflected in their average ranking. This deficiency is attributed to the absence of an educational environment that fosters higher-order thinking skills.
2. The gender variable does not significantly affect the level of critical thinking, reinforcing the hypothesis that this cognitive competence is shaped by educational, not biological, variables.
3. A below-average level of sustainable behavior indicates a deficiency in the environmental and social awareness system provided by the college to its students.
4. The significant positive correlation between the two variables demonstrates that critical thinking is a strong predictor of sustainable behavior, and that investing in developing one positively impacts the other.

Seventh: Recommendations

Based on the research findings, the researcher recommends the following:

1. Adopting active teaching strategies that stimulate critical thinking, such as inquiry-based learning, case studies, and problem-solving, and training faculty members in their application.

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2. Integrating sustainable education content into existing curricula and designing student research projects that address environmental and social issues in the local community.

3. Organizing awareness programs and student activities concerned with sustainability, and benefiting from the excellence of females in this field by enabling them to take on leadership roles in these activities.

Eighth: Recommendations

Based on the findings of this research, the researcher suggests the following further studies:

1. A study of the impact of a critical thinking training program on the level of sustainable behavior among students in colleges of basic education.

2. A comparative study of critical thinking and sustainable behavior among students in different Iraqi universities.

3. The development of a local Iraqi scale for sustainable behavior that takes into account the cultural, environmental, and economic specificities of the Iraqi context.

5. A study of the role of faculty members in developing sustainable behavior among students in colleges of basic education and identifying the most effective teaching practices in this field.

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