

The Role of Thinking Patterns in Predicting the Level of Desire for Knowledge Among Egyptian University Students

دور أنماط التفكير في التنبؤ بمستوى الرغبة في المعرفة لدى طلاب الجامعات المصرية

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Abstract

This study examined how thinking styles predict the level of epistemic curiosity among 80 randomly selected students from the Faculty of Education at the Arab Open University in Egypt. Using a descriptive-correlational design, the research employed the Thinking Styles Inventory and the Epistemic Curiosity Scale. Data analysis through Pearson's correlation, multiple regression, and ANOVA revealed a significant positive relationship between legislative and judicial thinking styles and knowledge desire, suggesting that creative and analytical thinkers are more curious. However, executive thinking showed no significant impact. Additionally, students in higher academic years demonstrated greater curiosity, indicating that epistemic curiosity may grow with academic progression. Regression results confirmed legislative and judicial styles as strong predictors of knowledge desire. The study recommends fostering these thinking styles through interactive strategies like problem-based learning and critical thinking activities. It also highlights the importance of early intervention via guidance programs to support first-year students in developing their curiosity.

Keywords: Thinking Styles; Knowledge Desire; Legislative Thinking; Executive Thinking; Judicial Thinking.

ملخص:

تناولت هذه الدراسة كيفية تنبؤ أنماط التفكير بمستوى الفضول المعرفي لدى 80 طالبًا تم اختيارهم عشوائيًا من كلية التربية بالجامعة العربية المفتوحة في مصر. وباستخدام التصميم الوصفي الارتباطي، استخدم البحث مخزون أنماط التفكير ومقياس الفضول المعرفي. كشف تحليل البيانات من خلال ارتباط بيرسون والانحدار المتعدد وتحليل التباين عن وجود علاقة إيجابية مهمة بين أنماط التفكير التشريعي والقضائي والرغبة في المعرفة، مما يشير إلى أن المفكرين الإبداعيين والتحليليين أكثر فضولًا. ومع ذلك لم يظهر التفكير التنفيذي أي تأثير كبير. بالإضافة إلى ذلك أظهر الطلاب في السنوات الأكاديمية العليا فضولًا أكبر، مما يشير إلى أن الفضول المعرفي قد ينمو مع التقدم الأكاديمي. وأكدت نتائج الانحدار أن الأنماط التشريعية والقضائية هي مؤشرات قوية للرغبة في المعرفة. توصي الدراسة بتعزيز أنماط التفكير هذه من خلال استراتيجيات تفاعلية مثل التعلم القائم على حل المشكلات وأنشطة التفكير النقدي. كما تسلط الضوء على أهمية التدخل المبكر من خلال برامج الإرشاد لدعم طلاب السنة الأولى في تنمية فضولهم. **كلمات مفتاحية:** أنماط التفكير؛ الرغبة في المعرفة؛ التفكير التشريعي؛ التفكير التنفيذي؛ التفكير القضائي.

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1. Introduction

Knowledge is the cornerstone of societal progress, serving as the primary driver of development and innovation. In light of the rapid changes in today's world, the pursuit of knowledge has become an essential trait for university students, playing a pivotal role in shaping their academic and professional futures. However, the level of desire to acquire knowledge is not equal among individuals, as it is influenced by multiple factors, including the thinking styles that students adopt in their engagement with information and various educational situations.

Thinking styles represent a distinctive approach individuals use to process information, solve problems, and make decisions. They influence how individuals interpret new knowledge, how deeply they engage in learning environments, and their willingness to explore unfamiliar concepts. Based on this, thinking styles can be considered a fundamental factor affecting the level of desire for knowledge among university students—either by fostering intellectual curiosity or limiting it.

Numerous studies and research have highlighted the importance of the relationship between thinking styles and the desire for knowledge. Some studies have confirmed that the way individuals think directly impacts their motivation to acquire knowledge and develop cognitive abilities. For example, a study by **Al-Ogaidi & Al-Dulami** (2025) found that different thinking styles play a crucial role in determining students' readiness to engage in deep learning processes, which, in turn, affects their curiosity and desire to explore new concepts. Additionally, a study by **Nurakenova & Nagymzhanova** (2024) found that creative thinking enhances students' intrinsic motivation, increasing their desire to seek knowledge through unconventional means. Moreover, research by **Cojorn & Sonsupap** (2024) revealed a strong relationship between analytical thinking styles and the desire for continuous learning, as students who rely on analytical thinking tend to seek in-depth explanations for information, which heightens their interest in knowledge.

At the same time, some studies have identified various challenges that impact the level of desire for knowledge among university students in Egypt, including the underdevelopment of critical and creative thinking skills and the reliance on traditional teaching methods that emphasize rote memorization rather than analysis and exploration. A study by **Haibah** (2022) indicated that a significant percentage of university students in Egypt struggle with the limited use of higher-order thinking strategies, which reduces their ability to conduct independent research and explore new information. Furthermore, **Bahrawi** (2023) pointed out a gap between what students learn at universities and the demands of the job market, leading to a decline in their motivation to acquire knowledge, as they feel that what they study lacks practical relevance.

Additionally, research by **Nasr** (2021) showed that the educational environment in some Arab universities lacks encouragement for critical dialogue and active participation in the learning process, which diminishes students' motivation to acquire knowledge in innovative ways. Moreover, academic and economic pressures that students face, as highlighted by **Hussein** (2024), contribute to the decline in their intellectual curiosity, as their primary focus shifts to passing exams rather than developing a genuine interest in learning.

From this perspective, there is a need to study the relationship between thinking styles and the desire for knowledge among Egyptian university students to understand how different cognitive approaches influence students' motivation for learning and intellectual development. This study could provide valuable insights for educational institutions on how to design supportive learning environments that stimulate students' passion for knowledge by adopting educational strategies that align with their diverse thinking styles.

Based on this, the present research aims to explore the role of thinking styles in predicting the level of desire for knowledge among Egyptian university students by analyzing the relationship between these two aspects and highlighting the factors that may enhance or hinder students' willingness to acquire knowledge. The study seeks to answer the following main research question:

What is the role of thinking styles in predicting the level of desire for knowledge among Egyptian university students?

2. Importance of the Study

The significance of this research stems from the pivotal role that thinking styles play in shaping university students' level of desire for knowledge, which directly impacts the quality of the educational process and its outcomes. In light of rapid developments in the field of education and the increasing need for generations capable of analysis, critical thinking, and creativity, it is essential to understand the factors influencing students' motivation to acquire knowledge. This understanding can help in developing more effective educational strategies.

2.1. Theoretical Significance

This research contributes to enriching the scientific literature on educational psychology by providing an analytical perspective on the relationship between thinking styles and the level of desire for knowledge. It also aims to clarify how different cognitive approaches influence students' scientific curiosity, offering a theoretical foundation for future studies that may explore the topic from various angles.

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2.2. Practical Significance

The findings of this research could help in developing educational curricula that align more closely with students' thinking styles, thereby enhancing their motivation for learning and exploration. Additionally, decision-makers in educational institutions may benefit from these findings to improve university learning environments by adopting teaching methods that support critical and creative thinking and encourage students to actively seek knowledge more effectively.

2.3. Societal Significance

Since knowledge is one of the fundamental pillars of societal development, fostering university students' desire to acquire it contributes to producing more aware and productive human resources capable of addressing labor market challenges and contributing to sustainable development. Moreover, enhancing individuals' conscious thinking can lead to improved quality of life by enabling them to make decisions based on deep understanding and logical analysis.

3. Study Terminology

3.1. Thinking Styles

The concept of thinking styles refers to the different approaches individuals use to process information, make decisions, and solve problems (Fan, 2020, p. 35).

In this study, thinking styles refer to the cognitive approaches that Egyptian university students adopt in processing academic information, making decisions, and dealing with educational challenges.

3.2. Desire for Knowledge

Desire for knowledge is defined as the innate tendency to seek information and understand phenomena through continuous exploration and inquiry. It consists of two main dimensions: cognitive curiosity, which is related to understanding information, and curiosity driven by uncertainty, which reflects the desire to reduce ambiguity regarding a particular topic (Dezza et al., 2022, p. 53).

Operationally, the desire for knowledge is defined as the score a university student obtains on a cognitive curiosity scale, which measures their level of interest in acquiring new knowledge, exploring various concepts, and seeking answers to scientific and academic questions.

4. Theoretical framework

4.1. Thinking Styles

Thinking styles refer to the ways individuals process information and make decisions. Sternberg proposed a classification model of thinking styles (Fair et al., 2016, p. 36), which includes three main types:

(I)- Legislative Thinking

- Individuals with a legislative thinking style are characterized by their creativity and ability to develop new plans and ideas.
- They tend to think independently and prefer solving problems in non-traditional ways.
- They possess intrinsic motivation that drives them to explore and seek knowledge, increasing their desire for learning.

(II)- Executive Thinking

- Individuals who adopt this style tend to follow instructions and rules as they are, without attempting to modify or innovate them.
- They prefer adhering to organizational structures and pre-established systems.
- This style may have a limited effect on the desire for knowledge, as it relies on compliance with instructions rather than actively seeking new information.

(III)- Judicial Thinking

- Those with a judicial thinking style excel in analyzing, critiquing, and evaluating information based on specific standards.
- They tend to question concepts and seek deeper explanations, making them more inclined to explore and search for new knowledge.

From our perspective, thinking styles act as a cognitive compass that guides individuals in how they process information, make decisions, and engage with different problems. Just as fingerprints are unique to each person, every individual has a distinctive thinking style that directly influences how they receive, interpret, and explore knowledge.

Legislative thinking provides room for creativity and independence, viewing rules as adaptable rather than rigid, which encourages exploration. In contrast, judicial thinking is centered on analysis, evaluation, and critique, driving individuals to delve deeper into knowledge rather than settling for surface-level information. On the other hand, executive thinking favors routine and adherence to predefined systems, making individuals less likely to seek new intellectual horizons.

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However, the real paradox lies in the fact that the human mind does not function with a single fixed style; instead, it operates as a cognitive mosaic, integrating different thinking styles depending on the situation, environment, and individual needs. The most innovative and knowledgeable minds are those capable of flexibly shifting between these styles—creating when necessary, analyzing when required, and executing with precision when needed. Therefore, developing educational environments that foster the integration of these thinking styles could be the key to enhancing students' epistemic curiosity, enabling them to think critically, analyze effectively, and innovate in an ever-changing world.

4.2. Desire for Knowledge

The desire for knowledge refers to an individual's tendency to seek information and explore the unknown, driven by epistemic curiosity. Litman and Spielberger classified epistemic curiosity into two main types (Beswick, 2017, p. 54):

- **Interest-Type Curiosity (I-Type Curiosity):** A cognitive drive that motivates individuals to seek knowledge for enjoyment and exploration.
- **Deprivation-Type Curiosity (D-Type Curiosity):** A motivation that drives individuals to seek information to reduce uncertainty or gain a clearer understanding of a subject.

A study by Lim (2024) confirmed that epistemic curiosity is influenced by several factors, including thinking styles, educational level, and academic environment. It highlighted the significant role of analytical and creative thinking in fostering an individual's inclination toward knowledge acquisition.

From our perspective, the desire for knowledge is not merely an internal drive; it is a dynamic cognitive system influenced by learning environments and thinking styles. Just as curiosity propels children to explore the world around them, this drive continues to evolve as learning challenges become more complex and critical thinking expands. Interestingly, the desire for knowledge is not only about seeking facts but also about how information is processed and interpreted, making it a fundamental element in shaping a creative and adaptive mindset.

What distinguishes individuals with a high level of epistemic curiosity is not just their ability to ask questions, but their ability to reframe them in deeper and more insightful ways. This reflects non-traditional thinking, which leads to the exploration of new dimensions of knowledge. Thus, epistemic curiosity is not just a tendency to seek information; it is a skill that can be refined and nurtured through an academically stimulating environment that

prioritizes encouragement over rote learning and critical thinking over repetition.

Accordingly, enhancing the desire for knowledge requires a fundamental transformation in teaching methods—one that shifts the focus from simply delivering information to stimulating curiosity and encouraging students to seek answers on their own. In this way, learning becomes an ongoing exploratory journey rather than just a transfer of knowledge. By fostering such an approach, the desire for knowledge becomes an "intellectual fuel" that never runs dry.

From the above discussion, it can be concluded that thinking styles play a fundamental role in shaping the level of desire for knowledge, as an individual's thinking style determines how they interact with information. People with different thinking styles tend to adopt varying cognitive approaches, and studies have indicated a strong relationship between one's thinking style and their level of epistemic curiosity. The way individuals process and analyze information directly impacts their motivation to seek knowledge. This relationship can be further detailed as follows:

- Legislative Thinkers possess creativity and independent thinking, allowing them to explore new ideas and reframe problems in innovative ways. This makes them more inclined to seek knowledge and expand their understanding. As a result, they demonstrate a high level of epistemic curiosity, enjoying the challenge of questioning traditional ideas and discovering non-conventional solutions.
- Executive Thinking is characterized by a strict adherence to rules and instructions, with little emphasis on modification or creativity. This makes it less associated with epistemic curiosity, as individuals who follow this style often seek knowledge only to complete assigned tasks, rather than out of personal curiosity. Consequently, their intrinsic motivation for intellectual exploration tends to be lower.
- Judicial Thinkers excel in analyzing and critically evaluating information, which enhances their desire to understand phenomena more deeply. They are naturally inclined to ask questions, seek evidence, and assess the validity of information, which fosters a high level of epistemic curiosity and encourages continuous learning and exploration.

5. Method and tools

This study employed the descriptive correlational method, which aims to examine the relationship between thinking styles and the level of desire for knowledge among Egyptian university students. This method involves describing the phenomenon as it exists in reality and analyzing the degree of

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correlation between variables. It is particularly suitable for studying the mutual influences between psychological and educational factors, as it allows for the collection of quantitative data that can be statistically analyzed to derive precise conclusions. The research utilized the following tools:

●Thinking Styles Scale:

This tool was developed based on Sternberg's model, which classifies thinking styles into several types, such as legislative, executive, and judicial thinking. The scale consists of a set of statements through which students express their preferred way of processing information, making decisions, and solving academic problems. Students' responses are assessed using a five-point Likert scale, ranging from (1 = does not apply to me) to (5 = applies to me completely). The aim of this scale is to identify the dominant thinking styles among students and analyze their impact on their knowledge-related orientations.

● Desire for Knowledge Scale

This scale is based on the Litman & Spielberger model for measuring epistemic curiosity. It includes two main dimensions:

- Interest-type Epistemic Curiosity, which reflects students' desire to explore new concepts out of personal interest.
- Deprivation-type Epistemic Curiosity, which represents students' tendency to seek information to resolve ambiguity and uncertainty.

The scale comprises a set of statements that measure the level of desire for knowledge, and it is also assessed using a five-point Likert scale.

The research tools were applied to a random sample of (80) students from the Faculty of Education at the Arab Open University in Egypt. The sample was selected using the stratified random sampling method to ensure a balanced representation of students across different specializations and academic levels. The research tools were distributed among the participants, and data were collected and analyzed using appropriate statistical methods to examine the relationship between thinking styles and their level of desire for knowledge.

6. Study Results and Statistical Analysis

After applying the research tools to a random sample of (80) students from the Faculty of Education at the Arab Open University in Egypt, the collected data was analyzed using appropriate statistical methods. The results were as follows:

● **Analysis of the Relationship Between Thinking Styles and Epistemic Curiosity**

Pearson Correlation Coefficient was used to examine the relationship between different thinking styles (Legislative, Executive, and Judicial) and the level of epistemic curiosity among students. The results are shown in **Table 1**:

Table (1): Pearson Correlation Between Thinking Styles and Epistemic Curiosity

Variables	Correlation Coefficient (r)	Significance Level (p-value)	Statistical Significance
Legislative Thinking & Epistemic Curiosity	0.65	0.001	Significant at (0.01) level
Executive Thinking & Epistemic Curiosity	0.21	0.07	Not Significant
Judicial Thinking & Epistemic Curiosity	0.58	0.003	Significant at (0.01) level

- The results indicate a strong positive correlation between Legislative and Judicial thinking styles and epistemic curiosity. This suggests that students who favor analytical and evaluative thinking tend to have higher levels of curiosity.
- However, there was no statistically significant relationship between Executive thinking and epistemic curiosity, implying that this style may not be a key factor in driving students to seek knowledge.

● **The Predictive Role of Thinking Styles in Epistemic Curiosity**

Multiple Regression Analysis was conducted to determine the extent to which thinking styles can predict the level of epistemic curiosity among students. The results are presented in **Table 2**:

Table (2): Multiple Regression Analysis Predicting Epistemic Curiosity

Independent Variable	Regression Coefficient (β)	T-value	Significance Level (p-value)
Legislative Thinking	0.47	4.32	0.001
Executive Thinking	0.12	1.45	0.15
Judicial Thinking	0.41	3.98	0.002

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- The regression analysis shows that Legislative and Judicial thinking styles significantly predict epistemic curiosity, accounting for a substantial portion of the variance in curiosity levels.
- On the other hand, Executive thinking did not emerge as a significant predictor of epistemic curiosity.

• Differences in Epistemic Curiosity Based on Academic Level

A One-Way ANOVA test was conducted to examine differences in epistemic curiosity among students at different academic levels. The results are displayed in **Table 3**:

Table (3): One-Way ANOVA for Differences in Epistemic Curiosity by Academic Level

Group	Number of Students (N)	Mean Epistemic Curiosity Score	Standard Deviation
First-Year	20	3.8	0.45
Second-Year	20	4.2	0.51
Third-Year	20	4.5	0.47
Fourth-Year	20	4.7	0.42
F-value = 6.87	p-value = 0.002	Statistically Significant at (0.01) level	

- These findings indicate statistically significant differences in epistemic curiosity levels among students at different academic stages.
- The data suggests that epistemic curiosity increases as students' progress through their academic journey, likely due to greater exposure to academic content and intellectual challenges.

5. Discussion

The findings of this study highlight the strong relationship between thinking styles and the level of desire for knowledge among university students. Statistical analyses confirmed that legislative and judicial thinking play a significant role in stimulating epistemic curiosity, while executive thinking showed no clear impact. Additionally, the results revealed variations in the level of desire for knowledge across different academic years, suggesting that academic progress influences students' motivation for learning.

● **Relationship Between Thinking Styles and Desire for Knowledge**

The study found a strong positive correlation between legislative and judicial thinking and desire for knowledge, which aligns with the findings of **Al-Ogaidi & Al-Dulami** (2025). Their research indicated that individuals with legislative thinking tend to have intellectual independence, driving them to explore knowledge in novel ways, while those with judicial thinking focus on critical analysis and continuous evaluation, enhancing their epistemic curiosity.

- **Legislative Thinking and Desire for Knowledge:** Students with legislative thinking demonstrate a high degree of independence and creativity in forming ideas, which encourages them to seek new information and expand their knowledge. The strong correlation coefficient ($r = 0.65$, $p = 0.001$) reflects how creative and independent thinking fosters epistemic curiosity.
- **Judicial Thinking and Desire for Knowledge:** This thinking style relies on deep evaluation and critical analysis of acquired knowledge, motivating students to continuously seek information for deeper understanding. The correlation ($r = 0.58$, $p = 0.003$) suggests that students with analytical and critical thinking tendencies are more inclined to explore and discover knowledge.
- **Executive Thinking and Desire for Knowledge:** This style did not show a statistically significant impact on the desire for knowledge. A possible explanation is that executive thinking primarily focuses on following rules and procedures, rather than actively seeking alternative solutions or exploring new information, which may limit curiosity.

● **Predictive Role of Thinking Styles in Desire for Knowledge**

The results of multiple regression analysis confirmed that legislative and judicial thinking were the most significant predictors of desire for knowledge:

- Legislative Thinking: $\beta = 0.47$, $p = 0.001$
- Judicial Thinking: $\beta = 0.41$, $p = 0.002$

These results support the notion that students who engage in creative and critical thinking have a stronger drive to explore new knowledge, as they actively seek explanations and innovative solutions to problems.

Conversely, executive thinking showed no predictive significance, suggesting that strict adherence to rules and instructions does not necessarily stimulate a strong drive for knowledge acquisition. This may indicate that

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students with executive thinking styles are more likely to rely on provided information rather than independently seeking new knowledge.

• Differences in Desire for Knowledge Across Academic Levels

The results of a One-Way ANOVA analysis revealed statistically significant differences in the level of desire for knowledge based on students' academic year ($F = 6.87$, $p = 0.002$). This indicates that students in higher academic years exhibit greater levels of epistemic curiosity compared to first-year students. Possible Explanations:

- **Increased Exposure to Academic Knowledge:** As students' progress, they are introduced to more advanced theoretical and practical concepts, which stimulates their curiosity and drive to explore further.
- **Development of Critical Thinking Skills:** Senior students engage in deeper analysis and evaluation of information, enhancing their curiosity.
- **Engagement in Research Activities:** In later academic years, students participate in research projects and advanced studies, contributing to their motivation to seek knowledge and explore new ideas.

6. Conclusion

This study highlights the significant role of thinking styles in predicting epistemic curiosity among university students. The findings indicate that legislative and judicial thinking styles have a strong positive correlation with epistemic curiosity, while executive thinking does not significantly impact students' curiosity levels. This suggests that students who engage in analytical and evaluative thinking are more likely to seek knowledge and explore new ideas, whereas those who primarily follow instructions and execute tasks may not exhibit the same level of curiosity.

Additionally, the study revealed that epistemic curiosity increases as students' progress through their academic levels. This can be attributed to greater exposure to academic challenges, the development of critical thinking skills, and participation in research activities. The One-Way ANOVA analysis confirmed statistically significant differences in curiosity levels across different academic years, emphasizing the impact of educational experience on students' intellectual engagement.

7. Recommendations

Based on these findings, several educational strategies can be proposed to foster epistemic curiosity among university students:

1. Encouraging legislative and judicial thinking styles: Universities should incorporate problem-based learning, open-ended discussions, and

critical thinking exercises to stimulate curiosity and independent exploration.

2. Designing interactive learning environments: Implementing research projects, case studies, and real-world problem-solving tasks can enhance students' motivation to seek knowledge.
3. Supporting first-year students: Since curiosity levels tend to be lower in early academic stages, targeted interventions, such as mentorship programs and inquiry-based learning activities, can help cultivate a strong foundation for intellectual engagement.

8. References

1. Al-Ogaidi, M., & Al-Dulami, Y. (2025). Twisted thinking and its relationship to radical thinking among university students. *SA Journal of Industrial Psychology*, 51(1). <https://doi.org/10.4102/sajip.v51i0.2245>
2. Bahrawi, S. (2023). Programmatic transfer planning for Egyptian universities to keep up with the labor market. *Scientific Journal of Social Service - Applied Studies and Research*, 23(1), 22-72.
3. Beswick, D. (2017). *Cognitive Motivation : From Curiosity to Identity, Purpose and Meaning*. United Kingdom : Cambridge University Press.
4. Cojorn, K., & Sonsupap, K. (2024). Impact of community of practice and lesson study on fostering the student thinking competency. *International Journal of Education & Literacy Studies*, 12(1), 284-294.
5. Dezza, I, Schulz, E. & Wu, C. (2022). *The Drive for Knowledge: The Science of Human Information Seeking*. United Kingdom: Cambridge Scholars Publisher.
6. Fair, F., Johnson, D. & Wagner, P. (2016). *Thinking Beyond the Test: Strategies for Re-Introducing Higher-Level Thinking Skills*. United States: Rowman & Littlefield Publishers.
7. Fan, J. (2020). *Thinking Styles: Identity, Value, and Malleability*. United Kingdom: Cambridge Scholars Publisher.
8. Haibah, L. (2022). The relationship between higher-order thinking skills in mathematics and self-efficacy among student teachers in colleges of education. *Journal of the Faculty of Education, Benha University*, 131(33), 511-548.
9. Hussein, F. (2024). The relationship between epistemic curiosity and emotional stability among students of the Faculty of Education at University. *Journal of Arts for Psychological and Educational Studies*, 6(4), 205-237.
10. Lim, J. (2024). Students' interaction, satisfaction and cognitive presence in online discussions: Comparing novice and experienced instructors with distinguished interaction patterns. *Journal of Educational Technology & Society; Palmerston North*, 27(1), 35-49.
11. Nasr, O. (2021). Critical thinking skills. *Scientific Journal of Social Service - Applied Studies and Research*, 13(1), 131-147.
12. Nurakenova, A., & Nagymzhanova, K. (2024). A study of psychological features related to creative thinking styles of university students. *Journal of Psycholinguistic Research*, 53(1). <https://doi.org/10.1007/s10936-024-10042-3>