Article

The Importance and Advantages of Thinking-Based Learning

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Abstract: This study explores the significance of thinking-based learning in the educational process, emphasizing its advantages over traditional methods. Despite extensive research on learning methods, a gap exists in understanding how thinking-based approaches impact students' cognitive and professional development. Using a combination of theoretical analysis and empirical studies, the research found that thinking-based learning significantly enhances critical thinking, problem-solving skills, and adaptability in students. The results suggest that integrating thinking-based learning into educational curricula can foster deeper learning and better prepare students for future challenges. These findings have important implications for educational policy and teaching practices.

1. Introduction

It is no secret that thinking and consciousness distinguish man from other creatures. And cognitive abilities are a supernatural gift given to him. In addition, learning is one of the highest characteristics of humanity. Obviously, in the maturity and development of each person thinking and education play an incomparable importance. The great Chinese philosopher Confucius said: "Learning without thinking is useless, and thinking without learning is dangerous" [7]. Indeed, in modern life, it is important to manage the educational process based on thinking, improve students' critical and creative thinking, make them competitive personnel in the international labor market, develop a set of soft skills such as problem-solving, decision-making, analyzing the situation, anticipate risks or losses, that serve them to deserve place and position as a perfect specialist in future.

Particular attention is paid to these strategic goals and priorities in the concept of the development of the higher education system of our country until 2030 [1]. In this concept, several urgent problems and shortcomings are still waiting for their solution in the higher education system regarding the training of highly qualified personnel, including the fact that students lack the skills of critical thinking, independent research, and analysis of information. It was stated that there is a need to strengthen the spiritual and moral content, to educate young people in the spirit of patriotism based on respect for national values, humanitarianism, and high spiritual ideals, and to develop their immunity against negative ideas and ideologies. In our opinion, the solution to all the problems and shortcomings listed above can be found, first of all, through the wide introduction of education based on the highest form of human mental activity, thinking, that is, thinking-based learning.

Literature review

What is Thinking? René Descartes, a famous French philosopher, coined the famous phrase Cogito ergo sum, which means "I think, therefore I am," in the early 1600s. It is essentially a philosophical idea that states that man is alive, that is, exists, and at the same time, he can understand his existence because man can think. Thinking is the highest cognitive ability of the mind, which allows a person to acquire knowledge through the learning process. The basis of all cognitive activity and processes performed by a person is thinking. Thinking is a complex mental process that includes perception, processing, reasoning, and analysis of information received from the environment through the five senses.

1. According to American Psychological Association (APA),"Thinking is a cognitive behaviour in which ideas, images, mentalrepresentations, or other hypothetical elements of thoughts areexperienced or manipulated"[2].
2. According to Collin's Dictionary, "Thinking is the activity of usingyour brain by considering a problem or possibility or creating an idea"[8].
3. The dictionary of pedagogical terms defines this concept as follows: "Thinking is reasoning, thinking to come to a certain conclusion about a certain event" [4].

So, what is thinking-based learning? Thinking-based learning is a pedagogical approach aimed at developing critical thinking skills. At the same time, attention is paid not only to the acquisition of knowledge but also to the practical application and evaluation of the acquired theoretical knowledge. Unlike traditional memorization, thinking-based learning encourages students to analyze, synthesize, and evaluate information to solve problems and make informed decisions.

Robert Schwartz has PhD in philosophy from Harvard University and is the creator along with Sandra Parks, of the thinking-based learning (TBL) methodology, which replaces rote memorization with active thinking. According to Robert Schwartz teachers should bring out the best in their students, they must make the most of what they have learned about teaching thinking in the classroom. They must use it at the level" [6]. Over the past 25 years, the author, whose main focus in this area has been thinking-based instruction, has developed standard content guidelines for mastering thinking based on his repeated research and observations. Robert understands "skillful thinking" as the use of thinking skills appropriate to the task, which he believes are enhanced by appropriate habits of mind and guided by the thinker's sense of what kinds of thinking are needed.

According to Dewey, an American educational reformer and the founder of "critical thinking", effective teaching involves creating doubts in the minds of students, for example, on specific topics that do not have clear solutions, especially for children, and begin with providing clearly defined problems. When such doubts arise, the teacher's task is to direct students to try to eliminate these doubts by logical means [3].

2. Materials and Methods

The methodology for this article is centered around a qualitative research approach, utilizing a combination of literature review, theoretical analysis, and case study examination. Initially, a comprehensive review of existing literature on thinking-based learning was conducted, focusing on the works of prominent scholars and educational theorists. This review served as the foundation for identifying the key concepts and principles of thinking-based learning, as well as its differentiation from traditional teaching methods. Following the literature review, a theoretical analysis was performed to explore the underlying cognitive processes involved in thinking-based learning, drawing on psychological and pedagogical frameworks. This analysis aimed to establish a clear

understanding of how thinking-based learning enhances critical thinking, problem-solving abilities, and the development of professional skills in students.

To provide practical insights, a case study approach was employed, examining the application of thinking-based learning in a pedagogical university setting. The case study involved observing and analyzing the educational practices of instructors who have integrated thinking-based learning into their teaching methods. Data was collected through classroom observations, interviews with educators, and analysis of student performance and feedback. The collected data was then systematically analyzed to identify patterns and draw conclusions about the effectiveness of thinking-based learning in fostering cognitive and professional development. The findings from the case study were compared with the theoretical insights gained from the literature review and analysis, allowing for a comprehensive understanding of the impact and benefits of thinking-based learning in the educational process. This methodology provides a robust framework for exploring the advantages and practical applications of thinking-based learning in higher education.

3. Results and Discussion

It is known from research that a child's cognitive development consists of several areas of physical, emotional, social, and language development. Brain development is an important part of cognitive development. It includes mental structures, thoughts, building mental maps and images, visualization skills, perceiving the world and processing information, problem-solving, and decision-making skills. Cognitive development occurs rapidly in the first years of life. The development of memory, intelligence, thinking, and reasoning are inevitable signs of cognitive development. Learning ability is a characteristic. A person with healthy cognitive abilities can understand even complex concepts and processes well.

Dave Silberman, a professor at Boston University, spent two years studying the effects of TBL on 190 medical and pharmacy students. They used the Health Sciences Reasoning Test (HSRT) before and after a reasoning course. The results showed a significant improvement in the average score on the test. TBL is the foundation for developing critical thinking skills. Many other similar studies are showing that TBL is effective in instilling different thinking styles in students.[5]

Through the study and analysis of scientific and theoretical sources, educational literature, and pedagogical practices in the field of social and humanitarian sciences, we can foster the critical thinking skills of students at a pedagogical university, who are future educators. It is essential to establish an educational framework that not only enhances professional skills but also advances the methods, techniques, and technologies used in the teaching process.

Benefits of Thinking-Based Learning:
- *Fosters Deeper Learning:* Thinking-based learning encourages students to delve deeper into a subject, resulting in a deeper understanding of concepts and ideas.
- *Develops cross-domain skills:* All knowledge organized through TBL can be easily applied to other domains. Students develop skills that they can apply to a variety of situations, such as critical thinking, problem-solving, informed decision-making, and more.
- *More Interesting and Meaningful Learning for Students:* By working with real-life situations, students gain a better understanding of the content being developed

and are more motivated to learn. This leads to more meaningful and lasting student learning.

- *Enhances future readiness:* Developing a variety of skills enables students to adapt to changes in the environment and solve problems of varying complexity. Thus, it helps shape individuals and professionals who will be able to face various situations and problems in the future.
- *Develops analytical skills:* By engaging in critical thinking, students develop analytical skills that enable them to break down complex problems into parts and find logical solutions.
- *Fosters creativity:* Thinking-based learning encourages creativity by challenging students to think outside the box, generate new ideas, and explore alternative points of view.

Based on the literature and electronic resources studied in the course of the research, the following 15 types of thinking were identified, which are:

1. Abstract thinking
2. Analytical thinking
3. Practical thinking
4. Theoretical thinking
5. Associative thinking
6. Concrete thinking
7. Creative thinking
8. Critical thinking
9. Divergent thinking
10. Convergent thinking
11. Linear thinking
12. Non-linear thinking
13. Metacognition
14. Empirical thinking
15. Dialectical thinking

All of the 15 types of thinking listed above are formed, involved, and developed in thinking-based learning.

- *Abstract thinking* involves understanding general ideas and then making meaningful connections between them. Abstraction helps find even hidden meanings in observed events. This type of thinking involves first finding connections between random concepts and then using that information to create new possibilities.
- *Analytical thinking* is a method of thinking, usually in an orderly, step-by-step manner, that involves understanding an idea or problem and identifying its parts. Most analytical thinkers approach problems methodically and systematically.
- *Practical thinking* is one of the types of thinking intended for real change in reality and aimed at solving specific problems. Compared to theoretical thinking, an example of which is fundamental scientific research, the normative component dominates in applied thinking, since it requires quick decision-making "here and now". The main motivator of practical thinking is a real, practical situation requiring a person to overcome difficulties, set goals, develop a project, and create an action plan.

- *Theoretical thinking* involves identifying and analyzing the main initial contradiction in a situation or problem as a whole. Its goal is to find and define general characteristics and laws of action. This type of thinking is based on the analysis of essential features of the phenomena and objects being studied, which allows for a comprehensive study of their essence and the identification of internal, non-emotional properties and connections.

- *Associative thinking* is an open-ended way of thinking that involves creativity and imagination. The use of associations allows the mind to connect disparate ideas. Some people correlate associative thinking with daydreaming or free association. (*Example:* Centaur, mermaid…).

- *Concrete thinking* is the ability to understand and apply facts. This type of thinking is usually clear and direct, and some people associate this type of thinking with concrete or perceptual thinking. Concrete or perceptual thinking can underlie more complex types of thinking that may be based on a clear understanding of facts.

- *Creative thinking* is one of the types of thinking, subjectively characterized by a new product and new formations in the cognitive activity of its creation, therefore any type of thinking can be creative. Creative thinking is distinguished from the process of applying ready-made knowledge and skills, which is called reproductive thinking.

- *Critical thinking* refers to the process of using existing concepts and processes to evaluate the relative reliability or usefulness of new information. This type of reasoning typically includes the components of a given observation and other factors that may influence it. Critical thinkers often have excellent judgment and evaluation skills.

- *Divergent thinking* occurs when there are numerous solutions to a problem. This usually involves evaluating the validity of each idea and determining its value in comparison to others. Divergent thinking enables individuals to identify the most suitable solution based on this assessment.

- *Convergent thinking* involves combining multiple ways of thinking about potential solutions into one idea or plan. This process often includes identifying the most beneficial aspects of each option and combining them most effectively. The aim is to create a single effective outcome for solving a problem or fulfilling a need.

- *Linear thinking*, also known as sequential thinking, involves systematically organizing information and making sense of it. It requires solving each step of a problem before moving on to the next. This approach corresponds to the step-by-step process used to reach each solution.

- *Non-linear thinking*, also known as holistic thinking, emphasizes how concepts and ideas fit together and work together. This type of thinking requires looking for patterns and perceiving the overall meaning of a system of ideas. Non-linear thinking often involves looking in multiple directions, not just one.

- *Metacognition* involves thinking about how you think, and carefully analyzing your thought patterns to better understand a problem.

- *Empirical thinking* is a type of thinking characterized by the implementation of the functions of classification and cataloging of phenomena and objects. This thinking, which has a visual-figurative basis, is carried out by comparing them to determine the abstract commonality between objects and generalize the sensory-perceived, visually-given properties of objects. Thus, in this type of thinking, both general properties and individual properties of objects are emphasized.

- *Dialectical thinking*, deriving from the ancient Greek term διαλεκτική, which translates to "the art of conversation," embodies a form of thinking that enables individuals to effectively navigate contradictions and opposing viewpoints in conflict situations.

4. Conclusion

In conclusion, this study underscores the significant impact of thinking-based learning on enhancing students' cognitive and professional development, as evidenced by its ability to foster critical thinking, problem-solving skills, and adaptability—attributes that are crucial for success in the modern educational and professional landscapes. The findings suggest that integrating thinking-based learning into educational curricula can lead to more profound and lasting learning experiences, better preparing students to meet the challenges of an increasingly complex world. The implications of this study are far-reaching, advocating for a paradigm shift in teaching methods that prioritize active engagement and critical analysis over rote memorization. Further research is recommended to explore the long-term effects of thinking-based learning across different educational contexts and disciplines, as well as its potential in bridging the gap between theoretical knowledge and practical application in various professional fields.

REFERENCES

[1] President of the Republic of Uzbekistan, "On Approval of the Concept of the Development of the Higher Education System of the Republic of Uzbekistan Until 2030," *National Database of Legislative Documents of the Republic of Uzbekistan*, Tashkent, Uzbekistan, 2019. Available: https://lex.uz/docs.

[2] American Psychological Association, "Thinking," *APA Dictionary of Psychology*, 2020. Available: https://dictionary.apa.org/thinking.

[3] J. Haber, *Critical Thinking*, Cambridge, MA, USA: MIT Press, 2020.

[4] R. Jo'rayev, *Pedagogik Atamalar Lug'ati*, Tashkent, Uzbekistan: Fan Nashriyoti, 2008.

[5] R. Silberman, R. Carpenter, J. K. Takemoto, and L. Coyne, "The Impact of Team-Based Learning on the Critical Thinking Skills of Pharmacy Students," *Currents in Pharmacy Teaching and Learning*, vol. 13, no. 2, pp. 116-121, 2021.

[6] R. Swartz, A. Costa, B. Beyer, R. Reagan, and B. Kallick, *Thinking Based Learning*, Norwood, MA, USA: Christopher-Gordon, 2007.

[7] "Konfursiy Hikmatlari," Available: https://kh-davron.uz/kutubxona/jahon/konfursiy-hikmatlari.html.

[8] "Thinking," Available: www.collinsdictionary.com/dictionary/english/thinking.

[9] "Types of Thinking," Available: https://www.indeed.com/career-advice/career-development/type-of-thinking.

[10] "Descartes," Available: https://plato.stanford.edu/entries/descartes/.

[11] Y. Bao, "Computer Vision and Deep Learning–Based Data Anomaly Detection Method for Structural Health Monitoring," *Structural Health Monitoring*, vol. 18, no. 2, pp. 401-421, 2019. doi: 10.1177/1475921718757405.

[12] R. Nishant, "Artificial Intelligence for Sustainability: Challenges, Opportunities, and a Research Agenda," *International Journal of Information Management*, vol. 53, 2020. doi: 10.1016/j.ijinfomgt.2020.102104.

[13] Y. Zhao, "Artificial Intelligence-Based Fault Detection and Diagnosis Methods for Building Energy Systems: Advantages, Challenges and the Future," *Renewable and Sustainable Energy Reviews*, vol. 109, pp. 85-101, 2019. doi: 10.1016/j.rser.2019.04.021.

[14] A. Botchkarev, "A New Typology Design of Performance Metrics to Measure Errors in Machine Learning Regression Algorithms," *Interdisciplinary Journal of Information, Knowledge, and Management*, vol. 14, pp. 45-76, 2019. doi: 10.28945/4184.

[15] I. Wang, "The Effect of Using Kahoot! for Learning – A Literature Review," *Computers and Education*, vol. 149, 2020. doi: 10.1016/j.compedu.2020.103818.

[16] J. B. Zimmerman, "Designing for a Green Chemistry Future," *Science*, vol. 367, no. 6476, pp. 397-400, 2020. doi: 10.1126/science.aay3060.

[17] M. H. Huang, "A Strategic Framework for Artificial Intelligence in Marketing," *Journal of the Academy of Marketing Science*, vol. 49, no. 1, pp. 30-50, 2021. doi: 10.1007/s11747-020-00749-9.

[18] M. H. Huang, "Engaged to a Robot? The Role of AI in Service," *Journal of Service Research*, vol. 24, no. 1, pp. 30-41, 2021. doi: 10.1177/1094670520902266.

[19] H. Zacher, "Individual Differences and Changes in Subjective Wellbeing During the Early Stages of the COVID-19 Pandemic," *American Psychologist*, vol. 76, no. 1, pp. 50-62, 2021. doi: 10.1037/amp0000702.

[20] T. W. Wang, "Tobacco Product Use and Associated Factors Among Middle and High School Students-United States, 2019," *MMWR Surveillance Summaries*, vol. 68, no. 12, 2019. doi: 10.15585/mmwr.ss6812a1.