

The Impact of ICT-Based Critical Thinking Technologies on Students' Moral Qualities

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Abstract

In the modern era, the widespread use of ICT in education significantly influences students' thinking and social behavior. Critical thinking technologies enhance young people's objective approach to events and their ability to make sound decisions. The use of these technologies stimulates not only students' academic achievements but also their moral and spiritual development. The cultivation of moral qualities creates conditions for students to find their place in society and grow as well-rounded individuals.

Critical thinking skills in an ICT-based environment strengthen values such as independence, responsibility, and collaboration. This process ensures success for young people both in their academic life and future professional activities. The role of educators is to nurture students not

only as consumers of information but also as carriers of creative and analytical thinking. Such an approach fosters tolerance, fairness, and effective communication skills among students.

The combination of ICT and critical thinking also contributes to the preservation of moral and ethical values. Consequently, this approach not only improves the quality of education but also helps develop thoughtful and responsible citizens.

Keywords: ICT, critical thinking, moral qualities, higher education, pedagogical technology

Introduction

Over the past decades, research in the field of education has shown that the development of critical thinking in students is closely connected with the formation of their moral qualities. Critical thinking not only involves the ability to reason analytically but also encompasses values

such as ethical decision-making, tolerance, and social responsibility. Contemporary pedagogical

approaches indicate that the use of information and communication technologies (ICT) plays a significant role in this process.

At the stage of modern societal development, two key factors play a crucial role in shaping students' personalities: adaptation to information and communication technologies (ICT) and the preservation of moral and ethical values. Integrating these two areas into the educational process fosters the development of both analytical thinking and a humanistic worldview in students. This approach emphasizes the need to strengthen not only professional competencies but also moral qualities among young people.

In ICT-based learning, the teacher should move away from the traditional role of a "knowledge transmitter" and act more as a facilitator of the learning process. Using interactive platforms, online forums, digital presentations, and group projects, teachers engage students in an active learning process. This approach allows students not only to memorize facts but also to analyze and compare them. One of the key conditions for developing critical thinking is the ability to formulate questions effectively.

Teachers should ask students not only questions aimed at finding the "correct answer" but also those that allow them to justify their thoughts with reasoned arguments. For example, instead of asking, "Do you agree with this opinion?" a more productive question would be, "Which arguments, in your view, support this opinion, and which weaken it?" Such questions help students develop critical analysis skills. In ICT-oriented discussions, students can present different viewpoints. The teacher's role is to ensure that these discussions adhere to ethical standards while reinforcing principles of mutual respect and tolerance. In this environment, students not only experience intellectual freedom but also learn to respect the positions of

others. One of the primary responsibilities of teachers is to encourage students to consider multiple perspectives.

Since critical thinking develops not through one-way reasoning but by comparing alternative viewpoints, students can, for example, be asked to compare different scientific approaches to the same topic. This simultaneously strengthens analytical thinking and cultivates moral qualities such as empathy and tolerance.

In the traditional approach, the teacher was mainly perceived as a knowledge provider. In the modern approach, however, the teacher acts as a “facilitator” – guiding the learning process. In this role, the teacher does not provide ready-made answers but creates conditions for students to independently search for solutions.

ICT tools play a crucial role in this process: online debate platforms, digital tests, and simulation

programs help students develop independent learning skills.

In the modern era, one of the main tasks of educational systems is not only to enrich students' academic knowledge but also to form and develop their moral qualities. In the context of globalization, it becomes strategically important not only to strengthen the intellectual potential of the younger generation but also to preserve and enhance national and spiritual values. Within this framework, innovative pedagogical technologies used in higher education institutions should serve not only to transmit knowledge but also to promote the comprehensive development of the individual.

In recent years, the role of information and communication technologies (ICT) in the educational process has become increasingly significant. The integration of these technologies with extracurricular activities not only promotes the development of students' critical thinking but also has a substantial impact on the formation of their moral qualities.

The rapid development of ICT and its implementation in education have created conditions for the emergence of new pedagogical approaches. In this context, critical thinking development technologies and ICT-oriented approaches play an important role in students' educational and formative activities.

Moreover, these approaches are particularly important for developing students' ability to think independently, their awareness of moral values, and their sense of social responsibility.

In Azerbaijani pedagogical thought, there are also notable studies in this area. Researchers note that the use of ICT in education activates critical thinking skills, fosters a creative approach among students, and also influences their attitudes toward national and spiritual values. The

use of digital platforms in teacher-student interactions strengthens both mutual respect and the spirit of collaboration (Aliyeva, 2021).

Critical thinking technologies are considered one of the key 21st-century skills in pedagogical theories. Applying these skills within an ICT context allows students not to limit themselves to merely receiving information during the learning process, but to analyze it, support their reasoning with evidence, and evaluate it from an ethical perspective. In such an environment, a student is shaped who remains competitive in the global world while, remaining faithful to national and spiritual values, strengthens their sense of social responsibility (Facione, 2020).

Brookfield (2017), interpreting critical pedagogy in a broader context, demonstrates that

ICT-based teaching methods develop not only students' academic skills but also their norms of democratic behavior. According to him, the role of technology in the modern educational environment is not limited to the transmission of information; it also serves as a mediator in

strengthening students' capacity for moral judgment.

Steps for Developing Critical Thinking

To develop critical thinking, several steps are important at both the pedagogical and personal levels. The following directions can be highlighted:

- **Developing Questioning Skills:** Students should not limit themselves to simply receiving information; they need to critically question it. *For example: "What is the source of this information?", "Could there be an alternative explanation?", "Do I have the right to disagree with this opinion?"*
- **Use of ICT Tools:** Online discussion platforms (forums, LMS), interactive programs, and simulations help students see different perspectives. *For example: interactive Q&A sessions on platforms such as Kahoot, Padlet, or Edmodo.*
- **Reflection (Self-Assessment and Self-Analysis):** Encourage students to analyze their own learning at the end of each lesson: *"What did I learn?", "What do I disagree with?", "How can this be done better?"*

Critical thinking is considered one of the key 21st-century skills. This skill enables individuals to analyze information objectively, compare different positions, identify the strengths and weaknesses of arguments, and justify their own viewpoints. ICT serves as an important tool that enhances the effectiveness of this process.

Electronic educational platforms, interactive programs, discussion forums, digital simulations, and AI-based educational resources provide students with a wide range of opportunities. These technologies facilitate not only knowledge acquisition but also the exploration of different perspectives, independent decision-making, and the stimulation of creative approaches. For example, discussions on electronic debate platforms help students develop both analytical skills and a culture of ethical dialogue. Collaboration in a virtual learning environment strengthens students' sense of mutual assistance, empathy, and responsibility. Discussing critical thinking allows students not only to analyze knowledge but also to evaluate it from their own perspective.

Stages of Strengthening Self-Confidence

This, in turn, contributes to the strengthening of self-confidence through three main stages:

1. **Expression of Thought:** The student clearly presents their argument during participation in a discussion.
2. **Position Defense Skills:** When confronted with opposing arguments, the student strives to justify their viewpoint.
3. **Confirmation:** By receiving recognition or positive feedback from other participants, the

student realizes the value of their ideas.

On the other hand, within the framework of the 21st-century skills concept, alongside critical thinking, digital literacy, communication, collaboration, and creative problem-solving skills also gain particular importance. When all these skills are integrated with the cultivation of moral values in the education system, they enable the comprehensive development of students.

The application of ICT-based methods helps achieve this harmony. Modern pedagogical approaches, such as project-based learning, problem-based learning, and blended learning, create an environment for students that supports both intellectual and moral development.

Contemporary pedagogical literature notes that the development of critical thinking contributes not only to students' intellectual growth but also to their moral development. As students learn to think independently, compare different arguments, and consider alternative perspectives, they simultaneously gain a deeper understanding of social and ethical values.

The aim of this study is to determine the impact of ICT-based critical thinking technologies applied in extracurricular activities on students' moral qualities. To achieve this goal, various pedagogical methods were employed: surveys were conducted among students, discussions and debate sessions were observed, and the results of project-based activities were analyzed. The study was built on a comprehensive approach, considering both theoretical-methodological and practical perspectives.

Key Research Questions

- Through which mechanisms do ICT-based critical thinking technologies, applied in the educational environment, strengthen students' moral qualities?
- How do teachers' pedagogical approaches influence the effectiveness of these technologies?
- How do students' levels of motivation, interest, and participation affect the development of their moral qualities?

The conducted theoretical and practical studies show that the application of ICT-based critical thinking technologies transforms students not only into consumers of information but also into its creative users. They learn to conduct independent analysis and make decisions grounded in social and ethical reasoning. This directly contributes to the strengthening of moral qualities.

According to practical observations, students who use electronic resources and interactive environments demonstrate higher levels of tolerance and collaboration. They compare information from various sociocultural contexts, draw analytical conclusions, and learn to

respect the viewpoints of others during discussions. All of this reinforces their culture of ethical behavior.

On the other hand, the application of ICT-based critical thinking technologies also enhances students' information literacy. They learn not only to use reliable sources but also to evaluate the credibility of information and avoid false or manipulative data. These skills play a crucial role in developing social responsibility and a moral stance in modern society.

The results show that the use of ICT platforms—such as forums, virtual conferences, online discussion groups, electronic surveys, and digital presentations—directly impacts the development of students' critical thinking. Students compare facts, justify their arguments, and learn to analyze different viewpoints. In turn, this strengthens their sense of social responsibility, tolerance, teamwork skills, and ability to make ethical decisions.

In ICT environments, this process becomes even more dynamic. Virtual platforms, electronic resources, interactive forums, and online collaboration tools provide students with wide-ranging opportunities. When these tools are used effectively, both students' cognitive activity and their moral stance are strengthened.

In other words, the development of critical thinking contributes not only to the cognitive domain but also to the deepening of moral qualities. Organizing extracurricular activities—such as debate clubs, “round tables,” student conferences, intellectual competitions, and social

projects—with ICT support enhances this effect. During such activities, students demonstrate their knowledge while simultaneously putting moral qualities into practice, including social responsibility, leadership, honesty, diligence, and mutual respect. For example, online debate sessions help young people develop both argumentation skills and respectful consideration of

others' positions. Collaboration in virtual projects fosters team spirit and a culture of joint work.

It is recommended that when planning extracurricular activities at universities, special attention be given to ICT-based critical thinking technologies. Teachers and advisors should regularly conduct online discussions, virtual debates, and project presentations. At the same time, to stimulate not only academic but also moral development, a variety of interactive methods should be actively employed.

Strengthened Moral Qualities

The research results indicate that the application of ICT-based critical thinking technologies strengthens the following moral qualities in students:

- **Conscience and Honesty:** avoiding academic dishonesty and striving for objective results;

- **Responsibility:** completing assigned tasks on time and with quality;
- **Collaboration and Sharing:** actively participating in teamwork and respecting others' opinions;
- **Empathy and Tolerance:** understanding and accepting different viewpoints;
- **Fairness:** evaluating arguments based on facts rather than personal likes or dislikes.

The development of such moral qualities impacts not only students' academic success but also their proper integration into society and growth as well-rounded individuals. A young person who has well-developed critical thinking skills will be better able to advance professionally after graduation and establish effective communication with colleagues and peers.

The cultivation of these moral qualities supports not only personal development but also strengthens the social environment. A student equipped with critical thinking skills can objectively assess events, consider alternative viewpoints, and justify their own position. This fosters qualities such as tolerance, fairness, collaboration, and responsibility.

Moreover, ICT-based approaches help students develop the ability to make independent decisions, think creatively, and select information wisely amid an abundance of data. Thus, critical thinking plays a vital role not only in achieving academic success but also in the development of moral and ethical values.

Conclusion

ICT-based critical thinking technologies are an important tool in modern education, contributing to both the intellectual and moral development of students in accordance with strategic learning goals. Their application enables students not only to acquire knowledge but also to become honest, responsible, and tolerant individuals guided by ethical principles. Thus, this approach makes a significant contribution to shaping the model of the 21st-century individual, mature both professionally and morally.

Accordingly, ICT-based critical thinking technologies serve as a universal tool in the pedagogical process, influencing not only cognitive activity but also the development of moral qualities. This approach ensures students' academic success as well as their social and ethical development. The results of the conducted research indicate that the purposeful and systematic implementation of these technologies in higher education institutions effectively contributes to the formation of moral values.

Therefore, the application of ICT-based critical thinking technologies in the educational process can be regarded as one of the strategic objectives of the modern education system. Continued and expanded scientific-pedagogical research in this area will allow for the refinement of

practical mechanisms aimed at fostering students' moral qualities.

According to the results presented in the article, ICT-enriched critical thinking technologies produce positive effects in students in the following areas:

- Analytical analysis and comparative study of values;
- Strengthening social responsibility and ethical decision-making skills;
- Formation of collaboration principles and mutual respect in virtual environments;•

Practical testing and reinforcement of moral values;

- Ensuring an integrated approach to personal development.

Thus, when combining ICT and critical thinking, the primary task of instructors is not only to transmit knowledge but also to develop students' capacity for independent thinking and reasoning. Proper organization of this process ensures not only the intellectual development of students but also the strengthening of their moral qualities. A modern instructor is an educator who is proficient in technology while upholding humanistic values.

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