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Clarifying Critical Thinking in Improving students' virtual Education Learning

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Abstract

Aim: The purpose of this research was to explain critical thinking in electronic education.
Method: The qualitative research aimed at analyzing the importance of critical thinking skills in improving students' virtual education learning with a descriptive-interpretive approach sought answers to the following 2 questions: 1- How do students describe their learning experiences with critical thinking in virtual education? 2- What changes has the critical thinking skill made in learning the virtual education of students? The data collection tool was an open-ended interview with 12 of the 98 incoming student teachers, with targeted sampling and the research location of the Faculty of Teacher Education, Farhangian University of Ardabil, who had studied with virtual education.
Findings: Analysis of the findings, after implementing the experiences and interviews of the students and the components obtained from the open and central and selective coding with 6 components (self-knowledge - spirituality - media literacy - receptivity to criticism and criticism - pluralism - cognition and metacognition).
Conclusion: of the following 3 themes according to the elements of the national curriculum and the goals of education as follows: 1- Communication with oneself 2- Communication with God 3- Communication with creation It could be used in educational systems and the positive and negative consequences in learning and education in order to be successful in learning, and it is necessary that the virtual learner is not limited to education, but must be a critical thinker or acquire educational skills and abilities during his education. to find Also, virtual learning, like face-to-face learning, could improve the depth of students' learning by using critical thinking skills to achieve learning strategies and cognitive and metacognitive skills.

Keywords: Critical thinking, Virtual education, Students.

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Introduction

A few years ago, having a mobile phone for students was an indigestible issue for parents and teachers. But nowadays, having a mobile phone has become a necessary issue for students to continue their studies. Literally, virtual education and electronic education are intertwined with our lives and our children.

Virtual education, which some call electronic education, is a type of distance education. Few people are not familiar with it these days. From a 6-year-old preschooler to a PhD student, everyone is dealing with it in some way.

Virtual education or virtual learning, or in other words, electronic education (e-learning), is one of the types of education in which the teacher and student enter the virtual class at a specific time and interact with each other in a virtual environment. In online virtual training, the teacher can share the desired educational topics with students by presenting PDF files, PowerPoint slides, and audio and video. Sharing the teacher's computer desktop and showing the environment of different software live to the learners creates the possibility of practical training in different subjects, such as working with all kinds of software.

Virtual education is a type of distance education in which virtual space is the platform for teaching and learning. A student and a teacher or a student and a professor communicate with each other online instead of attending the classroom in school and university.

People who have undergone virtual training are well familiar with its meaning and concept. Most likely, you are also familiar with this teaching method. If you think not, just look at what you are doing now. You are currently reading an educational article about online education. You are learning from the internet, and you are learning what you need to know about online education through virtual education.

The virtual education that is being held in schools, universities, and educational workshops is similar to this. A person shares information with users online and in virtual space, and users learn what they need to know by using them. The trainer can be a teacher, a professor or a skilled technician. The person receiving the training can also be a student, a student or a technician in training.

An online class or virtual education system is a teaching and learning environment where distance education is provided to the participants, and they can communicate, interact, and view lectures and presentations only in an Internet system. Discuss and engage with educational resources through group work. This environment often works with a web conferencing system that allows multiple users to connect to the Internet at the same time, allowing users to participate in an online class from anywhere. Choosing to study in an online school or take an online course means you do not have to travel a long distance. In the case of online and virtual universities, this issue is more effective. The staggering costs of living in a strange city or the psychological costs of being away from home and family can deter anyone. All this should be added to the costs of studying in a school or university to understand what pressure we have to endure financially and psychologically to get a university degree. Online school helps us eliminate physical distances and allows us to take an online course from anywhere in the country or the world.

One issue that many people have questions about is whether virtual education is the same as electronic education and distance education. In a cursory and general look, "yes" these

days, all these expressions convey the same concept. If you want to look at the story in a little more detail, it should be said that there is a difference between all of them, and the above options are subsets of each other and are not the same. There are different types of distance education. "Books and pamphlets" are also a form of distance learning. Payam Noor students have been studying remotely through these self-reading products for years. Another type of distance education is "e-learning". Electronic education is a type of education that is conducted through electronic and digital tools. Education that is held through any type of technology, such as electronic devices such as mobile phones, tablets, computers, laptops, televisions, and other similar devices, is called electronic education. Messengers, social networks, online education platforms, etc., are also a type of electronic education, and since they operate through the Internet and virtual space, they are called virtual education. "As a result, virtual education is a type of electronic education, and electronic education is also a type of distance education." Of course, as we said, these days, they all mean the same concept, and that is that virtual education that is being held in schools.

Virtual education is a clear example of the ability of information and communication technology to provide flexible and wide-ranging education, which is expanding today in many countries of the world. The importance and necessity of this research for students who prefer only virtual education. It has been necessary. One of the important goals of education in the use of information and communication technology in classrooms is to enable students to engage and intervene more in the teaching-learning process.

In fact, in order to play an effective role at different levels of society, students must have advanced education and be in line with the changes and developments of the information age in order to have the necessary competencies to face the surrounding phenomena and make the best appropriate decisions. (Mary Beck-Ove et al., 2022).

The literature related to critical thinking is divided into three currents, i.e., the critical thinking movement, the social-cultural criticalism movement, and the critical pedagogy movement. The critical thinking movement is, first and foremost, about thinking and, in other words, the cognitive views of reasoning and informal logic focus (Stefan & Reznoit, 2023). According to Anna Reznovit (2010) in her book Critical Thinking Curriculum, critical pedagogy can be considered a branch of critical theory, i.e., social sciences and normative theories, in the first priority by identifying and reconstructing social norms and also challenging these norms from the perspective of memory change. First and foremost, criticism focuses on thinking, in other words, the cognitive views of reasoning and informal logic. In a very simple way, this research focuses on a person's cognitive-analytical and rational thinking abilities and relies on critical pedagogy, which is something very close. It is based on logical and textual thinking on the interaction and communication of the individual with the world around him. In this sense, critical thinking is critical knowledge as a prerequisite for the ability and critical vision of the outside world and his beliefs. Then, he chooses it as a practical way of life in education. Virtual is based on interaction. In this research, we tried to apply critical thinking in teacher training students as what a person does and thinks when faced with problems, one of which was the student's encounter with learning problems of virtual education (Rosenquist-Wakrantz, 18; 2023).

One of the results of the expansion of information and communication technology and the provision of virtual education is to facilitate the participation and involvement of students and, as a result, develop critical thinking skills in them. The flow of critical thinking in classrooms is a focal point in the field of teaching-learning (Saad et al., 2012).

Critical thinking is one of the many challenges that the information age has brought and has a significant impact on the teaching profession. It is necessary for teachers to think critically because it affects their teaching styles. Critical thinking, according to the characteristics of today's world and the fact that today's people are faced with much information, and according to the comprehensiveness of this Thinking, which evaluates issues from different dimensions and then chooses the best solution, is of particular importance (Stanford et al., 2020).

Critical thinking is recognized as an essential skill for wise participation in a democratic society, and in today's modern world, it is a required skill that is best understood as the ability of individuals to challenge their thinking; this ability requires that they meet the criteria expand themselves to analyze, analyze and evaluate their thinking and use those criteria and standards to expand the quality of their thinking. Everywhere in the world, there is an attempt to make thinking about thinking or how to think instead of How to teach thinking (Wellspower, 2020).

Rasmussen considers critical thinking to be one of the most important educational principles of any country, and every society needs people with high critical thinking to achieve growth and prosperity. Critical thinking training leads to the motivation to learn and acquire problem-solving skills, decision making and creativity (Mohammadi et al., 2015). E-learning experts believe that virtual student's skills and tendency to think critically are necessary for e-learning to be successful. Thus, the virtual learner must be a critical thinker or achieve this ability during his education (Ransdell, 2010). Kaplan's results emphasize that e-learning environments can foster critical thinking in students (Kaplan, 2004).

In this regard, Khalfan and Al-Fathali (2009) in research concluded that electronic learning environments have a positive effect on students' critical thinking skills. The importance of critical thinking is so great that the World Federation of Medical Education has listed critical thinking among the global standards of medical science education. Tendency to critical thinking is a set of mental habits or the tendency to think critically, which includes seven components of truth-seeking, broad-mindedness, analysis, systematicity, critical self-confidence, curiosity, and maturity in judgment (Zarabian et al., 1394).

Universities and virtual education institutions in the world are increasing day by day. Our country is also at the beginning of virtual education. According to what has been stated in the background of the research about the significant role of critical thinking in advancing educational goals and textbooks at the level of knowledge and skills and its role in increasing their individual and social work in facing various issues of life and society, therefore, awareness of the level of critical thinking and the tendency towards it in students with the help of such research can give a clear view to managers, officials and planners of educational centers in the field of goal setting in educational planning and criticism of curriculum planning resources in academic levels and fields. Based on this,

this research has tried to study the role of critical thinking pedagogy in students' learning and virtual education and its educational achievements.
Therefore, in this research, we wanted to find answers to the following questions:
1- How do students describe their learning experiences with critical thinking in virtual education?
2- What changes has the critical thinking skill made in learning the virtual education of students?

Methods

This article is based on a qualitative method with a descriptive-interpretive approach, and it was conducted in the desired location of Farhangian University of Ardabil with a targeted sampling of 12 student teachers (Patten, 2002). The data collected with interview tools - listening - audio materials - note-taking, etc. have been recorded. The data collection tool was an open-ended interview with 12 student teachers who recounted their experiences in studying with virtual education. The field notes were collected using open, central and selective coding methods.

Categorization and narrative analysis of relationships between categories, 6 components, and 3 main themes that had higher codes in classification, descriptive-prescriptive performance, and explanatory interpretation (Chart 1) was done (Wolcott, 2001).

Thinking skills and critical thinking

One of the problems and obstacles in cultivating critical thinking is the general definition in this field. There are different definitions of critical thinking, which shows the different views on defining this category. But almost all experts in this field believe that critical thinking is a special subject and this type of thinking can be taught. One of the most well-known definitions of critical thinking is from Robert Ennis (1991). In 1985, he considered critical thinking about real action and living based on it as a guiding principle in education. One of the leading figures in the field of critical thinking pedagogy is Paiolo Freire (1921-1997), who considers education as a form of action. Power knows. This means that critical knowledge is a prerequisite for the ability to critically face the surrounding and virtual world, which is a practical and practical way of life in today's age (Rosenquisto et al., 2023).

Lippman (1991) states that critical thinking is skillful and responsive thinking that facilitates good judgment because it relies on intuition, self-correcting, and sensitivity to circumstances. According to Lippman's belief, critical thinking is closely related to criteria-based thinking, and this relationship has caused him to name critical thinking as criterion-based thinking.

Critical thinking is identifying wrong arguments, avoiding contradictions and assumptions stated and not stated in other people's discussions, and lacking emotional

excitement when facing a problem or imbalance. The main factor in critical thinking is raising questions related to the problem and criticizing and examining solutions without proposing alternatives (Myers, 1986; translated by Abili, 2014).

A person with critical thinking skills cannot accept what is presented or imposed on him without careful examination. For example, values, interactions and media are part of the realities of a person's life. Analyzing these factors will help clarify his position and correct his attitude. As a result, the pressure caused by conflicts and crude and imposed beliefs is reduced, and the mental health of a person is less exposed to serious damage. What often hinders critical thinking is a kind of lack of skill in imagining the problem outside oneself (Wells Power 2020).

This concept is called problem-oriented versus self-oriented. Selfishness, as a big mental obstacle, has always prevented man from solving his problems objectively. On the other hand, problem orientation causes people to leave themselves and focus on the problem itself. A person with critical thinking tries solutions one after another. In this case, his answers are not inductive, mental, emotional, or baseless; they arise from the context of reality.

Mixing traits, desires and feelings with the issue leads to adopting one-sided positions and more or less incomplete and insufficient prejudices. Teaching features of learning management system software, creating a suitable inclusive environment and considering critical thinking as one of the lesson and evaluation goals. Badri Gregari (2008), in his doctoral thesis, pursued the goal of determining the effect of rethinking in practice on the critical thinking of student teachers and concluded that the method of rethinking in practice leads to the development of critical thinking skills (inference) and tendency to critical thinking (curiosity and regular practice) students become teachers.

Al-Azi (2008) studied teachers' perceptions of critical thinking in Jordan using a qualitative method. The results of his research have shown that social studies teachers in Jordan have little familiarity with the definitions and teaching strategies of critical thinking.

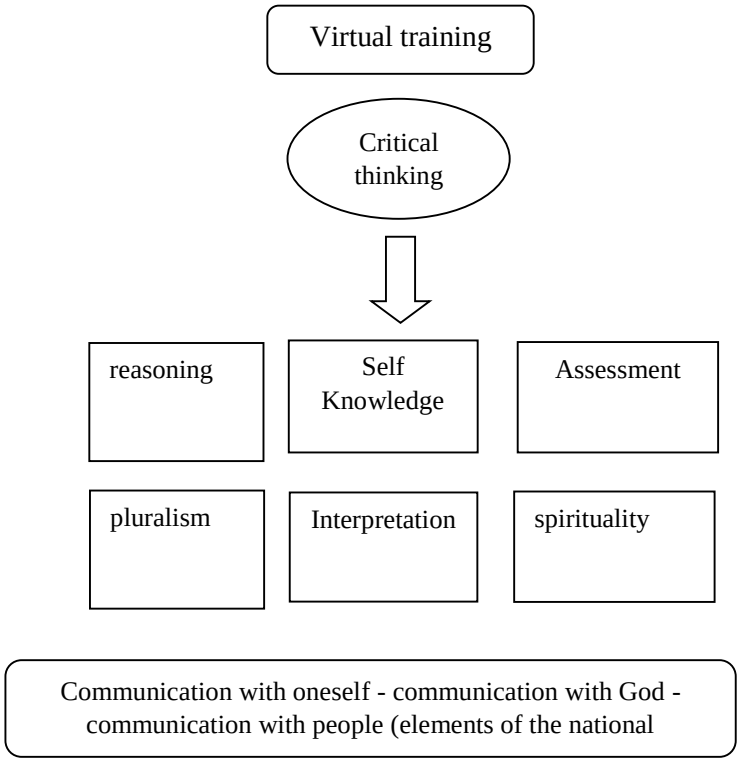

Chart 1- Changes in critical thinking in learners

In a study, Palmer (2007) concluded that part-time teachers tend to think more critically when they have received formal training. Other results of his research showed that there is a positive relationship between those professors who have positive critical thinking tendencies and professors who consider critical thinking as a learning goal and use discussion in class.

Today, we are experiencing a social change and accumulation of knowledge with the presence of virtual satellite networks and the Internet. If we ignore the acquisition of original thinking skills, including critical thinking, we will suffer fallacies, confusion and weak media literacy (Catalina Caraza, 2021).

Factors that form the basis of critical thinking

McManus (2019) emphasizes a type of project-based learning that focuses on the relationship between computer science and educational science, and teaching the above

skills with the exchange of experiences and dialogue and dialectic between the audience creates deep and original learning.

The underlying factors of critical thinking are continuous internal motivations that force a person to face a problem and cause a person to decide by using problem-solving thinking.

In order to create critical thinking, background factors are very important. The most important factors underlying critical thinking are search, analytical power, search for information and facts, criticism, creativity and development.

Friedel also considers the underlying factors of critical thinking to be a set of a series of special features that lead to the creation of special attitudes to apply a series of skills. Unlike skills that can be taught, it takes a long time to develop and develop enabling factors (Friedel, 2006).

According to Trendal (2020), the narrow and thin border between the scope of critical thinking and problem-oriented learning is problem-oriented, which becomes an effective approach for establishing, strengthening and developing the improvement of learning. The goal of educational activities at different levels is to achieve and empower learners with critical thinking skills. Therefore, improving the underlying factors of critical thinking is an inevitable prerequisite to achieving this important goal.

Results

In critical thinking, the main goal is to provide skills and strategies that students can use to manage large amounts of information. Experts consider the use of critical thinking skills as one of the methods of equipping learners to face today's information-filled world.

With critical thinking, one can judge the accuracy, validity, and value of the information and arguments presented. According to the mentioned experiences of the students of the Faculty of Teacher Education, information management in the learning style with virtual education is one of the highlights of this learning style.

Table 1- *Demographic information of the interviewees*

Demographic profile of students	**The first part**
2	Number of interviewers
12	Number of interviewees
8women - 4 men	sex
Bachelor student	education
Farhangian University of Ardabil	education place
Educational Science	Field of Study

Table 2- *Supplementary information of the interviewees*

Analysis of virtual education on students' critical thinking learning	**Part II**
In your opinion, what changes can critical thinking skills and thinking skills make in communication and interaction between people?	
How virtual education can be effective in improving the quality .of learning of students and teachers	
What changes does the virtual and online learning style bring about in your learning?	
Describe your experience of teaching and learning in a virtual .classroom or happy program	
What educational achievements can learning virtual education create in strengthening the critical pedagogy of student teachers?	

Learning with virtual education is one of the highlights of this learning style.

Answer to the first question:

- How do students describe their learning experiences with critical thinking in virtual education?

According to 9 of the interviewees, in virtual education, one needs to manage information, which initially requires a special order and learning style different from the face-to-face style. Also, the experiences of 8 of the interviewees mentioned this type of education as the cause of interaction and conversation with their classmates in order to solve problems and creative thinking, and problem-solving skills strengthen cognitive and metacognitive skills and strengthen learning strategies in individual learning styles.

- 11 of them considered the role of face-to-face training as very important. They stated that both traditional and virtual paradigms require the effort and will of the learner and that in virtual training, the important part of teaching and learning is carried by the learner himself and the person responsible for learning.

Answer to the second question:

- What changes does the skill of critical thinking make in students' learning of virtual education?

In this context, after the implementation of interviews and narrative writing from students' experiences, the following categories were extracted with three themes from 6 components according to the elements of the national curriculum of Iran (Chart 1).

According to 10 people, critical thinking skills through thinking, creative thinking, and problem-solving cause behaviors such as self-evaluation components - other evaluation in educational environments, personal growth and development or self-knowledge - spirituality - reasoning and inference, interpretation and interpretation - truth The search for the individual also strengthens social skills and cognitive pluralism in the learner.

Discussion

Our findings revealed several interrelated factors that affected critical thinking development. Our participants perceived virtual education, particularly the teaching and learning of critical thinking, as a new and unfamiliar experience that led to a sort of imbalance. Therefore, a framework, with adaptation and finding equilibrium as the core, was proposed.

It is noteworthy that our findings, as in other qualitative research, may be context-dependent, and in the continuing discussion, we will focus on our local implementation; meanwhile, we have described our research context in a way that faculty members, educational designers, and leaders in other settings can transfer these findings to their own context. Furthermore, we tried to meet a "conceptual generality" in our suggested framework. We have developed our framework based on ideas; for example, the belief system component is an important concept regardless of context, yet each institution and country may possess its own culture and belief system and act upon it.

In this framework, the factors within two main themes, that is, instructional design and educational leadership and management, could be planned and manipulated to promote critical thinking in the short term; in addition, factors in the "local evidence" theme could be modified in the short and medium term. These factors were thus considered as dynamic factors in the proposed framework. Meanwhile, the factors in the belief systems theme were constant and unchangeable during virtual education. These were, therefore, regarded as static factors.

Among our findings, the instructional design had been formerly incorporated into the virtual education system of TUMS. Nevertheless, a redesign based on the findings of the present study was also scheduled.

Our participants highlighted the necessity of a philosophical and theoretical framework in course development. While e-learning is recognized as the pioneer of change in higher education, it needs to be justified. The main question is the nature of the learning experience and the desired educational outcomes. Educational strategies and an appropriate student-centered atmosphere play a determining role in the promotion of critical thinking.

While our virtual programs had been developed based on a combination of cognitivism and constructivism, after exploration of the participants' experiences, course outlines, and faculty empowerment workshops were revised to comply with humanistic strategies and student-centered education requirements. Moreover, the school's educational council approved of integrating the promotion of critical thinking in the general objectives and assessment of courses.

Our participants appreciate the presence of face-to-face sessions, a limited number of students, and the asynchronous approach in our system as factors encouraging critical thinking. These findings showed that the planning of our system was in line with the standards of virtual education. In fact, e-learning had to be complemented with face-to-face classrooms to facilitate the achievement of educational goals; in addition, higher numbers of virtual students (>20) can reduce student-instructor interactions. Meanwhile, asynchronous online group discussions could be more successful than in-person discussions in promoting critical thinking.

Conclusion

One of the basic goals of education at the global level is to create critical thinking. By examining the concept of thinking and thinking strategies of critical thinking and the definitions provided by experts in this field, which is often considered as accurate or measured judgment and evaluation, It can be concluded that critical thinking is placed at a higher level of reasoning in relation to normal thinking, and it strengthens the critical skill and criticism of the individual and learning life skills in different dimensions.

In critical thinking, the main goal is to provide skills and strategies that students can use to manage large amounts of information. Experts consider the use of critical thinking skills as one of the methods of equipping learners to face today's information-filled world. With critical thinking, one can judge the validity and value of information and arguments presented.

Therefore, in order to have capable people with freedom of thought and creativity in the future, they should be nurtured from childhood. Mapson and Courtney write that educational strategies and creating a suitable student-centered atmosphere and environment play a decisive role in promoting critical thinking (Simpson & Corneti, 2002).

Another important finding of the present study showed that virtual education in general and critical thinking training, both from the point of view of teachers and students and from the point of view of professors, was a change that led to anxiety and created an internal motivation in them to learn and balance and learn. It is learned. Researchers put a lot of emphasis on electronic learning environments because they believe that in these environments, learners can save enough time for themselves, as a result of which a platform for deep analytical thinking is provided for them to face questions and solve assignments.

Also, another basic point is that teachers themselves should have sufficient knowledge and skills in the field of critical thinking in the virtual education environment so that they can create a platform for the growth and strengthening of their students.

One of the many cases and obstacles that are noticeable in teaching critical thinking is the weakness of classical teaching resources and their evaluation.

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