

ORIGINAL ARTICLE

Phenomenology of the Challenges of Education in the E-learning Ecosystem and the Competencies Required for Effective Participation in this System

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ABSTRACT

The present research aims to explore phenomenologically the challenges of education in the ecosystem of electronic learning and the competencies required for effective participation in it. For this purpose, a qualitative approach was employed, utilizing phenomenological methods to identify and represent the phenomenon under investigation. Data were collected through purposeful sampling and semi-structured in-depth interviews with sixteen active teachers and principals in the new ecosystem and were analyzed based on the Colaizzi model. The tenth interview achieved theoretical saturation of the data; however, to ensure the validity of the findings, interviews continued until the sixteenth participant". The analysis of data obtained from the interviews led to the identification of two categories (challenges and competencies) and ten main themes. The challenges of education in the new ecosystem include the lack of traditional communication, the neglect of educational topics, the prevalence of academic dishonesty, privacy invasions, a lack of seriousness regarding the ecosystem and the emergence of false confidence. The competencies required for the new ecosystem include operational, cognitive, collaborative and self-directed competencies. In conclusion, it can be stated that education in the new ecosystem faces numerous challenges and requires a form of transformation in educational design. Therefore, improving its quality necessitates a shift in perspective from the authorities and moving away from these views that take education as temporary, part-time, or of secondary importance.

KEY WORDS

Phenomenology, Challenges, Education, Ecosystem, Competency



Extended Abstract

Introduction

Information technology has played a significant role in various domains of human life, including education. With the emergence and development of information and communication technology, the rate of global developments is expanding at a greater pace, centered on the element of information and knowledge. In this regard, today, many educational systems are conducting research on various solutions for expanding e-learning, and this process is viewed as part of the educational development process. E-learning, as a new paradigm in modern education, is a set of academic activities (Jia, 2011) that utilizes electronic media, educational technologies, and information and communication technologies in education (Contreras, 2015). Chen defines E-learning as education through network-based electronic tools, with the main goal of enabling the learner to achieve complete self-education through the network (Chen et al., 2005: 241).

Due to its unique features and indicators compared to traditional, education learning has changed the nature of the teaching-learning process. Changing teaching styles and increasing the quality of learning, the possibility of presenting courses and content in a multimedia environment, and the ease of access to a large volume of information and Reducing educational costs, flexibility and being supratemporal and supraspatial, receiving feedback quickly and analyzing it, changing methods of evaluating results, monitoring and controlling the educational system and information, establishing educational justice, supporting a large number of students in a class, reducing transportation and commuting costs, and time management are all examples of advantages of education learning. Therefore, E-learning is rapidly replacing traditional education and migrating educational systems to this new ecosystem (Shaeidi and Sadeghzadeh, 2012; Farajollahi and Badiiee, 2013; Manuela Cruz-Cunha et al, 2006; Hara & Kling, 2003; Agawam, 2009).

In the realm of e-learning, we are confronted with two highly interwoven dimensions: the

longstanding domain of education and the profound and far-reaching influence of information and communication technologies (ICT) on it. The significance of neither of these two constitutive aspects of E-Learning can be regarded as less than the other. Technology is intended to serve as a facilitator of learning, and in the current era, meaningful learning cannot be fully achieved without the integration of technology (Montazer & Ghashoul-Darehsibi, 2020, p.15).

However, within this rapidly evolving educational ecosystem, policymakers and administrators have not devoted sufficient attention to optimizing the effective use of E-Learning within instructional processes. Despite the considerable opportunities afforded by e-learning, which have triggered remarkable educational, cultural, and social transformations, this shift has also given rise to emerging and unprecedented pedagogical challenges in this domain (Altbach & de Wit, 2020; Oleksienko et al., 2020).

In general, technology is neither philosophically nor ethically neutral; it tends to enhance certain dimensions of human life while potentially diminishing others (Feenberg, 2002). Consequently, E-Learning technologies cannot be regarded as neutral or value-free tools. Rather, they can be seen as a double-edged sword with both constructive (positive) and disruptive (negative) implications. For example, the continuous separation of E-Learning from the physical classroom and school environment has created significant challenges for learners' identity formation and personal development. Furthermore, the lack of adequate interaction within virtual learning environments constitutes another critical challenge. In fact, in such settings, comprehensive instructional support tends to diminish, thereby raising concerns about the very principle of autonomous learning (Islam & Beer, 2015).

On the other hand, some researchers argue that E-Learning is not universally suitable for all types of educational contexts. Moreover, there is no unanimous consensus among scholars

regarding the overall effectiveness of e-learning, and divergent perspectives exist in the literature. From an optimistic point of view, proponents argue that the integration of E-Learning into educational systems has enabled faster, broader, and more sustained access to learning for a wider range of learners (Eugenia, 2002). In contrast, the pessimistic perspective emphasizes that pedagogical and developmental components are often neglected in E-Learning environments. According to this view, many pioneers of digital education have overlooked its formative and moral functions, and some even argue that e-learning, by its very nature, is not well-suited to simulate or foster educational and character-building activities (Little et al, 2002; Samson & Keen, 2006; Ko & Rosen, 2010).

A review of the literature reveals that numerous studies have been conducted in the field of e-learning, focusing on its opportunities and challenges within the educational context. For example, Montazer and Gashool Darehsibi (2020) examined the technological transformation of education under the influence of information and communication technologies. They traced the evolution of distance learning across six generations, from correspondence education to social e-learning. Their findings highlighted how ICT has shaped personalized and intelligent learning environments and revealed a growing scholarly focus on the technological dimensions of e-learning. The authors argued that neglecting policymaking in this area would not only limit the advantages of E-Learning but also increase future educational costs and deepen the gap between the education system and the needs of the information society.

Shafei Sarvestani et al (2019) explored students' experiences of E-Learning challenges at Shiraz University of Medical Sciences through a phenomenological study. Their findings indicated that students faced multiple barriers, including educational (e.g., excessive content and lack of faculty support), organizational (limited course diversification), ethical (negative perceptions of e-learning), technical (poor internet and infrastructure), as well as

managerial, evaluative, supportive, and communicational challenges. Awareness of these multifaceted obstacles provides valuable insights for improving the effectiveness of virtual education in higher education.

Sharifi et al (2019) conducted a meta-analysis on the effectiveness of E-Learning compared to face-to-face education in Iran's educational system. Reviewing 45 eligible scientific research articles, they found that E-Learning demonstrated a higher overall effectiveness, with a combined effect size of 0.483, representing a moderate impact according to Cohen's criterion. The analysis further revealed that E-Learning was particularly more effective in studies involving student samples, skill-based outcomes, and randomized sampling. These findings suggest that E-Learning can serve as a viable alternative to traditional education in the Iranian context.

Kian (2014) highlighted the challenges of virtual education in three main areas of education: creativity and power relations in Iranian universities. The study concludes that in a virtual environment, due to the lack of face-to-face communication and the student's mimicry of the teacher and others, the educational environment is not adequately provided. Virtual students do not have the opportunity to observe the teacher's daily reactions or follow his/her moral and academic models.

Bagheri and Shamshiri (2014) in their research found that the opportunities of information and communication technology for ethical education include easy and fast access to the latest religious and spiritual information, utilizing information technology and media for teaching religious and moral issues, and increasing intelligence, creativity, and imagination. Additionally, the challenges include reducing susceptibility to influential groups, weakening religious beliefs, inclination towards pornography and sexual issues, promoting Western culture, promoting superstitions and deceptive mysticisms, internet addiction, etc. Therefore, awareness of these opportunities and challenges can help us in our current study.

Peters et al (2020) found that the physical and

mental health urgencies associated with COVID-19 have a profound impact on the theory and practice of higher education worldwide. Bryson and Anders (2020) observed a shift towards more diverse but concise forms of delivering online content. Other researchers have observed further negative consequences in the new ecosystem, including the finding that educational gaps and inequalities among students have worsened in the virtual education ecosystem, with these inequalities being more pronounced in schools and higher education institutions in poorer countries (Albach & Dewitt, 2020). Amemado (2020) argues that, in the short term, instead of being optimistic or skeptical, the focus should be on finding ways to maximize the quality of online education, improve students' learning experiences, and enhance reliability. It should be noted that this process cannot only be accomplished by, but also requires, the support of students, information technology experts, instructional designers, online education specialists, and student staff (Leask & Green, 2020).

Holford et al (2014) point out that the ease of access and acceptance, the unconditional interest of participants, and the absence of logical entry conditions and regulations for online courses can lead to a lack of commitment, adherence to completing tasks, and the occurrence of scientific dishonesty. This is because they do not consider online education as an exceptional opportunity, but rather see it as accessible to anyone, anywhere, at any time.

Dowens (2012) believes that learning in electronic and online education is based on four fundamental principles: self-directedness (independence), diversity, openness, and /or interaction. According to the first principle, implementing the principle of self-directedness or independence increases awareness, facilitates independent decision-making, and ultimately fosters the learner's responsibility and acceptance of tasks.

The study by Coppola et al (2001) revealed that the change in the role of teachers in virtual environments has co-occurred across three cognitive, emotional, and managerial categories. The cognitive role (mental learning processes, information storage, and thinking) has become more complex. The emotional role (influencing relationships between students, teachers, and the

classroom atmosphere) led teachers to find new ways to express their emotions and establish a more intimate relationship with students. The managerial role (classroom and lesson management) required teachers to pay more attention to details, consider more structure and organization, and have increased supervision over students.

Stodel (2006) has identified five main areas of neglect in virtual education in the field of higher education, including a lack of deep online discussions, a lack of spontaneous and creative ideas, a lack of understanding and being understood by others, a lack of knowledge of others, and ultimately a lack of learning and modeling behavior. Dreyfus (2004) believes that being present in a real classroom, face-to-face with the teacher and other students, provides learners with a sense of excitement and enthusiasm different from that of online classes and interaction with their classmates, a feeling they do not want to lose. Additionally, being in the classroom is such a positive experience that students often make an effort to come to class under any circumstances and participate. Dreyfus believes that in online courses, teachers can never be certain if students are engaged in the lesson, complete assignments independently, or focus on the class.

Previous studies indicate that despite the shift in the form of education in schools, new educational concerns and challenges have appeared in the new ecosystem. The importance and necessity of this study stem from the fact that the use of innovative technology in electronic and online education (the new ecosystem) has been able to bridge the gap between what is and what should be within limited time (such as flexibility and reduction of time and spatial constraints in education and learning, justice and equality of educational opportunities, the cultivation of learners in line with the era of knowledge and information, etc.).

The use of modern technology in education has led to the emergence of new fundamental challenges that require unbiased and scientific investigation. Experience has shown that if we focus solely on teaching and transferring information, neglecting the field of education in the new ecosystem of modern technologies, we will overlook the ethical implications of

communication and information technologies, leading to the incorrect and inappropriate use of these technologies. In this case, virtues will turn into vices.

However, being indifferent to modern educational technologies and preventing their use is neither possible nor reasonable, as it would deprive educational institutions in the country of the latest technology in the field of electronic education and learning during the COVID-19 closures. However, using these technologies outside a framework can also cause harm to learners in terms of both educational and ethical implications. Therefore, it is necessary to provide academic guidance on modern electronic education technologies to benefit from their positive aspects and to keep learners and the country away from harm.

In Iran, with the spread of coronavirus and the authorities' decision to implement virtual education for students, students quickly migrated to the new educational ecosystem (social network of students or Shad), and education began and continued for all students in the country. However, the point overlooked was the challenges and competencies necessary for teachers and students to effectively participate in the new ecosystem, as most teachers and students had to engage in these virtual learning environments without any prior training or specialized courses. Therefore, this article aims to provide a phenomenological understanding of the challenges of education in the E-learning ecosystem and the competencies required to participate effectively in it. The research questions are:

- What are the challenges of education in the new electronic education ecosystem?
- What competencies are necessary for participating effectively in the new electronic education ecosystem?

Materials and methods

In the present study, a qualitative method and a phenomenological approach were used to examine the perceptions of teachers, their students, and the students' parents. Phenomenological research aims to describe

lived experiences as they occur in everyday life. According to Husserl (Sokolowski, 2000), phenomenology is a method that enables one to "see" the essence, truth, or meaning of anything. Therefore, the focus of phenomenology is on lived experiences, as it is these experiences that create the meaning of each phenomenon for each individual and reveal to them what is genuine in their lives. In this study, the seven-stage model by Colaizzi (1978) was employed to provide a clear description of the lived experiences and perceptions of participants regarding the phenomenon under investigation. The stages of this model include:

1. Note-taking and transforming conversations into texts.
2. Rereading the text of the conversations and discovering and marking important phrases related to the phenomenon under investigation.
3. Conceptualization of the important extracted sentences.
4. Organizing participants' descriptions and common concepts into specific categories.
5. Transforming all inferred comments into comprehensive and complete descriptions.
6. Converting complete descriptions into a concise summary.
7. Final validation.

The field of this study consisted of teachers and principals from the three districts of Kermanshah city. A total of 16 participants (8 females and 8 males), including 14 teachers and 2 principals who were actively engaged in the new educational ecosystem, were purposefully selected. These participants represented all three academic levels: elementary, middle school, and high school.

In accordance with the ethical principles of qualitative research, the names and personal information of participants have been kept confidential. The criteria for purposeful selection were: (a) active presence and professional engagement in the new educational ecosystem (through teaching, supervision, or school management), and (b) willingness and informed consent to participate in the interviews and share their lived experiences. Table 1 presents the details of the participants in the research.

Table 1: Specifications of participants in the research

participant	gender	Degree field of study	Years of experience	Position
1	Male	Bachelor's- educational sciences	11	Grade2 teacher
2	Male	Bachelor's- Elementary Education	15	Grade2 teacher
3	Male	Bachelor's- counseling and guidance	13	Grade2 teacher
4	Male	Master- Arabic	10	High Sc principal
5	Male	Bachelor-mathematics	8	Middle School math teacher
6	Male	Master- experimental sciences	13	Middle Sc teacher
7	Male	Bachelor- psychology	18	High school psychology teacher
8	Male	Master-chemistry	18	High sc teacher
9	Female	Bachelor- Biology	16	Geology high school teacher
10	Female	Bachelor- Theology and Islamic knowledge	14	Chemistry high school teacher
11	Female	Master- Persian literature	18	Persian Literature Middle School
12	Female	Bachelor's- elementary education	14	Grade2 teacher
13	Female	Bachelor's- educational sciences	12	Grade2 teacher
14	Female	Bachelor's- physical education	17	High sc teacher
15	Female	Bachelor-English language	9	English middle teacher
16	Female	Bachelor's- elementary education	15	High sc principal

For data collection, semi-structured and in-depth online interviews were conducted. The process began with the researchers introducing the purpose of the study and the guiding questions, which focused on the challenges of the E-Learning ecosystem and the competencies required for its effective use. Participants were then invited to share their lived experiences through open-ended and probing questions. All interviews were audio-recorded with participants' consent, and the responses were transcribed verbatim to create a textual dataset for analysis. To enhance the credibility of the findings, member checking was employed: the researchers re-engaged with participants to validate the interpretations of their statements and made necessary revisions based on their feedback.

Ethical considerations were carefully observed. Participants were informed about the study's objectives, and their voluntary participation was emphasized. No personal or identifying information was collected, and confidentiality was strictly maintained. Audio files were deleted after transcription, and only anonymized data were retained. Participants were assured that the results would be used exclusively to improve the quality of virtual education in the Shad system, and a summary of the findings would be shared with them.

Data analysis was conducted using the

method proposed by Straub and Carpenter (2003), as cited in Adibhajbagheri et al. (2011). This method includes describing the phenomenon in question by the researcher, putting aside the researcher's preconceptions, interviewing participants, reading the participants' descriptions, extracting main and sub-themes, identifying fundamental relationships, writing a description of the phenomenon, returning the description to participants for their validation, reviewing relevant literature, and publishing the findings.

To assess the validity and reliability of the data, Guba and Lincoln's (1994) trustworthiness criteria were employed, which consist of four separate but interconnected criteria. These four criteria include:

- **Credibility:** To make the findings credible, strategies such as triangulation (collecting data from various sources and methods), analyzing contradictory data, and examining interpretations of raw data were utilized.

- **Transferability:** In this regard, an effort was made to ensure precision and sensitivity in the interpretation, analysis, and description of the data, providing a comprehensive examination of the data.

- **Dependability or Reliability:** To follow a consistent approach, from the beginning to the end, efforts were made to accurately interpret the lived experiences of participants, and document

the stages and methods for the integration, synthesis, and summarization of data. This was done to help other researchers replicate the study and achieve new insights, rather than reaching the same outcomes if they wish to do so.

- Dependability: To ensure the credibility of the data, efforts were made to review the findings and processes of the research (examining the coherence of the research processes). The validity of the data was determined through the researchers' self-review, which ensured credibility. Dependability was ensured by carefully guiding the information collection process and aligning the researchers. In addition to the researchers, the text of the

interview questionnaire was studied by another specialist. After re-extracting sub-themes from the responses and comparing them with the themes extracted by the researchers, alignment was achieved between the attitudes of the researchers and the subject matter expert.

Findings

Following the initial data analysis and in response to the two research questions, the results obtained from the coding process using MAXQDA software were categorized into 54 open codes, 10 sub-themes, and two overarching themes (challenges and required competencies), as presented in Table 2.

Table 2. Evidence, main themes and sub-themes of the education category in the E-Learning ecosystem

Category	Main Themes	Sub-Themes	Selected evidence (meaningful statements)
Education within the E-Learning Ecosystem	Pedagogical Challenges in the Emerging Educational Ecosystem	Loss of Face-to-Face Communication	The lack of physical presence, the absence of real-time participation of students and teachers in the classroom, the reduction of opportunities for face-to-face individual and group guidance and personal development, and the limited possibility for students to observe, model, and internalize the teacher's ethics, demeanor, and appearance.
		The Overlooked Topic of Education	The loss of mutual pedagogical and moral influence between teachers and students, the lack of opportunities for moral and character development, the absence of emotional and sensory interaction with students, and the failure to achieve a comprehensive understanding between teachers and learners.
		The Prevalence of Academic Dishonesty	The emergence of cheating, plagiarism, and academic dishonesty in E-Learning environments, the low reliability and validity of assessment results, and the possibility of unauthorized individuals attending virtual classes or taking exams on behalf of students.
		Violation of personal privacy	The increase in disturbances and interruptions during non-official hours, the expectation of responsiveness during holidays and personal rest times, and the pressure to respond to individuals other than students.
		Not Taking the New Ecosystem Seriously	Absence from class or irregular and scattered attendance in the virtual class, lack of willingness to actively and consistently participate in discussions, not completing assigned homework, irregular attendance, and not adhering to the full class time by the teacher.
		Emergence of False Self-Confidence (Through Obtaining Unrealistic Grades)	The presence of a bubble in students' grades, the lack of a logical and real difference between clever and lazy students, high class average grades, and the existence of false self-confidence in average and weak students.
	Essential Competencies for Effective Engagement in the New Ecosystem	Operational Competence	Gaining sufficient expertise in the use of ICT tools, enhancing knowledge in using ICT tools for searching, retrieving, analyzing, and disseminating information and data, awareness of how to use system tools and capabilities, and orientation in the virtual environment.
		Cognitive Competence	Gaining awareness of how to access learning content, course materials, and study guides, as well as understanding how to reach technical support within the learning management system and resolve system-related issues.
		Collaborative competency	Ability to interact with students in learning or group work, participate in discussions and classroom activities, readiness for meaningful negotiation and efforts to reach consensus or agreement, readiness to receive feedback and respond to it.
		Self-regulation Competency	Readiness to pay attention to and respond to classmates' and teachers' ideas and criticisms, readiness to learn from others' mistakes, responsibility for one's own learning, flexibility in the face of failure, disappointment, and uncertainty.

Research Question 1: What are the challenges of education in the new electronic learning ecosystem?

By studying and analyzing the aggregated responses of participants, six sub-themes related to the challenges of education in the new ecosystem were identified. Next, we will explain the themes derived from the perceptions of teachers and managers.

1. Loss of Face-to-Face Communication

Participant 2: "In my opinion, a significant challenge of the new ecosystem is the inability of teachers and students to be physically present in the school environment and classrooms. This challenge makes the students not listen to what teachers say".

Participant 5: "In the new ecosystem, due to the COVID-19 pandemic, there is no real opportunity for students and teachers to be present in class, and this issue has decreased the impact that we teachers have on students. I can say that students and even families are somewhat abandoned and are confused regarding education".

Participant 10: "As teachers in the new ecosystem of electronic education, we can only teach and present academic content, and we have no real understanding of the personalities and temperaments of our students. Therefore, they are like a black box for us, and we cannot positively influence their behavior and ethics".

2. The Overlooked Topic of Education

Participant 1: "I think the biggest challenge of the new ecosystem is that no thought was given to the important topic of education, and electronic learning hasn't been able to provide a foundation for educating students".

Participant 9: "In school and the classroom, teaching and education usually occur together, but in the new ecosystem, only teaching happens, with many issues and problems. Therefore, I believe that education is absent in electronic learning because the traditional, emotional connection and interaction between our students and us is not established".

Participant 15: "The lack of face-to-face communication has made my students not know me well, and some of them may even not know my name, so they can't take me as a moral role

model".

3. The Prevalence of Academic Dishonesty

The Academic Integrity Consortium considers any activity that affects the education process, the pursuit of knowledge, and fair evaluation of students' performance—including cheating, plagiarism, literary theft, falsification of assignments, submission of false documents, assisting others during cheating, and accessing exam content—as instances of academic misconduct and a lack of academic integrity (Academic Integrity Consortium, 1999; Schmelkin et al., 2008).

Participant 3: "I think that assessing students' learning in an online environment is not credible at all, and we don't really know who is answering the exam questions and under what conditions they are responding".

Participant No. 7: "In the new ecosystem, cheating happens a lot, and unfortunately, parents also contribute to this issue. For example, I deliberately designed a question that students shouldn't be able to answer, but to my surprise, I see that it has been answered. I become convinced that someone else is answering the questions instead of my student".

Participant No. 11: "Unfortunately, due to students' access to the internet and the web, many of them send me articles and scientific content from others under the guise of their own work for assigned tasks. This concerns me, as it undermines their academic integrity".

4- Violation of personal privacy

The concept of privacy comprises three key components: anonymity, confidentiality, and solitude (Banisar, 2000). In the realm of virtual education, an issue that threatens the privacy of both teachers and students is the increased interaction between them, as well as their constant availability to each other.

Participant No. 6 stated: "In the new ecosystem or the Shad system, the increase in interaction and communication between my students and me has meant that I am often available to them. This has led to a decrease, and even the loss, of my mental, spiritual, and family peace during my non-working hours".

Participant No. 8: "The constant availability of the teacher and students in the new ecosystem

leads to unnecessary interactions and disturbances that can be considered a type of disrespect to the teacher-student boundary. For example, I have often experienced that some students and their parents expect me to respond to their questions and demands even during my breaks and on weekends".

Participant No.13: "Unfortunately, in the new ecosystem, most students and even some of my colleagues do not adhere to the school's weekly schedule and the official class times. They hold classes at any hour of the day or night that they wish, or students send their questions and assignments at all hours, expecting quick and precise responses. I see this as a complete violation of privacy".

5. Not Taking the New Ecosystem Seriously

With the onset of the COVID-19 pandemic and the compulsory closure of schools, the education system tried to compensate for students' academic lag at three levels by resorting to television education, online learning, and launching the Shad social network. However, unlike the education system, students did not take this new style of teaching and learning seriously.

Participant Number 4: "One of my classes has 30 students. During class times, about half of my students are online and present in class, while the rest either join late or announce their presence and then log off. In short, I think the kids do not take the Shad classes seriously and make little effort to participate actively and complete assignments".

Participant No. 12: "In my opinion, due to the abrupt and urgent change in the educational ecosystem in Iran, even after two years, most teachers and students are still in shock and do not accept that they need to engage in academic activities in this ecosystem. Therefore, many of them still do not take this new environment seriously and have only devoted part of their effort, energy, and focus to it".

Participant No. 16: "I think that some teachers have become neglectful, and on the pretext that their classes are not monitored and followed up, they make various excuses, such as slow or frequent interruptions of the internet, and either do not attend classes or show up only

occasionally. Sometimes, some teachers upload their assignments or files to the class channel in just a few minutes and then immediately close the class".

6. Emergence of False Self-Confidence

In the new E-Learning ecosystem, the grading bubble has become a growing issue. This is because most teachers are more lenient and forgiving in online education. Teachers tend to provide students with easy notes and sample questions and then use those same materials to evaluate them (Schutz et al, 2013).

Participant Number 6: "According to the emphasis from the director and education officials on considering the students' well-being during this COVID era, I typically make my assessments and exams easier and conduct them in a multiple-choice format. This has resulted in my class averages being higher than before".

Participant Number 14: "The reality is that even my laziest student is getting good grades in exams now, and sometimes even surprisingly protests when receiving a score of 19. Unfortunately, the online exams and the acquisition of unrealistic grades have led them to feel they are the masters of the universe, while I am certain that this is not the case at all".

Participant number 15: "I also agree that the existence of grading bubbles or inflation reduces learning standards and causes students to feel entitled, as it creates a false sense of confidence in them, leading to a distorted feeling of progress. Therefore, they make less effort".

In summary, based on the challenges of education in the new ecosystem, it is concluded that despite the numerous opportunities and possibilities created in the field of education and electronic teaching processes, the new ecosystem faces multiple challenges in the realm of training that require scientific and philosophical scrutiny. Additionally, the existence of such challenges suggests that teachers, as educational agents in this new ecosystem, need to acquire competencies relevant to this environment, which will be addressed and referenced further on. Based on the perceptions of the interviewees, the challenges of education in the new electronic education ecosystem are illustrated in Diagram 1.

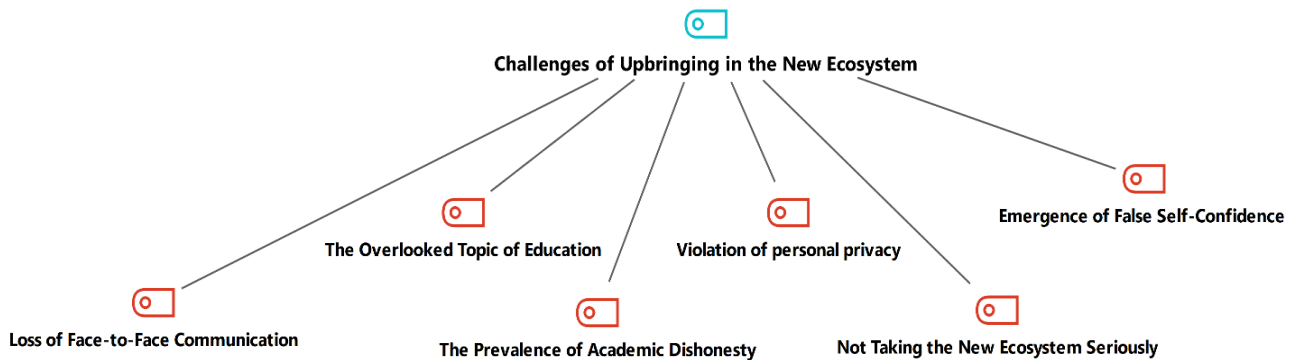


Diagram 1. Pedagogical Challenges in the New Electronic Education Ecosystem

Research Question 2: What are the competencies required for effective participation in the new electronic learning ecosystem?

Unlike traditional face-to-face training, where the teacher is the primary source of communication and the center of the teaching-learning experience, electronic and online education utilizes media to facilitate effective communication. However, in this new ecosystem, the teacher still plays an important facilitative role in teaching and learning. "Perceived communication" refers to students' understanding of the teacher's communication skills and their impact on their education. Interactions between the instructor and learners that enhance the acquisition of knowledge and information also improve the instructor's perceived competence in performing course duties. This is crucial not only in face-to-face settings but also in online formats. Although it may be challenging, achieving similar levels of perceived competence in both classroom formats is not impossible. Based on the participants' perceived understanding and comprehension in the research, the competencies required for effective participation in the new electronic education ecosystem include the following items.

1. Operational Competency: Operational competency refers to the effective use of ICT tools for teaching and learning, communication, collaboration, and self-regulation. Given the systematic, remote, and flexible nature of virtual education, the primary aim of developing operational competency is to enhance users' responsibility and make them accountable for their own learning and assignments.

Participant 3: "Teachers and students in the E-Learning environment should possess sufficient

skills to use technological tools for establishing and maintaining communication and collaboration with their students and classmates".

Participant 10: "I believe that E-Learning users should have adequate knowledge and awareness of how to use the features and options available within the learning management system for searching, retrieving, analyzing, and sharing information and data, so that they can fully utilize all the available functionalities".

2. Cognitive Competency: Cognitive competency refers to efficient learning from course content, the effective use of one's knowledge and information, and the ability to seek help when necessary.

Participant 1: "In e-learning, teachers and students should be able to access the educational environment and classroom individually, receive all course and lesson information, upload their own files, and complete official tasks without difficulty".

Participant 8: "An E-Learning user should have the skill to reach the course support team when necessary and request assistance if needed".

3. Collaborative Competency: Collaborative competency refers to effective communication and collaboration with students and colleagues within the new educational ecosystem.

Participant 5: "The most important competency is that teachers and students in the E-Learning classroom can establish initial interaction and communication, and express their ideas, opinions, and personal feelings".

Participant 9: "It is essential to achieve this competency so that teachers and students attend virtual classes and educational activities regularly and actively participate in collaborative

classroom tasks".

Participant 16: "I believe that teachers and students involved in E-Learning should be able to engage in deep discussions with classmates and teachers, similar to a face-to-face classroom, to achieve learning objectives, understand the content, and provide timely feedback on differing viewpoints".

4. Self-Regulation Competency: Self-regulation competency refers to effective self-management, self-monitoring, and self-assessment during virtual learning.

Participant 2: "The essential skill in E-Learning is achieving autonomy and independent learning; in fact, educational and learning management is a vital competency for success in e-learning".

Participant 7: "Students engaged in E-Learning should acquire the competency to strive for learning according to their abilities and talents, while teachers should design instructional content considering individual differences, so that each student can be

accountable and responsible for their own learning".

Participant 11: "I feel that initiative and creativity skills are required in E-Learning to master this educational approach, as they enhance individual flexibility".

Overall, it can be said that for effective presence in the new E-Learning ecosystem, acquiring four categories of competencies is essential: operational competence (using technological tools), cognitive competence (efficient learning from content), collaboration competence (effective interaction with others), and self-leadership competence (self-management and self-assessment). Equipping users with these four competencies helps them to succeed in online educational environments with responsibility, independence, and flexibility. Based on the perception of the interviewees, the competencies required for effective participation in the new electronic learning ecosystem are shown in Diagram 2.

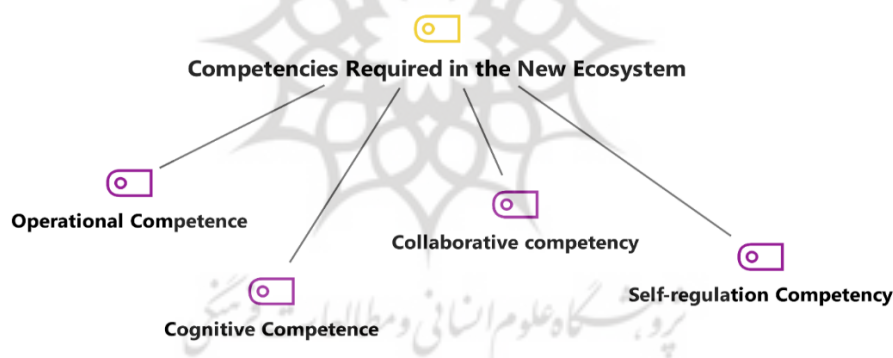


Diagram 2: Competencies required for effective participation in the new electronic learning ecosystem

Two main categories of challenges in the new ecosystem, along with the required competencies and their ten main themes, are presented in Table 2.

Table 2. Challenges and competencies in education within the new ecosystem

Categories	Main themes	Codes
Challenges of the new ecosystem	Lack of traditional and face-to-face communication	2,3,5,6, 8, 9,10,12,13,15
	Overlooked educational issues	1,3,4,6,8,9,12,14,16
	Prevalence of academic dishonesty	3,5,7,10,11,13,15
	Invasion of personal privacy	2,4,6,8,9,13,16
	Not taking the new ecosystem seriously.	1,4,5,7,8,11,12,16
	Emergence of false confidence through unreal grades	1,2,4,6,7,10,11,14,15
Required Competencies	Operational competency	1,2,4,5,7,9,10,12,14,16
	Cognitive competency	1,3,4,7,8,10,11,13,14, 15,16
	Collaboration competency	2,3,5,6,8,9,12,14,15
	Self-directed learning competency	1,2,4,5,7,8,9,11,12,14,15,16

Based on the data in Table 2, the main identified challenges within the new electronic education ecosystem were the lack of traditional face-to-face communication (repeated 10 times), overlooked educational issues, and the emergence of false confidence through unreal grades (repeated 9 times). Regarding the required competencies, self-leadership

competency (repeated 12 times), cognitive competency (repeated 11 times), and operational competency (repeated 10 times) were identified as the most important required competencies. Finally, after the current coding and responding to the research questions, the final diagram of the research findings is shown in diagram 3.

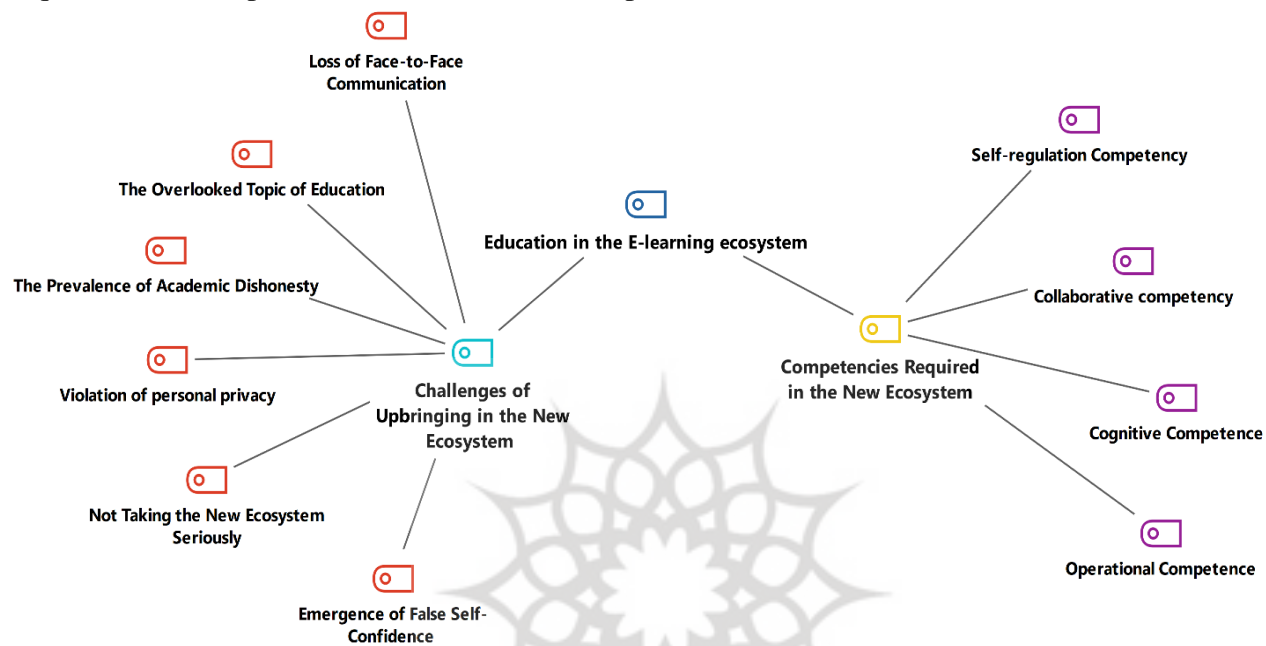


Diagram 3: Competencies required for effective participation in the new electronic learning ecosystem

Conclusion

The objective of the present research is to phenomenologically explore the challenges of education in the new electronic learning ecosystem and to investigate the competencies required for effective participation in it. To this end, a qualitative method with a phenomenological approach was employed to identify and represent the challenges and competencies needed in the studied new ecosystem. The interview questions centered on two main themes: the participants' lived experiences with the challenges of education in the new ecosystem and the competencies required for effective participation. The analysis of the data obtained from the interviews led to the identification of two categories (challenges and competencies) and ten main themes.

Based on the findings and the opinions of the participants in the interviews, the most significant challenges of the new ecosystem

include the lack of traditional face-to-face communication, the overlooked issue of education, the prevalence of academic dishonesty, invasion of privacy, the failure to take the new ecosystem seriously, and the emergence of false confidence through obtaining unrealistic grades. Regarding the reasons for the existence of such educational challenges in the new ecosystem, it can be said that the new ecosystem is an unfamiliar environment with unique and new capabilities that have suddenly become a serious habitat for teachers, principals, and learners with the outbreak of the coronavirus. They had not received any training or specialized competencies regarding it, and essentially could not utilize all its capacities and potentials in the field of teaching and education. Therefore, the new educational ecosystem, compared to the traditional one, features modern and emerging facilities, capabilities, and equipment that require the acquisition of new

training and skills to utilize them effectively in the teaching-learning process.

Based on the findings and opinions of participants in the interview, the most important competencies required for teachers include operational, cognitive, collaborative, and self-directed competencies. In fact, acquiring these mentioned competencies by teachers and managers active in the new ecosystem and internalizing them leads to the maximization of resources and capabilities of the new ecosystem, increased motivation and enthusiasm for teaching and learning, acceptance of responsibility and accountability, active participation in discussions and debates, and the fostering of responsibility among users. The reality is that the ecosystem of electronic learning differs from that of traditional face-to-face education; therefore, the competencies and strategies for learning and teaching in each case are distinct. As a result, one of the changes that has occurred in the new educational ecosystem compared to the previous one is the necessity to identify and foster specific skills and competencies required for this mode of education in users, so they can make the best use of virtual learning technologies, engage in learning, and achieve success. González and Wagenaar (2003) identify some of the competencies within the ecosystem of electronic education as follows:

- Accountability and responsibility for high engagement in one's learning.
- Expectation of active performance from learners (and nurturing by teachers).
- Self-regulated learning.
- Interaction in regular and effective

communication.

- Participatory learning (nurtured through teaching practice).
- Information skills: searching, selecting, analyzing, producing, and disseminating information and knowledge.

On the other hand, Borges Sáiz (2008) and Birch (2001) argue that the roles and responsibilities of teachers and principals in the new ecosystem differ from those of their counterparts in face-to-face and traditional education. Therefore, they need to be equipped with competencies that differ from those in the conventional and in-person environment.

In conclusion, it can be inferred that in the new ecosystem, due to the lack of connection and modeling of students by teachers and principals, the environment for the comprehensive development of students' character is not provided. On the other hand, a student reaches a mature stage in education and ethical behavior when they can observe all the daily reactions and behaviors of their teachers, both inside and outside the classroom, and model their own moral and behavioral style. Unfortunately, these processes currently have no place in the new ecosystem.

Finally, based on the research findings, it is recommended that teachers and administrators address the challenges of education in the electronic learning ecosystem by acquiring the necessary competencies of the new ecosystem through empowerment workshops and in-service training courses led by experienced instructors in this field, and participating in them with readiness.

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