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DESIGNING AN E-LEARNING CURRICULUM MODEL BASED ON THE COMPONENTS OF ACTIVE CITIZENSHIP EDUCATION IN THE ELEMENTARY SCHOOL

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***ABSTRACT*:**

Background and Objectives: With the expansion of digital technologies, e-learning plays an important role in cultivating active citizens. The aim of this research is to design an e-learning curriculum model based on the components of active citizenship education in the elementary school stage. This study was conducted using a mixed-methods approach. Methods: The qualitative section was conducted using grounded theory, interviews with curriculum planning experts, and analysis of documents and reputable scientific sources. The quantitative section involved collecting data from 207 teachers and school principals in Hamadan province, which were analyzed using confirmatory factor analysis and partial least squares structural equation modeling (PLS-SEM). Findings: The qualitative findings identified barriers to designing and implementing the e-learning curriculum at three levels: causal (e.g., weaknesses in e-learning and critical thinking), contextual (e.g., lack of interactive learning environments and access inequality), and intervening (e.g., cultural resistance and teacher skill gaps). "Active citizenship education in e-learning" emerged as the central concept, requiring transformative strategies, teacher empowerment, and purposeful use of digital technologies. The quantitative results confirmed the model's validity and structure, with significant relationships between constructs and strong predictive power (R^2). Conclusion: The overall conclusion indicates that the proposed model, with precise planning, teacher training, and strengthening of infrastructure, can be an effective step toward cultivating active and responsible citizens in the digital society of the elementary education stage.

***Keywords**: E-learning, Digital Technologies, Active Citizenship Education, Mixed-Methods Research.*

INTRODUCTION

Rapid advances in digital technologies have dramatically transformed education and paved the way for the widespread adoption of e-learning. E-learning encompasses a wide range of digital tools and instructional strategies designed to enhance the learning experience through flexibility, accessibility, and interactivity (Dritsas & Trigka, 2025). This transformation is driven by the growing demand for personalized education that meets the diverse needs of learners, the spread of internet connectivity, and the global emphasis on lifelong learning (Klašnja-Milićević & Ivanović, 2021). E-learning technologies are therefore essential tools in education at all levels of education, helping to create more adaptive and personalized learning environments. These technologies, which include online platforms, mobile applications, and interactive resources, have transformed the way students access knowledge and participate in the educational process (Cardona-Acevedo et al, 2025). The use of e-learning technologies not only facilitates access to extensive educational resources, but also encourages self-study and self-directed learning, which is very important in developing vital skills in children and adolescents (Dieck et al, 2018). As a new approach to teaching-learning, e-learning plays an important role in creating equal educational opportunities, improving the quality of learning, and developing 21st century skills (Aulia & Utami, 2021). With the introduction of this model into basic education, the need to revise primary school curricula based on new needs, especially in the field of citizenship education, is increasingly felt.

On the other hand, active citizenship, as a key concept in the development of democratic and sustainable societies, has its roots in Marshall's concept of social citizenship, which explains the rights and duties of individuals in the

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social welfare system (Christensen et al, 2025). However, criticisms of Marshall's view have raised the need to expand the concept of citizenship towards participatory dimensions and active responsibility (Eggers, 2023). Beyond individual rights, active citizenship emphasizes the role of active participation, broad responsibilities, and informed choice of citizens; components that are of great importance in educating the citizens of the next generation, especially in the primary school (Newman & Tonkens, 2011). In other words, educating active citizens, as one of the key goals of education in democratic societies, emphasizes the cultivation of individuals who are critical, responsible, participatory, and aware of social, environmental, and human rights issues (Timidi & Okuro, 2024). Educating such citizens in the primary school requires designing curricula that simultaneously develop students' social, moral, and digital competencies using new technologies (Falloon, 2020).

The use of e-learning, with the use of digital tools and the possibility of self-directed learning at any time and place, has created a fundamental transformation in the education system (Karakas & Manisaligil, 2012). The growth of the Internet, the use of interactive multimedia content, affordable digital devices, and learning management systems (LMS) are the main factors in the progress of this field. The COVID-19 pandemic has made the use of technology essential in everyday life and digital education an inevitable ecosystem (Alturki & Aldraiweesh, 2021). E-learning has not only increased the capacity of learners, but has also equipped teachers with new skills for lifelong learning. The concept of digital citizenship, which was previously limited to security and legality, has now expanded to empower learners to use digital tools for sustainable development (Dixit & Pathak, 2023). Designing e-learning with an individual approach prepares learners to become future global citizens. The use of digital learning management systems and the integration of tools help to achieve educational goals (Turnbull et al, 2020). Also, according to UNESCO recommendations, the four pillars of education (learning to know, do, live together and be) can be realized with digital citizenship education (Dixit & Pathak, 2023).

Given the vital role of education in shaping children's citizenship attitudes and behaviors, the use of new technologies and e-learning can provide a suitable platform for cultivating active citizenship components (Almudara et al, 2024). In this context, the development of e-learning curriculum models that can strengthen participation, responsibility, and informed choice in elementary school students has become necessary. This research seeks to design and present a model for an e-learning curriculum that is based on the components of active citizenship education in elementary school. Such a model can help achieve educational and social goals and pave the way for educating a generation that is responsible, participatory, and aware of its role in society. The integration of these two approaches—i.e., e-learning and active citizenship education—can lead to the design of curricula that not only promote the use of new media, but also emphasize the development of digital, critical, and participatory citizens. These programs should be designed to transform elementary school learners from mere consumers of content to producers, analysts, and decision-makers in the digital space. E-learning can serve as an effective tool in realizing citizenship education if its curriculum is designed based on the precise and considered components of active citizenship education. In other words, simply transferring educational content through technology is not enough; rather, the structure, content, goals, and methods of the curriculum need to be revised in a way that transforms passive learners into digital citizens who are engaged, creative, and critical (Selwyn, 2019).

Therefore, designing an e-learning curriculum based on the components of active citizenship education in elementary school is an inevitable necessity that is not only in line with the transformational needs of the education system, but will also contribute to the formation of a democratic, ethical, and technology-enabled society. A study of previous sources and research shows that in the field of citizenship education in primary school, most of the focus is on traditional methods and curriculum models based on e-learning and active citizenship education, especially at the primary level, have received less attention. Also, the key components of active citizenship education in digital learning environments have not yet been comprehensively localized and represented in the form of an integrated curriculum.

Therefore, the main gap in research lies in the lack of a theoretical and practical model for designing an e-learning curriculum with an approach to active citizenship education in primary school. A model that can align goals, content, methods, technologies, and assessment in a way that leads to the development of a responsible, participatory generation with digital and social competencies.

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RESEARCH BACKGROUND

Tavernae et al. (2025) conducted a study entitled Lifelong Learning e-Learning Systems for Sustainable Development and Public Participation. The results of this study show that e-learning is an effective solution for lifelong learning programs, but there is still resistance to it in Italian higher education. This method helps to increase access to knowledge and active participation of the public, especially in the context of public university interaction and communication with society. Based on the experiences carried out at the Rome Technopole Foundation in the Lazio region, e-learning can involve citizens in educational and research processes and strengthen the relationship between the university and its surrounding community. This model also provides a basis for future research on sustainable and effective solutions in university-society interaction and is consistent with Italy's national development goals.

Abubakar and Otunya (2024) conducted a study on the implementation of civic education curriculum in senior secondary schools: the need to incorporate e-learning strategies. The results of this study show that the success or failure of any educational system largely depends on the quality of curriculum implementation. In senior secondary schools, the implementation of the citizenship education curriculum faces problems, especially in the field of using e-learning strategies that are considered an alternative to face-to-face education. This deficiency has caused the backwardness of citizenship education, especially during the Corona pandemic when face-to-face education was limited. Therefore, the use of e-learning in the implementation of the citizenship education curriculum is essential to facilitate and improve the education process. The study emphasizes that the integration of e-learning strategies can increase the success and achievements of this curriculum. The importance, benefits and effective methods of using e-learning in this field are also examined and suggestions are provided for the optimal application of these methods in schools.

Song (2023) conducted a study titled “Constructing Cosmopolitan Identity through E-Learning and Blended Learning Environments in Global Citizenship Education.” The findings showed that individuals can shape their global citizenship identity through a practical cycle of reflection and interaction provided in the form of blended learning. The participants’ comfort level influenced the different paths of identity formation, but their ultimate goals were to engage in local activities with lifelong commitment. Intrapersonal and interactive forms of communication synergistically strengthened self-confidence and collective trust through blended learning activities. In general, global citizenship identity gradually evolved and self-confidence and trust in others gradually increased through different stages of communication. The results of the study by Hosseinzadeh et al. (1402) show that the curriculum for e-citizen education in primary school should pursue goals at three levels: ultimate, general and specific; Including students' ability to live effectively in the digital age, familiarity with electronic rights and identity, safe and responsible participation in cyberspace, and online behavior management. The content of the program should be interdisciplinary and designed in line with these goals. Also, teaching and learning strategies such as participatory, personalized, problem-based, simulation, and contingency methods have been proposed. The presented model, after data analysis and validation by experts, was recognized as valid and can be a basis for designing related educational programs in elementary school. Khosravi Babadi et al. (1401) found in a study that e-citizen education requires strengthening innovation, creativity, adaptation, mental insight, individual and social responsibility, the ability to share information, interaction, and collaboration. Training should be provided to make people aware of citizenship rights and create participatory motivation in order to improve citizens' learning and increase their participation in urban affairs. This partnership can lead to the improvement of environmental health, urban order and security, better use of urban services, improved accessibility, elimination of unnecessary uses, and development of green and sports spaces. The e-citizen education model in the second cycle of secondary education is based on increasing global awareness, information literacy, cultural literacy, functional literacy, and technological literacy. To achieve these goals, the design, development, and implementation of educational programs, the way content is presented, the communication between the teacher and the learner, the use of educational equipment and facilities, content review, and the assessment of the learning process must be reviewed. Measures must be formulated in the form of specific strategies and measurable outcomes, and appropriate to the educational system, the expertise of professors, hardware and software infrastructure, and necessary training should be utilized. Also, educational intelligence and data-based decision-making are essential for the successful implementation of this model.

Hosseini et al. (1400). In a study examining the position of virtual citizen education in the official curricula of the Iranian primary education system, the findings from Shannon entropy analysis showed that the highest amount of information load and importance coefficient among the desirable components of virtual citizen education belongs

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to the component of "virtual literacy" with a total value of (0.386) and the lowest amount of information load and importance coefficient belongs to the components of "virtual security", "virtual etiquette", "virtual rights and responsibilities", "virtual laws" and "virtual commerce" with a total value of (0). Also, the findings related to descriptive statistics showed that about 4 percent of the content of the textbooks under study paid attention to the components of virtual citizen education. According to the findings, it can be concluded that the position of virtual citizen education in the Iranian primary education curricula has been largely neglected. Therefore, it is suggested that, given the necessity of educating virtual citizens in the present era, the primary education curricula be reviewed in terms of creating appropriate coverage on the required components of virtual citizen education.

The findings of Poursalim et al. (2019) in the data-based model of the curriculum for global citizenship education in primary school show that the existence of this program is necessary due to social needs, global developments, threats to peace, and the emphasis of international institutions. Its goal is to strengthen learners' awareness of global issues such as justice, human rights, the environment, and peace. The content of the curriculum should include key concepts of global citizenship with a coherent structure and vertical and horizontal connections. The teacher, as a key factor, should have professional competence, global insight, and communication skills, and should use modern teaching methods such as collaborative learning and role-playing. Evaluation should also be diverse, comprehensive, and focused on creative and critical thinking. Successful implementation of the program depends on factors such as appropriate scheduling, desirable physical space, and access to rich and up-to-date resources. Finally, organizational support and the role of learners' implicit learning can facilitate or hinder effective implementation of the program and require careful management by teachers and educational policymakers.

A review of studies shows that, given the extensive developments in the field of information technology and the increasing use of e-learning, one of the necessities of educational systems in the 21st century is to review the content and methods of educating citizens for living in a digital society. Especially in the elementary school, where the foundation of students' personality, attitudes, and social skills are formed, paying attention to educating active and responsible citizens in the context of e-learning is of great importance. However, a careful review of the literature and studies conducted shows that despite the increased attention to categories such as "education of digital citizenship", "citizenship education in the context of technology" and "e-learning", a comprehensive, localized framework based on the real needs of the elementary school has not yet been developed to design an e-learning curriculum model based on the components of educating active citizens. Most previous research has either generally addressed the principles of citizenship education, or has focused on higher education, higher education, or international experiences, and lacks specific operational solutions for the Iranian primary education system in the context of e-learning. On the other hand, in many official documents and existing curricula, the components of active citizenship education, especially in the digital domain, have either been sporadically addressed or have faced numerous challenges in the implementation stage due to the lack of a specific implementation framework. This has led to the failure to achieve goals such as promoting digital literacy, increasing civic responsibility, conscious participation in the virtual community, and developing effective communication skills in students. In this regard, the lack of a structured model that can design and implement the goals, content, teaching methods, evaluation, and learning strategies in a coherent manner based on the components of active citizenship education in the form of e-learning is considered one of the serious gaps in the field of curriculum planning. This need is felt doubly, especially in the context of post-COVID-19 education developments, where e-learning has been presented as a necessity and not just a choice. Therefore, the present study seeks to not only help fill this theoretical and practical gap by designing an e-learning curriculum model that is appropriate for the needs of the elementary school and emphasizes the education of active citizens, but also to provide a platform for improving the quality of students' civic education in the digital context. Designing such a model can help educational policymakers, curriculum planners, teachers, and those involved in formal education in the country to take an effective step towards realizing educational goals appropriate to the digital age and prepare the future generation for effective, responsible, and informed participation in today's and tomorrow's society.

METHOD

The present study is applied in terms of its purpose and was conducted in two separate stages with different methods in terms of data collection. In the first stage, this research has a descriptive-survey nature that was conducted to identify and describe the existing conditions and phenomena related to the research topic. In the second stage, the research was designed as a mixed exploratory study (with priority for qualitative over quantitative) in which qualitative data were first collected and then the findings were used as the basis for the quantitative stage. In the qualitative part, the statistical population included all experts in the field of educational sciences in Hamadan, 21

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of whom were selected through purposive sampling until theoretical saturation was reached. The information in this part was collected through semi-structured interviews. In the quantitative part, the statistical population included all principals and teachers of elementary schools in Hamadan. Based on the Cochran formula and using the stratified random sampling method, 207 people were selected as the final sample. The data collection method was carried out in two ways: library and field. In the field section, data collection tools included in-depth interviews and a researcher-made questionnaire. The validity and reliability of the interview form were confirmed using the Delphi technique and expert opinions. Also, the validity of the questionnaire was calculated and confirmed through concurrent validity and its reliability using Cronbach's alpha coefficient. Grounded data theory was used to analyze qualitative data, and factor analysis and structural equation modeling based on partial least squares were used to validate the extracted categories and ensure reliability. The software used in this study included maxqda software version 18 and pls software version 4.

FINDINGS

a) Qualitative Section

In the qualitative section of this study, the grounded theory method with an inductive approach was used to discover hidden semantic patterns in the data. Data analysis was conducted in three consecutive stages including open coding, axial coding, and final (selective) coding. To collect qualitative data, semi-structured and in-depth interviews were conducted with 21 professors and educational and training specialists in Hamedan city. These interviews were conducted individually and in person, and the duration of each session was 45 minutes on average. Interview questions were designed to focus on the effective factors, contexts and platforms, processes, and consequences of the e-learning curriculum based on the components of active citizen education. With the participants' consent, the conversations were recorded to enable deeper analyses of the extracted themes. In some cases, re-interviews were also conducted to clarify points or complete the data. Theoretical sampling continued until the conceptual saturation stage; That is, when no new information was added to the theoretical framework and the categories were well established.

In the first stage of data analysis, the content of the interviews was separated into smaller conceptual components. Initial codes that indicated the concepts hidden in the participants' statements were extracted. Then, these codes were organized into initial concepts by semantic categorization, eliminating duplicates, and merging similar codes. The result of this stage was the extraction of a large volume of initial indicators and concepts that, due to their extensiveness, are not mentioned in detail in this section.

In the second stage, the analysis went to a deeper level and the relationship between the conceptual categories extracted from open coding was examined. The main goal in this section was to determine systematic conceptual structures among the scattered concepts. For this purpose, the concepts were classified into six analytical dimensions, which are:

1. Causal conditions (causes and contexts of the phenomenon formation)
2. Central phenomenon (central concept of the research)
3. Strategies and actions (related reactions and behaviors)
4. Contextual conditions (effective cultural, organizational, and environmental contexts)
5. Intervening conditions (facilitating or inhibiting factors)
6. Consequences (results and effects of the phenomenon)

Based on the analysis of the obtained codes, 8 main categories and 30 subcategories (subcategories) were finally identified and extracted, which form the theoretical foundation of the e-learning curriculum model based on the components of educating active citizens in the elementary school.

Causal conditions

In this model, causal conditions are events that create situations and issues related to a phenomenon and explain why and how individuals and groups respond in certain ways. Causal conditions include items of categories that directly affect the phenomenon under study and have direct and indirect effects on strategies and on the resulting consequences. The categories and concepts associated with causal conditions are shown in Table 1.

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Table 1. Categories of Causal Conditions

Corresponding concepts	Category
E-learning, distance learning, role of technology in education, guided learning, active learning, independent learning, lifelong learning, project-based learning, collaborative learning, interactive learning, personalized learning.	E-Learning
Digital literacy, technology skills, cybersecurity, digital ethics, online responsibility, privacy, computer skills, internet use, online communication skills, information analysis skills.	Digital Literacy
Information analysis, critical thinking, problem solving, social problem analysis, decision making, logical reasoning, social activity analysis, interactive data analysis, participation analysis, interaction analysis.	Critical thinking
Modern teaching methods, project-based learning, game-based learning, collaborative teaching, interactive teaching, technology-based teaching, experiential learning, flipped learning, exploratory learning, problem-based learning.	Modern teaching methods
The role of technology in learning, educational technologies, smart equipment, innovation in education, information and communication technologies, the Internet, electronic media, multimedia, video conferencing, course management software.	The role of technology in education
Adapting to the culture of the society, maintaining cultural identity, intercultural interaction, cultural differences, culture building, cultural resistance, the role of culture in education, preserving cultural heritage, practicing and educating social values in schools, increasing historical and cultural understanding.	Educational and cultural needs
Electronic curriculum design, transformational curriculum, interdisciplinary curriculum, integration of courses, educational and cultural needs, age-appropriate curriculum, digital resources, school equipment, teacher training, practical projects.	Electronic curriculum design

Contextual conditions

Contextual conditions represent a specific set of characteristics related to a phenomenon, which generally refers to the location of events and related events. Contextual characteristics include factors without which the design of effective strategies, plan results and desired outcomes will not be achieved. These conditions are made up of a set of contextual concepts, categories and variables. These factors are shown in Table 2.

Table 2. Contextual conditions categories

Corresponding concepts	Category
Virtual learning environment, dynamic learning environment, interactive learning environment, safe learning environment, dynamic educational space, virtual classes, online interactions, digital interactions, intercultural interactions, social interactions.	E-learning environment
Educational equity, equal access to services, reduced costs, increased student enrollment, broader access, flexibility in scheduling, diversity in content provision, equal opportunities, reduced educational restrictions, access to digital resources.	Educational justice
Adapting to the culture of society, maintaining cultural identity, intercultural interaction, cultural differences, culture building, cultural resistance, the role of culture in education, preserving cultural heritage, practicing and educating social values in schools, increasing historical and cultural understanding.	The role of culture in education
Reducing costs, increasing student admission capacity, wider access, flexibility in scheduling, diversity in content provision, reducing educational costs, developing e-commerce, reducing costs and investment, e-learning topics.	The role of economics in education
Parent-school communication, monitoring of learning, family and community involvement, support for learners, the role of parents in education, social participation, interaction between school and community, financial support, participation in social activities.	Family and community involvement
Reduced social interactions, infrastructure problems, lack of funding, quality of online classes, cultural resistance, lack of teacher skills, internet costs, bandwidth limitations, content incompatibility, challenges in integrating e-learning and traditional learning.	Technology infrastructure
Educational technologies, smart equipment, innovation in education, information and communication technologies, the Internet, electronic media, multimedia, video conferencing, course management software, online interactive tools.	Smart equipment

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Intervening Conditions

Intervening conditions include general conditions such as time, place, culture, etc. that influence and play a role as opportunities or threats to strategies. These conditions act to facilitate or constrain the interaction of factors in a specific context. Each of these conditions forms a spectrum whose impact varies from very distant to very close. These factors are shown in Table 3.

Table 3. Categories of Intervening Conditions

Corresponding concepts	Category
Reduced social interactions, infrastructure problems, lack of funding, quality of online classes, cultural resistance, lack of teacher skills, internet costs, bandwidth limitations, content incompatibility, challenges of integrating e-learning and traditional education.	e-Learning Challenges
Adapting to the culture of the community, maintaining cultural identity, intercultural interaction, cultural differences, culture building, cultural resistance, the role of culture in education, preserving cultural heritage, practicing and educating social values in schools, increasing historical and cultural understanding..	Cultural Resistance
Weak teacher skills, changing the role of the teacher, facilitating learning, guiding learning, providing constructive feedback, teacher training, the complementary role of e-learning, teacher knowledge, the connection of information technology with the subject matter, teachers' e-skills.	Lack of Teacher Skills
Reduced social interactions, lack of infrastructure, information challenges, lack of funding, quality of online classes, content incompatibility.	Decrease in Social Interaction
Content incompatibility, parent-school communication, monitoring of learning, family and community participation, support for learners, parental role in education, social participation, school-community interaction, financial support, participation in social activities.	Content Incompatibility
Lack of funding, quality of online classes, cultural resistance, lack of teacher skills, internet costs, bandwidth limitations, challenges of integrating e-learning and traditional education.	Lack of Budget
Infrastructure problems, educational technologies, smart devices, innovation in education, information and communication technologies, internet, electronic media, multimedia, video conferencing, lesson management software, online interactive tools..	Infrastructure Problems

Central phenomenon

The phenomenon in question must be central, meaning that all other main categories can be linked to it and appear repeatedly in the data. This means that in all or almost all cases, there are signs that point to that concept. Central phenomena refer to ideas or phenomena that are the basis and axis of the process to which all other main categories are linked.

Table 4 shows the central category of these factors.Table 4. Categories of the central phenomenon

Corresponding concepts	Category
Digital citizenship education, social participation and responsibility, citizenship rights, digital ethics, digital skills	Training active citizens in e-learning

Strategies

Strategies are actually plans and actions that are the output of the central category of the model and end in consequences. Strategies are a set of measures that are taken to manage, administer or respond to the phenomenon under investigation. The researcher, considering the set of concepts extracted from the interviews and final codes, makes the necessary decisions regarding the importance and prioritization of each of the concepts of strategies. Table 5 shows the categories and concepts related to strategies.

Table 5. Categories of strategies

Corresponding concepts	Category
Electronic curriculum design, transformational curriculum, interdisciplinary curriculum, integration of courses, educational and	Electronic Curriculum Design

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cultural needs, age-appropriate curriculum, digital resources, school equipment, practical projects.	
Strategic planning, foresight, flexibility, e-learning model design, individual characteristics review, technology characteristics review, user needs, synchronization with developed countries, growth of educational systems, new methods.	
Changing the role of the teacher, learning facilitator, learning guide, providing constructive feedback, teacher training, teacher knowledge, teacher e-skills.	Teacher training
LMS platforms, online tests, online questionnaires, digital portfolios, simulations, educational games, interactive data analysis tools, constructive feedback tools, participatory assessment tools, interactive content.	Using e-learning tools
Performance assessment, multi-faceted evaluation, continuous feedback, self-assessment, peer assessment, participatory assessment, interactive data analysis, digital portfolios, online tests, online questionnaires, online presentations.	Assessing citizenship skills
Critical thinking, information analysis, problem solving, critical discussions, online debates, social issue analysis, decision-making, logical reasoning, respect for the opinions of others, analysis of social activities.	Enhancing critical thinking

Outcomes

Outcomes are the outputs or results of actions and reactions. According to open coding, concepts related to the outcomes of the model are extracted, then according to the interactions between the central phenomenon and the strategies, extraction and naming are realized, and on this basis, the outcomes are determined. Table 6 deals with the categories and concepts related to outcomes.

Table 6. Outcome Categories

Corresponding concepts	Category
Electronic curriculum design, transformational curriculum, interdisciplinary curriculum, integration of courses, educational and cultural needs, age-appropriate curriculum, digital resources, school equipment, practical projects.	Increasing social participation
Strategic planning, foresight, flexibility, e-learning model design, examination of individual characteristics, examination of technology characteristics, user needs, synchronization with developed countries, growth of educational systems, new methods.	Improving citizenship skills
Changing the role of the teacher, learning facilitator, learning guide, providing constructive feedback, teacher training, teacher knowledge, teacher e-skills.	Promoting critical thinking and problem solving
Improving infrastructure and technology, training and empowering teachers and students, designing interactive and engaging educational content, continuous evaluation and feedback, creating a culture and acceptance of e-learning, strategic planning and resource management, social interaction and participation, reducing costs and increasing access, developing digital skills and technological literacy, creating a safe and supportive learning environment.	Reducing e-learning challenges
Educational justice, equal access to services, cost reduction, increased student intake capacity, wider access, Flexibility in scheduling, diversity in content delivery, equal opportunities, reduction of educational restrictions, access to digital resources.	Increasing educational equity and access to digital resources

In the data-driven theorizing process, the selective coding stage, as the final stage of qualitative analysis, emphasizes the integration and coherence of data with the aim of developing a conceptual model. After collecting and analyzing the data in depth, the research enters the phase of combining the findings and presenting the final model. In this stage, the current situation was first examined and the resulting data were organized into six key categories. Then, using the opinions of experts and qualitative content analysis of the interviews, a total of 31 final

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indicators were extracted, which were the basis for designing an e-learning curriculum model based on the components of educating active citizens in the elementary school. In the following, the presented paradigmatic model explains the conceptual framework of this program in the systematic relationship between contextual, causal, strategic, intervening, and consequential factors.

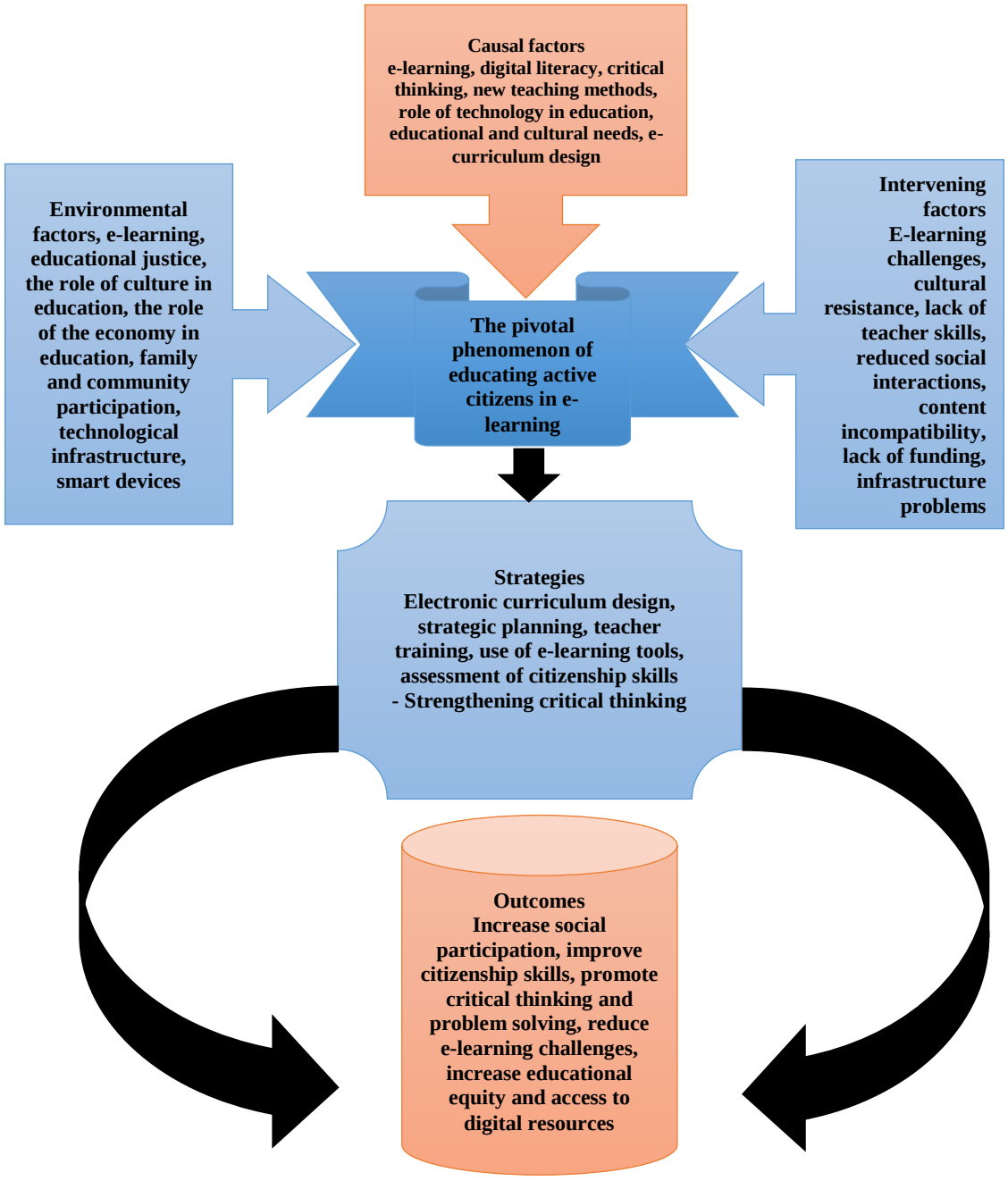

Figure 1. Research paradigm model

B) Quantitative section

At the beginning of the quantitative section, the demographic information of the participants was examined. In this study, 207 people answered the questionnaires. The results showed that the majority of the respondents were men (71 percent), while 29 percent were women.

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In terms of marital status, 70 percent were married and 30 percent were single. The age distribution of the respondents also showed that the largest age group was 41 to 50 years old, and other age groups accounted for a smaller share.

Regarding the level of education, the highest frequency was related to a bachelor's degree, followed by master's and doctoral degrees. Finally, the examination of job history showed that most of the participants had an experience between 10 and 15 years, while a smaller percentage were in the work experience groups of less than 10 years or more than 20 years.

In continuation of the quantitative findings, after reviewing the demographic characteristics of the respondents and the cluster sampling method, confirmatory factor analysis was conducted to assess the validity of the constructs of the conceptual model. Due to the limitation of the size of the article, it was not possible to present the factor analysis models graphically and graphically. Therefore, it is sufficient to simply report the numerical results of the confirmatory factor analysis for each of the dimensions, including causal conditions, background, intervening factors, pivotal phenomena, strategies, and consequences. In all cases, the values of the factor loadings and fit indices indicate the suitability of the measurement model and confirm the validity of the constructs. A summary of the fit indices of the confirmatory factor analysis models of the dimensions of the data-based model is presented in

Table 7. Fit indices of the factor analysis model of the dimensions of the data-based model

Overall model fit indices (summary)	R2R^2	Factorial load	Components / Items	Model Dimension
χ^2/df=1.99 RMSEA=0.076 CFI=0.96 GFI=0.96 NFI=0.92	77%	0.84	E-learning	Causal Conditions
	92%	0.93	Digital literacy	
	93%	0.96	Critical thinking	
	93%	0.94	New teaching methods	
	96%	1	The role of technology in education	
	96%	0.99	Educational and cultural needs	
	90%	0.89	Electronic curriculum design	
χ^2/df=2.16 RMSEA=0.069 CFI=0.93 GFI=0.92 NFI=0.90	98%	0.99	Electronic learning environment	Background conditions
	96%	0.97	Educational justice	
	93%	0.94	The role of culture in education	
	95%	0.96	The role of economy in education	
	96%	0.98	Family and community participation	
	91%	0.92	Technological infrastructure	
	90%	0.89	Smart devices	
χ^2/df=2.08 RMSEA=0.070 CFI=0.93 GFI=0.93 NFI=0.91	68%	0.83	Challenges of e-learning	Intervening conditions
	86%	0.92	Cultural resistance	
	96%	0.98	Lack of teacher skills	
	92%	0.94	Decrease in social interactions	
	97%	0.98	Content incompatibility	
	94%	0.92	Lack of funding	
	95%	0.94	Infrastructure problems	
χ^2/df=2.19 RMSEA=0.040 CFI=0.90 GFI=0.91 NFI=0.91	61%	0.85	Digital skills	Pivotal Phenomenon
	62%	0.85	Knowledge of digital citizenship rights	
	58%	0.8	Online social participation	
	63%	0.85	Readiness for digital society	
χ^2/df=2.83	90%	0.93	Designing e-curriculum	Strategies

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RMSEA=0.071 CFI=0.92 GFI=0.91 NFI=0.90	92%	0.94	Strategic planning	
	95%	0.98	Teacher training	
	93%	0.95	Using e-learning	
	95%	0.97	Assessing citizenship skills	
	89%	0.85	Strengthening critical thinking	
χ^2/df=2.07 RMSEA=0.072 CFI=0.92، GFI=0.95 NFI=0.94	90%	0.89	Social Engagement	Consequences
	94%	0.93	Citizenship Skills	
	98%	0.97	Critical Thinking and Problem Solving	
	94%	0.95	Reducing the Challenge of E-Learning	
	71%	0.68	Educational Equity and Digital Access	

The table above provides a summary of the results of confirmatory factor analysis related to the different dimensions of the research conceptual model. In this table, standardized factor loadings and coefficients of determination (R^2) for each component are reported, all of which are at an acceptable level and indicate that the items have been able to measure their latent variables well. Also, the fit indices of the models, including RMSEA, CFI, GFI and the ratio of chi-square to degrees of freedom, show that all measurement models have a good fit. These results confirm the construct validity and the adequacy of the research conceptual model in explaining the structure of the concepts under study.

After conducting confirmatory factor analysis and confirming the fit indices of the dimensions of the data-based theory model, this section examines the final research model. Given the complexity of the model and the small number of samples, the structural equation modeling method based on partial least squares using PLS software was used for the final analysis.

The results of modeling using the partial least squares method showed that the factor loadings of all dimensions of the data-based model were higher than 0.70 and were therefore confirmed. Also, the Cronbach's alpha and composite reliability values for all variables were higher than the accepted value of 0.70, indicating appropriate reliability of the constructs. The convergent validity examination using the AVE criterion also showed that all constructs had values higher than 0.50, so the convergent validity of the model was also confirmed. After examining the convergent validity, the divergent validity of the model was also evaluated using the Fornell and Locker method. Divergent validity is appropriate when the AVE value of each construct is greater than the shared variance of that construct with other constructs (the square of the correlation coefficients between the constructs). The results showed that the AVE root value of the latent variables in the main diagonal of the matrix is greater than their correlation value with other constructs in the cells below the main diagonal; Therefore, the structures interact more with their indicators than other structures, and the divergent validity of the model is acceptable. After examining and confirming the fit of the measurement models in the partial least squares method, it is time to evaluate the fit of the structural model of the research. Unlike measurement models that examine explicit variables (questions), in the structural model, only latent variables and the relationships between them are analyzed. To measure the fit of the structural model, various criteria are used, the most important of which is the size and significance of the path coefficients. In the meantime, the significance coefficients Z or t-values are examined; if the t value is higher than 1.96, the relationship between the structures is considered significant and the research hypotheses are confirmed. Of course, it should be noted that the t value only indicates the existence of a relationship and does not determine the intensity or strength of this relationship. Finally, according to model 2, the relationship between the variables of the paradigm model of the research was tested based on quantitative data. According to the table and model below, all the relationships considered in the model are significant and the research model is confirmed. Also, the coefficient of determination has been determined based on the model below. The coefficient of determination indicates the effect of exogenous variables on the endogenous variables of the model and is used to connect the measurement and structural parts in structural equation modeling. The R^2 value is calculated only for endogenous constructs and the higher this value, the better the model fit. According to the criteria of Chain (1998), the values of 0.19, 0.33 and 0.67 indicate weak, moderate and strong fit of the model, respectively. The results show that the R^2 values for the endogenous constructs of the model (strategies 0.777, central phenomena 0.672 and outcomes 0.800) indicate good fit and appropriate predictive ability of the model.

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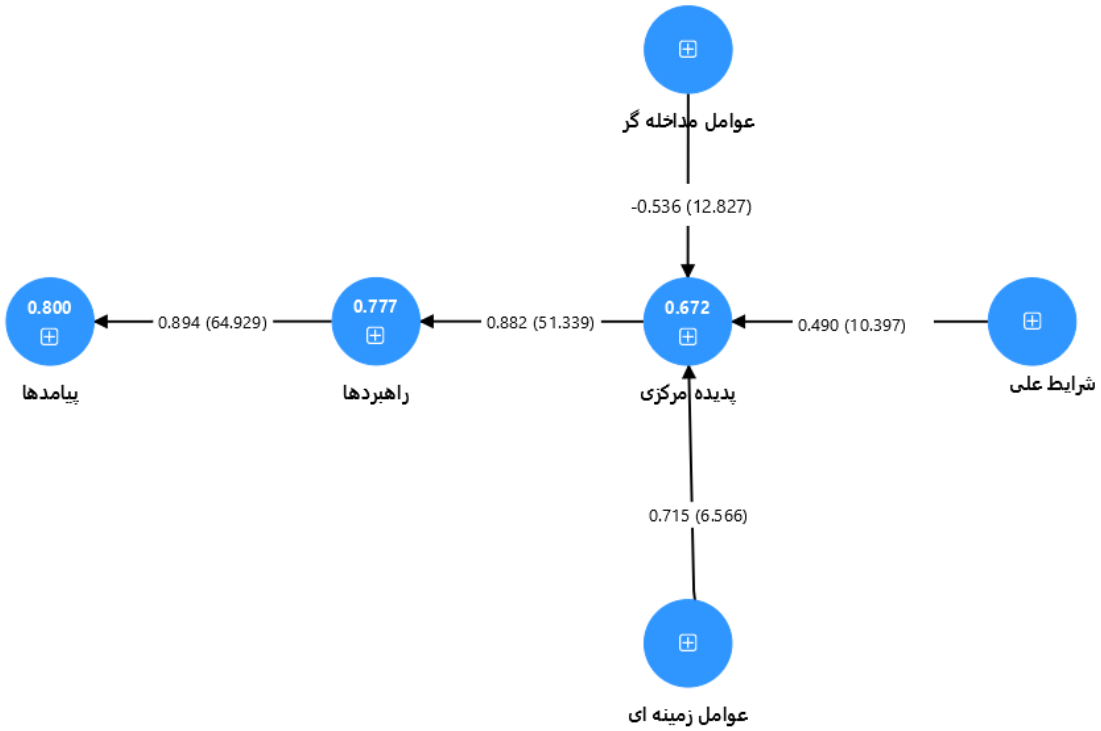

Figure 2. Testing the data-driven model with quantitative data

DISCUSSION AND CONCLUSION

Given the extensive developments in the field of technology and the increasing spread of e-learning, the need to revise primary school curricula with a new approach is increasingly felt. In the meantime, educating active citizens, as one of the fundamental goals of democratic educational systems, requires the use of new learning tools that find new meaning and application within the framework of e-learning. A review of the research literature shows that so far, a comprehensive, localized, and structured approach that can integrate the components of educating active citizens in the form of an e-learning curriculum model in primary school has received less attention. Accordingly, this research was conducted with the aim of designing an e-learning curriculum model based on the components of educating active citizens in primary school using a mixed research method. The findings of the qualitative section, through the analysis of data obtained from in-depth interviews with experts in the field of education, using the grounded theory method and through the stages of open, axial and selective coding, revealed a systematic structure of factors affecting the design of such a program. In this process, six main components including causal conditions, context, intervention, axial phenomenon, strategies and consequences were identified and analyzed. The analyses led to the extraction of 8 main categories and 31 subcategories, which are considered as the theoretical foundation of the desired model. The axial phenomenon, namely "education of active citizens in the context of e-learning", was placed at the center of the model and other components were organized in a logical connection with it. Based on the qualitative results, the design of e-curriculum should be based on various factors such as strengthening digital literacy, critical thinking, educational justice, family participation, and addressing infrastructural and cultural challenges. In addition, to realize this program, teacher training, strategic planning, and the use of modern educational technologies are needed. Ultimately, outcomes such as increased social participation, improved citizenship skills, enhanced critical thinking, and expanded educational justice are expected through this model.
The findings of the quantitative section, while confirming the validity of the constructs through confirmatory factor analysis, showed that the respondents had a desirable diversity in demographic characteristics and their views were correctly reflected in the statistical analyses. The combination of qualitative and quantitative data provided a basis for proposing an integrated, valid, and indigenous conceptual model for an e-learning curriculum based on educating active citizens in primary education.

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The findings of the present study indicate that e-learning can act as an effective tool in educating active and responsible citizens in primary education; This result is consistent with the findings of Taverna et al. (2025) who have introduced e-learning as a way to increase access, public participation and strengthen the university's connection with society, although there has been resistance to it in the Italian higher education system. Like this study, the present study also emphasizes that the use of e-learning should be carried out in a designed and structured context to lead to effective and active participation..

On the other hand, the findings of the present study are also consistent with the results of Abu Bakr and Otnia (2024). In their study, they considered the weakness in implementing the citizenship education curriculum in secondary schools to be due to the lack of attention to e-learning. This is while the present study also emphasizes the necessity of using e-learning in primary school to compensate for the shortcomings of traditional education and strengthen students' digital and social skills. In the area of citizenship identity formation, the findings of the present study are consistent with the results of Song (2023). Song believed that e-learning and blended learning can lead to the gradual formation of global citizen identity through reflection, interaction, and trust-building. This process is also seen in the present study, where e-learning is introduced as a platform for the gradual growth of active citizenship components, such as responsibility, digital ethics, and healthy interactions. The findings of the study are also consistent with the study of Hosseinzadeh et al. (1402). Their research has designed an e-citizenship education curriculum for primary school and has proposed goals such as empowerment for an effective digital life and safe participation in cyberspace. These goals have also been considered in the findings of the present study as necessities for curriculum planning and it has been emphasized that interdisciplinary content and interactive methods should be the focus of educational design.

From the perspective of the required skills and competencies, the findings of the present study are consistent with the results of Khosravi Babadi et al. (1401). They have emphasized components such as innovation, responsibility, interaction, and intelligent use of technology in e-citizenship education. This study also emphasizes the development of these competencies in the form of e-learning in primary school and believes that fundamental revisions should be made in the design, implementation, and evaluation of educational programs. In the context of the place of digital citizenship education in the curriculum, the research findings are consistent with the results of Hosseini et al. (1400). Using Shannon entropy analysis, they found that attention to virtual citizenship components in elementary school textbooks is very low. The present study also points out the same shortcoming and raises the need to revise the content of textbooks with the aim of including digital citizenship education components. Also, the findings are in line with the study of Poursalim et al. (2019). They emphasized the need to design a global citizenship education curriculum in response to international developments and highlighted the key role of teachers, coherent content, and modern evaluation methods. The present study also considered the use of capable teachers, standardized content, and multidimensional evaluation essential for the success of the e-learning program.

The findings show that e-learning plays an important role in educating active and responsible citizens in primary education, but currently, existing curricula and educational content have paid less attention to these components, and teachers have not been sufficiently empowered to effectively utilize this technology. Also, the lack of appropriate infrastructure and localized content has prevented the full realization of the goals of digital citizenship education. Therefore, to improve this situation, it is suggested that a digital citizenship education curriculum specifically for primary education be designed and developed, which includes key components such as digital literacy, virtual rights and responsibilities, media ethics, and responsible participation in cyberspace. Next, teachers should be trained and empowered to use modern methods of e-citizenship education so that they can better guide the teaching-learning process. Also, developing information technology infrastructure in primary schools and providing the equipment and systems required for e-learning is essential. Producing engaging and localized multimedia content with an emphasis on digital citizenship concepts can increase student motivation and engagement. In addition, designing creative and performance-based assessment methods instead of traditional tests is important in assessing citizenship skills. Parental involvement in the digital citizenship education process should also be strengthened through education and awareness-raising so that they can be more active in supporting their children’s learning. Finally, revising formal curricula to include digital citizenship education components in an interdisciplinary manner and developing school-based learning networks to implement joint projects can pave the way for the sustainable and effective development of this type of education. These measures can play an effective role in educating the next generation of active, responsible, and informed citizens in the digital space.

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