Iranian Journal of Educational Sociology

Journal Website

Article history:
Received 16 December 2023
Revised 01 April 2024
Accepted 14 April 2024
Published online 24 June 2024

Iranian Journal of Educational Sociology

In Press, pp 09-19

Quarterly
Iranian Journal of Educational Sociology

E-ISSN: 2645-3460

Evaluation of the Analytical Model for Policy Making in Online Education at the Primary Level

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A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Mohammadzadeh Shadmehri, M, Maghool, A., Karimi, M., Akbari, A. (2024). Evaluation of the Analytical Model for Policy Making in Online Education at the Primary Level. *Iranian Journal of Educational Sociology, In Press* 09-19.
https://doi.org/

A B S T R A C T

Purpose: The purpose of this study was to investigate the policy-making processes for online education at the primary level, focusing on the objectives, content, strategies, resources, and assessment practices. It aimed to identify the challenges and opportunities within these policies to enhance the effectiveness of online education.

Methodology: This cross-sectional survey study involved 384 educators, administrators, and policymakers in the primary education sector. Data were collected via a researcher-made questionnaire to gather comprehensive insights into the participants' perceptions of online education policies. The questionnaire was validated through a pilot study, and data analysis was conducted using SPSS and SMART-PLS for quantitative responses and thematic analysis for qualitative responses. Confirmatory factor analysis and Cronbach's alpha coefficients were utilized to assess the reliability and validity of the constructs within the questionnaire.

Findings: The findings revealed a general consensus on the importance of clearly defined objectives, engaging content, and effective strategies for the successful implementation of online education policies. Challenges identified include the need for better technology infrastructure, financial resources, and professional development for educators. The analysis also highlighted the significance of affective and psychomotor domains in online education, which are often overlooked in policy making. Participants expressed a desire for more innovative and interactive online learning environments to enhance student engagement and learning outcomes.

Conclusion: The study concludes that while there are significant opportunities to enhance the quality and effectiveness of online education through policy improvements, there are also considerable challenges that need to be addressed. These include the integration of affective and psychomotor learning goals, the development of comprehensive support systems for educators, and the improvement of technology and financial infrastructures. Policymakers and educators must work collaboratively to refine online education policies, ensuring they are inclusive, effective, and capable of meeting the diverse needs of primary education students.

Keywords: *Policy making, Educational system, Online education, Primary level*

1. Introduction

Given the significant impact of most policymakers' decisions, the field of policy making is of paramount importance. When the decision-making of managers in organizations is examined at a macro level, it is considered as part of policy making in society. A policy, as a link between public policymakers and society, can play a very important role in society (Mohammadimehr, 2021).

In this regard, Zeinabadi and Mousavi (2019) believe that one of the emerging advancements that has gained significant importance in the field of education is online courses, which have increasingly attracted attention over the past few years. The advancements that have taken place in the field of technology related to education and learning herald the emergence of new learning environments (Zeinabadi & Mosavi, 2019). According to Verkuyl and Hughes (2019), the advent of information and communication technology has transformed all aspects of human life, significantly changing the way tasks are performed, both qualitatively and quantitatively (Verkuyl et al., 2020). As a result of these changes and transformations, educational centers are faced with a new phenomenon known as educational technology, which has taken education out of its traditional state and given it a specific flow.

Regarding educational policy making and its models, which are considered a form of public policy, one of the common methods for easier understanding and examination of policies is modeling. Policy making models, by providing an analytical framework, facilitate a better understanding of environmental factors and pave the way for further examination and more realistic analysis of policy making (Ghadermazi & Bolandhematan, 2021; Salimi & Fardin, 2020).

Policy making models related to information technology are of great importance depending on which segment of the population they relate to. Since the primary school period plays a very important role in the development of children's talents, research and examination of this period are strongly emphasized by policymakers in the fundamental transformation document of the education system (Mirabolghasemi et al., 2019; Zhang et al., 2010).

Regarding the content knowledge of teachers in online education, according to Al-Feki and Adam Khamis (2014), it is worth mentioning that teachers need to change their old perspectives on the learning process so that the traditional concept of the classroom, where the teacher was responsible for transmitting information or knowledge, should be transformed into a facilitator of knowledge (Al-Faki & Khamis, 2014). However, the issue here is that, according to Young (2020), students do not engage much with online education and prefer attending in-person classes. Although they like the flexibility and freedom of online education, they would prefer in-person classes if given the choice (Yang, 2008).

Regarding the issues of online education, Keramati et al. (2022) also believe that virtual education in the primary period is designed for educational and nurturing interactions between teachers, students, and their parents through mobile phones (Keramati et al., 2022). The use of online education from the beginning has faced teachers, especially those with less experience in teaching, with numerous challenges. Furthermore, the issues and challenges of online education have been examined by Zeinabadi and Mousavi (2019), Arain et al. (2022), and Azlan et al. (2020) also believe that online education is much more tedious than in-person education and does not create the necessary motivation for interaction and learning. Additionally, staying focused in an online learning environment is very difficult, and various factors can lead to distractions (Arain et al., 2022; Azlan et al., 2020; Zeinabadi & Mosavi, 2019). Moreover, according to Liang et al. (2023), the issue in online education involves shortages, network equipment, and education (Liang et al., 2023). Regarding financial infrastructures in education, as reported by the social reporter of Tasnim News Agency, the budget for the Ministry of Education in 2023 is set at 239 trillion Tomans, which represents a 20.65% growth compared to 2022 and accounts for 11.05% of the total government budget expenditures. According to the Islamic Consultative Assembly Research Center, based on the allocated budget, the per capita for each student, considering a student population of 13,510,708, is equivalent to 17.6 million Tomans. Additionally, in 2023, we will face a shortage of per capita educational funds for students (320,000 Tomans for the entire year) (Ghadermazi & Bolandhematan, 2021; Mohammadimehr, 2021).

Given the aforementioned, greater transparency of financial infrastructures in the country's budget will help improve the effectiveness and perspective of education and training policymakers. The importance and necessity of research are stated as follows: The education and training institution, as the formal institution of education and upbringing in the country, plays a significant role in the economic, social, political, and cultural transformation, which, considering this role, policy making in its area should be seriously examined. Our country also needs educational

Iranian Journal of Educational Sociology
E-ISSN: 2645-3460

strategies to improve the quality of learning, which can help it keep pace with the development of science and technology and environmental changes.

The goal of education and training is to nurture students who, with a creative mind, can face problems and have the ability to solve them. This is exactly what Mirsamadi (2022) have mentioned in their research as the most important goals of education and upbringing (Mirsamadi, 2022). According to Ghadermazi and Bolandhematan (2021), the educational system and the fundamental activities that take place in it, namely the education of human resources and capital, are the basis of sustainable development; therefore, the quantity and quality of this education play an important and vital role in the welfare and happiness of nations (Ghadermazi & Bolandhematan, 2021). The most important task of the educational system rests on the shoulders of managers in education and training. Managers, to be able to make serious decisions in special circumstances, must be equipped with policy-making knowledge.

Regarding the research conducted, Keramati et al. (2022) conducted a study on identifying challenges and effective assessment methods for primary school students' learning in the Shad program. The results of this study indicate that assessment in the Shad environment is one of the most difficult tasks for novice teachers. Some of the assessment challenges in the Shad environment were very serious, and despite considerable effort, novice teachers did not have a successful solution to overcome them, but in the face of other challenges, with considerable time and enduring additional work pressure, they were somewhat successful in conducting valid assessments (Keramati et al., 2022). Haji et al. (2021), in a study on representing the problems of education in the virtual space using the Shad program, found that the problems and challenges of education fall into six general themes: students and parents, teachers, content, equipment, organization, and assessment (Haji et al., 2021). Abbasi et al. (2020) also found in their research, examining the challenges and opportunities of online education, that assessing real learning outcomes in online education is very difficult, and the loss of monitoring power by the teacher is a very important challenge (Abbasi Kasani et al., 2020).

In foreign research and studies, Bawa (2020) concluded that online education, in terms of quality, is at a lower level than in-person education and even online education that existed under normal (non-emergency) conditions (Bawa, 2020). Auilera-Hermida (2020) also concluded that motivation, self-efficacy, and cognitive engagement with educational materials play an important role in academic performance growth in online education (Aguilera-Hermida, 2020).

Regarding the research gap in domestic studies, research by Salimi and Fardin (2020), on the opportunities and challenges of virtual education (Salimi & Fardin, 2020), and Hamzlu and Rahimi (2020), examining the quality of education and learning in the virtual space Shad (Hamzalo & Rahimi, 2019) can be mentioned, in which the process of policy making and instructional design has not been examined. Also, in stating the research gap in foreign studies, studies such as Liang et al. (2023), the impact of online education on education (Liang et al., 2023), Wang (2023), research on the sufficiency of online education (Wong, 2023), and Papakonstantinou (2023), examining the perceptions of Greek teachers about online parent groups of primary schools can be mentioned (Papakonstantinou, 2023), in which the process of policy making and model validation has not been conducted in their research. Therefore, considering the research conducted and the existing research gap, this research seeks to answer the question of whether the analytical model of policy making for online education at the primary level possesses the necessary validity.

2. Methods and Materials

2.1. Study Design and Participants

This research employed a cross-sectional survey design to explore the intricacies of policy making in online education. The target population comprised educators, administrators, and policymakers engaged in the primary education sector who are directly involved with or affected by online education strategies and implementations. A purposive sampling technique was adopted to select participants who could provide insights into the effectiveness, challenges, and opportunities of online education policies. Based on the Morgan's Table, the sample consisted of 384 respondents, representing a diverse range of experiences, geographic locations, and roles within the education system, including teachers with various specializations, school administrators, and district education officers.

2.2. Measures

2.2.1. Researcher-Made Questionnaire

Data were collected through a structured questionnaire developed specifically for this study. The questionnaire was

Iranian Journal of Educational Sociology
E-ISSN: 2645-3460

designed to capture comprehensive information about the participants' perceptions of online education policy goals, content, strategies, resources, and assessment practices. It included both closed and open-ended questions, allowing for quantitative and qualitative responses. The questionnaire was validated through a pilot study involving a smaller subset of the target population, which led to refinements in the wording and structure of the questions to ensure clarity and relevance. The final questionnaire was distributed electronically via email and social media platforms, leveraging professional networks in the education sector to maximize reach and participation. The specialized questions consist of 139 items, 5 categories, and 15 components.

2.3. Data Analysis

Quantitative data from the closed-ended questions were analyzed using SPSS and SMART-PLS. Descriptive statistics provided an overview of the demographic characteristics of the participants and the distribution of responses to survey items. Confirmatory factor analysis (CFA) was employed to assess the reliability and validity of the constructs within the questionnaire, examining the factor loadings of policy objectives, content, strategies, resources, and assessment practices in online education. Cronbach's alpha coefficients were calculated for each section of the questionnaire to evaluate internal consistency and reliability.

3. Findings and Results

In the study, the demographic characteristics of the participants were analyzed to understand the composition of the sample. Of the 384 respondents, 207 (53.91%) were female, and 177 (46.09%) were male, highlighting a slight female predominance in the sample. Regarding age distribution, the participants were divided into three age groups: those aged 20-30 years constituted 118 individuals (30.73%), those aged 31-40 years were 152 (39.58%), and the group aged 41-50 years included 114 participants (29.69%). In terms of professional experience, 96 respondents (25%) had 1-5 years of experience, 144 (37.5%) had 6-10 years of experience, and the remaining 144 (37.5%) reported having more than 10 years of experience in education.

Table 1

Frequency and percentage frequency results of demographic information

Demographic Characteristics		Frequency	(%) Percentage
Gender	Male	207	53.9
	Female	177	46.1
Age	20-30	118	30.7
	31-40	152	39.6
	41-50	114	29.7
Work Experience (Years)	1-5	96	25.0
	6-10	144	37.5
	>10	144	37.5

The research findings in online education policy include the examination of instructional design categories such as objectives, content, strategies, resources and facilities, and assessment. In the context of examining education policy, two questions were answered.

First Question: How is the validation of the online education policy model at the primary level?

For data analysis, partial least squares modeling was used. Validity and reliability estimation were employed to examine the measurement model, which assesses the data's alignment with a specific factorial structure. Before conducting any test in reflective measurement models, a homogeneity test must be performed to ensure the questions of a variable are uniform or one-dimensional.

Iranian Journal of Educational Sociology
E-ISSN: 2645-3460

Figure 1

Factor loadings of the confirmatory factor analysis model for online education policy objectives

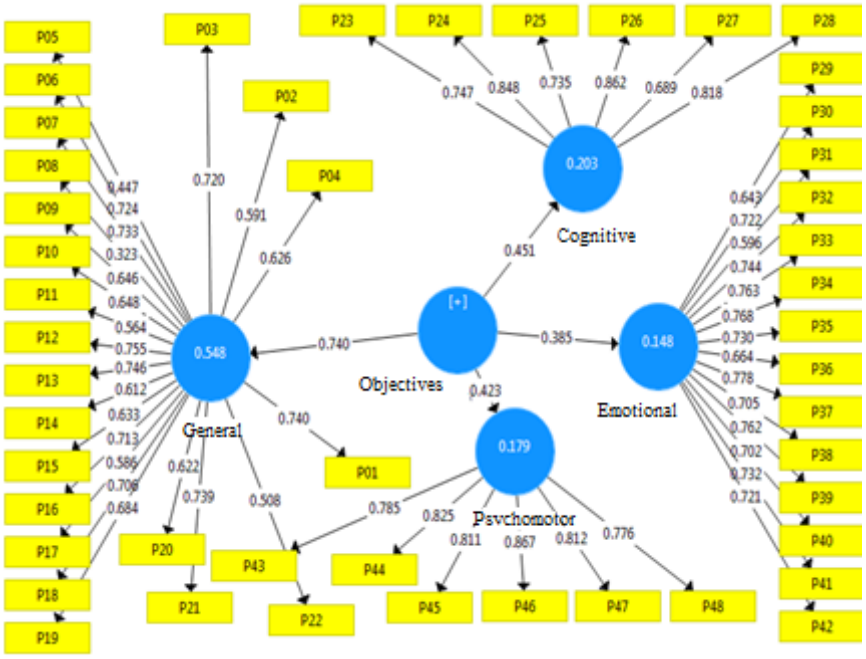
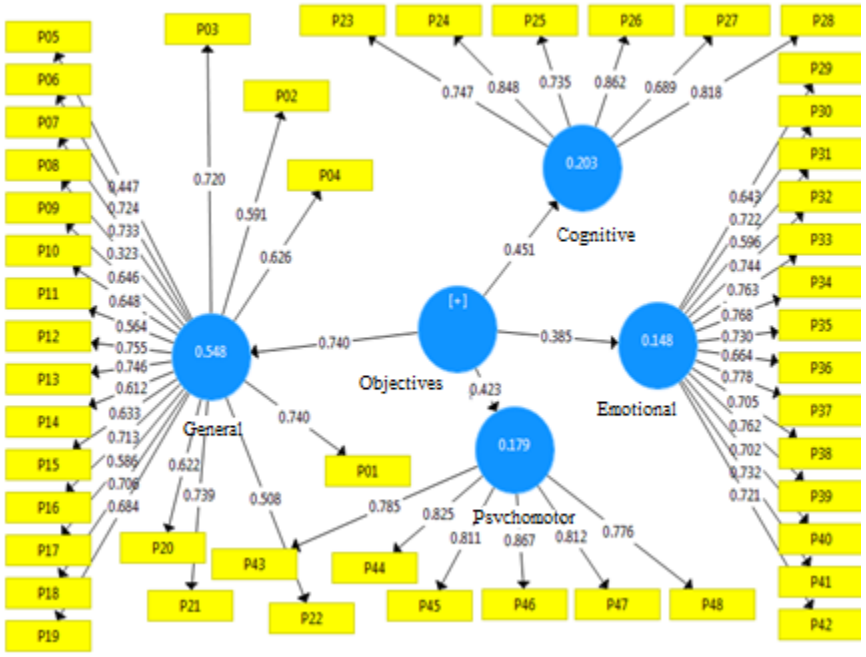


Figure 2

Factor loadings of the confirmatory factor analysis model for online education policy content



Iranian Journal of Educational Sociology
E-ISSN: 2645-3460

Figure 3

Factor loadings of the confirmatory factor analysis model for online education policy strategies

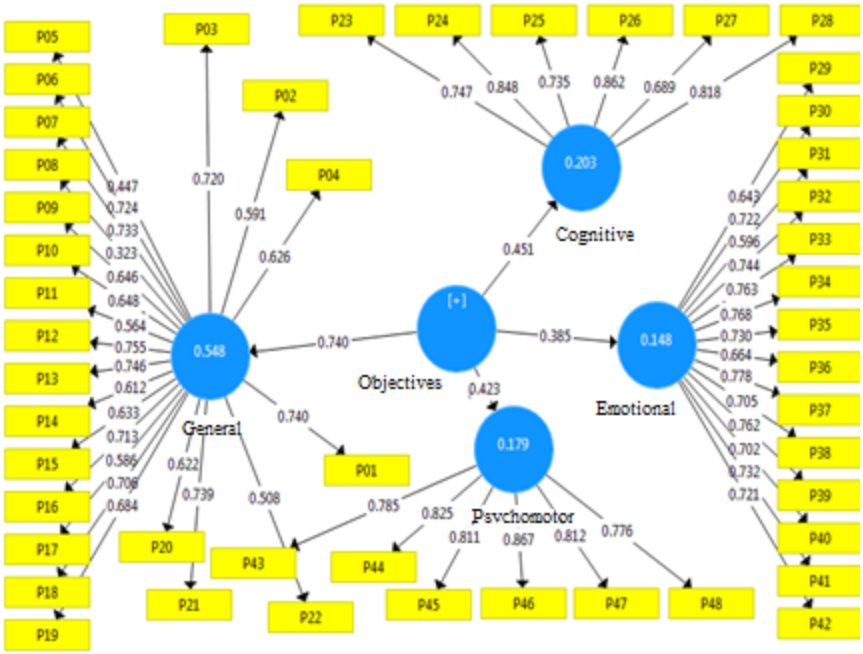
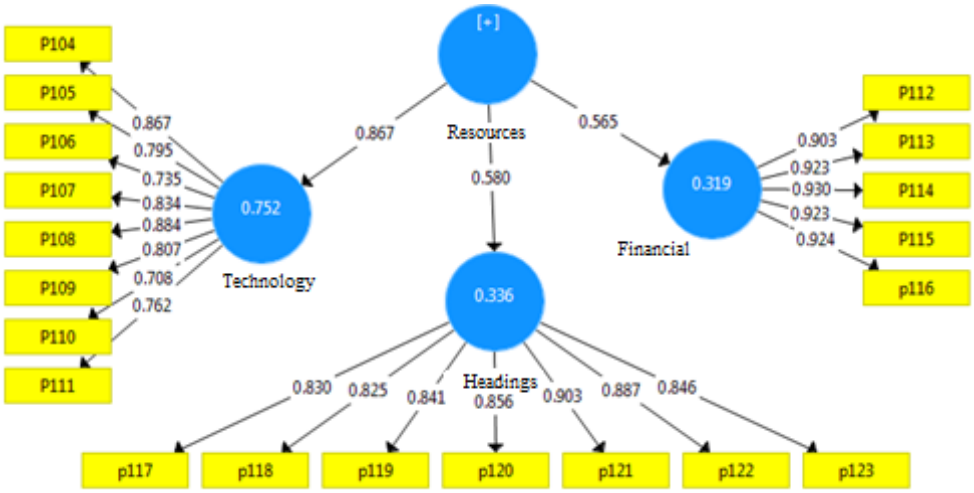


Figure 4

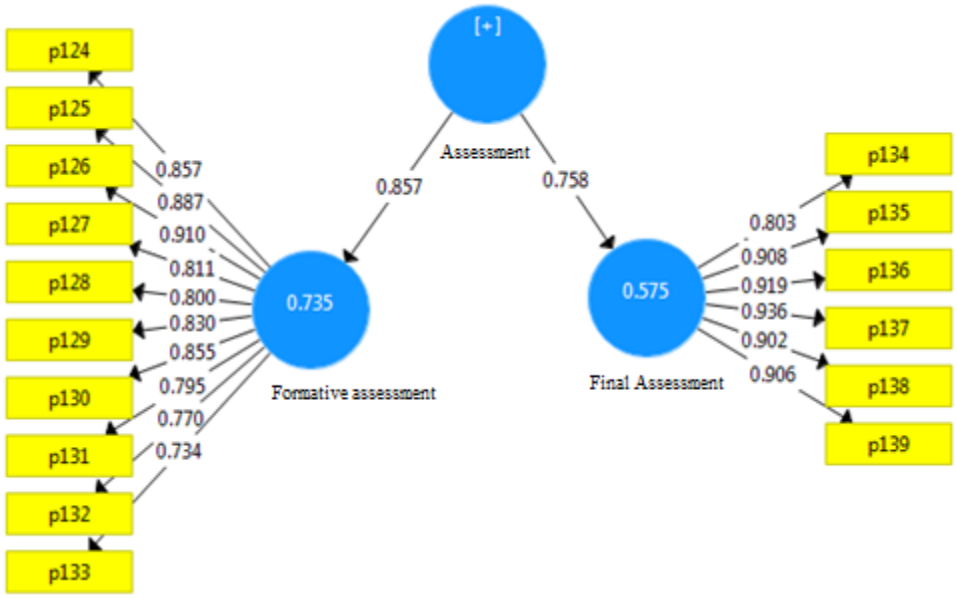
Factor loadings of the confirmatory factor analysis model for online education policy assessment



Iranian Journal of Educational Sociology
E-ISSN: 2645-3460

Figure 5

Factor loadings of the confirmatory factor analysis model for online education policy assessment



The above figures display the factor loadings of the confirmatory factor analysis model for online education policy categories. To examine the model's reliability, Cronbach's alpha test was conducted, showing the internal consistency of questions of a variable outside the model. According to Fornell and Larcker (1986), Cronbach's alpha should be above 0.7. The composite reliability test, indicating the internal consistency of questions of a variable within the model, should also be greater than 0.7. The average variance extracted (AVE) test was used for convergent validity, suggested by Henseler (2009) for convergent validity, stating that it should be greater than 0.5 for each variable.

In the adjusted factor analysis model, the factor loadings of all variables in predicting their respective items were significantly different from zero at a 95% confidence level and had test statistics greater than 1.96; therefore, the mentioned questions or items are not removed and are not excluded from the further process.

Table 2

Reliability results obtained for the research model

Row	Components	Cronbach's Alpha	Composite Reliability	AVE
1	General objectives	0.933	0.939	0.520
2	Cognitive domain	0.876	0.906	0.617
3	Affective domain	0.928	0.937	0.516
4	Psychomotor domain	0.898	0.921	0.661
5	Knowledge content	0.929	0.938	0.538
6	Skill content	0.915	0.931	0.601
7	Attitude content	0.953	0.959	0.703
8	Effective social networks	0.921	0.935	0.644
9	Creative thinking strategies	0.915	0.940	0.797
10	Information technology strategies	0.944	0.951	0.640
11	Technology infrastructure	0.920	0.934	0.642
12	Financial infrastructure	0.955	0.965	0.848
13	Curriculum resources	0.939	0.950	0.732
14	Formative assessment	0.948	0.955	0.683
15	Summative assessment	0.951	0.961	0.804

E-ISSN: 2645-3460

The results show that Cronbach's alpha and composite reliability of all research components are above 0.7. All the average variance extracted coefficients are also above 0.5.

Second Question: What is the current and desirable status of online education policy at the primary level?

To examine the status of online education policy at the primary level, a one-sample t-test was used to test whether respondents' reactions are above the average (desirable) level or not. Table (3) shows the t-test results for examining the status of online education policy at the primary level.

The reported findings indicate that, based on respondents' views and opinions, the t-test statistics and the resulting significance level are meaningful. Therefore, it can be concluded that the policy of online education at the primary level is above average (desirable).

Table 3

T-test results for examining the status of online education policy at the primary level

Variable	N	Mean	Mean diff.	Df	t	p
Objectives	384	4.06	1.06	383	18.648	0.000
Content	384	4.04	1.04	384	14.863	0.000
Strategy	384	3.84	.848	384	11.251	0.000
Resource	384	3.45	.457	384	5.486	0.000
Assessment	384	3.66	.669	384	7.839	0.000

The reported findings indicate that, based on respondents' views and opinions, the t-test statistics and the resulting significance level are meaningful. Therefore, it can be concluded that the policy of online education at the primary level is above average (desirable).

4. Discussion and Conclusion

As the findings of this study have shown, in the policy making of online education, objectives must initially be clearly defined. Having a goal helps students focus and engage in their activities. Consistent with the results of this study, the research by Salimi and Fardin (2020) and Hamzlou and Rahimi (2020) also emphasizes the importance of clearly defined objectives (Hamzalo & Rahimi, 2019; Salimi & Fardin, 2020). It is suggested that policymakers in the education sector adopt a holistic approach, considering all factors, components, and indicators related to the stages of policy formulation, solution creation, solution selection, policy implementation, and evaluation used in this study. Regarding cognitive objectives, it is explained that cognitive objectives in online education policies include thoughts, beliefs, and mental learnings of students, which differ in depth, breadth, and degrees compared to other objectives. Understanding content in online education and watching video images engages students' senses more than reading a written text received in a physical classroom, attracting their attention and leading to deeper learning.

For the cognitive domain, it is recommended that content production categorizes concepts with the help of symbols. Also, given that the curiosity of primary school students is targeted and directed, it is suggested that online education content should include concepts that spark their curiosity and lead them to explore causality. In other words, by watching clips and teaching by the teacher, students explore the reasons for issues and pay attention to how processes work. Regarding affective objectives, it is stated that affective objectives refer to the interest of students, their participation, and their reactions to online education. Therefore, affective objectives, related to attitudes, emotions, interests, and values of students, need significant attention. For the affective domain, it is recommended that teachers and parents understand the various characteristics of students at this age to better meet their diverse needs. Psychomotor objectives refer to the skills and behaviors of students in online education and, according to behaviorist theory, focus on repeating a new behavioral pattern. This behaviorist theory emphasizes observable behaviors that can be seen and measured. In behaviorist learning models, learning is nothing but acquiring a habit. In other words, behaviorism, discussed as behavioral psychology, is a learning theory that states all behaviors are acquired through interaction with the environment through a process called conditioning, which is very important in online education.

For the psychomotor domain, it is suggested to coordinate movements, such as the coordination between listening to the lesson and taking notes, teachers should receive effective feedback during the lesson on performing this action. It is also suggested that teachers ask students to read a section of the text aloud during the lesson, enhancing their auditory ability and concentration while reading. Regarding the

Iranian Journal of Educational Sociology
E-ISSN: 2645-3460

discussion and conclusion of knowledge content, according to Bloom's taxonomy, knowledge content is used when education is intended to increase a student's knowledge about a topic. Content production in virtual space is a professional and specialized task. Adhering to content production principles greatly helps teachers in creating impactful and effective content. Producing engaging content with exciting games in educational programs immerses students in the content. In contrast, immersing in a virtual environment and seeing Mount Everest from different angles can help improve understanding and visualization. Regarding the knowledge content component, it is suggested that electronic resources be updated, and continuous review and monitoring be conducted. Regarding the discussion and conclusion of skill content, it refers to teachers' skills in communicating with students in virtual spaces or social networks in online education. The ability of teachers to quickly, simply, and diversely provide content to students demonstrates their skill. Skill in this area includes students' communication and social interaction skills with others, and it is suggested that policymakers appoint qualified and competent individuals with necessary skills for primary education. In explaining creative thinking strategies, it is stated that since creative thinking occurs as a process, part of it is applied in various forms based on critical thinking. In online education, group activities are structured so that students must find solutions to problems they face. Regarding creative thinking strategies, it is recommended that school administrators interact with student innovation centers.

Regarding information technology strategies, it is suggested that in-service training workshops for teachers be organized. Scientific educational gatherings, specialized conferences, and festivals of superior teaching models for teachers familiarize them with information and communication technologies and education methods in online education and content production methods in developed countries.

In explaining the use of effective social network strategies, creating a social network and converting individual capital into social capital are important issues in all educational areas. Through this, one student's knowledge is transferred to another, and collective knowledge can be used to solve problems in the world of science. Regarding effective social network strategies, the findings of this study are consistent with the research by Lim and Richardson (2016), Miraboulghasemi et al. (2019), Veletsianos and Navarrete (2012), and Balakrishnan et al. (2014) (Balakrishnan et al., 2017; Lim & Richardson, 2016; Mirabolghasemi et al., 2019; Veletsianos & Navarrete, 2012). It is suggested that policymakers introduce reputable information channels when formulating a policy so that up-to-date information is available to actors in the policy implementation field through effective social networks.

Regarding the better effectiveness of using technology infrastructure and equipment strategies, the role of teachers as facilitators is of great importance, and it is suggested that methods of working with computers and new technologies be provided for teachers. The use of methods of interaction with new technologies by foreign authors is also beneficial. Familiarity with the latest educational and upbringing achievements in the world can be very effective and beneficial for the country.

In discussing and concluding on financial resource provision, the necessary conditions for establishing an online education system in the education organization depend on the financial infrastructure for communication through technology, consistent with the findings of Mohammadimehr (2021) (Mohammadimehr, 2021). Regarding financial infrastructures, it is suggested that economic rationality and financial infrastructures be given considerable attention when policy making in the education system.

Regarding the discussion and conclusion of curriculum resources, the most important curricular planning activities relate to topics that collectively provide an environment for student growth in cognitive, affective, social, and physical domains. It is suggested to use educational computer games and animations to convey curriculum concepts to enhance the attractiveness of resources. Presenting engaging educational content stimulates students' interest in the subjects and encourages their greater activity in the virtual educational space.

Regarding the discussion and conclusion of assessment, it is stated that any deficiencies or weaknesses in the presentation and implementation of curriculum content through online education should be addressed and the current status examined. The findings in this section are consistent with the research by (2020), Zhang and colleagues (2021) and Rezaei (2020) (Rezaei, 2020; Zareai, 2013). Regarding assessment, it is suggested that small educational groups be formed during the academic year. Dividing class members into groups makes their assessment more accurate. In small educational groups, while establishing a deeper connection with students and receiving feedback from them, teachers can better assess students' performance and gain a

Iranian Journal of Educational Sociology
E-ISSN: 2645-3460

more accurate understanding of their abilities and strengths and weaknesses.

This study, while providing valuable insights into the policy making of online education at the primary level, is not without its limitations. First, the reliance on a survey-based research method, although effective for gathering data from a broad audience, might not capture the depth of individual experiences and perceptions regarding online education policy. The sample size, determined by Morgan's table, while statistically robust, may not fully represent the diversity of educational settings and contexts across different regions. Additionally, the use of questionnaires limits the ability to probe deeper into the responses of participants, potentially overlooking nuanced aspects of online education policy making and implementation.

Future research could address the limitations of this study by incorporating qualitative methodologies, such as interviews or focus groups, to gain deeper insights into the experiences and perceptions of educators and policymakers involved in online education. Longitudinal studies could also be beneficial to understand the impacts of online education policies over time, tracking changes in educational outcomes, student engagement, and teacher adaptation. Further, exploring comparative studies between different regions or countries could provide a broader perspective on effective online education policies and practices, highlighting cultural and contextual differences in online learning implementation.

For practitioners, this study underscores the importance of clearly defining educational objectives and aligning them with online education strategies. Educators and policymakers should focus on creating engaging and interactive online content that stimulates curiosity and promotes deeper learning among primary school students. Incorporating technology training for teachers as part of professional development programs can enhance their skills in delivering online education effectively. Additionally, fostering collaboration between schools and innovation centers can encourage creative thinking and problem-solving among students. It is also essential for educators to continuously update and monitor online educational resources to ensure they meet the learning needs of students effectively.

Authors' Contributions

The authors contributed equally and all activities of this study were carried out collaboratively and consultatively.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

The authors feel it necessary to express their gratitude and appreciation to the research participants.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

The researcher committed to observing all ethical standards, including confidentiality, non-disclosure of the interviewees' names, and others.

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Iranian Journal of Educational Sociology
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Iranian Journal of Educational Sociology
E-ISSN: 2645-3460