



Identifying the effective factors on empowering the virtual education of elementary school teachers in Sabzevar city in order to provide a suitable model

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Background and Aim: Virtual education is necessary and necessary for education, like face-to-face education. As the Corona crisis showed how virtual education becomes important in reality when face-to-face education faces a challenge. On the other hand, virtual education may receive more attention in the future. Based on this, it is necessary to pay attention to the empowerment of teachers; Therefore, the purpose of this research was to identify the effective factors on the virtual learning empowerment of primary school teachers in Sabzevar city. **Methods:** The present research method was combined (qualitative-quantitative) and practical in terms of purpose. The population studied in the qualitative stage included Sabzevar education experts, and the researcher reached theoretical saturation after selecting 15 people, and the purposeful sampling method was used. Also, the statistical population of the research in the quantitative part included male and female teachers of primary schools in Sabzevar city in the academic year of 2013-2014, and 934 people were selected as the sample size by simple random sampling method. The research tool was semi-structured interviews in the qualitative part and researcher-made questionnaire in the quantitative part. Validity and reliability in both parts were examined by experts. **Results:** The factors affecting the empowerment of virtual education of primary teachers had 61 concepts, 22 factors and 10 categories. Categories and factors include: organizational support (organizational factors - structural requirements for teachers) organizational culture (structural factors - provision of individual needs by the organization) effective training in virtual networks (learning needs - learning effects) individual-social conditions (organizational process - individual and collective characteristics) Facilitating learning (comprehensive management - skill enhancement), mental-practical dimension (mental dimension - skill dimensions), obstacles to empowerment (middle-level problems - micro-level problems), internal-external factors (superior factors or outside the individual's control - exclusive factors) Problem solving (regular training for teachers - strategic changes - social development) has negative and destructive consequences (individual consequences - transpersonal consequences). There is a significant difference between the average of all factors and the average of the population. Also, the quantitative results showed that there is a significant difference between all factors ($P < 0.05$). **Conclusion:** Education experts and officials can design and implement programs for empowering the virtual education of elementary teachers according to the identified factors and categories and the introduced model.



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Introduction

Today's education system is the fundamental basis for sustainable social, cultural, economic, and political development in all societies (Okiki & Ametiodo, 2017). Teachers are the source of significant changes in societies and are regarded as important scientific and ethical models for students (Abdollahi, Darbani & Parsakia, 2022). Among the new issues that are increasingly felt to require empowerment among teachers is virtual education, especially in light of the recent years and the spread of the COVID-19 pandemic. Primary school teachers, in particular, are among the most crucial groups leading the beginning of education for children (Nagle, 2018), thus making their empowerment highly significant. It is clear that the path of development and progress of any society passes through education and training (Karimizadeh, 2016).

Human resources are considered the backbone of organizational capital and a very important element in value creation in organizations (Ikichukovwo, Ohuoma, Suprini, Achi & Sutton, 2019). This type of capital, referred to as the most important measure of organizational capital (Blau & Blau, 2017), encompasses all the knowledge present in an organization's individuals (Wilson, 2018) and demonstrates the organization's ability to find the best solutions through the knowledge of its employees (Celin, Eskit, & Engstrom, 2019). Given the necessity of empowering employees as a fundamental factor in the organization's excellence towards its goals, one of the primary approaches of organizations is to increase employee empowerment through various approaches (Yim, Siu, Cho & Kim, 2017). One major reason motivating us to enter this topic is the special circumstances of 2020, where the widespread COVID-19 pandemic led to global quarantine, forcing countries to use educational technology and new platforms in social networks.

Empowerment in today's modern world is of vital importance and, as a process, leads to the improvement of teachers' intrinsic motivation to use it in various educational tasks (Thomas, 2017). Empowerment is about enhancing employees' ability to use more of their discernment and analysis, have insight in their work, and fully participate in decisions that affect their lives (Hatami, Sobhani & Bahrami Eghdar, 2015). Virtual education, along with

face-to-face education, started in 1996 globally and in the mid-70s of the Persian calendar in Iran to create equal educational opportunities and better implement educational justice (Kazempour & Ghaffari, 2011). The more a system's services can meet students' needs towards their goals, the more satisfaction it will bring (Skezina, Buber & Kumar, 2021), which has been overlooked in Iran. The coronavirus pandemic provided teachers, students, and many people in society with a golden opportunity to become familiar with technology, also making education more technology-friendly.

Regarding virtual education empowerment, few studies have been conducted. Research findings in this field indicate that teachers lack sufficient capabilities for virtual knowledge transfer to students (Golsen & Jormilo-Kreiz, 2021), and this issue is more acute in Iran (Hatami, Nik Pey & Farahbakhsh, 2021). Kanani and Hasani (2022) conducted a study titled "Presenting a Paradigmatic Model of Cultural Learning Empowerment of Teachers in Kermanshah Schools," with causal conditions including knowledge transfer and sharing, learning; effective interaction and communication, and professional development of teachers, and contextual conditions including capacity building for teaching and learning; expansion of educational infrastructures, and optimization of teaching and learning, and intervening conditions including demotivation and scientific weakness of students; infrastructure and resource weaknesses, and demotivation and scientific weakness of teachers. Ahmadi (2022) conducted a study titled "Designing a Model of Factors Affecting the Development of Empowerment and Retention of Secondary School Teachers in Ardabil," showing that organizational factors include teamwork, organizational culture, providing opportunities for growth and flourishing, information and communication management, organizational climate, empowerment, training and enhancement. Asgharnejad and Haghdoost (2021) conducted a study titled "Investigating the Relationship between Digital Literacy and Knowledge Management with Teacher Empowerment in Dehdasht City," where the correlation coefficients between digital literacy and empowerment, knowledge management and empowerment were positive and significant. Ghorbanian, Ebrahimi & Zarei (2021) conducted a study titled "Identifying the

Dimensions and Components of Attraction, Retention, and Empowerment in the Teacher Training System of the Country with Emphasis on the Fundamental Transformation Document of Education." Adib Manesh (2021) conducted a study titled "The Lived Experience of Primary and Secondary School Teachers on the Challenges of Teaching and Providing Solutions for Empowering Teachers for Teaching in Virtual Space." The most important challenges of virtual space were identified in four main themes (educational, administrative, hardware, and cultural-social). Hatami, Nik Pey & Farahbakhsh (2021) conducted a study titled "Presenting a Model for Empowering Teachers in Virtual Education during the Corona Period." Sadeghi, Moazzami, Hashemi, Kavousi & Mirasmaeili (2021) conducted a study titled "Presenting a Model for Technological Empowerment of New Primary School Teachers in Tehran," showing that contextual conditions, knowledge and skill development, individual characteristics, and digital literacy are the main dimensions of the model for technological empowerment of new primary school teachers in Tehran. In the quantitative part, each of the findings of the qualitative part was confirmed. Hojati and colleagues (2021) concluded that the problems of virtual education are high in technical, legal, organizational, and financial components and moderate in cultural, cognitive, executive, and educational components. Toktamysso, Berestova, Esrafilov, Trantsoski & Krozho (2021) also pointed out weaknesses in educational structures for teachers and indicated that teachers need extensive empowerment in this regard. Ha, Park, Kim & Kim (2022) also mentioned the role of teachers' media literacy in this regard. Therefore, it can be concluded that teachers play a central role in the virtual education of students.

In foreign research, Gonzalo (2021) conducted a study titled "Analysis of Empowerment and Social Responsibility of High School Teachers and Ethical Behaviors." The results showed that empowerment is implemented more systematically and organized, and social responsibility is implemented more broadly. In a study by Caballero & Vera (2020) titled "The Impact of Educational Technology in Higher Education," one of the important points is that students usually don't need much training to

work with new tools and devices, and it is the teachers who need to be trained to use new tools.

Regarding the necessity and importance of virtual education, it must be said that the COVID-19 crisis and its consequences showed that real education cannot continue at times, and therefore the only way to continue education is to use virtual education. On the other hand, globalization and the acceleration of changes in life in the future may increase the share of virtual education (Parsakia & colleagues, 2023), which requires teacher empowerment. Few studies have been conducted on the empowerment of virtual education of teachers, creating a research gap. Therefore, the main objective of the present research is to identify the factors affecting the empowerment of virtual education of primary school teachers in Sabzevar to present an appropriate model.

Method

The current research method was mixed (qualitative and quantitative) and aimed at practical application. The qualitative part's population included all experts, officials, heads, and deputies of the Sabzevar Department of Education, experienced teachers, elites, and administrative and executive staff, selected through purposive and snowball sampling methods. The researcher reached theoretical saturation after selecting 15 individuals. The quantitative part's population comprised male and female primary school teachers in Sabzevar, who were employed during the academic year 2020-2021, totaling 934 individuals. In the quantitative phase, stratified random sampling was used, and after determining the sample size for each stratum, individuals were randomly selected.

Materials

1. Semi-structured interviews: Conducted based on interview questions to access concepts and categories, ultimately identifying the main themes. The qualitative data's validity was established through face validity, and reliability was assessed with a coding agreement coefficient, which was found to be 0.90.

2. Researcher-constructed questionnaire: Designed based on qualitative findings, it contained 10 main components and 44 items.

The scoring method was a five-part scale ranging from very low (1) to very high (5). The questionnaire's validity was confirmed through expert opinion surveys from 10 experts in the field (including education sector experts and some experienced teachers) and was finalized after modifications suggested by the guide and consultant professors. The questionnaire's reliability was calculated using Cronbach's alpha after a pilot study on 30 primary school teachers in Sabzevar, and as the alpha coefficient obtained was above 0.70, the questionnaire was deemed to have sufficient validity and reliability.

Implementation

In the qualitative section, coding (open, axial, and selective) was done manually, while in the quantitative section, the T-test was conducted using SPSS24 software.

Results

In the qualitative part, interviews were conducted with 15 individuals, and in the quantitative part, questionnaires were distributed among 245 individuals. In the qualitative part, the samples were almost equally distributed by gender (7 men and 8 women), with the highest level of education being a bachelor's degree (53.3%) and the most common service duration being 20 to 30 years (30%). In the quantitative part, most samples were male (51.84%), with bachelor's degrees being the most common (61.2%) and the majority having a service duration of 6 to 10 years (35.1%). The results of open, axial, and selective coding for identifying factors affecting the empowerment of virtual education for primary teachers are outlined in Table 1.

Table 1. The results of qualitative codings

Selective codes	Axial codes	Open codes
Organizational support	Organizational factors	Structural Facilities
		New Work Environment
	Structural Requirements for Teachers	Organizational Changes
		Education Focus
Organizational culture	Structural Factors	Behavioral Change in Teachers
		Organizational Training
		Strengthening Teamwork
		Organizational Supervision
	Meeting Individual Needs by the Organization	Care in Selection
		Autonomy
		Attention to Individual Characteristics
		Attention to Individual Needs
Effective training for social networks	Necessity of Learning	Meeting Psychological Needs
		Prior Familiarity
	Impacts of Learning	Difficulty of Teaching in Virtual Space
		Ability to Learn from Others
Personal-social conditions	Organizational Process	Positive Performance in Learning
		Infrastructure Facilities
		Proper Recruitment
	Individual-Collective Characteristics	Implementation of Reward Systems
		Psychological Impulses
		Social Characteristics
		Individual-Social Conditions
Facilitating learning	Individual-Collective Characteristics	Providing Virtual Facilities to Teachers
		Improving Teachers' Performance
		Organizational Support
	Comprehensive Management	Macro Planning
		Organizational Knowledge
		Individual Performance

Cognitive-practical dimensions	Cognitive Dimensions	Media Literacy	
		Macro Changes	
		Constructive Attitude	
	Skill Dimensions	Distinct Performance	
		Performance Improvement	
		Technical Skills	
Obstacles to empowerment	Macro-Level Problems	Infrastructure Facilities Issues	
	Mid-Level Problems	Gaps Among Teachers	
		Harm to Teachers	
		Behavioral Conflicts Between Groups	
	Micro-Level Problems	Students' Weaknesses	
		Students' Shortcomings	
	Internal-external factors	Upstream Factors (Beyond Individual Control)	Higher-Level Activities
			Interpersonal Communications
Empowerment			
Exclusive Factors		Intrinsic/Acquired Factors	
		Individual Factors	
Problem-solving	Conducting Regular Training for Teachers	Combining Educational Approaches	
		Modeling	
		Practical Training	
		Individual Solutions	
		Freedom of Action	
		Provision of Virtual Learning Environments	
	Strategic Changes	Solving Virtual Challenges	
		Performance Evaluation	
		Addressing Teachers' Difficulties	
		Family Support	
Negative and destructive consequences	Individual Outcomes	Long-Term Effects	
		Disruption in Spiritual Growth	
	Transpersonal Outcomes	Educational Quality	
		Students' Personality Weaknesses	

According to Table 1, the factors affecting the empowerment of virtual education for primary teachers consisted of 61 concepts, 22 factors, and 10 categories. These categories and factors include: Organizational Support (Organizational factors - Structural requirements for teachers), Organizational Culture (Structural factors - Meeting individual needs by the organization), Effective Training in Virtual Networks (Need for learning - Learning impacts), Personal-Social Conditions (Organizational process - Individual and collective characteristics), Facilitating Learning (Comprehensive management - Skill enhancement), Mental-

Practical Dimension (Mental dimension - Skill dimensions), Barriers to Empowerment (Mid-level problems - Micro-level problems), Internal-External Factors (Upstream or uncontrollable factors - Exclusive factors), Problem Solving (Regular training for teachers - Strategic changes - Social development), Negative and Destructive Outcomes (Individual outcomes - Interpersonal outcomes). The one-sample T-test results for determining the status of factors affecting the empowerment of virtual education for primary teachers are presented in Table 2.

Table 2. The results of one sample T-test

Factor	t	df	p	Mean diff.	Mean
Organizational factors	7.987	244	0.000	0.609	4.853
Structural Requirements for Teachers	9.902	244	0.001	0.327	4.616

Structural Factors	5.672	244	0.000	0.699	4.520
Meeting Individual Needs by the Organization	6.254	244	0.000	0.529	4.317
Necessity of Learning	5.997	244		0.524	7.853
Impacts of Learning	6.240	244		0.385	8.616
Organizational Process	6.240	244	0.005	0.479	3.220
Individual-Collective Characteristics	5.599	244	0.002	0.450	7.009
Comprehensive Management	6.752	244	0.000	0.573	4.122
Skill Enhancement	5.358	244	0.000	0.495	6.310
Cognitive Dimension	7.530	244	0.000	0.572	4.130
Skill Dimension	6.978	244	0.000	0.513	4.790
Macro-Level Problems	7.230	244	0.000	0.548	4.853
Mid-Level Problems	9.460	244	0.000	0.439	4.616
Micro-Level Problems	3.516	244	0.000	0.575	7.329
Upstream Factors (Beyond Individual Control)	7.440	244	0.000	0.572	4.116
Exclusive Factors	6.679	244	0.001	0.513	7.230
Conducting Regular Training for Teachers	6.542	244	0.000	0.465	4.115
Strategic Changes	7.231	244	0.000	0.511	4.290
Social Development	5.290	244	0.000	0.462	7.150
Individual Outcomes	6.540	244	0.000	0.462	6.120
Transpersonal Outcomes	7.391	244	0.000	0.403	7.941

Based on the results of Table 2, and the significance level of the tests ($P < 0.05$), it can be concluded that there is a significant difference between the mean of all factors and the mean of the population; such that the mean of factors including Need for learning, Learning impacts, Individual-Collective characteristics, Skill enhancement, Micro-level problems, Exclusive factors, Social development, Individual outcomes, Interpersonal outcomes are higher than the population mean (5), and the mean of factors like Organizational factors, Structural requirements for teachers, Structural factors, Meeting individual needs by the organization, Organizational process, Comprehensive management, Mental dimension, Skill dimensions, Macro-level problems, Mid-level problems, Upstream factors (out of individual

control), Regular training for teachers, Strategic changes are lower than the population mean (5). The final question was what the conceptual model for empowering virtual education for primary teachers in Sabzevar city was. These components, after being identified through qualitative interviews, were subject to quantitative analysis. They were then presented to a larger statistical population to determine their initial generalizability among this population. Accordingly, these data were entered into SPSS software, and the final result was obtained. These findings indicated that the initial model, presented in the previous sections, was confirmed. Thus, the final model for enhancing the capability of virtual education for primary school teachers in Sabzevar city can be depicted as follows:

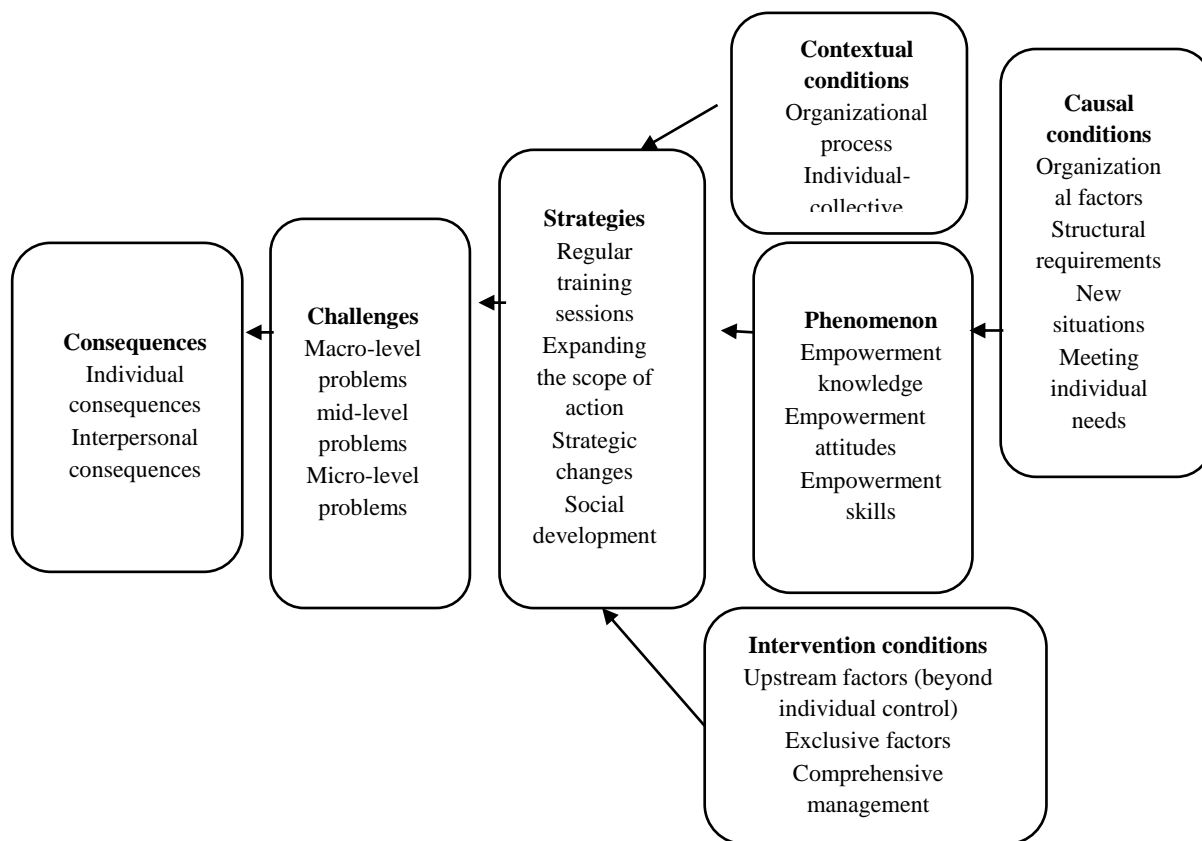


Table 1. Final model

Conclusion

This research was designed and compiled to identify factors affecting the empowerment of virtual education for primary school teachers in Sabzevar to present a suitable model. For this purpose, interviews were conducted with part of the community, and after designing the initial model, the final model was reviewed and confirmed. The current research findings showed that the factors affecting the empowerment of virtual education for primary teachers consisted of 61 concepts, 22 factors, and 10 categories.

Question 1: What are the internal factors (school-related factors) affecting the empowerment of teachers in Sabzevar in virtual education compared to face-to-face education? The results from the analysis of interview questions, according to grounded theory and coding with MAXQDA software, showed that the internal factors affecting empowerment are as follows: Organizational Support (Organizational factors: Structural facilities - Organizational changes) and (Structural requirements for teachers: Education-focused -

Behavioral changes in teachers). Most of these components identified in this research are new and have not been seen in similar studies. However, Taghavai Yazdi (2015) in a research titled "The Relationship Between Information Technology and Cognitive Empowerment of Education Managers in Sari District 1" has referred to some of these components. Also, Khoroushi and colleagues (2017) in a study titled "A Conceptual Model of Expected Competencies from Student Teachers in Farhangian University Curriculum Based on Experts' View," have mentioned several of these components. Finally, Ali Mohammadi, Jabbari, and Niaz Azari (2019) in their research titled "Professional Empowerment of Teachers in the Future Perspective and Presenting a Model" have referred to some of these components.

Question 2: What are the external factors (factors outside the school domain) affecting the empowerment of teachers in Sabzevar in virtual education compared to face-to-face education? The factors extracted from the interviews were re-tested using SPSS software and the results were confirmed. Accordingly, the external factors or factors outside the school domain in

this research include: Organizational Culture (Structural factors: Organizational training - Strengthening teamwork - Organizational supervision - Care in selection - Autonomy) and (Meeting individual needs by the organization: Attention to individual characteristics - Attention to individual needs - Meeting psychological needs). Most of the components identified in this research are innovative and have rarely been mentioned in previous research. However, recent studies such as Tabli and colleagues (2017) with the title "Barriers to Smartization and the Impact of In-Service Virtual Training on Usage and Quality of Learning Process among Primary Teachers" and Shamshiri and colleagues (2021) in their research titled "Identification of Effective Teacher Characteristics in Virtual Education during the Corona Era - A Meta-synthesis Approach," have identified and introduced some of these components.

Question 3: How familiar are you with virtual education and to what extent? Regarding how these individuals are familiar with virtual education, the research findings showed that these components are as follows: Effective Training in Virtual Networks (Need for learning: Prior familiarity - Difficulty in working with virtual education) (Learning impacts: Ability to learn from others - Positive performance in learning). Research data showed that these factors have rarely been identified in previous research. However, the research of Abbasi and colleagues (2020) showed that two components, the role of others in social network learning, gradual learning, the role of family members in the Shad network education, have been identified in this research.

Question 4 stated what are the contextual conditions affecting the empowerment of teachers in virtual education? The components include: Personal-Social Conditions (Organizational process, infrastructure facilities - Proper employment - Implementing a reward system) and (Individual-Collective characteristics: Psychological impulses - Social characteristics - Personal-social conditions). These components have been referred to in the research of Taghavai Yazdi (2015) titled "The Relationship Between Information Technology and Cognitive Empowerment of Education Managers in Sari District 1." Also, Khoroushi and colleagues (2017) in a study titled "A Conceptual Model of Expected Competencies

from Student Teachers in Farhangian University Curriculum Based on Experts' View," have mentioned several of these components.

Question 5 of the research states how can the empowerment of primary school teachers in Sabzevar in virtual education be improved? The extracted and confirmed components are as follows: Facilitating Learning (Comprehensive management: Providing virtual facilities to teachers - Improving teachers' performance - Organizational support - Macro planning) and (Skill Strengthening: Organizational knowledge - Individual performance). These data have not been shown in previous research. However, the research of Abbasi and colleagues (2020) showed that motivation and organizing classes can be effective in empowerment.

Question 6: What is the respondents' definition of virtual education empowerment by teachers in terms of knowledge, attitude, and skills?

The Mental-Practical Dimension includes (Mental dimension: Media literacy - Macro changes - Constructive attitude) and (Skill dimensions: Distinct performance - Performance improvement - Technical skill - Experiential skill). Most of these components are new, i.e., identified in the current research, but two of them have been identified in the research of Shamshiri and colleagues (2021) titled "Identification of Effective Teacher Characteristics in Virtual Education during the Corona Era - A Meta-synthesis Approach".

Question 7: What are the challenges of using virtual education? The barriers to empowerment include (Macro-level problems: Infrastructure facilities issues - Network deficiencies) and (Mid-level problems: Gaps among teachers - Harm to teachers - Behavioral conflicts between groups) and (Micro-level problems: Weaknesses and deficiencies for students).

Question 8 inquired about the intervening factors affecting the empowerment of virtual education by teachers. These intervening factors in this research include: Internal-External factors (Upstream factors or beyond individual control - Upstream activities) and (Interpersonal communications: Exclusive factors, Intrinsic/Acquired factors - Individual factors). The research findings of Mohammadi (2016) titled "Identification of Factors Affecting the Empowerment of Education Employees in Tehran City Based on Karaçor's Opinion" confirm these findings. Although only a few of them have been identified in this research.

Question 9 related to the necessary strategies for increasing teachers' capabilities in virtual education and improving its quality. The finer details include: Problem-Solving (Organizing regular training for teachers: Combining educational approaches - Modeling practical training) and (Strategic changes: Providing virtual education grounds - Solving virtual challenges - Performance evaluation) and (Social development: Addressing teachers' difficulties - Support from families). These findings are observed in similar research, such as the study of Mohammadi (2016) titled "Identification of Factors Affecting the Empowerment of Education Employees in Tehran City Based on Karaçor's Opinion."

The final subsidiary question was: What are the consequences of failing to identify the factors affecting the empowerment of teachers in virtual education? The responses obtained from both qualitative and quantitative parts show that these consequences include: Negative and destructive outcomes (Individual consequences: Long-term effects - Disruption in spiritual growth) and (Extra-individual consequences: Educational quality - Personality weakness in students). Although these findings are innovative, only three of them have been referred to in the research by Taghavai Yazdi (2015) titled "The Relationship Between Information Technology and Cognitive Empowerment of Education Managers in Sari District 1." After identifying the dimensions and influential components on the empowerment of primary teachers in virtual education based on grounded theory, some dimensions and components were identified from the interview results with experts based on the paradigm path and then the identified dimensions and components were provided in a questionnaire to the quantitative research community for the generalizability of the initially identified model. The collected data were entered into software for analysis, and confirmatory factor analysis was performed on them, which confirmed 22 factors and components; Causal conditions include: Organizational factors - Structural requirements - New opportunities - Meeting individual needs. The central phenomenon is the empowerment knowledge - Empowerment attitude - Empowerment skill. Contextual conditions are organizational processes - Individual-collective characteristics. Intervening

conditions include upstream factors (beyond individual control), exclusive factors, comprehensive management, skill strengthening. Strategies are organizing regular training - expanding the scope of action - strategic changes - social development. Challenges are macro-level problems - mid-level problems - micro-level problems. Outcomes are individual outcomes - extra-individual outcomes.

Regarding limitations, it can be said that any research may face certain limitations: The first limitation in this case was the lack or serious scarcity of resources on the research issue. This means that the scarcity of theoretical or data resources can be an obstacle in the researcher's path, as the subject was relatively new and has never been addressed in this form before. Second, not all teachers are necessarily willing to interview with the researcher, and this issue, especially among female teachers, has more significant difficulties. Third, some respondents were not fully willing to complete the questionnaire, leading to the questionnaire's elimination or the need to revisit respondents, sometimes making the compatibility between the questionnaire and the researcher difficult and resulting in the loss of data and the need to repeat the process. As a subject for future research, it can be noted that this research could similarly be conducted among other cities, provinces, or even across the entire country in terms of subject matter, to gain a more comprehensive perspective or to provide a basis for comparing data among each city or province. In addition to empowering teachers in the field of virtual education, their empowerment in other areas or the capabilities of managers, etc., can also be a point of focus.

Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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