Original Article

Using SEM to Analyze challenges and mechanisms to Empowering the Instructors in Iran's TVET

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Abstract
Due to importance of instructor empowering of Technical and Vocational Education and Training (TVET) in Iran, this paper discussed effective challenges and mechanisms. Therefore, by investigating other studies and collecting data from a questionnaire from instructors of Iran's TVET, key factors of challenges and mechanisms were identified and confirmed by using expert's opinion. In the next step, the correlation and effectiveness of each factor were analyzed by Structural Equation Modeling (SEM). In the SEM, the Standardized Root Mean Square Residual (SRMR) test was used to assess the fit of the proposed model to the investigated data. The obtained results showed that all identified challenges and mechanisms are significant in the 95% level and have the SRMR values 0.095 and 0.048, respectively. Also, the results represented that the most challenges faced to the instructors were limited internet access, software issues, and limited accessibility features. The findings also suggest several mechanisms for strengthening the teacher empowerment system in the context of online education. These mechanisms include training for all, flexible learning options, and development of virtual content. In conclusion, providing training courses for online teachers, creating specific frameworks for online education processes, strategic planning and allocating the required financial resources are among the most important suggestions that can be deduced from this research.

Introduction
The final decade of the 20th century witnessed a pivotal shift in various facets of human civilization. Institutions, economies, societies, political structures, and lifestyles all underwent significant transformations. The transition from an industrial to an information-based society, along with the move from manufacturing to service-oriented economies, profoundly impacted the nature of vocational demands. While comprehensive school vocational programs offer a diverse range of service areas, they typically provide fewer specialized courses per area compared to dedicated vocational or specialty schools. Regardless of the educational institution, aligning vocational programs with prevailing societal trends remains crucial (Balamuralikrishna & Dugger, 1995). Technological advancements and evolving lifestyles have necessitated a re-evaluation of educational and empowerment strategies. A meticulous examination of these novel methods, including their merits and demerits, serves as a crucial initial step. This evaluation allows for the assessment of their efficacy and the identification of modifications or alternative approaches where necessary. Efficiency and productivity are paramount considerations, and efforts to enhance them can significantly benefit organizations (Varkani Motalebi & Taghipour, 2017) .

    The interest in distance learning, particularly among Technical and Vocational Education

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and Training (TVET) instructors, various enterprises, institutions, and HR managers, has significantly increased for several reasons. Firstly, a global trend towards establishing new mechanisms for directly utilizing information and knowledge in production and service sectors underscores the importance of continuous learning in knowledge-based societies. Secondly, the need for lifelong learning extends beyond recent graduates to include adults seeking new knowledge and skills. Thirdly, the complex social, cultural, and economic landscape, marked by the presence of a large number of displaced workers, has created a heightened demand for new professions, qualifications, or skill enhancements (O'Connell, 2017). Finally, the establishment of a distance learning system facilitates integration into the global sustainable education landscape. This broadens the potential scope of the domestic information and education environment for participants in the sustainable education process, achieved through the utilization of modern information technology (IT) methods and tools (Petrenko et al., 2020). E-learning's extensive capabilities and ability to transcend temporal and spatial limitations have propelled it to a prominent position within the educational landscape. Concurrently, there has been a growing recognition of the crucial role human resources (HR) play in nurturing creativity and innovation within organizations. The rapid acceleration of ICT development in the last decade has further fueled the adoption of new educational and skill training paradigms, with e-learning garnering significant (Wu et al., 2008). On the other hand, public policy formulation for economic growth and human development hinges critically on addressing the domain of education. Education exerts a multifaceted influence on these objectives through various mechanisms (Agbedahin, 2019).

TVET institutions play an indispensable role in societal human development. However, they often face environmental changes and challenges more acutely than other educational institutions. This underscores the ever-increasing demand for highly skilled and empowered instructors in TVET schools to enhance their instructional proficiency. Also, TVET is a distinct field within higher education. It encompasses the study of technologies and related sciences, coupled with the development of practical skills, attitudes, and knowledge applicable to various sectors of economic and social life. The core objective of TVET is to cultivate application-oriented talent equipped with both theoretical knowledge and practical expertise (Mostafaei et al., 2020). Empowerment of human resources is a contemporary approach in modern human resource management. Organizations increasingly embrace it as a strategic response to the need for change and transformation. Employee empowerment serves as a managerial technique designed to increase employee productivity by fostering their commitment to the organization (Melhem, 2004). The World Bank defines empowerment as the process of strengthening the capacity of individuals or groups to make choices and translate those choices into actions that lead to desirable outcomes (Olori & Olori, 2018). Alternatively, empowerment can be seen as the process of enhancing individuals' self-efficacy by identifying and mitigating conditions that hinder employee capabilities. It entails equipping individuals with the strength, confidence, and intrinsic motivation to overcome challenges and execute tasks effectively. Additionally, empowerment involves frontline employee participation in decision-making related to information, knowledge, rewards, and power. Empowerment is a multidimensional concept with varying interpretations depending on the individual. It is not simply an action taken by managers on behalf of employees. Rather, it is an acknowledgment of employees' perceptions and understanding of their roles within their jobs and the organization (Hossini Kashani et al., 2021)(G. L. Bowen et al., 2006)(Saremi & Nezhad, 2014)(Fry et al., 2005). A thorough examination of the most crucial sources within the field of the research topic is presented in Table 1, providing a summary of their key findings.

Table 1. A summary of reviewed references.

Reference	Main Findings
(Coutinho et al., 2022)	By undergoing suitable training, instructors can identify children who may be at risk and offer them preventive services.
(Alqahtani et al., 2022)	While e-learning offers numerous potential benefits, its implementation in developing countries faces significant challenges. A critical barrier is the digital divide – the disparity in access to and utilization of information and communication technologies (ICT) faced by a majority of students in these regions. Financial constraints and underdeveloped technological infrastructure often limit students' access to the internet, hindering their participation in online learning environments. Beyond access issues, research suggests that e-learning can present pedagogical challenges for students in developing countries. These challenges include: 1) Reduced In-Person Interaction: The absence of face-to-face interaction with instructors can diminish the richness of the learning experience and hinder opportunities for real-time feedback and clarification. 2) Delayed Responses: Limited access to technology and reliable internet connections can lead to delayed responses from instructors and peers, potentially impacting the pace and effectiveness of online learning. 3) Reduced Participation: Online learning environments may require a different set of skills and strategies for participation compared to traditional classroom settings. Students unfamiliar with these online environments may experience reduced participation and engagement.
(Gökbulut & Bakangöz, 2021)	TVET institutions face numerous challenges, including a lack of sufficient educational facilities, limited educational resources, and a shortage of qualified instructors.
(Yeap et al., 2021)	The COVID-19 pandemic significantly impacted educational delivery across all sectors, and TVET was no exception. TVET institutions grappled with numerous challenges, including: 1) Connectivity Issues: Limited or unreliable internet access for instructors and trainees hampered effective online learning. 2) Instructor Competency: The rapid shift to e-learning exposed potential gaps in some instructors' digital literacy and online teaching skills. 3) Societal Stigma against TVET: Prevailing negative attitudes towards TVET may have discouraged some students from pursuing vocational training during the pandemic. 4) Student Motivation: The shift to online learning environments may have negatively impacted student motivation and engagement. 5) Career Counseling Limitations: The pandemic may have disrupted access to traditional career counseling services, hindering student decision-making. 6) Insufficient Infrastructure and Learning Resources: A lack of appropriate technological infrastructure and e-learning resources hampered effective online skills development. 7) Gaps in Curriculum Material and Assessment: Curriculums and assessment methods may not have been adequately adapted for the online learning environment. 8) Uneven E-Learning Readiness: Disparities in both instructors' and trainees' preparedness for online learning environments created challenges.

(Rabiman et al., 2020)	The internet has revolutionized access to learning resources, enabling them to be accessed, saved, and distributed with unprecedented ease. Virtual learning environments frequently incorporate social media platforms, such as Facebook, WhatsApp, and Line. This integration leverages students' existing familiarity with these platforms, potentially enhancing the efficiency and accessibility of learning experiences. However, it is important to acknowledge that social media platforms may not always be the most suitable tools for in-depth learning due to limitations in content structure, information permanence, and focus. Effective virtual learning should ideally encompass a variety of tools and resources tailored to specific learning objectives.
(Mtebe, 2020)	The confidence instructors exhibit towards e-learning systems is demonstrably influenced by two key factors: the experience of the instructional leadership (e.g., deputies) and the level of organizational support provided. As such, it becomes imperative to prioritize the provision of comprehensive user guidance for e-learning systems, fostering enhanced utilization and promoting instructor buy-in.
(Brinkley-Etzkorn, 2020)	A fundamental tenet of effective education posits that improvements in teacher instruction led to enhanced student learning outcomes. However, recent experiences with online course delivery suggest a potential disconnect between instructor preparedness and program efficacy. Following the implementation of online courses, it became evident that a significant number of teachers possessed less online teaching experience than initially anticipated. This lack of experience likely contributed to a decline in instructor optimism regarding the program's effectiveness compared to their initial expectations.
(King, 2019)	Involving teachers in professional development programs specifically focused on collaborative discourse about teaching and learning practices is crucial. This approach fosters a sense of teacher ownership over their professional practice. Through collaborative discussions, teachers can critically examine the gap between their educational values and their actual classroom practices, leading to more effective and aligned pedagogical approaches.
(Abramovich & Miedijensky, 2019)	Participation in professional development courses designed around collaborative discourse can yield several positive outcomes for instructors. These benefits may include fostering a sense of shared goals among educators, bolstering their self-confidence in the classroom, leading to improvements in teaching effectiveness, and potentially enhancing leadership skills. Furthermore, the observation that nearly half of the described teaching techniques involved technology-related tools or applications suggests a noteworthy level of adaptability among the participating instructors. This finding implies that they were able to effectively manage the inherent ambiguity associated with integrating new technologies and successfully incorporate these tools into their classroom practices.

This study investigates the reconfiguration of the empowerment system for TVET trainers in Iran, with a specific emphasis on the potential of e-learning to enhance their professional development. Therefore, the most important key research aspects in this research are efficiency of e-learning components, challenges faced by trainers, and mechanisms for empowering trainers in Iran's TVET.

Materials and Methods
- Data Collecting
This study adopts a quantitative, descriptive-correlation approach, employing surveys and documentary analysis to gather data from TVET trainers across Iran. This research begins with a comprehensive literature review exploring the teacher empowerment system within TVET. It examines the system's components, common challenges, and how e-learning can contribute to its improvement. The review process helps identify relevant research variables,

develop pertinent indicators, and establish a foundational conceptual model. At the next step, an online questionnaire distributed via Google Forms was used to collect data from the target population

The questionnaire's content validity was established by determining the number of items for each section based on theoretical foundations, findings from previous studies, and expert opinions. This process resulted in the initial version of the questionnaire. The questionnaire was then piloted with a group of professors from the Progress School group, along with experts from Tehran University, to assess its clarity and relevance. Also, the questionnaire's reliability, which refers to its consistency in measuring the intended constructs, was assessed by calculating Cronbach's alpha coefficient. The results of this analysis showed that value of Cronbach's alpha coefficient for the all investigated variables was greater than 0.9 and the reliability of the questionnaire was confirmed .

Data collection for this study occurred between early January and the end of March 2022. The questionnaire employed a four-point Likert scale, where respondents indicated their level of agreement with statements using options ranging from "A lot" to "Not much." To ensure the instrument's comprehensiveness, experts provided input on the development of questions for each variable of interest. In addition to the core survey questions, the questionnaire also collected basic demographic information about the participants, including gender, area of expertise, and work experience. Detailed research questions are outlined in Table 2.

Table 2. Investigated questions in the study.

Label	Description
X062	Assigning a performance rating for educators engaged in virtual education.
X063	Educating instructors to proficiently teach in virtual environments.
X064	Educating students to effectively engage in online learning.
X065	Furnishing high-speed internet connectivity for both trainers and trainees.
X066	Creating videos and educational content tailored for effective instruction in virtual environments.
X067	Supplying appropriate educational software solutions.
X068	Enabling trainers and trainees to access electronic equipment, such as tablets, for educational purposes.
X069	Promoting and supporting instructors who conduct virtual courses.
X070	Inclusion of the organization's membership information in both internal and external databases.
X071	Establishing a collaborative and interactive network of trainers within the organization.
X072	The adaptability of training programs to be conducted either virtually or in person.
X073	Rendering software support services to both trainers and trainees.
X074	The feasibility of conducting a portion of assessments in a virtual format.
X075	Establishing a dedicated database within the organization.
X076	Compensating instructors for the development of educational content.
X077	Compiling guidelines for instructors on the facilitation of virtual classes.
X078	Development of intellectual property regulations for educators engaged in content creation.
X079	Provision of organizational support for innovations in e-learning.
X080	Establishing virtual education platforms.
X081	The challenge of fostering meaningful interaction with students in a virtual environment.
X082	Educators lacking visibility into the extent of student learning in virtual education.
X083	Elevating the potential for academic dishonesty in virtual training scenarios.
X084	The incapacity of educators to conduct certain courses through virtual means.

X085	The challenge associated with delivering practical lessons in a virtual environment.
X086	The prevalence of a unidirectional relationship from the teacher to the trainee.
X087	Disregarding educational objectives in electronic education.
X088	Virtual education transforming into a mere lecture format for teaching.
X089	Challenges in the transmission and reception of messages and files within the context of e-learning.
X090	Technical issues with software.
X091	Inadequate resources for websites and digital educational tools.
X092	Insufficiency of alternative solutions to tailor online education for students with special needs.
X093	Interns residing in underprivileged areas with a low socio-economic status.
X094	Elevating the likelihood of internet addiction.
X095	Physical ailments resulting from prolonged internet use, such as eye strain, neck and back pain, and diminished mobility.
X096	Impediment to social development arising from decreased interaction with peers.
X097	Challenges in accessing high-speed internet connectivity.
X098	Limited parental involvement and communication with educators.
X099	Educators lacking proficiency in new technological tools and content production methods.
X100	Deficiency in teachers' proficiency in remote training methods.
X101	Work-related pressure on teachers stemming from extended teaching hours.
X102	Implementation of flexible working hours for teaching, assignments, feedback, etc., beyond traditional timeframes.
X103	Absence of structured planning and ambiguity in class schedules.
X104	Conducting training sessions during unconventional hours, on weekends, holidays, or during the night.

- Qualitative Data Sampling

The research employed semi-structured interviews to gain rich, in-depth insights from a group of experts. This interview style provides a balance between a structured format with key questions and the freedom to explore unexpected but relevant information that arises during the conversation. To identify suitable interviewees, snowball sampling was utilized. This technique leverages the social networks of initial participants. Here, the initial participants, likely individuals with established expertise in the field, recommend others with relevant knowledge and experience. This method is particularly valuable when studying niche topics or populations that are difficult to access through traditional sampling methods. However, to strengthen the explanation, it would be beneficial to know more about the specific criteria used to select the initial participants and how the snowballing process was managed to ensure a diverse and representative pool of expert voices. Additionally, details regarding the number of interviews conducted and the thematic areas covered in the interview guide would further enrich the understanding of the research methodology.

- Quantitative Data Sampling

The target population for this study comprises all trainers employed in TVET organizations within Tehran province during 2022. Based on information from a senior HR manager, the estimated population size is 430 individuals. Using Cochran's formula (Equation 1), a sample size of approximately 145 participants was determined.

$$n = \frac{N(t.s)^2}{Nd^2 + (t.s)^2} = \frac{430 * (1.96 * 1.0973)^2}{430 * 0.145^2 + (1.96 * 1.0973)^2} = 145.53 \qquad (1)$$

While a random sample is ideal, this study utilized a non-probability convenience sample due to the challenges of online data collection in an educational setting. Trainers from TVET organizations in Tehran and Karaj provinces, representing both public and private vocational institutions, were invited to participate voluntarily. A two-step approach was employed include a separate questionnaire was administered prior to the main survey to identify eligible participants (Initial Screening), and trainers who met the inclusion criteria were invited to participate in the main study through a self-submission system (Self-Selection). Finally, a total of 145 instructors from various public and private vocational institutions across the study area participated in the research. The detailed distribution and characteristics of the sample are presented in Table 3.

Table 3. Background of participants

Dimensions	Category	Percent	Numbers
Gender	Male	54.5%	79
	Female	45.5%	66
Age	26-35	6.2%	9
	36-45	45.5%	66
	46-55	42.5%	62
	+56	5.5%	8
Experience	1-5	1.4%	2
	6-10	7.6%	11
	11-15	20.7%	30
	16-20	28.3%	41
	21-25	26.9%	39
	26-30	13.1%	19
	+30	2.06%	3
Level of Education	Diploma	3.4%	5
	Bachelor	55.9%	81
	Master	40.7%	59
Marital Status	Single	12.4%	18
	Married	87.6%	127
Time Spending in Social Media	Less than 1 hour	29.7%	43
	Between 1 and 2 hours	39.3%	57
	Between 2 and 3 hours	23.4%	34
	More than 3 hours	7.6%	11

-Data Analyzing

Two approaches include Challenges Analysis and Mechanism Analysis were considered in this study. The indicators included in each were identified by the experts after providing the final questionnaire. After that, Confirmatory Factor Analysis (CFA) was employed to verify that the indicators accurately measured the underlying concepts (constructs) they were designed to assess. The CFA considers convergent and divergent validities. Convergent validity uses Average Variance Extracted (AVE). The AVE range from -1 to 1, with values closer to 0 indicating a weaker relationship and values closer to 1 (positive or negative) indicating a stronger relationship, suggesting a good fit. Heterotrait-Monotrait Method

(HTMT), and cross-loading indices were used to assess divergent validity. Divergent validity ensures that the constructs in the model are distinct from each other. Ideally, HTMT values should be below 0.85 for good discriminant validity. After CFA, the Structural Equation Modeling (SEM) was employed to analyze the data and test the research hypotheses. SEM is a powerful statistical technique that allows researchers to examine both direct and indirect relationships among multiple variables. In the SEM, the Standardized Root Mean Square Residual (SRMR) test was used to assess the fit of the proposed model to the investigated data (N. K. Bowen & Guo, 2011). In this study, SmartPLS 3.0 software was chosen for data analysis due to its ability to handle complex models with numerous variables, even in situations where variables might be highly correlated (Noto & Sato, 2000) .

-Results and Discussion
Results for Challenges
By analysis the findings of questionnaire, five key challenges were identified include Teaching and Training, Ability of Trainers, Infrastructure & Technology, Process, and Individual & Social factors.   The results for convergent validity of the challenges are presented in Table 4.

Table 4. Results for convergent validity of challenges by comparing the AVE.

	Teaching and Training	Ability of Trainers	Infrastructure Technology	Process	Individual Social
Teaching and Training	0.738				
Ability of Trainers	0.658	0.757			
Infrastructure Technology	0.707	0.631	0.858		
Process	0.511	0.726	0.618	0.886	
Individual Social	0.777	0.621	0.678	0.527	0.788

The results present the correlation coefficients between the different variables associated with challenges in the teacher empowerment system. The key Findings from this table are discussed in the following. The strongest positive correlation exists between Teaching and Training and Individual-Social challenges (0.777). Teaching and Training also exhibits strong positive correlations with Ability of Trainers (0.738) and Infrastructure-Technology (0.707). Ability of Trainers has its strongest positive correlation with Process (0.726). Process also has a strong positive correlation with Ability of Trainers (0.726). These findings suggest that various challenges within the teacher empowerment system are interconnected.

   The results related to divergent validity are shown in Table 5. As it was said before, HTMT ratios help assess how well-separated these constructs are from each other. The results show that all HTMT ratios are below the recommended threshold, indicating that the constructs are sufficiently distinct from each other. The findings showed Teaching and Training is well-differentiated from Ability of Trainers (0.817), Ability of Trainers is distinct from Infrastructure-Technology (0.729) and Process (0.772), Process is well-separated from Individual-Social challenges (0.660), Individual-Social has a moderate overlap with Teaching and Training (0.930), but it's still considered distinct based on the HTMT threshold.

Table 5. Results for divergent validity of challenges by comparing the HTMT.

	Teaching and Training	Ability of Trainers	Infrastructure Technology	Process	Individual Social
Teaching and Training					
Ability of Trainers	0.817				
Infrastructure Technology	0.832	0.729			
Process	0.653	0.921	0.772		
Individual Social	0.930	0.718	0.774	0.660	

The analysis results confirmed satisfactory reliability and validity for all latent variables in the proposed model. Additionally, all standardized factor loadings were statistically significant at the 95% level, supporting the chosen indicators' ability to accurately measure their respective constructs. The results of SEM for the challenges are represented in Figure
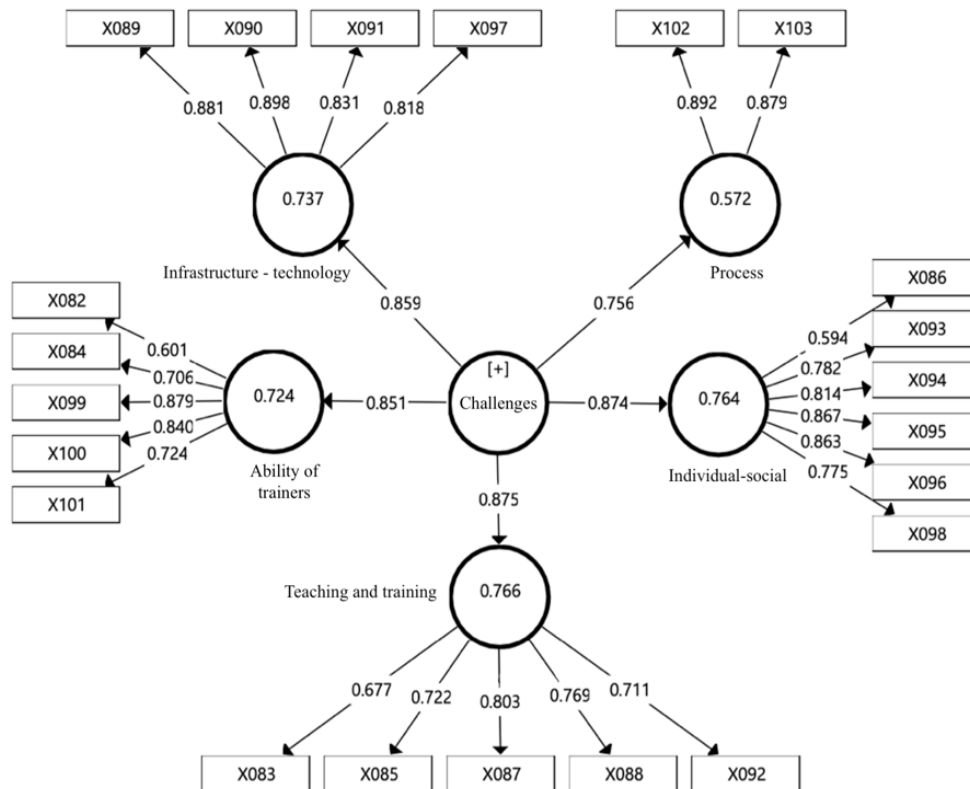
Figure 1. Results of SEM for the studied challenges

The SEM results indicate that the overall SRMR for this model was 0.095, suggesting a good fit between the model and the data at the 95% level. The analysis confirms that the proposed model exhibits a good fit with the data for the challenges.

Results for Mechanisms
Similar to the results for challenges and after analysing the findings of questionnaire, three key mechanisms were identified include Training and Motivation of Teachers, Improving Infrastructure and Technology, and Process and Program Improvement. The results for convergent validity of the challenges are presented in Table 6.

Table 6. Results for convergent validity of mechanisms by Comparing the AVE.

	Training and Motivation of Teachers	Improving Infrastructure and Technology	Process and Program Improvement
Training and Motivation of Teachers	0.953		
Improving Infrastructure and Technology	0.839	0.942	
Process and Program Improvement	0.824	0.920	0.929

The findings showed the values along the diagonal represent the reliability of each construct. High values on the diagonal indicate strong internal consistency. Also, the values off the diagonal represent the correlations between the mechanisms. Moderate to high correlations in this table suggest that these mechanisms are interrelated. Furthermore, it suggests that effective teacher empowerment likely involves a comprehensive approach that addresses Training & Motivation, Infrastructure & Technology, and Process & Program Improvement all working together. See Table 7 for the results of divergent validity of mechanisms.

Table 7. Results for divergent validity of mechanisms by comparing the HTMT.

	Training and Motivation of Teachers	Improving Infrastructure and Technology	Process and Program Improvement
Training and Motivation of Teachers			
Improving Infrastructure and Technology	0.812		
Process and Program Improvement	0.893	0.953	

The key findings of this table are the high values along the diagonal confirm the reliability of the measurement instrument, the moderate to high correlations outside the diagonal indicate that these mechanisms are interconnected. Notably, Training and Motivation of Teachers has a strong positive correlation with both Improving Infrastructure and Technology (0.812) and Process and Program Improvement (0.893). Also, these findings emphasize the importance of a holistic approach to teacher empowerment. Effective strategies likely encompass not only motivational aspects but also improvements in infrastructure and processes that support teachers. Moreover, all HTMT values were statistically significant at the 95% level, supporting the chosen indicators' ability to accurately measure their respective mechanism. The results of SEM for the mechanisms are represented in Figure 2 .
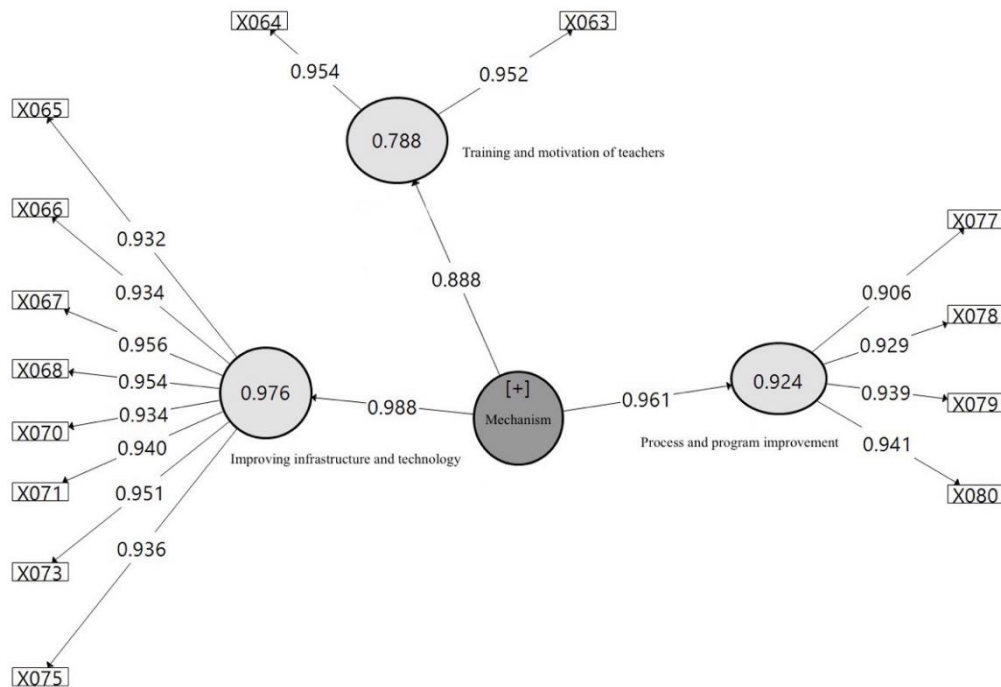
Figure 2. Results of SEM for the studied mechanisms

The SEM results indicate that the overall SRMR for this model was 0.048, suggesting a good fit between the model and the data at the 95% level. The analysis confirms that the proposed model exhibits a good fit with the data for the mechanisms.

Conclusion
The study revealed positive aspects regarding teachers' access to technology for e-learning and their ability to use electronic resources for educational purposes. Educators reported having sufficient access to electronic devices and using the internet effectively for searching information, communication, and online courses. This suggests a generally good level of proficiency in using electronic educational tools. The research also identified key factors that influence the effectiveness of electronic education. In this study, after reviewing the other similar resources, a questionnaire was provided using the expert's opinions. Then, by collecting the data from questionnaire, five and three fundamental factors were identified to investigate proposed challenges and mechanisms, respectively. To assess the fitness and significance of the suggested models, the SEM analysis was considered .

Challenges were identified in revitalizing the technical and professional aspects of teacher empowerment for online education. These challenges included limited internet access (Not all teachers have access to high-speed internet, which can hinder online learning), software issues (Difficulties with educational software can impede effective online instruction), and limited accessibility features (A lack of alternative solutions for customizing online education for students with special needs was identified as a barrier). The study also suggests several mechanisms for strengthening the teacher empowerment system in the context of online education. These mechanisms include training for all (Providing comprehensive training for both teachers and students on how to effectively utilize virtual learning spaces), flexible learning options (Offering flexible program delivery options that allow students to choose between virtual and in-person learning), and development of virtual content (Creating high-quality educational content specifically designed for virtual instruction).

This research has faced several limitations, among which these ones can be mentioned.

The study did not account for the unique culture of each school environment, which can influence teacher attitudes. Limited access to teachers for data collection purposes could have affected the comprehensiveness of the study. Certain factors like age, education level, socio-economic background, and teachers' existing beliefs were not controlled for in the study design. This could potentially impact the internal validity of the findings (the extent to which the results truly reflect the variables being studied). Delays and lack of cooperation from some trainers resulted in incomplete questionnaires, reducing the amount of usable data.

Based on the results and the method used in this research, several suggestions are made which are stated below. E-learning courses should be designed to enhance practical skills and knowledge for trainees. Government, private sector, and educational institutions should collaborate to develop a comprehensive e-learning framework for Iran. This includes strategic planning under the guidance of educational authorities. New e-learning instructors require proper training to effectively deliver online courses. Organizations need to allocate sufficient funds to acquire equipment and maintain up-to-date technology for e-learning initiatives. Building a supportive environment for e-learning involves establishing infrastructure, fostering a positive learning culture, and removing administrative hurdles. Continuous efforts are required to improve teaching quality, enhance infrastructure, and maintain effective virtual training methods. E-learning content should be current, comprehensive, practical, relevant to trainee needs, and visually appealing. E-learning platforms should be easy to access, navigate, and use. They should offer personalization options, ensure strong security measures, and provide an aesthetically pleasing interface. Providing both technical and educational support is crucial for a smooth learning experience. This includes guidance, prompt responses from instructors, timely content delivery, and easy access to learning resources. Continuous assessment with self-assessment opportunities is essential. Trainees should receive feedback on their performance, and remote online testing should be facilitated. Conducting comparative studies with leading countries in e-learning can provide valuable insights for improvement. Developing a model that integrates effective methodologies, technologies, and pedagogical approaches tailored to technical and vocational education is crucial. E-learning programs should be evaluated based on established e-learning standards to ensure a high-quality learning experience. A comprehensive analysis of the necessary requirements and conditions is essential before implementing an e-learning system for skill training.

Acknowledgment

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