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Designing a Model for Improving the Professional Competencies of Teachers in University of Applied Science and Technology with an Organizational Learning Approach

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Article Info

ABSTRACT

Article type:

Research Article

Article history:

Received 11 Feb. 2023

Received in revised form 16 Apr. 2023

Accepted 24 Sep. 2023

Published online 01 Mar. 2024

Keywords:

Professional competencies,

University lecturers,

Organizational learning

Objective: The purpose of this research was to design a model for improving the professional qualifications of academic-applied university lecturers with an organizational learning approach.

Methods: This study was a mixed exploratory design that was conducted in two qualitative and quantitative stages. The statistical population of this research in the qualitative part includes managers and vice-presidents of Razavi Khorasan Scientific-Applied University, university professors and experts in the relevant field, who were selected by purposive sampling method (25 people). In the quantitative part, the dimensions and components were extracted in the form of a questionnaire from the interviews. The sample was considered 351 people based on Morgan's table. Structural equations were used to examine the main research question and fit the model to the data.

Results: The findings showed that professional competence has five dimensions (moral competence, knowledge competence, attitudinal competence, perceptual competence and behavioral competence) and 21 components. The highest priority is with the dimension of academic competence. Also, organizational learning has four dimensions (commitment, continuous learning, empowerment, and knowledge management) and 19 components, and the highest priority is the empowerment dimension. The impact of organizational learning on the promotion of professional competence showed that organizational learning has a 63% effect on professional competence in general.

Conclusions: As a result, managers and officials should take steps by holding classes, gatherings, conferences and workshops in order to improve the academic status and practical activity of professors to increase the practical participation of professors in personal and large-scale projects.

Cite this article: Bakhtiari, G., Naseri, N. & Ghorbani, M. (2024). Designing a model for improving the professional competencies of teachers in university of applied science and technology with an organizational learning approach. *Iranian Evolutionary Educational Psychology Journal*, 6 (1), 137-152. DOI: <https://doi.org/10.22034/6.1.137>

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Publisher: University of Hormozgan.

DOI: <https://doi.org/10.22034/6.1.137>



Introduction

In the realm of tertiary education, the ongoing assessment of a university's performance serves to identify both its strengths and weaknesses. University officials, driven by a concern for the future, are actively seeking to identify the factors that impede or enhance the institution's performance, with the ultimate goal of improving the efficiency of the entire system. Historically, the founders of universities were primarily motivated by a passion for intellectual and academic pursuits, as well as a sense of belonging to a larger truth. This dedication served as the bedrock for the preservation and continued existence of universities. To some extent, this perspective still persists. However, recent years have witnessed a shift in the priorities of governing bodies, particularly the Ministry of Science. This shift is characterized by an increased emphasis on learning, as opposed to mere education, and a transition from knowledge creation to a focus on education, technological advancement, and ultimately, entrepreneurship. It is abundantly clear that in order to foster greater productivity among students for the sustainable development of the nation, university professors and faculty members must undergo a transformation in their roles. This transformation necessitates a reevaluation of their values, beliefs, and attitudes, which in turn will result in changes in individual, group, and societal behaviors (Qurbankhani & Salehi, 2017).

The importance of continuous and strong learning in organizations has never been so vital. Due to the existence of forces such as globalization and technology, the speed and complexity of developments have increased in such a way that organizations are forced to always learn more things in order to survive (Timurzadeh, 2019). In the discussion of academic and specialized education, the higher education system, as the main guardian of education and research, plays a fundamental role in the education and training of the specialized and efficient forces of each country, and in this regard, the professional qualifications of teachers are very important; Because professional qualifications and having competence and skills and abilities necessary for better teaching and management will lead to improved performance (Guraya & Chen, 2017).

In the higher education system, the qualifications of members can have a direct effect on the quality of performance and have a positive effect on increasing efficiency in the dimensions of education, evaluation, curriculum support, organizational leadership, and coaching, and lead to the improvement of the organization. have (Guraya et al., 2016). The most important thing a manager

can do to make employees more efficient is to help them experience personal mastery over certain issues.

By successfully completing a task or solving a problem, people develop a sense of mastery; Therefore, it is true that continuous learning has the greatest effect on the organizational performance of employees, but managers can design people's work tasks in such a way that the control of tasks and work results is improved; In such a way that the understanding of the learning results and also the empowerment of the organization increases (Sanjari et al., 2020). Organizational learning is the capacity or processes within the organization to maintain or improve the performance of the organization based on experiences. In other words, organizational learning is a collective process of acquiring and creating competencies that will change the way variables are managed and change the conditions (Gasemzadeh Alishahi et al., 2019).

Having up-to-date knowledge and information and innovative behavior in professors is one of the basic concerns of university managers. By improving the conditions of knowledge management and organizational learning, university administrators can lead to the expansion of innovative approach and behavior among faculty members, and as a result, provide more productivity for the university (Araei & MohammadiMehr, 2020). Competence refers to a set of knowledge, attitudes, skills and other related personal characteristics that affect a major part of a job and are correlated with the performance of that job, and can be measured against well-accepted standards and developed and improved through retraining and experience. found (Saemian, 2008). Acquiring and strengthening problem-solving skills is an undeniable necessity for human resources in order to face the complex issues of society. In recent decades, the desire for active methods to respond to the educational needs of the employees of organizations in this field has increased (Abdulvahabi et al., 2019).

In research, Baker et al. (2018) listed the desired qualifications on the basis of competence of faculty members in four components, including personality and human relations, preparation and delivery of lectures, scientific and professional qualifications, and evaluation methods. In their research, Deemer et al. (2011) listed factors such as collaboration with faculty members, counseling, service delivery, research, and teaching as the five basic competencies of faculty members. Malechwanzi et al. (2016) believe that four conditions are necessary for organizational learning: First, that the management of the organization must create a solid support for

organizational learning. The second is the existence of a collective intelligence. Thirdly, the organization needs to develop organizational knowledge based on the transfer and integration of knowledge, and fourthly, simple adaptation to changes in the environment is not enough. Rather, it should lead to creative learning.

Siegel et al. (2019) investigated the mechanisms used by professors and trainers to maintain knowledge and skills in the industry sector of technical and professional colleges. The results indicate that trainers often lack work experience in real environments and tend to update their knowledge using informal mechanisms such as study and academic performance. Ardahan and Ardharn and Vinai (2018) in research studied the effect of organizational learning on organizational commitment and organizational performance. The results of this research have shown that the learning organization had a positive effect on organizational performance and commitment, but no direct relationship between organizational commitment and organizational performance was observed. Based on this research; Seven aspects of learning in the organization including continuous learning, inquiry and dialogue, cooperation and working group, empowering employees, creating a system and paying attention to the systemic approach in the organization, communication with the environment and strategic leadership have been specified. According to the above researches, it seems that competence can be focused on four aspects, the first dimension of which is the level of knowledge, which is the basis of development, skills and attitudes, and the second dimension of that skill includes It is said that it refers to the ability to implement science in practice and it is obtained from repeating the application of knowledge in the real environment. Ability is also considered as the third dimension of qualification that binds a person to achieve and perform at the highest level in physical and intellectual jobs; And finally, attitude as the fourth dimension of competence refers to the mental image that explains and shapes the field of thought and action (Asarzadeh, 2014). In order to synchronize the organization's human resources, professional learning should be done continuously by creating a favorable organizational training atmosphere (Qorban Niati et al., 2020).

Considering the aforementioned points and taking into account the fact that the scientific-applied university and the higher education system of the country do not meet the scientific standards set by fifth generation universities and lack adequate infrastructure, it is crucial to examine the role of higher education in the economic, social, technological, and cultural development of the country.

Additionally, it is important to acknowledge that higher education plays a key role in training specialized manpower required by society, and the competence and professional qualifications of university lecturers directly impact the performance of higher education institutions. Consequently, it is necessary to evaluate the professional qualifications of teachers. Nonetheless, the literature review on the professional qualifications of university lecturers reveals that various factors contribute to their qualifications, making it challenging to find a suitable model in this field. Despite the lack of studies in this area, it is imperative to enhance the professional qualifications of academic-applied university lecturers, identify the components of their professional qualifications, and develop a comprehensive model. Thus, this research aims to achieve these objectives by examining the background and perspectives of researchers who have been active in the field of professional qualifications. The model proposed in this study is based on the concept of organizational learning and has been designed, explained, and tested to identify and determine the knowledge, skills, characteristics, and personal competence required by teachers in scientific-applied universities. By incorporating the functions and consequences derived from the model, it aims to enhance the professional qualifications of scientific-applied university lecturers. In summary, this research seeks to address the following question: What is the model for improving the professional qualifications of academic-applied university lecturers using an organizational learning approach?

Materials and Methods

This study will be a mixed method exploratory design (sequential mixed exploratory research design) that was conducted in two qualitative and quantitative stages. The statistical population of this research includes managers and vice-presidents of Razavi Khorasan Scientific-Applied University, university professors and experts in the relevant field, considering the qualitative nature of the first part of the study, the purposeful sampling method was used (25 people). In the quantitative part, the dimensions and components were extracted in the form of a questionnaire from the interviews and distributed to the statistical community of lecturers of Razavi Khorasan Scientific and Applied University. The number of scientific-applied universities in Razavi Khorasan province is 55 and the number of their lecturers is 3680. According to Morgan's table, the number of samples was considered to be 351 people. All participants completed an informed

consent form. Descriptive and inferential methods were used to analyze the data. In the descriptive part, the description of the studied population, the variables and the questions of the questionnaire were discussed by drawing a diagram and reporting frequency and frequency percentage as well as central tendency and dispersion indicators. Delphi method was used in the qualitative part. In the inferential part, while examining the distribution of data using the Kolmogorov Smirnov test, the assumption of normality was made. Appropriate statistical methods were used. Finally, structural equations were used to examine the main research question and fit the model to the data. Excel, SPSS version 24, PLS software were used to analyze and draw data.

Results

In the findings of the descriptive statistics of the qualitative part, it was found that the number of male participants in the expert group is 19 and the number of female participants is 6. Of these, 7 people are between 31 and 40 years old, 9 people are between 41 and 50 years old, and 9 people are over 50 years old. In terms of education, 11 people have a master's degree and 14 people have a doctorate. Also, in the quantitative section, it was determined that the number of male participants is 239 and female 112. Of these, 165 people are less than 40 years old, 137 people are between 41 and 45 years old, and 49 people are between 46 and 50 years old. In terms of education, 23 people have a bachelor's degree, 174 people have a master's degree, and 154 people have a doctorate.

First stage Delphi method

In the first stage of the Delphi project, the components proposed by the researcher to measure the model of improving the professional qualifications of scientific-applied university lecturers with an organizational learning approach were provided to the group of experts to give their opinion about the importance of the presence of the mentioned items to the researcher. The members of the expert group were asked to present their agreement and disagreement with these issues raised in the research model. In the following, those dimensions that had a positive score higher than 0.7 remained in the study and were included in the second stage of Delphi.

Table 1. The level of experts' agreement with each of the items

Dimension	Components	Agree		Disagree	
		F	%	F	%
Ethical competency	seeking justice	19	76	6	24
	moral value	25	100	0	0
	Ethical behavior	25	100	0	0
	dignity	13	52	12	48
	piety	24	96	1	4
Knowledge competency	Understanding concepts	22	88	3	12
	Mastery of specialized knowledge	25	100	0	0
	Educational expertise	19	79	6	24
	General regulations	22	88	3	12
	Career options	19	76	6	24
Attitude competency	Values based attitude	19	76	6	24
	Attitudinal competence based on interests	13	52	12	48
	Professional development attitude	25	100	0	0
Perceptual competency	critical thinking	25	100	0	0
	Ability to make decisions	22	88	3	12
	Creative thinking	25	100	0	0
	Organizational awareness	16	64	9	36
	Problem Solving	25	100	0	0
	Development of beliefs	22	88	3	12
Behavioral competency	Psychological feature	22	88	3	12
	Motivational features	19	76	6	24
	Cognitive characteristics	25	100	0	0
	Business relations	13	52	12	48
	individual flourishing	25	100	0	0
	flexibility	25	100	0	0
Commitment	Normative	19	76	6	24
	Continuous commitment	19	76	6	24
	Emotional commitment	19	76	6	24
	Management commitment	25	100	0	0
Continuous learning	Coherent learning opportunities	22	88	3	12
	Systemic thinking	25	100	0	0
	Learning space	25	100	0	0
	Competitiveness	25	100	0	0
	Trans organizational learning	25	100	0	0
	Team learning	22	88	3	12
Empowerment	Psychological Empowerment	20	80	5	20
	Managerial empowerment	25	100	0	0
	Individual empowerment	25	100	0	0
	Continuous empowerment	25	100	0	0
	Organizational empowerment	22	88	3	12
Knowledge management	Educational knowledge	25	100	0	0
	Knowledge of human resources	25	100	0	0
	Organizational knowledge	25	100	0	0
	Educational knowledge	25	100	0	0

Second stage Delphi method

In the first stage of the study, the items were extracted from the review of related texts. After the important dimensions required for the design of the model were determined from the point of view of the experts, 4 dimensions were removed and the rest of them were placed in the second stage of the Delphi design with slight changes in order, which was to examine the dimensions and the proposed components for each of the research variables should be discussed and the required dimensions should be planned and explained according to the opinions and views of the responding experts. In the second stage, a questionnaire with a 5-point Likert scale from very agree to very agree was considered. Experts answered the questions. The results of these answers are shown in Table 2. All the mentioned components were confirmed and entered in the third stage of Delphi.

Table 2. The percentage of relative frequency of experts' opinions in the second stage

Dimension	Components	Strongly agree	Agree	Moderately	Disagreed	Strongly disagree	Mean	SD	Result
Ethical competency	seeking justice	5	4	2	1	3	3.46	0.71	Accept
	moral value	5	5	2	1	2	3.66	0.92	Accept
	Ethical behavior	6	3	3	2	1	3.73	0.88	Accept
	dignity	4	5	3	2	1	3.60	0.82	Accept
	piety	5	3	1	1	5	3.13	1.04	Accept
Knowledge competency	Understanding concepts	8	4	1	1	1	4.13	0.96	Accept
	Mastery of specialized knowledge	7	3	2	1	2	3.80	0.71	Accept
	Educational expertise	6	3	1	2	3	3.46	0.82	Accept
	General regulations	4	3	6	1	1	3.53	0.75	Accept
	Career options	8	4	1	1	1	4.13	0.99	Accept
Attitude competency	Values based attitude	4	5	4	1	1	3.66	0.92	Accept
	Attitudinal competence based on interests	4	5	3	2	1	3.60	0.98	Accept
	Professional development attitude	4	4	5	1	1	3.60	1.08	Accept
Perceptual competency	critical thinking	6	5	2	1	1	3.93	0.91	Accept
	Ability to make decisions	5	4	4	2	0	3.80	0.96	Accept
	Creative thinking	5	5	4	1	0	3.93	0.87	Accept
	Organizational awareness	7	3	4	1	0	4.06	0.82	Accept
	Problem Solving	4	3	6	2	0	3.60	0.99	Accept

	Development of beliefs	5	4	2	1	3	3.46	0.71	Accept
Behavioral competency	Psychological feature	5	5	2	1	2	3.66	0.92	Accept
	Motivational features	6	3	3	2	1	3.73	0.88	Accept
	Cognitive characteristics	4	5	3	2	1	3.60	0.82	Accept
	Business relations	5	3	1	1	5	3.13	1.04	Accept
Commitment	individual flourishing	8	4	1	1	1	4.13	0.96	Accept
	flexibility	7	3	2	1	2	3.80	0.71	Accept
	Normative	6	3	1	2	3	3.46	0.82	Accept
	Continuous commitment	4	3	6	1	1	3.53	0.75	Accept
	Emotional commitment	8	4	1	1	1	4.13	0.99	Accept
Continuous learning	Management commitment	4	5	4	1	1	3.66	0.92	Accept
	Coherent learning opportunities	4	5	3	2	1	3.60	0.98	Accept
	Systemic thinking	4	4	5	1	1	3.60	1.08	Accept
	Learning space	6	5	2	1	1	3.93	0.91	Accept
	Competitiveness	5	4	4	2	0	3.80	0.96	Accept
	Trans organizational learning	5	5	4	1	0	3.93	0.87	Accept
Empowerment	Team learning	7	3	4	1	0	4.06	0.82	Accept
	Psychological Empowerment	4	3	6	2	0	3.60	0.99	Accept
	Managerial empowerment	8	4	1	1	1	4.13	0.99	Accept
	Individual empowerment	4	5	4	1	1	3.66	0.92	Accept
	Continuous empowerment	4	5	3	2	1	3.60	0.98	Accept
	Organizational empowerment	4	4	5	1	1	3.60	1.08	Accept
Knowledge management	Educational knowledge	5	4	2	1	3	3.46	0.71	Accept
	Knowledge of human resources	5	5	2	1	2	3.66	0.92	Accept
	Organizational knowledge	6	3	3	2	1	3.73	0.88	Accept
	Educational knowledge	4	5	3	2	1	3.60	0.82	Accept

The third stage of Delphi

In this research, content validity has been used to check the validity. To check the content validity in a quantitative way, two coefficients of the content validity ratio and the content validity index are used (Schultz et al., 2013) to measure the content validity of the questionnaire among 25

people. To calculate the content validity ratio, the questionnaire was divided into the content validity ratio section, and experts and informants scored the obtained components based on a three-point Likert scale (necessary - useful but unnecessary - unnecessary). Also, to calculate the content validity index from Waltz and Basel method, a quadruple questionnaire (not relevant - relatively relevant - relevant - completely relevant) was distributed, and the following results were obtained.

Table 3. The content validity of Delphi codes of the third stage based on the criteria

Variable	Dimension	N of items	Alpha	CVR	CVI
Professional competency	Ethical competence	8	0.786	0.844	0.914
	Knowledge competence	12	0.856	0.769	0.919
	Attitudinal competence	5	0.749	0.794	0.978
	Perceptual competence	13	0.782	0.799	0.926
	Behavioral competence	11	0.717	0.784	0.914
Organizational learning	Commitment	8	0.798	0.815	0.897
	Continuous learning	13	0.849	0.799	0.932
	Empowerment	10	0.730	0.764	0.908
	Knowledge management	8	0.731	0.798	0.944

According to Table 3, Cronbach's alpha rate, content validity ratio and content validity index are more than 0.7, which indicates the validity and reliability of the questionnaire. For the approved components, 88 questions were designed in the form of a questionnaire, and for the quantitative part, they were prepared, duplicated, completed, collected and analyzed by the statistical community.

What is the model for improving the professional qualifications of academic-applied university lecturers with an organizational learning approach?

In the previous section, the measurement models for each of the two main variables, i.e., organizational learning and professional qualification improvement, were examined, and indicators, components, and dimensions that played a certain role in explaining each of the main variables were identified. After confirming the appropriateness of each of these models, the final fitted research model included both variables of organizational learning and professional competence along with their dimensions and components as well as the relationship between these two main variables (Figure 1).

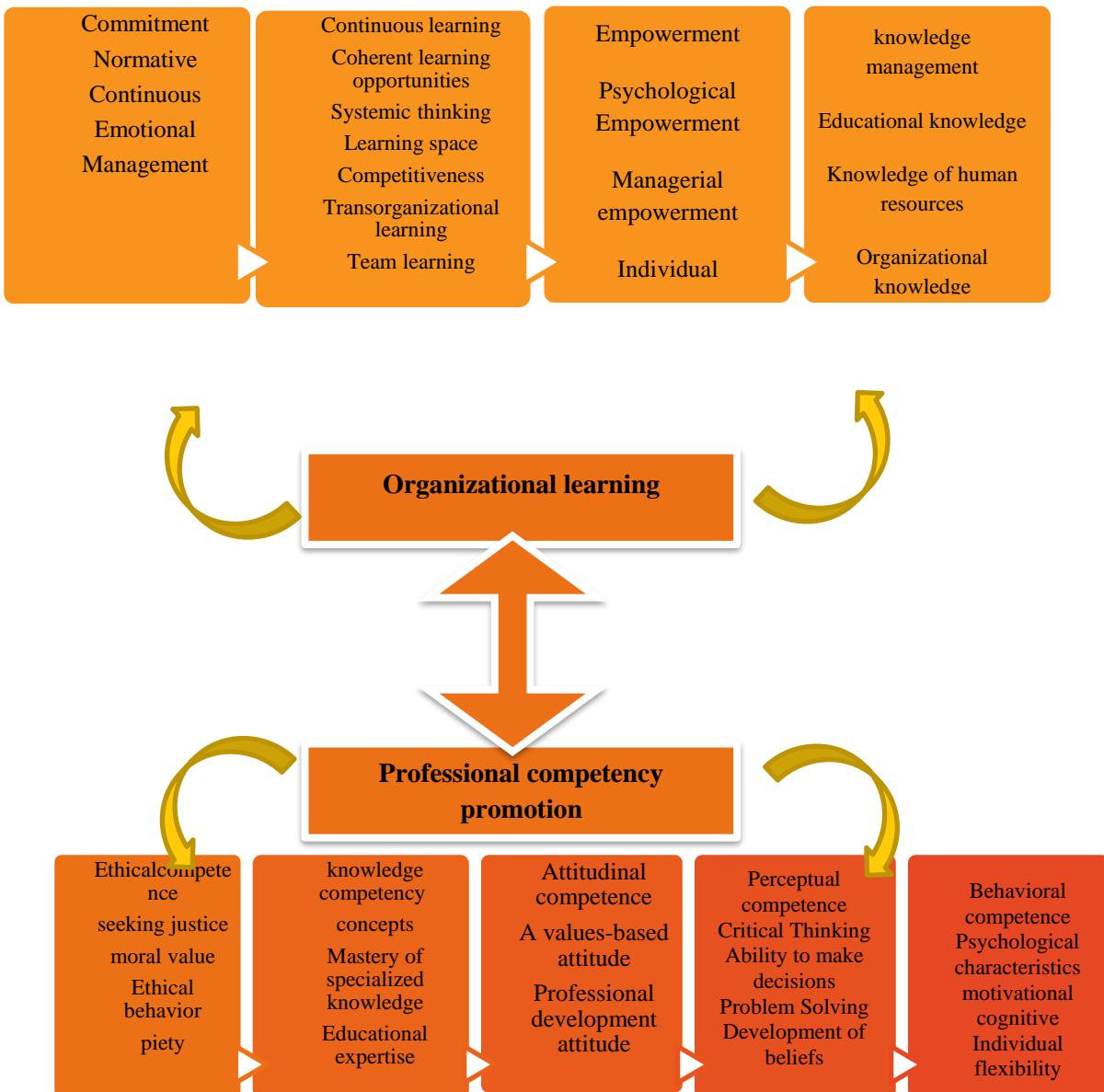


Fig 1. The relationship between organizational learning and the promotion of professional competence and their components

Discussion

Higher education serves as the primary institution for the transmission of values, norms, and advanced knowledge to students. Unlike other educational levels, higher education introduces students to concepts and characteristics that were previously unfamiliar to them. However, the effectiveness of this process relies on the educators possessing sufficient literacy, information, and knowledge, in other words, the necessary competence to transfer knowledge to their students. Competence encompasses a combination of skills, knowledge, values, traits, and motivations that define exceptional performance in a given profession. Among professors, various types of competence exist, with professional competence being the primary and most crucial one. This is due to the fact that professional competence encompasses a broad range of characteristics. It includes both scientific competencies and moral and behavioral competencies. Consequently, there is currently a significant emphasis placed on developing professional competences among university faculty members.

According to the theory of cognitive learning, it is recognized that learners, who are considered human resources, exhibit diverse learning styles and are at various stages of development. Their competence and overall performance are assessed based on these factors. Furthermore, as adult learners, human resources, particularly managers, have distinct needs that necessitate tailored development programs (Rappaport, 2008). Additionally, Bloom's cognitive classification highlights the disparity in cognitive levels among different activities, emphasizing the importance of presenting competency development programs at higher cognitive levels as much as possible. Moreover, when designing competency development courses, it is crucial to consider not only the knowledge aspect but also the attitudinal and skill dimensions of human resources. Furthermore, it is important to note that human resources exist at every level, and instead of comparing them, the focus should be on assisting them in recognizing their growth level and identifying their own capacity for learning and development (Clarke, 2010). Enhancing the competence of adult learners as employees is achieved through the acquisition of new knowledge in their respective fields. Therefore, efforts in competency development should often concentrate on pedagogy, assessment, and technical knowledge. Gorai and Chen (2017) propose certain assumptions about adult learners, suggesting that the principles of adult education should be taken into account when designing a learning experience.

In contemporary society, universities assume a significant role in enhancing the economic, cultural, and social aspects of society, among others. On one hand, they provide essential knowledge to various institutions, while on the other hand, they cultivate the required human resources for diverse organizations. Thus, modern-day universities have assumed multiple responsibilities in contrast to their original purpose. Consequently, there is now a great emphasis on the quality of universities, with many researchers and thinkers believing that by enhancing university quality, we can aspire to a brighter future for society and improve individual and societal well-being.

The competencies of university members serve as an indicator of the quality of universities and scientific environments. For instance, a university lacking academically and professionally competent professors cannot foster an entrepreneurial, innovative, and exemplary environment. Therefore, its future prospects are uncertain. Conversely, universities equipped with professors who possess a wide range of professional expertise can contribute significantly to efficiency, productivity, and optimization. Consequently, in today's context, the efficacy of universities is not solely reliant on society or policy makers, but often hinges on professors with extensive professional qualifications.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Islamic Azad University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis and contributed to the article and approved the submitted version.

Funding

The authors did (not) receive support from any organization for the submitted work.

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