

*Apuntes Universitarios*, 2021: 11(1), enero-marzo  
ISSN: 2304-0335 DOI: <https://doi.org/10.17162/au.v11i1.597>


## Factors Effect Development of Professional Competencies of Lecturers at Iran's University of Applied Science and Technology


### Factores que afectan el desarrollo de las competencias profesionales de los profesores de la Universidad de Ciencia y Tecnología Aplicadas de Irán

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**Recibido:** 15 de abril de 2020

**Aceptado:** 12 de noviembre de 2020

#### Abstract

This study proposes different approaches and models to analyze the factors affecting the development of professional competencies of lecturers at the University of Applied Science and Technology (UAST) in Tehran Province by using the lecturers' viewpoints. This is an applied-quantitative descriptive-correlational study. The statistical population included all the 14000 lecturers of the UAST in Tehran. The sampling standards were employed to select 384 participants as the research sample. Based on the conceptual model, the research questions and hypotheses were then addressed through a researcher-made questionnaire and the items extracted from the statistical sample. In the descriptive statistics, data description was presented through both contextual and primary variables; however, Pearson's product-moment correlation coefficient, structural equation modeling, and factor analysis were employed in the inferential statistics to analyze the research hypotheses. According to the research data, effective teaching and skill training improvement of lecturers had the greatest and smallest impacts, respectively, on the development of their professional competencies at the UAST. The standardized beta coefficients of these two variables were reported to be 0.591 and 0.368, respectively.

**Keywords:** skill training improvement of lecturers, effective teaching, virtual education, education, Iran.

#### Resumen

Este estudio propone diferentes enfoques y modelos para analizar los factores que afectan el desarrollo de las competencias profesionales de los profesores de la Universidad de Ciencia y Tecnología Aplicadas (UAST) en la provincia de Teherán utilizando los puntos de vista de los

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profesores. Este es un estudio descriptivo correlacional cuantitativo aplicado. La población estadística incluyó a todos los 14000 profesores de la UAST en Teherán. Los estándares de muestreo se emplearon para seleccionar 384 participantes como muestra de investigación. Con base en el modelo conceptual, las preguntas e hipótesis de investigación se abordaron a través de un cuestionario elaborado por un investigador y los ítems extraídos de la muestra estadística. En las estadísticas descriptivas, la descripción de los datos se presentó a través de variables contextuales y primarias; sin embargo, el coeficiente de correlación producto-momento de Pearson, el modelado de ecuaciones estructurales y el análisis factorial se emplearon en las estadísticas inferenciales para analizar las hipótesis de investigación. Según los datos de la investigación, la mejora efectiva de la enseñanza y la capacitación de los profesores tuvo el mayor y menor impacto, respectivamente, en el desarrollo de sus competencias profesionales en la UAST. Se informó que los coeficientes beta estandarizados de estas dos variables eran 0.591 y 0.368, respectivamente.

**Palabras clave:** Mejora de la formación profesional de los profesores, enseñanza eficaz, educación virtual, educación, Irán

### Introduction

In any country, the higher education system is considered an important institution playing an undeniable role in the development of communities, whereas universities are known as thoughtful, informed, and innovative institutions expected to take effective steps in realizing the community ideals and constantly guide the country toward development by performing their duties and accomplishing their missions in education, research, and presentation of scientific and social services (Bazargan, 2007). Generally, the development and improvement of learning and teaching should be at the top of the agenda in higher education systems (UNESCO, 2013:14). In this regard, faculty members are among the most important elements of higher education systems and universities, playing an undeniable role in realizing both qualitative and quantitative goals of higher education in any country. It is therefore essential to appraise lecturers' competencies in various aspects, especially in education, as well as their impacts on the improved learning quality of students and their academic achievements. The teaching competency refers to the minimum information, skills, and creative capacities as well as professional tendencies and utility that should be acquired by faculty members to perform their duties and provide services more effectively (Aldini, Olya, & Jamali, 2009).

According to Rodriguez et al. (2002), competencies are behavioral patterns. They regarded competencies as measurable patterns of knowledge, skills, attitudes, behavior, and other personal characteristics required to perform occupational roles or job functions successfully (Rodriguez, Patel, Bright, Gregory, & Gowing, 2002).

To define and select the indicators for assessing the quality of professional education and training, three priorities have been considered in the EU countries: providing employment capacity, matching demand and supply for competencies, and providing comprehensive access to professional training and education (Blom & Meyers, 2003).

In recent years, the quantitative growth of the higher education system has resulted in insufficient attention paid to quality in universities, and the development of the higher education system has intensified the sensitivity of stakeholders to the quality of this system. According to Marofi et al. (2007), universities have faced many challenges and problems in the past two decades. Some of these issues include the inability to produce theoretical knowledge, consumption of fundamental and theoretical sciences produced in other countries, the inapplicability of academic training, lack of proper communications between universities and other social sectors, inattention to research functions and services in universities, multiple decision-making centers and authorities, the ever-increasing growth of students and applicants, the qualitative development of the higher education system neglecting existing capacities and economic, social and cultural potentials of the community for accepting university graduates, reduced financial resources, and pressure from the community for responsibility. To deal with these challenges, universities should pay special attention to maintain, improve, and promote the quality of higher education systems.

Despite high public and private expenditures on formal skill training, there are still criticisms regarding the functions and achievements of this system for training professional human resources in the national economy. Regarding the macro-pathology of the current education status, especially formal skill training in Iran, the challenges include the island nature and the presence of parallel organizations, the lack of coherence and coordination among skill training in Iran, and the lack of a national policy-making system for planning and evaluating skill training to develop professional competencies. They also include the lack of policy-making for attracting efficient instructors and curriculum, the incompliance of the existing structure with the missions of the skill training system in the Ministry of Education, and the Technical and Vocational Training Organization, and the University of Applied Science and Technology (UAST). Other challenges include the willingness of students, families, suppliers, and the community to theoretical education for success in various higher education levels, the unknown authority of skill training and incorrect organizational borders and biases among ministries involved, and the lack of a continuous path for promoting knowledge and skill of audience due to the lack of longitudinal and transverse communication of educational policymakers and

learning and educational standards and regulations. These challenges have caused the policies and regulations of the higher education system to face criticisms (Attarnia, 2014). Therefore, this study aims to explain the roles of the factors affecting the development of professional competencies of lecturers at the UAST.

### **Theoretical framework and research model**

Factors Affecting the Development of Professional Competencies of Lecturers at the University of Applied Science and Technology including:

#### ***Skill training improvement of lecturers***

In the industrial and service sectors, all employees need some skills to have effective performance. These skills differ in significance depending on the types of jobs and organizational levels. Skills refer generally to those improvable capabilities leading to the effective performance of business owners. In the Public Skill Training Conference held by UNESCO and Labor Organization in 2011, skill training was defined by UNESCO as “various aspects of the education process in addition to public education, education of technologies, technology-related sciences, acquisition of practical skills, and occupation-related knowledge in various sectors of social and economic life” (UNESCO, 164:2013).

According to the consortium’s competency model, a skill is the ability to implement a science in practice. A skill is obtained and developed through repeated applications of knowledge in the real environment. Skill development improves the quality of performance. Without skills, information will not be effective in most cases. For instance, managers are unable to acquire the teamwork skill only by doing a great deal of reading without applying and experiencing teamwork principles in practice (Vajargah, 2013).

According to the Terminology of European Education and Training Policy, a skill is the ability to perform duties and solve problems. In other words, skill training is a kind of education providing the required practical skills and knowledge for a certain business, employment, or being skillful and expert in the existing business. This education type refers to those aspects of training leading to applied and practical skills and basic scientific knowledge about a job (Abayomi Olumade, 2016: 1842).

### ***Effective teaching by lecturers***

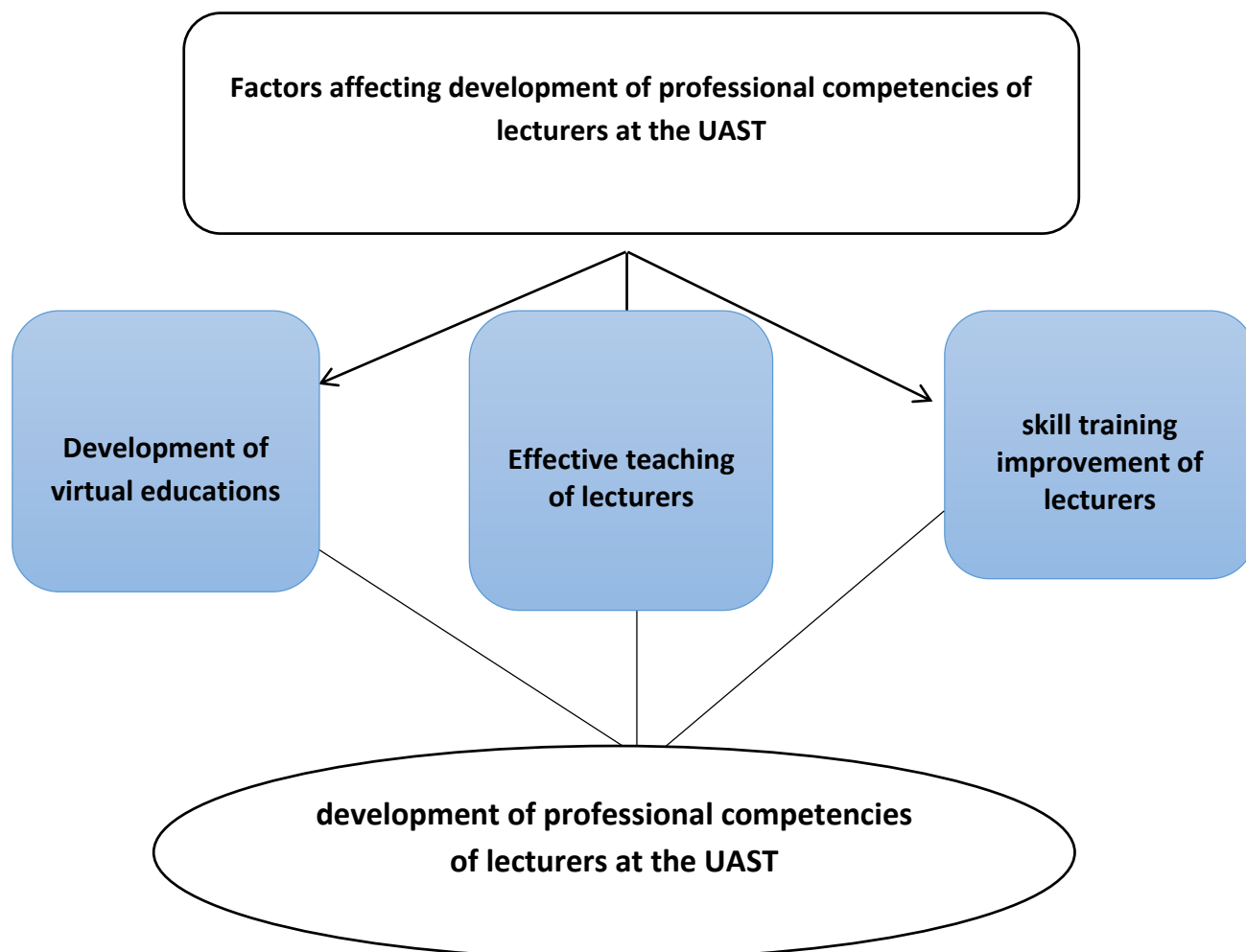
Effective teaching is a controversial concept in higher education systems with multiple definitions (Carner, 2007). By a broad definition, effective teaching means purposeful teaching focused on students and their learning process (Devlin, 2010). There is a basic hypothesis beyond this definition consisting of two fully-accepted components regarding academic teaching. First, teaching needs a set of skills and certain principles identified through the relevant studies. Second, effective academic teaching meets all related contextual requirements (Wiers-Jenssen, Stensaker, & Groggaard, 2016). In higher education systems, effective teaching is defined as promoting effective learning opportunities for students (Gruber *et al.*, 2018). Faculty members and academicians are among the most important educational players in universities. There is no doubt about the importance and role of expert human resources in educational systems, for the skillful human resources required in the community are trained by academicians. Therefore, it is vital to study various qualitative and quantitative aspects of faculty members to identify related issues. Teaching methods adopted by faculty members are of great importance. Accordingly, they should be aware of the effectiveness of these methods in addition to an outstanding personality, interest, and faith in work (Caresly quoted by Seraji, 2007: 74).

### ***Development of virtual education***

The tremendous and rapid growth of information and communication technologies and their impacts on all aspects of the human life have caused a great revolution in educational systems and their missions in learning environments so that effort should be made to train capable and efficient individuals having key roles in developed communities in the age of knowledge and knowledge development in line with technological development. The high-level learning skills of individuals should be strengthened to become more consistent with rapid technological, industrial, and social changes (Cheryl quoted by Seraji, 2004:92).

The use of ICT technologies has led to the development of a novel kind of learning called e-learning. At the same time, the history of the advent of educational technologies shows that these technologies do not solely affect the learning quality and that the effective use of technologies needs regular and purposeful education planning. Interactive capabilities and features of e-learning environments such as flexibility as well as the removal of time, location, and age constraints have caused the development of e-learning and a proper attitude toward this kind of education (Caresly quoted by Seraji, 2007: 74). E-learning provides numerous learning

opportunities that used to be impossible. E-learning provides the chance for learning in an accredited university without the need for the lifestyle change, or turnover, and migration of learners or their families. Learning in an “invisible class” provides unlimited access to information (Cheryl quoted by Seraji, 2004: 92).



**Fig. 1.** Conceptual Model.

***Research Hypotheses***

*Primary Hypothesis.* Skill training improvement, effective teaching, and development of virtual education affect the development of professional competencies of lecturers at the UAST.

*Secondary Hypotheses.*

1. Skill training improvement affects the development of professional competencies of lecturers at the UAST.

2. Effective teaching affects the development of professional competencies of lecturers at the UAST.

3. The development of virtual education affects the development of professional competencies of lecturers at the UAST.

### Methodology

This is an applied-descriptive fundamental survey, in which the research literature was reviewed to develop the theoretical framework through the desk method. The indices and research variables of the researcher-made model were presented. The statistical population consisted of all 14000 lecturers at the UAST in Tehran. The Cochran formula was employed to select 384 participants as the research sample, and a research-made questionnaire was then used in three dimensions and 25 items, scored on a five-point Likert scale, for data analysis.

### Results

After the content validity was confirmed by experts, the structural validity was measured, and the interplay of questions and components was confirmed. In the descriptive statistics, data were divided into contextual and basic variables, whereas the Pearson's product-moment correlation coefficient, structural equation modeling, and factor analysis were used for hypothesis testing in the inferential statistics.

#### *First Hypothesis*

Skill training improvement affects the development of professional competencies of lecturers at the UAST.

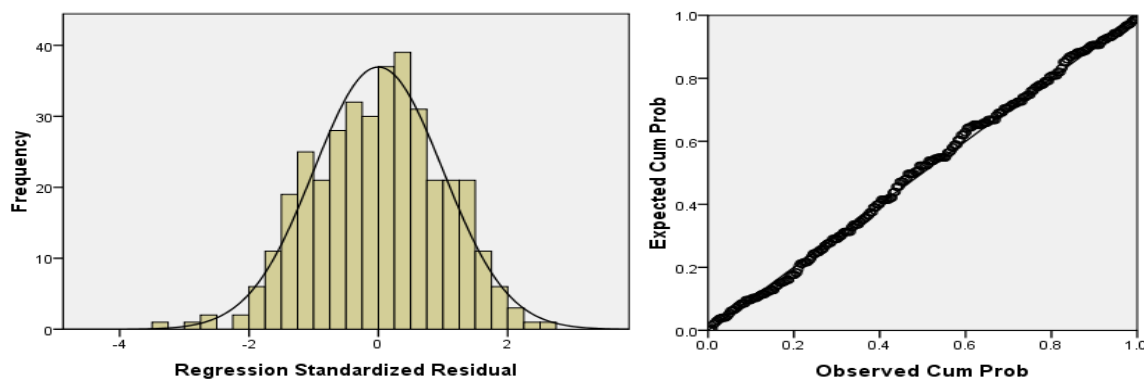
**Table 1**

*Descriptive results of the regression model for the first hypothesis*

Durbin–Watson statistic	Adjusted coefficient of determination	Coefficient of determination	Correlation coefficient
1.922	0.231	0.235	0.485

According to Table 1, the Durbin–Watson statistic (1.992) ranges within the 1.5-2.5 period; therefore, the lack of correlation between the residuals is not rejected, and the regression analysis can be used. A coefficient of determination of 0.235 indicates that 23.5% of changes

in the dependent variable (development of professional competencies of lecturers at the UAST) are explained by the independent variable (skill training improvement of lecturers). According to the F statistic and a significance level of above 95%, the regression equation is valid, and the results can be analyzed. Figure 2 shows the normal distribution of regression residuals.



**Fig. 2.** The normal distribution of regression residuals for the first hypothesis

**Table 2**

*Linearity testing of the ANOVA equation for the first hypothesis*

Source of variation	Significance level (sig)	F statistic	Mean squares	Degree of freedom (DOF)	Sum of squares
Regression	0.000	63.973	23.929	1	23.929
Error (residual)			0.374	368	137.653
Total				369	161.582

According to Table 2, the significance level (0.000) for skill training improvement of lecturers is lower than  $\alpha=0.05$ . Therefore, it can be concluded at a confidence level of 95% that skill training improvement affects the development of professional competencies of lecturers at the USAT. The positive sign of the correlation coefficient indicates a positive, direct relationship between these two variables. In other words, skill training improvement causes the development of professional competencies of lecturers at the UAST. The first hypothesis is confirmed consequently.



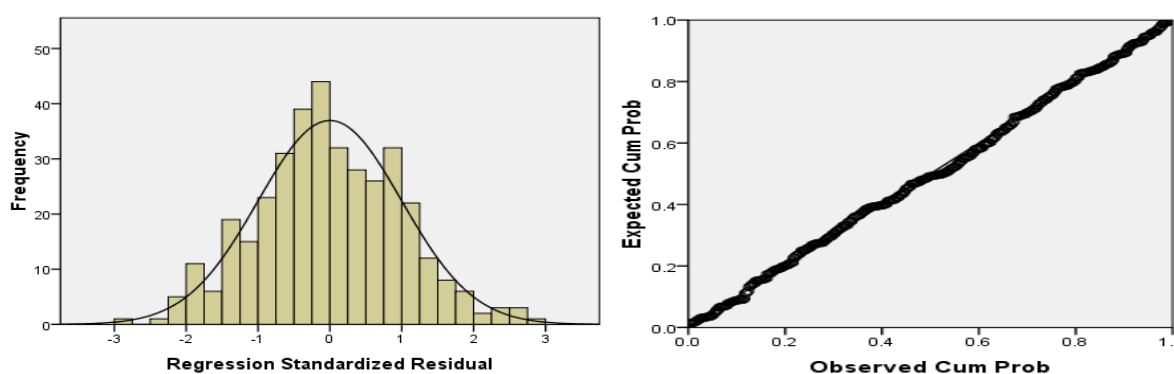
**Second hypothesis**

Effective teaching affects the development of professional competencies of lecturers at the UAST.

**Table 3**  
*The regression analysis and regression coefficients for the first hypothesis*

Variable	Significance level	t statistic	Standardized beta coefficient	Non-standardized coefficients	
				Standard error	Beta
Constant	0.000	11.606	-	0.163	1.897
skill training improvement of lecturers	0.000	7.998	0.385	0.048	0.382

According to Table 3, the Durbin–Watson statistic (1.757) ranges within the 1.5-2.5 interval. Therefore, the lack of correlation between the residuals is not rejected, and the regression analysis can be used. A coefficient of determination of 0.419 indicates that 41.9% of changes in the dependent variable (development of professional competencies of lecturers at the UAST) are explained by the independent variable (effective teaching by lecturers). According to the F statistic and a significance level of above 95%, the regression equation is valid, and the results can be analyzed. Figure 3 shows the normal distribution of regression residuals.



**Fig. 3.** *The normal distribution of regression residuals for the second hypothesis.*

**Table 4***The regression analysis and regression coefficients for the second hypothesis*

Variable	Significance level	t statistic	Standardized beta coefficient	Non-standardized coefficients	
				Standard error	Beta
Constant	0.000	4.372	-	0.268	1.173
Effective teaching by lecturers	0.000	16.295	0.647	0.075	1.228

According to Table 4, the significance level (0.000) for effective teaching by lecturers is lower than  $\alpha=0.05$  ( $\text{sig}<0.05$ ). Therefore, it can be concluded at a confidence level of 95% that effective teaching affects the development of professional competencies of lecturers at the UAST. The positive sign of the correlation coefficient indicates a positive direct relationship between these two variables. In other words, effective teaching causes the development of professional competencies of lecturers at the UAST. The second hypothesis is, therefore, confirmed.

***Third Hypothesis***

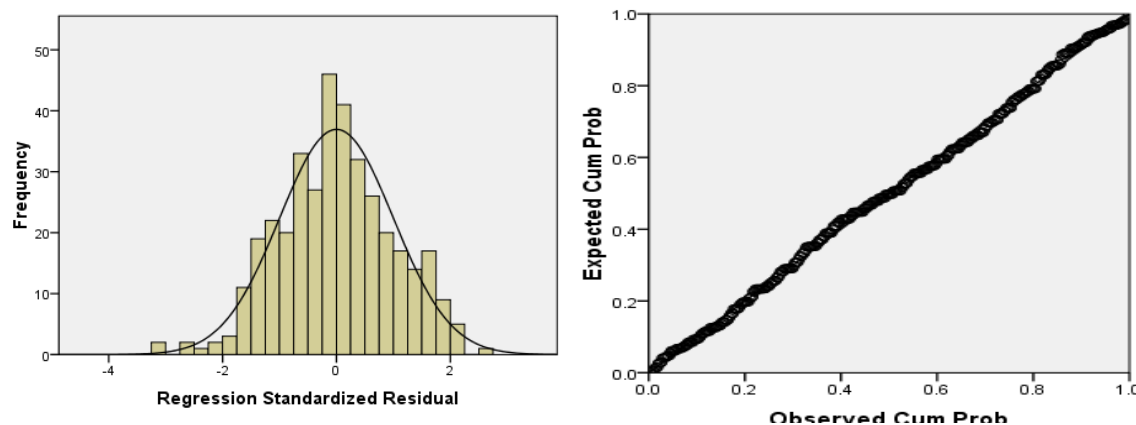
The development of virtual education affects the development of professional competencies of lecturers in the UAST.

**Table 5***Descriptive results of the regression model for the second hypothesis*

Durbin–Watson statistic	Adjusted coefficient of determination	Coefficient of determination	Correlation coefficient
2.01	0.341	0.345	0.588

According to Table 5, the Durbin–Watson statistic (2.01) ranges within the 1.5-2.5 interval. Therefore, the lack of correlation between the residuals is not rejected, and the regression analysis can be used. A coefficient of determination of 0.345 indicates that 34.5% of changes in the dependent variable (development of professional competencies of lecturers in the UAST) are explained by the independent variable (development of virtual education). According to the F statistic and a significance level of above 95%, the regression equation is

valid, and the results can be analyzed. Figure 4 shows the normal distribution of regression residuals.



**Fig. 4.** The normal distribution of regression residuals for the third hypothesis

**Table 6**

*The regression analysis and regression coefficients for the third hypothesis*

Variable	Significance level	t statistic	Standardized beta coefficient	Non-standardized coefficients	
				Standard error	Beta
Constant	0.000	9.843	-	0.179	1.758
Development of virtual education	0.000	8.082	0.588	0.068	0.547

According to Table 6, the significance level (0.000) for the development of virtual education is lower than  $\alpha=0.05$  ( $\text{sig}<0.05$ ). Therefore, it can be concluded at a confidence level of 95% that the development of virtual education affects the development of professional competencies of lecturers at the UAST. The positive sign of the correlation coefficient indicates a positive direct relationship between these two variables. In other words, the development of virtual education causes the development of professional competencies of lecturers at the UAST. The third hypothesis is confirmed consequently.

***Regression Model Fitting***

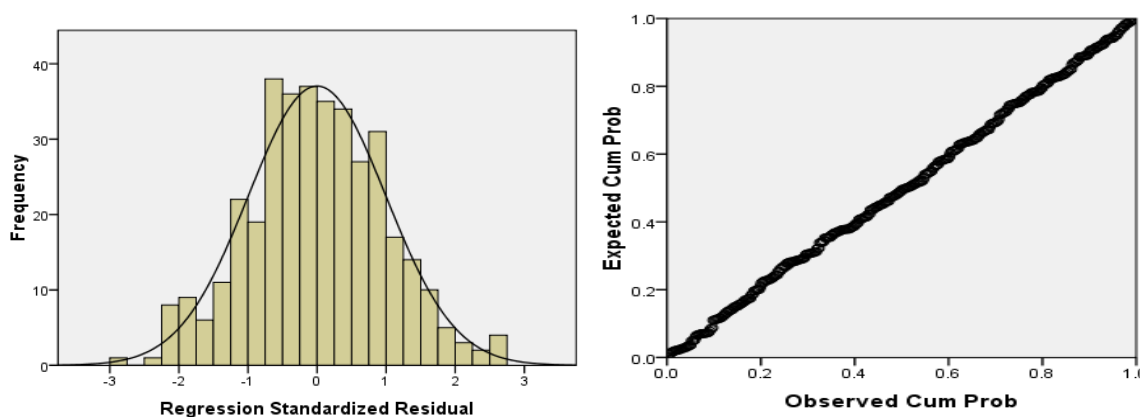
The hypothesis testing indicated the impacts of skill training improvement, effective teaching, and the development of virtual education on the development of the professional

competencies of lecturers at the UAST. The multi-linear regression was employed in this section to determine the variable with the highest impact on the development of professional competencies of lecturers at the UAST.

**Table 7**  
*Descriptive results of the regression model*

Durbin–Watson statistic	Adjusted coefficient of determination	Coefficient of determination	Correlation coefficient
1.725	0.434	0.439	0.662

According to Table 7, the Durbin–Watson statistic (1.725) ranges within the 1.5-2.5 interval. Therefore, the lack of correlation between the residuals is not rejected, and the regression analysis can be used. A coefficient of determination of 0.439 indicates that 43.9% of changes in the dependent variable (development of professional competencies of lecturers in the UAST) are explained by the independent variables. According to the F statistic and a significance level of above 95%, the regression equation is valid, and the results can be analyzed. Figure 5 shows the normal distribution of regression residuals.



**Fig. 5.** *The normal distribution of regression residuals*

**Table 8***The regression analysis and regression coefficients for the third hypothesis*

Variable	Collinearity statistics		Significance level	t statistic	Standardized beta coefficient	Non-standardized coefficients	
	Collinearity coefficient	Tolerance				Standard error	Beta
Constant	-	-	0.000	4.924	-	0.269	1.327
Skill training improvement	2.613	0.52	0.000	6.486	0.368	0.079	0.511
Effective teaching	1.486	0.581	0.000	10.267	0.591	0.071	0.729
Development of virtual training	1.358	0.436	0.000	9.875	0.471	0.064	0.632

According to Table 8, the tolerance ranges within the 0.4-0.6 interval, and the collinearity coefficient for all variables is lower than 10. Therefore, there is no problem regarding collinearity between the independent variables. The significance level for skill training improvement, effective teaching, and development of virtual education is 0, which is lower than  $\alpha=0.05$  ( $\text{sig}<0.05$ ). Therefore, all these variables are considered in the regression model, and it can be concluded at a confidence level of 95% that skill training improvement, effective teaching, and development of virtual education affect the development of professional competencies of lecturers at the UAST.

Besides, the findings According to the absolute value of the standardized beta coefficient, effective teaching and skill training improvement of lecturers with a standardized beta coefficient of 0.591 and 0.368, respectively, have the greatest and smallest impacts on the development of professional competencies of lecturers at the UAST.

The results show that the three dimensions of developing the professional competencies of the teachers of the University of Applied Sciences and Technology have a significant relationship with social responsibility. The results show that the promotion of skills training of lecturers is effective in developing the professional competencies of teachers in the University of Applied Sciences and Technology. Given the positive sign of the regression coefficient, we can say that the relationship between the two variables is positive and direct. In other words, increasing the promotion of skills training of teachers leads to the development of professional competencies of teachers in the University of Applied Sciences and Technology. Therefore, the above hypothesis is confirmed. The results show that effective teaching of teachers is effective in developing the professional competencies of teachers in the University of Applied Sciences.

Given the positive sign of the regression coefficient, we can say that the relationship between the two variables is positive and direct. In other words, increasing the effective teaching of teachers leads to the development of professional competencies of teachers in the University of Applied Sciences. So, the above hypothesis is confirmed.

Also, the results show that the expansion of virtual education is also effective in developing the professional competencies of the lecturers of the University of Applied Sciences and Technology. Given the positive sign of the regression coefficient, we can say that the relationship between the two variables is positive and direct. In other words, the expansion of virtual education leads to the development of professional competencies of the teachers of University of Applied Science and Technology in the country. Therefore, the above hypothesis is confirmed. Also, the findings of stepwise regression analysis showed that the variable of effective teaching of teachers with standard beta coefficient (0.591) has the most impact and the variable of improving the training of teachers with standard beta coefficient (0.368) has the least impact on development of qualifications of the lecturers in the country's University of Applied Science and Technology. The results of this study are consistent with the studies of Rodriguez et al. (2002), Kruber et al. (2018), Abiomi Alomad (2017) and other studies.

### **Conclusion**

In the age of information explosion, Iran will not be able to compete in the “global science market” by using traditional methods and attitudes and will fall behind the development and progress caravan. Knowledge production and training productive, creative, and capable human resources require novel approaches to higher education in the context of the present “globalized world”. This approach should take into account the integration of novel communication and educational technologies, facilities, and novel institutional and structural requirements worldwide. Advances in information technology have caused significant changes in the methods of accessing information and educational systems, especially open and distance education systems. E-learning, e-economics, e-books, e-libraries, and e-cities have turned into undeniable topics in most developed and developing countries.

Paying attention to the importance of education and efforts made to achieve national development objectives through the distance education system with its unique capacities will pave the way to achieve such goals as in-service training or retraining of teachers and staff empowerment as well as helping governments to achieve national development. In general, the

performance of national development plans in the higher education sectors, after the Islamic revolution of Iran, show the quantitative and not the qualitative success of these plans, and a logical relationship is not observed between macro-objectives and the implemented policies. In other words, there is a significant difference between the development and implementation of plans in the Ministry of Science, Research and Technology. The failure of this plan has been attributed to the realization of ambitious goals in the short run.

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