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## The Role Of Cognitive Sharing In Enhancing The E-Learning Quality An Analytical Study Of A Sample Of Iraqi Universities

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### Abstract:

The world faced many communication challenges in 2020 after the Covid-19 pandemic, the most important of which was the continuation of schooling. Therefore, the research aimed to analyze the current reality of the studied universities in terms of strengths and weaknesses and measure the implementing level of quality requirements of e-learning. This research studies the impact of knowledge sharing in its dimensions (behavior, organizational culture, work teams, and technology) on the e-learning quality and its dimensions (e-learning management, educational content, evaluation and evaluation). After conducting the survey, there was a difference in the universities' application of the quality requirements of e-learning, as the study was conducted in the engineering departments of Iraqi public universities (Al-Nahrain, Technology, and Iraqia). The questionnaire was tested as a measure of the research variables and the relationship between them by selecting a sample that included 52 administrators who were distributed among the leaders (deans of colleges and heads of quality assurance departments). The descriptive analytical approach was adopted, in addition to using some statistical methods for the two programs (SPSS v.25). The results of the research indicated that the universities included in the study applied knowledge exchange to a moderate degree, and the behavioral dimension ranked first, while the organizational culture, technology, and work teams were good. There is a statistically significant effect of knowledge exchange on the quality of e-learning, and it also indicated that knowledge sharing has a direct impact on the dimensions of e-learning.

**Paper type** Research paper

**Keywords:** Cognitive Sharing, E-learning, E-Learning Quality.

## **1.Introduction:**

Educational institutions faced major challenges, especially after the Corona pandemic and the emergence of e-learning, which resulted the quality management need for educational institutions, and their pursuit for total commitment to education quality standards, all that to encouraging educational staff to work as teamwork, for increasing the necessary cognitive skills, and directing their behaviour to complete the educational process with the required quality. The researchers assumes that the contribution of cognitive sharing by improving behaviour directed towards cognitive sharing and cognitive -friendly culture and working within work teams will increase the strength of the impact of strategic quality management in achieving distinguished e-learning quality.

The importance of the current research stems from its role in clarifying the role of cognitive sharing through its dimensions (behaviour, organizational culture, work teams, and technology) to enhance E-learning quality. One of the important topics at the present time for which the need has increased, especially after the emergence of the Corona pandemic, which highlighted the importance of moving towards e-learning at the local and global levels. The e-learning system has become a common way to support teaching and education in many universities in the world, and the advantages of e-learning are recognized all over the world. The difference between e-learning and knowledge management systems is that they have completely different goals. E-learning systems attempt to provide structured educational contents and interconnection capabilities for specific topics so that learners are supported to develop their knowledge (insung,2011)

### **1.1 literature review:**

There are many studies that discussed cognitive sharing and linked it with e-Learning, the most prominent of them was discussed by Mustafa and Timothy (2019) who inquired the impact of knowledge and cognitive sharing on e-learning, The research population included approximately 200 students enrolled at Buraimi University College (BUC) in Oman for a random sample, and it is really affect adaption the e-learning, The study was conducted on students of Buraimi University College (BUC) in Amman, and the most important results were that knowledge acquisition perceived usefulness, and the ease of use have important direct effects on students' behavioral intention to adopt e-learning systems, and that knowledge sharing have a significant positive impact on E-learning quality.

While Baqour (2019) explained the relationship between information technology and knowledge sharing and their impact on ensuring the quality of higher education at Taif University in Saudi Arabia, and The sample consisted of 80 professors, therefore it was used the descriptive analytical approach in this study. Benefit from the uses of information technology, and benefit from the expertise and knowledge available to it. The university works to encourage activities that are concerned with training workers to develop their knowledge, and provides them with advanced and modern technology to improve their practical and academic capabilities.

The problem of current research is through the subject philosophy to be studied, and with the existence of a local field problem of a global nature, there was a discrepancy between the surveyed universities in applying the quality requirements of e-learning, and it is due to many reasons that will be investigated during the research. In particular, in creating the necessary environment for providing electronic educational services, As well as, the Iraqi universities delay in general in implementing the quality requirements of e-learning, which reinforces the importance of knowledge sharing to compare a number of universities, despite the end of the pandemic and its effects, it is necessary to continue developing and improving the accreditation of universities. On e-learning, in order to reduce distances and remove spatial and temporal boundaries, for the dissemination of science. Based on the above, the problem of the study was represented in the following question:

To what extent is cognitive sharing in the field of improving the quality of e-learning in the researched universities (Technology, Nahrain, and Iraqi)?

•What is the extent of the ability of the researched educational institutions to diagnose cognitive sharing and its role in inspiring the quality of e-learning?

The objectives can be identified based on the research problem and the justification for conducting it to be explained and illustrated by the following items:

•Attempting to arouse the interest of heads of the surveyed universities, their advanced staff, and their professors to the dimensions of cognitive sharing and the application of its constantly updated axes, and directing the attention of all Iraqi universities to the importance of cognitive sharing in the field of improving the quality of e-learning.

•Analyzing the current reality of the surveyed universities and their strengths that they are able to employ in their practices and weaknesses that can be addressed and avoided in the future.

•Evaluating the levels of e-learning quality and what are the ways to make it more appropriate to the reality of the required performance in light of the promotion of cognitive sharing pathways for the educational institutions under study.

## **2. Material and Methods:**

The research sample was 49 individuals from the deans and directors of the Quality Assurance Department and heads of departments, and this research relied on the analytical descriptive approach, and the statistical tools were represented in SPSS (v26) and Amos (v24) programs. Attia (2021) developed the questionnaire as a research tool consisted of 43 items, including 18 items for the quality of e-learning, while Abdul Latif (2021) built a scale of 25 items for knowledge sharing, although the theoretical framework for the study variables is based on previous literature that dealt with the most prominent concepts, basic factors, characteristics, and the importance of the study variables, which represent a knowledge base for the frameworks to be able to build a solid foundation for educational organizations. This research aims to evaluate the level of knowledge sharing and its impact on improving the quality of e-learning in a sample of public universities in the city of Baghdad.

### **2.1 Cognitive sharing:**

Cognitive sharing represents one of the essential pillars of the organization's success and acts as a strategy for survival in the cognitive age as it is among the total operations of the cognitive management cycle, it has been described as the cornerstone of effective cognitive management, because cognitive resources lie in the minds of individuals and helps organizations to use this resource values for their competitive advantage. This is why organizations need cooperation between individuals to share their cognitive with others within the organization (Tangaraja et al, 2015).

It differs from cognitive transfer and cognitive exchange, thus, the transfer of cognitive includes the sharing of the source of cognitive and the acquisition of the source of cognitive, which is the first stage in the sharing process. As for the exchange of cognitive, it is used to describe the transfer of information between units, departments, and different organizations (Zheng, 2017).

Kubaisi (2014) believed that this process includes terms such as distribution, dissemination, participation, or flow, transfer, and movement. Three conditions must be met for sharing cognitive:

- The mediator should be well aware of this cognitive and its content and be able to transfer it.
- The broker has an incentive to do so.
- There should be no obstacles to the transfer of cognitive.

On the other hand, organizational cognitive sharing is affected by the behaviour of individuals and their attitudes towards cognitive sharing, as the limited cognitive sharing in the organization leads to cognitive gaps in the organization and these cognitive gaps limit the organizational capabilities in achieving the goals of the organization, while Masoudi and Doaa (2018) clarified Cognitive sharing as the exchange of cognitive between individuals, whether in its written and official form, such as documents and reports, or in its intangible form, which individuals possess in their minds, such as experiences and skills.

Badakhova and Virza (2020) described it as a mechanism for spreading information and cognitive from an individual or one group or organization to another, and Jader (2021) explained that it is the practice of exchanging cognitive including skills, understanding and experience between people using tools or media such as information technology and communication technology.

The researchers define cognitive sharing: the activities of transferring or disseminating cognitive from one person to another, or from one group or institution to another, and this includes the exchange of both tacit and explicit cognitive .

## **2.2. Cognitive sharing Dimensions:**

Based on the literature, the dimensions of the research were chosen in line with the objectives of the study and the study environment, which are as follows:

- Behaviour: so that the process of sharing cognitive of both types, explicit and implicit, takes place between the members of the institution through its various mechanisms, whether direct and indirect, or formal and informal which achieves an increase in the productivity of individuals and then the improvement and development of institutional performance (Chen and Cheng, 2012).
- Organizational culture: based on cognitive sharing among the employees of the organization, in line with modern education systems in achieving development and forming a citizen with creative capabilities that enable him to rely on himself and contribute to the achievement of societal belonging (Farid, 2013).
- Work teams: They help share cognitive and ideas through brainstorming and future thinking, and work through software tools that make the Internet more effective in exchanging and sharing cognitive (Jasim, 2017).
- Information Technology: Technology represent a catalyst that enables and facilitates the process of sharing information through the Internet, as it is a means that improves the mechanism of information exchange, cognitive dissemination and sharing, and supports cooperation and interdependence among the parts of the organization, and increases the effectiveness of coordination; better and faster access to information and facilitates the practice of electronic brainstorming processes and the exchange of electronic discussions inside and outside the organization (McInerney and Mohr, 2007).

## **2.3 E-Learning Quality:**

The development of technology and the use of the Internet in various fields of life has made e-learning a relatively recent term. The definition of e-learning includes all its aspects, and covers most of the attempts and efforts involved, through different items of view (amir et al, 2019).

On the other hand, higher education facilities around the world, are facing many challenges to compete on a global level, which includes reshaping the education where networked education, e-learning, and the formation of virtual institutions. The accountability movement in higher education projects have magnified concerns about quality in e-learning. Which promote and assure the critical to the success of higher education institutions participating in e-learning (Williams and Wong, 2009).

While in Covid-19 pandemic conditions, most higher education institutions have shifted their teaching methods from existent mode to online teaching. Due to that shift, teachers and students faced many challenges, including the online education quality. And that is the most important component of sustainable development in any country around the world (Dhawan, 2020).

Arkorful and Abaidoo (2015) defined the quality of e-learning as the principles of quality on which successful online teaching and learning are based, which are exactly the same as those that support successful face-to-face teaching. While Omari et al (2016) described it as the use of multimedia technologies. Najdi (2017) indicated that the e-learning system relies on a declared procedure aimed at ensuring that the final educational outcomes match or exceed the required requirements, although Maqrani and Titrawi (2017) defined it as the use of technology and technical means in education, through multimedia, electronic devices and other means, for use in students' learning independently and collectively and making them the focus of lectures. It was discussed by Hassan and Ali (2019) as information technologies and the communications used to support students in improving their learning, and the researcher defines the quality of e-learning: it is a creative way to provide educational content with the appropriate quality and achieve the educational goal by means of computers, smart devices and global networks.

#### **2.4 E-Learning patterns:**

There are a variety of methods and styles for providing e-learning content. New forms of teaching and learning include classroom training, self-paced e-learning and face-to-face e-learning.

Arguably, e-learning tools are any computer program or application, ranging from complex online and real-time multiplayer games to basic applications such as Microsoft PowerPoint and Microsoft Word. These tools perform many functions in the teaching and learning process, such as displaying content, managing assessment, facilitating cooperation, facilitating communication, managing assessment results, and disseminating information. It also shows that active participation in building cognitive can be through the use of e-learning tools to facilitate the learning process (Kigundu, 2014).

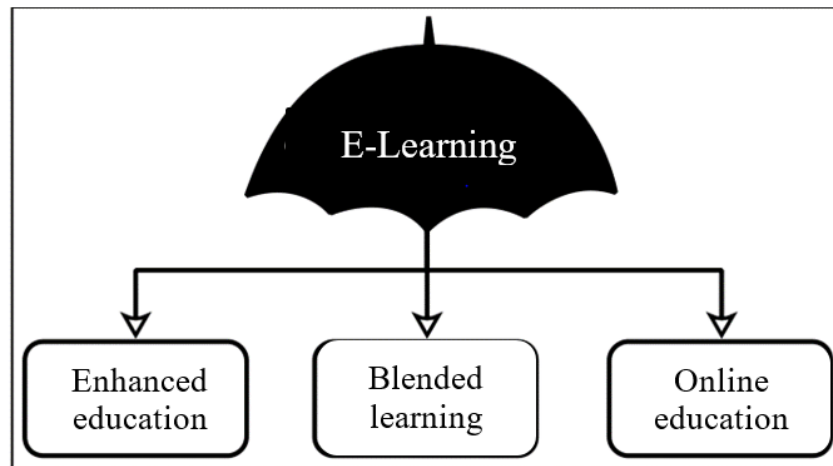
It is clear that e-learning takes place in two main areas, namely "education and training", but in terms of application formulas, there are three formulas that lie under the umbrella of e-learning as in Figure 1.

#### **2.5 Requirements for improving the quality of e-learning:**

There are requirements that must be met to achieve quality in any educational institution, and their availability is the basis for all other efforts that can be summarized (Alwan, 2021).

- Planning and managing quality assurance processes.
- Finding the appropriate environment to work in a gradual manner to implement quality.
- The importance of training before and during service and developing an effective training plan to develop the skills of work teams.
- Effective investment of available human brains.
- Availability of practical guidelines for all work within the educational sector.
- Availability of a database and statistical information within the education sector.
- Regulated scientific research should be relied upon in the educational sector, where previous studies are studied and used as a basis for decision-making and the development of educational practices.

The experiences and expertise of others in the education sector should be studied, by analyzing and evaluating similar experiences and applying what is commensurate with the reality and educational needs.



**Figure 1:** e-learning patterns.

The source: Hansen, M. (2016). Learning Management Systems Potential or utopia (Master Thesis in M.Sc. Business administration and Information Systems at Copenhagen Business School), p. 6.

## 2.6 The research methodology :

Radwan (2020) presented a measures that can be used in this paper as a descriptive approach, and the following statistical research tools were used are: arithmetic mean, standard deviation, coefficient of difference, and simple linear regression.

### 2.6.1 The research limitations:

Spatial limits: the application of the field side of the research was limited to the Iraqi University, Nahrain University, and the University of Technology.

The justifications for choosing the University of Technology are: A prior study was conducted in 2018, and the field survey noted the level of the university's achievement of the quality of educational service and its possession of technological equipment, which makes it the best example of prior technological application.

As for the Iraqi University: because it contains scientific departments similar to the University of Technology, which facilitates the comparison process between them and finding gaps in the quality of e-learning and the rest of the study variables,

While the justifications for choosing Al-Nahrain University: Al-Nahrain University was chosen because it is in the middle between the year of founding between the two universities, which leads to a more credible deepening of the research results, and the choice of the Computer Engineering major as it is the advanced department over the rest of the departments in technological improvement and reliance on electronic and computer programs. It makes us start where others left off.

Job deadlines: The periods of theoretical research and the practical component ranged between 1/4/2022 - 1/12/2022.

Cognitive boundaries: The research included two variables, the independent variable "cognitive sharing" with its dimensions (Behaviour, culture, and work teams), and the variable related to the "the quality of e-learning" with its dimensions (e-learning management, educational content, and evaluation).

Human limits: deans of engineering faculties and heads of quality departments.

### 2.6.2 Research Hypothesis:

The leading hypothesis (there is no statistically significant effect of cognitive sharing on the quality of e-learning).

- H1: There is no statistically significant effect of behaviour on the quality of e-learning).
- H2: There is no statistically significant effect of organizational culture on the quality of E-learning).
- H3: There is no statistically significant effect of the work teams on the quality of E-learning).
- H4: There is no statistically significant effect of technology on the quality of e-learning).

### 2.6.3 Hypothetical research scheme:

To clarify the logical relationships of a group of research variables, the dimensions of the variables were chosen according to the available sources, and accordingly a hypothetical scheme was developed, Figure 2 shows the scheme of the hypothetical study.

### 2.6.4 Measuring tool:

The independent variable, cognitive sharing, was measured across 18 items, distributed on four sub-dimensions represented by digital infrastructure, digital integration, digital management, work teams, organizational culture, Behavior, and technology (Abdul Latif ,2021).

The quality of e-learning, was measured across 25 items, distributed on three sub-dimensions that were manifested in e-learning management, educational content, and evaluation according to the scale.

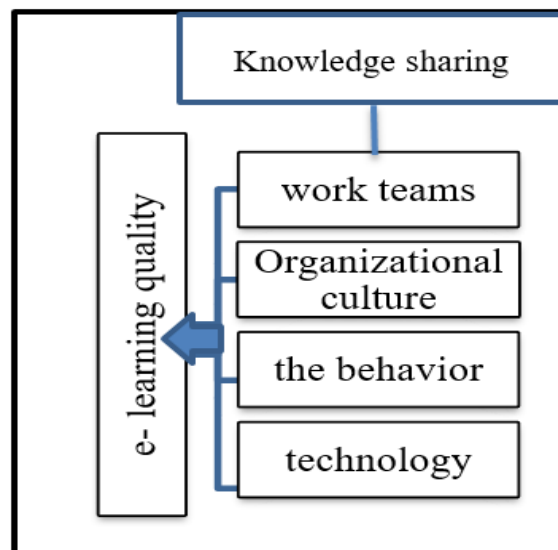


Figure 3: The hypothetical research scheme

### 2.6.5 The research community and sample:

The study population represents leaders (deans of faculties and heads of quality assurance departments) from public universities (Nahrain, Technology, and Iraqi). The method of determining the sample using the equation based on the number of items of the research variables and through the use of Stephen Thompson's statistical equation:

Sample = Number of Total Variable Items \* Average Number of Dimensional Items \* 25%  
Sample = 44 \* 5 \* 25% = 55 individuals.

The reason for choosing the percentage (25%) is due to the fact that the university community is one of the societies with medium to low response due to their many responsibilities and busyness.

Table 1 shows the demographic distribution of the research sample.

**Table 1:** The Demographic Distribution of the Research Sample

Demographic Factors	Category	Frequency	Percentage
<b>Gender</b>	Male	16	30.8
	Female	36	69.2
<b>Age</b>	31 - 40	24	46.2
	41- 50	14	26.9
	51 - 61	12	23.1
	61 – and over	2	3.8
<b>academic qualification</b>	Bachelor	4	7.7
	Master's	26	50.5
	Ph.D.	22	42.3
<b>Professional scientific title</b>	University Professor	2	3.8
	Assistant Professor	6	11.5
	Teacher	22	42.3
	assistant teacher	22	42.3
<b>university</b>	Technology University	14	26.9
	Iraqi University	18	34.6
	Nahrien University	20	38.5
<b>Experiences</b>	5 years and less	6	11.5
	From 6 to 10 years	6	11.5
	From 11 to 15 years	14	26.9
	From 16 to 20 years	14	26.9
	From 21 to 25 years	8	15.4
	More than 25 years	4	7.7

**The source:** By researchers, according to the SPSS Program.

It is clear from the above table, and there is a discrepancy between gender and age groups, but what draws attention is that some universities, represented by (Nahrain and Technological University), included professors holding a bachelor's degree and represented a percentage of 7.7%, while the percentage of holders of a master's degree represented 50.5.

This indicates that these universities encourage diversity with experiences and qualifications as long as they are of the required specialization and according to certain conditions. In terms of scientific titles, it is clear that the category (teacher and assistant teacher) is the most of the two categories, followed by the category of (assistant professor doctor) followed by the category of (professor doctor) in ascending order, and this is normal according to the organizational and administrative structure according to the departments' need for academic qualifications. Finally, according to years of experience, the category (from 11 to 15) and (16 to 20) are the two largest categories, with a similar percentage 26.9 . This indicates the dependence of the surveyed universities on the stock of cognitive and years of experience in the education process and cognitive sharing with students.



### 3. Discussion of Results :

The current item revolves around analyzing the relationships between the study's main and sub-variables using analytical statistical methods represented by Pearson's correlation coefficient (person), in an effort to identify the nature of the relationships between the main and sub-variables of each of the research variables, and to determine the extent of their attraction and convergence from their dissonance and divergence, and then explain The accuracy of the selection of these components and their belonging to one community, and the study variables were as follows: (cognitive sharing and its dimensions: Behavior, organizational culture, work teams, and technology) and (improving the quality of e-learning and its dimensions: e-learning management, educational content, and evaluation).

#### 3.1 Research hypothesis testing:

The leading hypothesis indicates that "There is no statistically significant effect of cognitive sharing on the E-learning quality" In order to verify the validity of the hypothesis or not, in this research was used a simple linear regression model for the research as it shown in Table 2 and its sub-dimensions, while The effect model of the total cognitive sharing on the E-learning quality was significant in the (F) value calculated 189.172 at a significant level 0.000 , and the coefficient value is 0.000 . Determination (R2) was 79.1 , which means that the total cognitive sharing explains 79.1% of the E-learning quality, and the effect coefficient in the (B) value amounted to 0.785 , meaning that a change of one unit of the total cognitive sharing causes a change of 0.785 percent. The quality of e-learning this result provides sufficient support to accept the alternative hypothesis "There is a statistically significant effect relationship of cognitive sharing in the E-learning quality". Hence, the regression model is:  
e-learning quality = 0.794 + 0.785 (total cognitive sharing)

**Table 2:** Results of the effect of cognitive sharing on the quality of e-learning

The independent variable	Dimensions of the respondent variable	fixed limit value (a)	Significant regression coefficients	Marginal slope value (β)	Significant marginal slope	Determination coefficient (R2)	Calculated (F) value	The tabular value of (F) is under the significant t of 0.01
Cognitive sharing	E-learning administration	1.019	0.002	0.760	0.000	%61.9	81.344	6.30
	educational content	0.843	0.035	0.754	0.000	50.7	51.371	
	Calibration and evaluation	0.579	0.037	0.826	0.000	%72.1	128.891	
	The total quality of e-learning	0.794	0.000	0.785	0.000	%79.1	189.172	

#### a. Test the first sub-hypothesis

To test the null hypothesis, which states (there is no significant effect of cognitive sharing in e-learning management), the analysis will be done according to the following equation:

$$Y1 = a + b (X)$$

The (F) value calculated to test the effect of cognitive sharing in the management of e-learning was 81.344 and at a significant level 0.000, which is less than the significance level 0.01. and thus accept the alternative hypothesis: (there is a significant effect of cognitive sharing in the management of e-learning), and through the value of the coefficient of determination ( $R^2$ ) amounting to 61.9 it is clear that the variable of cognitive sharing explains 61.9 of the variables that occur in the management of e-learning, while its percentage 38.1 is due to other factors that were not included in the regression model, and it is stated through the marginal slope value  $\beta$  of 0.760 at a significant level 0.000, which is less than the significant level 0.01, meaning that the marginal slope value is not significant. Statistically, increasing cognitive sharing by one unit will lead to an increase in e-learning administration by 0.760. The value of the fixed limit (a) in the equation was 1.019 with a significance of 0.002, which is less than the level of significance 0.05, meaning that the fixed limit statistically not significant.

**B. Test the second sub-hypothesis.**

To test the null hypothesis (there is no significant effect of cognitive sharing in the educational content), the analysis will be done according to the simple linear regression equation as:

$$Y_2 = a + b(X)$$

The value of (F) calculated to test the effect of cognitive sharing on the educational content was 51.371 and at a significant level 0.000, which is less than 0.01 the level of significant. Therefore, the alternative hypothesis is accepted, which states (there is a significant effect of cognitive sharing in the educational content), and through ( $R^2$ ) the value of the determination coefficient of 50.7, it is clear that the cognitive sharing variable explains 50.7% of the variables in the educational content, while Its percentage 49.3 is due to other factors that were not included in the regression model, and it is proven through the marginal slope value ( $\beta$ ) of 0.754 at a significant level 0.000, which is less than 0.01 the significant level, meaning that the marginal slope value is statistically insignificant, that increasing cognitive sharing by one unit will lead to an increase in educational content by 0.754. The value of the constant (a) in the equation was 0.843, with a significance of 0.035, which is less than the level of significance 0.05, meaning that the constant limit is not statistically significant.

**C. Test the third sub-hypothesis**

To test the null hypothesis (there is no significant effect of cognitive sharing on evaluation), and according to the simple linear regression equation analysis will be done as:

$$Y_3 = a + b(X)$$

As the table above shows, the value of (F) calculated to test the effect of cognitive sharing in assessment and evaluation was 128.891, with a significant level 0.000, which is less than the significant level 0.01, and based on it, the null hypothesis that states (there is no significant effect of the sharing variable Cognitive sharing in evaluation and assessment) and accept the alternative hypothesis which states (there is a significant effect of cognitive sharing in assessment and evaluation), and through the value of the determination coefficient ( $R^2$ ) amounting to 72.1 it is clear that the cognitive sharing variable explains 72.1% of the variables that occur on Assessment and assessment, while a percentage of 27.9 is due to other factors that were not included in the regression model. It is evident through the value of the marginal slope ( $\beta$ ) of 0.826 that an increase in cognitive sharing by one unit will lead to an increase in assessment and electronic assessment by a percentage of 0.826. While the value of the fixed limit (a) in the equation was 0.579, with a significance of 0.037, which is less than the level of significance 0.05, meaning that the fixed limit is not statistically significant.

This result allows sufficient support to reject the fourth sub-hypothesis, "There is a statistically significant effect of technology on the quality of e-learning." And accepting the alternative rejection "There is no statistically significant effect of technology on the quality of e-learning." Thus, the regression model is as follows:

$$\text{E-learning quality} = 1.577 + 0.518 (\text{technology})$$

### 3.2 Multi-linear effect:

On testing the main hypothesis: which states (there is no statistically significant effect of the dimensions of cognitive sharing Z on the quality of e-learning Y).

The researchers used the general multiple linear regression analysis and the sequential multiple linear regression method (Back Ward) in order to exclude non-significant dimensions from the regression model. As it appeared through the general model that the calculated (F) value is 68.835 with a significance of 0.000, meaning that the model is statistically significant, and the value of the coefficient of determination was 0.854. By using sequential multiple linear regression using the (BACK WARD) method, three models were obtained, and through the third model (the best), the value of the (F) test calculated for the model was 92.434, with a significance of 0.000, which is less than the level of significance 0.01 to indicate the significance of the model. And its statistical acceptance and the acceptance of the hypothesis in general, and the value of the determination coefficient 0.852 appeared, meaning that the dimensions of cognitive sharing Z (Z1 behavior, Z2 organizational culture, Z3 work teams) were able to explain 85.2% of the changes that occur in the quality of e-learning Y, While the remaining percentage 14.8% is attributed to other variables that were not included in the best model, and this model is considered strong and reliable in explaining the phenomenon of the quality of e-learning Y. As for the level of influence of the model components, it was found through the third model that there is a statistically significant effect At the significant level 0.01 for the dimensions (work teams Z3, behavior Z1, organizational culture Z2), as the values of the regression coefficients were 0.197, 0.598, 0.228. With a calculated (t) value 2.931, 6.090, 3.123 and significant 0.005, 0.000, 0.003. Which is less than the level of significance 0.01. As for the dimension (Z4 technology), it was excluded from the regression model because its effect was not statistically significant 0.05 significant level 0.05, and table 3 can describe this data.

**Table 3:** The effect of cognitive sharing dimensions Z on the quality of e-learning Y

independent variables	independent variable: cognitive sharing z						
	$\alpha$	$\beta$	t	Sig	R <sup>2</sup>	F	Sig
Z1 behavior	-0.179	.607	6.109	.000	0.854	68.835	0.000
Z2 organizational culture		.244	3.195	.002			
Team work Z3		.241	2.694	.010			
Z4 technology		-.067	-.750	.457			
Third model (best)							
independent variables	$\alpha$	$\beta$	t	Sig	R <sup>2</sup>	F	Sig
Teamwork Z3	-0.173	.197	2.931	.005	0.852	92.434	0.000
Z1 behavior		.598	6.090	.000			
Z2 organizational culture		.228	3.123	.003			
excluded independent variables	Dependent variable: cognitive sharing z						
		$\beta$	t	Sig			
Z4 technology		-0.101	-0.750	.457			

Through the results reached by the researcher, which are shown in Table 3, the main hypothesis is rejected and the alternative hypothesis is accepted, which states that "there is a statistically significant effect of the dimensions of cognitive sharing Z on the quality of e-learning Y" according to the following equation:

$$\text{E-learning quality } Y = (-0.173) + 0.197 * Z3 \text{ work teams} + 0.598 * Z1 \text{ behavior} + 0.228 * Z2 \text{ organizational culture.}$$

### 3.3 Descriptive Statistics:

#### 3.3.1 Presenting the results of the respondents' responses to the cognitive sharing variable:

The item reviewed the levels of cognitive sharing. Table 4 shows a general arithmetic mean 3.66, which is a value that means the choice of approval for most axes of the dimensions of the cognitive sharing, and there was a little dispersion in the answers, as the standard deviation and coefficient of difference was 0.64 and 17.54%, and that percentage indicates the agreement of most respondents with the presence of strategic quality management, and it was measured in four main dimensions, and the results will be presented in this table:

**Table: 4** Descriptive statistics of the cognitive sharing variable

	content	Arithmetic mean	standard deviation	coefficient of difference	Relative importance	seq
1	The university (college) is constantly striving to stimulate the exchange of experience between professors and with other universities.	3.46	0.85	24.58	69.23	5
2	I trust the abilities of the university (college) to promote cognitive sharing with professors and the community.	3.65	0.88	24.17	73.08	4
3	Professors are keen to share their cognitive.	3.88	0.65	16.64	77.69	2
4	I benefit from cognitive sharing such as increased experience and new cognitive transfer.	4.12	0.51	12.41	82.31	1
5	Cognitive sharing leads to career advancement.	4.23	0.85	20.20	84.62	3
	Behavior (X1)	3.87	0.42	10.73	77.38	
6	The university (college) encourages the exchange of ideas among professors.	3.92	0.88	22.49	78.46	2
7	The university (college) motivates teamwork among professors.	4.08	0.79	19.34	81.54	1
8	The administrative system of the university (college) facilitates the cognitive sharing process and simplifies its procedures.	3.62	1.09	30.08	72.31	5
9	The university works to create a climate of trust, solidarity and a cooperative environment among professors.	3.65	0.97	26.49	73.08	3
10	There is a perfect harmony of values between the university administration (college) and the professors.	3.54	1.06	29.86	70.77	4
	Organizational Culture (X2)	3.76	0.75	20.03	75.23	
11	There are work teams interested in achieving cohesion and integration among the professors.	3.35	1.05	31.25	66.92	3
12	There are research teams that provide opportunities to renew ideas and deepen research.	3.00	1.19	39.61	60.00	4
13	The university (college) supports teamwork relations in research activity within and outside its borders.	3.54	0.94	26.52	70.77	1

14	The university (college) administration, with the participation of its professors, organizes various scientific activities with the participation of its professors.	3.62	1.01	28.01	72.31	2
	Work teams (X3)	3.38	0.89	26.26	67.50	
15	The university (college) is keen to provide technology to control cognitive and generate new cognitive.	3.38	1.05	31.04	67.69	3
16	Extensive use of available technology is made for cognitive sharing.	3.69	0.92	24.89	73.85	2
17	The university (college) harnesses the available technology to facilitate and simplify the coordination of cognitive among professors.	3.50	1.09	31.25	70.00	4
18	The university (college) continuously publishes available and renewable cognitive.	3.58	0.80	22.38	71.54	1
	Technology (X4)	3.54	0.85	23.88	70.77	
	Cognitive sharing (X)	3.66	0.64	17.54	73.12	

The source: By researchers, according to SPSS.

**a.** Results of the Behaviour Dimension in Table 4 presents an arithmetic mean for the behaviour dimension 3.87, which means a high level of participatory good behaviour among individuals in terms of cognitive sharing among them, which was more than the standard mean, and little dispersion as the standard deviation and coefficient of difference reached 0.42 and 10.73%. As for item number 50 Achieved the highest arithmetic mean by reaching 4.23 which stated that (cognitive sharing achieves career advancement) and with moderate consistency in the responses, as the standard deviation and coefficient of variation reached 0.85 and 20.20%, while item number 46 the university (college) constantly seeks to stimulate the exchange of experience between professors and with other universities) achieved the lowest arithmetic mean by reaching 3.46, with average consistency in the answers, as the standard deviation and the coefficient of variation reached 0.850 and 24.58%.

**B.** Organizational Culture Dimension results in Table 4 shows an arithmetic mean for the organizational culture dimension 3.76, which is a fair value that indicates approval and that means a high level of organizational culture in these universities 20.03%. As for items, item 52 made the highest arithmetic mean by reaching 4.08 (the university (college) motivates team-works in a team spirit among professors), as the standard deviation and coefficient of difference reached 0.79 and 19.34%, and item 55 (there is complete harmony in values between the university administration (college) and professors) achieved the lowest arithmetic mean by reaching 3.54, with average consistency in the answers, as the standard deviation and coefficient of difference reached 1.06, and 29.86%.

**C.** On the other hand, work difference dimension results in Table 4 presents the arithmetic mean for the work difference dimension 3.38, which is more than the standard mean, and with little dispersion, as the standard deviation and the coefficient of difference reached 0.89 and 26.26%, but item No. 57 achieved the highest arithmetic mean, reaching 3.00 (there are research teams that provide opportunities to renew ideas and deepen research) and with moderate consistency in the answers, as the standard deviation and coefficient of difference reached 1.19 and 39.61%, and the item achieved 59 The university (college) administration organizes various scientific activities with the participation of its professors) the lowest arithmetic mean by reaching 3.62, with an average consistency in the answers, as the standard deviation and the coefficient of variation reached 1.01 and 28.01%.

D. although technology dimension results in Table 4 shows an arithmetic mean for the technology dimension 3.54, which indicates agreement on the importance of the technology dimension in general to achieve cognitive sharing, which is higher than the standard mean, and with little dispersion as the standard deviation and coefficient of variation reached 0.85 and 23.88%, and at the level of items, item No. 61 achieved the highest arithmetic mean by reaching 3.69 (there is extensive use of available technology for cognitive sharing as the standard deviation and coefficient of variation reached 0.92, and 24.89%, and item 60 (The university (college) is to provide technology to control cognitive and generate new cognitive) achieved the lowest arithmetic mean, as it reached 3.38 percent, with average consistency in the answers, as the standard deviation and coefficient of variation reached 1.05 and 31.04%.

### 3.3.2 Presenting the results of the respondents' responses to the e-learning quality variable

Table 5 shows a general arithmetic mean 3.66, which is a value that indicates agreement with the variable of e-learning quality in terms of its dimensions in general, which is more than the standard mean, and with little dispersion in the answers, as the standard deviation and the coefficient of variation were 0.57 and 15.45%, this result indicates that these universities have a good quality of e-learning, and it has been measured in three dimensions:

A. The e-learning administration results in Table 5 presents an arithmetic mean for the e-learning administration dimension 3.80, a value that highlights e-learning management and the importance of scheduling it within college councils and university presidencies. Which is more than the standard mean, with little dispersion, as the standard deviation and coefficient of difference 0.62 and 16.31%. As for the items, Number 23 achieved the highest arithmetic mean by reaching 4.04. The coefficient of difference is 0.95 and 23.5%, and item 24 (the university (college) has an information system for students linked with the education management system integrated software tests.) had the lowest arithmetic mean, as it reached 3.54, with average consistency with the answers, as the standard deviation and coefficient of variation were 1.06 and 29.86%.

B. Educational content dimension results in Table 5 shows an arithmetic mean for the educational content dimension 3.60, which refers to approval of most items of this dimension, which means higher than the standard mean, and with little dispersion, as the standard deviation and coefficient of variation has reached 0.68 and 18.87%. Therefore, item 30 achieved the highest arithmetic mean by reaching 3.96 (the university (college) works to store all information about students electronically). And with moderate harmony with answers, as the standard deviation and the coefficient of difference reached 0.95 and 23.95%, while item 33 has achieved the university has a platform for huge electronic educational competitions and supports open educational content for use in academic training courses and lifelong learning. The lowest arithmetic mean was 3.12, which means neutral in general and with average harmony with the answers, as the standard deviation and the coefficient of difference reached 0.90 and 28.89%.

C. Lastly, evaluating results in Table 5 shows an arithmetic mean 3.66, which refers to the selection of the approval category by the sample for the importance of evaluation stage for deviations if any, and the evaluation of the implemented process, which is more than the standard mean, and with little dispersion, as the standard deviation and coefficient reached. The difference is 0.57 and 15.45%. Item 38 achieved the highest arithmetic mean by reaching 3.81. The normative and coefficient of difference 0.84 and 9% 22.0, and item 37 (the university makes sure that students actually acquire the cognitive and skills required during the e-learning process and that it contributes to sparking scientific discussion and using critical thinking) had the lowest average mathematically, it reached 3.19 as a neutral category with average harmony with the answers, as the standard deviation and the coefficient of difference reached 0.97 and 30.41%.

**Table: 5** Descriptive statistics of the quality of e-learning variable

	content	Arithmetic mean	standard deviation	coefficient of difference	Relative importance	seq
1	The platform contains a digital content management system and management of learning events.	4.00	0.74	18.52	80.00	1
2	The platform approved by the university (college) contains a system for conducting electronic exams and tests within its software design.	3.88	0.76	19.51	77.69	2
3	Compatibility of testing and examination systems with the used platform is constantly ensured.	4.04	0.95	23.50	80.77	3
4	The university (college) has an information system for students linked with the education management system integrated software exams.	3.54	1.06	29.86	70.77	7
5	The university (college) has a student information system from a class that is not linked with the education management system.	3.62	0.89	24.59	72.31	4
6	The university (college) provides training programs for its teaching staff and students on how to effectively use the approved platform.	3.77	1.20	31.79	75.38	8
7	The university (college) provides the necessary supplies for e-learning, such as the Internet, computers, video recording devices, and places to record lectures.	3.58	1.05	29.48	71.54	6
8	The university (college) has a team that provides technological and technical support to all users of the educational platform and reviews and evaluates the e-learning process and updates it periodically	3.96	0.99	24.97	79.23	5
	E-learning management (Y1)	3.80	0.62	16.31	75.96	
9	The university (college) sets the goal of developing e-learning within its strategic plan.	3.77	0.81	21.42	75.38	1
10	The university (college) stores all information about students electronically.	3.96	0.95	23.95	79.23	4
11	The educational platform contains an electronic library linked to the educational platform and cloud storages.	3.38	0.97	28.76	67.69	6
12	The curriculum is designed according to SCORM standards.	3.27	0.72	21.94	65.38	2
13	The university (college) has a platform for massive electronic educational competitions and supports open educational content for use in academic training courses and lifelong learning.	3.12	0.90	28.89	62.31	7

14	The university (college) follows learning strategies and methods of teaching electronic educational content.	3.88	0.86	22.02	77.69	3
15	Software applications are approved to teach digital skills.	3.81	0.93	24.42	76.15	5
	educational content (Y2)	3.60	0.68	18.87	71.98	
16	The university (college) has practical procedures to ensure that e-learning achieves the goals of the academic program.	3.46	0.80	23.21	69.23	3
17	The university (college) makes sure that students actually acquire the required cognitive and skills during the e-learning process, and that it contributes to sparking scientific discussion and using critical thinking.	3.19	0.97	30.41	63.85	8
18	Students are evaluated according to the intended learning outcomes in the course descriptions.	3.81	0.84	22.09	76.15	2
19	The university (college) conducts rapid, monthly and final exams according to secure electronic programs.	3.73	0.87	23.21	74.62	# 3
20	The university (college) evaluates the activities presented by the student in academic objective articles and scientific projects electronically.	3.62	0.89	24.59	72.31	5
21	Students are evaluated by the number of participants in the discussion and the presentation of ideas electronically.	3.81	0.89	23.28	76.15	4
22	The university (college) monitors and evaluates students' discussion groups and learning outcomes achieved from peer interaction, and informs students of that.	3.31	0.92	27.79	66.15	7
23	The university (college) provides feedback to students about their education levels.	3.77	0.94	24.98	75.38	6
24	The electronic evaluation process for students is characterized by transparency and integrity.	3.73	0.72	19.22	74.62	1
25	The university (college) works to use the evaluating results to improve and develop e-learning.	3.58	1.13	31.49	71.54	9
	Rating and Evaluation (Y3)	3.60	0.62	17.34	72.00	
	The quality of e-learning	3.66	0.57	15.45	73.26	

Source: By researchers, according to the SPSS.



#### **4. Conclusion:**

The most important conclusion is that the management work rewards the good behavior of the employees and tends to choose a group to perform the work from individual activities. In addition to encouraging the universities under study to exchange experience between professors and with other universities to achieve progress and avoid unstudied mistakes. Hence, it was noticed that there is harmony between the values of the university and the values of the professor, and the professors participate in research teams to solve the problems of society and adopt technology in the opportunity of communication and cognitive sharing. In addition to the aforementioned, it is worth noting that the quality of e-learning in the universities under study was well applied and occupied after education management, followed by assessment and evaluation, and the educational content dimension occupied a close rank, as the universities under study were based on information systems for students linked with university information systems and keen to harmonize them with systems of educational platforms and tests. Thus, the university administration stores the students' information, educational and educational information according to the standards of the students and according to the education standards that the student is required to acquire in the use of different methods of analytical thinking, critical thinking, exploratory thinking, and others. It is necessary to train the teaching staff on how to work within work teams and to acquire communication skills between the team. Therefore, cooperation should be managed with local and foreign universities to exchange experiences between professors and students, and systems of knowledge communities that work on learning and participate in everything and whenever possible.

It is preferable to administer the accreditation for advanced information technology, which helps in understanding information about students and the status of managing educational information and activities easily, and adopting high security systems to protect private information.

#### **Authors Declaration:**

Conflicts of Interest: None

-We Hereby Confirm That All The Figures and Tables In The Manuscript Are Mine and Ours. Besides, The Figures and Images, Which are Not Mine, Have Been Permitted Republication and Attached to The Manuscript.

- Ethical Clearance: The Research Was Approved By The Local Ethical Committee in The University.

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## دور التشارك المعرفي في تعزيز جودة التعليم الإلكتروني بحث تحليلي لعينة من الجامعات العراقية

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### مستخلص البحث:

واجه العالم العديد من تحديات التواصل في عام 2020 بعد جائحة كوفيد-19، أهمها استمرار التعليم. ولذلك هدف البحث إلى تحليل الواقع الحالي للجامعات المدروسة من حيث نقاط القوة والضعف وقياس مستوى تنفيذ متطلبات جودة التعليم الإلكتروني. يدرس هذا البحث أثر تبادل المعرفة بأبعادها (السلوك، الثقافة التنظيمية، فرق العمل، التكنولوجيا) على جودة التعلم الإلكتروني وأبعادها (إدارة التعلم الإلكتروني، المحتوى التعليمي، التقويم والتقييم). وبعد إجراء الاستطلاع تبين وجود اختلاف في تطبيق الجامعات لمتطلبات جودة التعلم الإلكتروني، حيث أجريت الدراسة في الأقسام الهندسية في الجامعات الحكومية العراقية (النهرين، والتكنولوجيا، والعراقية). وتم اختبار الاستبانة كمقياس لمتغيرات البحث والعلاقة بينهما من خلال اختبار عينة ضمت 52 إدارياً تم توزيعهم على القادة (عمداء الكليات ورؤساء أقسام ضمان الجودة). وتم اعتماد المنهج الوصفي التحليلي، بالإضافة إلى استخدام بعض الأساليب الإحصائية للبرنامجين (AMOS, V.25) (SPSS v.25). وأشارت نتائج البحث إلى أن الجامعات التي شملتها الدراسة طبقت التبادل المعرفي بدرجة متوسطة، وحصل البعد السلوكي على المرتبة الأولى، بينما جاءت الثقافة التنظيمية والتكنولوجيا وفرق العمل جيدة. يوجد أثر ذو دلالة إحصائية لتبادل المعرفة على جودة التعلم الإلكتروني، كما أشارت إلى أن لتبادل المعرفة تأثير مباشر على أبعاد التعلم الإلكتروني.

### نوع البحث: ورقة بحثية.

المصطلحات الرئيسية للبحث: التشارك المعرفي، التعليم الإلكتروني، جودة التعليم الإلكتروني.

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