

## **The Impact of Academic Innovation on Information Technology (A Field Study of a Sample of Academic Basra University)**

By

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### **Abstract**

The current study aims to reveal the impact of innovation in its dimensions (originality, Flexibility, sensitivity to problems, and Analysis & Synthesis) in information technology, this study was applied and tested on a sample of the academicians of the University of Basra, as their number reached (365) academic. They were selected using the (simple random sampling) method, and the questionnaire was adopted as a tool for data collection through the use of a set of statistical methods available in the programs (SPSS.V.24 & AMOS.V.24), and the results showed that there is a positive impact of innovation and its dimensions in technology the information. Practical implications. The results of the study can be used to develop innovative methods and capabilities, which will reflect positively on improving the advanced use of information technology. Therefore, the increased interest in this field will increase the opportunity of the university in question to achieve its goals and raise the level of its general performance.

**Keywords:** academic innovation. - Information Technology

### **Introduction**

The spread of information technology has led to a rapid technological, social, political and economic transformation that has taken place in a networked society organized around information technology. There is no doubt that this technology has affected the educational process in terms of quality and quantity of teaching, learning and research in traditional and distance education institutions (Yusuf, 2005:316). Therefore, all educational institutions must respond to technological developments in order to be able to constantly improve their operations and keep pace with their competitors, through their various applications that lead to changing jobs and working relationships inside and outside the educational institution, as they contribute directly and indirectly to increasing the processes of innovation and creativity and raising the level of performance (Zarei et al., 2014:312). The International Society for Technology in Education (ISTE) emphasizes that today's academics must prepare to provide students with technology-based learning opportunities. In fact, preparation for the application of technology and awareness of technology to improve the quality of the educational process should be one of the most important basic skills of teachers (Hamidi et al., 2011: 370). This is because of its positive impact on improving the performance of the educational institution (Santos et al., 2020: 1015-1016). As (Kirkwood & Price, 2013:11) confirmed that enabling academics to make proper use of information technology is a technical issue, leading to a

variety of purposes that IT is expected to provide, such as: increasing accessibility, flexibility, developing the professionalism of lectures, scientific research, and self-improvement. And as the university is the arena of thought and the cornerstone in the process of construction and development, therefore, the academic should be the source of thought and the basis of the process of innovation and renewal, as it is characterized by the highest level of scientific mastery (Balgalm, 2021: 6). As (Youssef, 2018: 140) indicates that one of the indicators of academic efficiency in higher education is innovation in his performance, because it is one of the main tasks of faculty members in universities, as it links achievement and self-confidence in teaching and inventive learning that good academics realize and try reinforce it (Davies, 2000: 18). In addition, it is a basic requirement among the demands that are the supreme goal of institutions, as any institution that neglects innovation judges itself to be backward and fail, the more institutions pay attention to innovation, the more this will have a clear impact on their survival (Schermerhorn, 2000:678). Accordingly, the practice of inventive methods is an important matter in the educational institution, as it supports academic performance and helps in revealing different talents, in addition to that, it identifies the barriers that limit their practice (Yehya, 2020: 16).

And because the University of Basra is one of the largest and oldest Iraqi universities, and because it realizes the importance of academics in improving and developing its performance, it has trained and qualified them, for the purpose of creating an educational base capable of keeping pace with the course of the modern era, the era of advanced information technology on the one hand, and the development of inventive capabilities on the other.

## **1- Methodological framework**

### ***1.1. Research Problem***

The spread of information technology policies and practices in higher education has led to radical changes in the traditional academic roles of faculty members (Larbi-Apau et al., 2012: 222), especially after the challenges that universities witnessed in light of the pandemic crisis (COVID-19) that led To the need for academics to use electronic educational platforms for the purpose of continuing the educational process (Onyama et al., 2020: 108). Therefore, higher education institutions realized the need to focus on the competencies and skills of academics in order to be able to activate information technology methods in their activities. Nevertheless, the technologies used in higher education institutions are often far behind the technological applications necessary to improve the quality of higher education (Revere & Korach, 2011: 114), on the one hand, and on the other hand indicates (Yazgan & Emre, 2016:25-27) that the promotion and support of inventive methods in the educational institution would lead to its improvement, as the awareness of the academic and his knowledge of innovation has a profound impact on enhancing the educational and research process, but despite this, many researchers have emphasized (Shrik, 2010; Boldon et al., 2010; Baniya, Guragain, & Subedi, 2021; Gharde, Sharma, & Kandasubramanian, 2020). that the academic's general knowledge of innovation is very limited, as most of their opinions on innovation focus on the concept of inventive teaching rather than teaching for innovation. Therefore, the stagnation in the inventive thought of the academic is one of the most important challenges facing universities to upgrade from traditional methods to modern and more effective methods to improve their performance (Asmaa, 2016; Ma et al., 2021).

Accordingly, if the University of Basra wants to improve and develop its performance for the purpose of occupying high positions in the hierarchy of local and international universities, it should spread a culture that promotes the adoption of inventive methods and

provide the necessary technological infrastructure for that. Based on the foregoing, the problem of the study was reached, represented by the following question:

*(What is the extent of the impact of academic innovation on information technology at the University of Basra?)*

### **2.1. Research Objectives**

The study question leads to a set of objectives, as follows:

- 1) Getting to know the reality of developing and using inventive methods in managing the tasks of academics at the University of Basra.
- 2) To test the direct influence relationship between the dimensions of the independent variable (innovation) and the dependent variable (information technology).

### **3.1. Research Importance**

- 1) The current study represents a cognitive enrichment for the Iraqi library in the field of (IT, and academic innovation), including what will be included in the theoretical side of his summary of the researchers' ideas and their cognitive contribution in determining the relationship between research variables.
- 2) Presenting the results of the relationship between the research variables in a way that shows the strengths and weaknesses of the decision-makers in the researched university, which can be used to improve its performance.

### **4.1. Research Design**

The design of the study represents the master plan on the basis of which all methods and procedures are determined for collecting, measuring and analyzing the data required to enhance the goals that were identified during the early stages of the study, and to ensure that all the data collected is appropriate to address the problem (Zikmund et al., 2013: 66 ). The analytical descriptive approach has been adopted, which depends on collecting and analyzing data for the case in which it is investigated, and then presenting a set of conclusions and recommendations regarding them (Coopr & Schindiere, 2014:22).

### **5.1. Research Population and Sample**

Representing the research community at the University of Basra (colleges and centers). As for the research sample drawn at random, it was selected based on the population of (2916) academics. Relying on the statistical table provided by researchers (Sekaran & Bougie, 2016:263-264), the appropriate sample size of (341) teachers was determined as a minimum. For the purpose of getting closer to the community, the two researchers relied on the distribution of (365) questionnaires at the University of Basra.

### **6.1. Data collection methods**

The researchers used a number of tools to obtain the data and information necessary to achieve the purpose of this research, both theoretical and field, as follows:-

Theoretical side: The researchers relied on a number of studies (Arabic - foreign) closely related to the current field of research, represented by scientific references from (dissertations and theses, articles, books, conferences, research, in addition to the global information network (Internet)).

The field side: In covering the field side of the research, the researchers used the

questionnaire for the purpose of data collection. It included a number of questions for the respondent to answer, by choosing one of the specific alternatives. The final questionnaire included (44) items, and the five-point Likert scale was adopted to measure the response and responses of the respondents, which is graded on the basis of the following answers (1. Totally not agree, 2. disagree, 3. neutral, 4. agree, 5. totally agreed), Table No. (1) shows the study's standards and the sources that were relied upon.

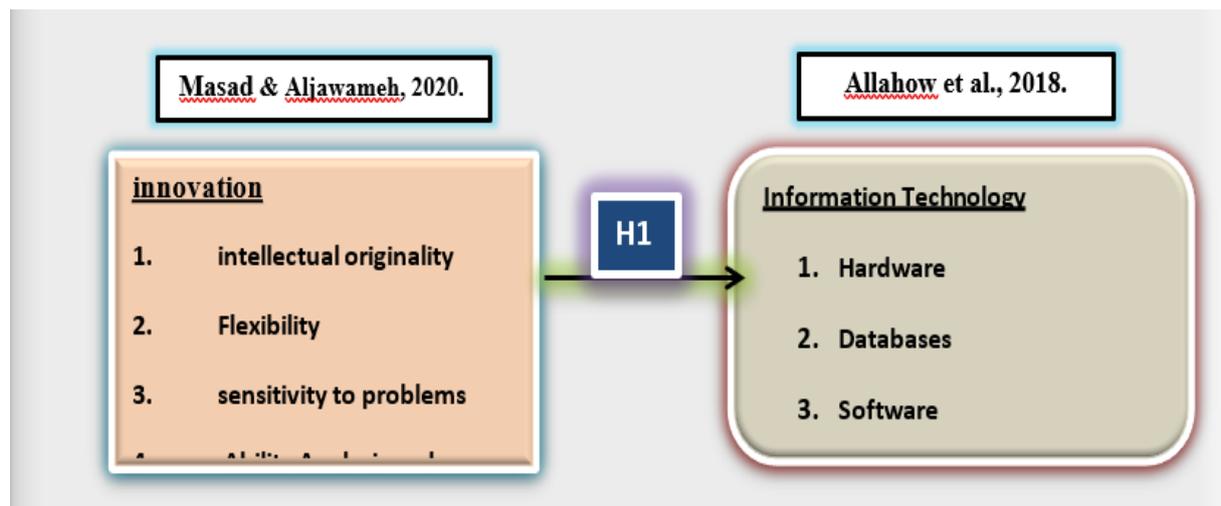
**Table No. (1) Study standards and sources**

main variable	sub-variables (dimensions)	items	sources
innovation	intellectual originality	1-6	Masad& Aljawameh,2020; Lin& Wu,2016.
	Flexibility	7-12	
	sensitivity to problems	13-17	
Information Technology	Ability Analysis and Synthesis	18-22	Allahow et al.,2018; O Brien& Marakas,2011.
	Hardware	23-28	
	Databases	29-34	
	software	35- 39	
	Networks	40-44	

Source: Prepared by the researchers.

### 7.1. Research hypothesis

The hypothesis of the research was built, in which the nature of the relationship between the two variables and their dimensions were clarified, on the basis of which the research problem was formulated, as shown in the following figure:



**Figure (1) The hypothesis diagram for the research**

Source: Prepared by the researchers, based on the aforementioned sources.

### 8.1. Research hypothesis

Depending on the research model in Figure (1), the main hypothesis can be formulated as follows:

H1: There is a direct, positive and statistically significant impact relationship between the dimensions of innovation and information technology. From this first main hypothesis, a number of the following sub-hypotheses are derived:

H1a: There is a direct, positive and statistically significant impact relationship between intellectual originality and information technology.

H1b: There is a direct, positive and statistically significant impact relationship between flexibility and information technology.

H1c: There is a direct, positive, statistically significant effect relationship between sensitivity to problems and information technology.

H1d: There is a direct, positive, statistically significant impact relationship between Ability Analysis and Synthesis and information technology.

### **9.1. Statistical Methods Used in Research**

The researchers used a number of ready-made statistical techniques in entering and analyzing data for the research variables and testing their hypotheses, which are represented in the SPSS, V.24 & AMOS, V.24 program), such as the following tools:

- 1) Validity and Reliability: - Cronbach's  $\alpha$  and Item-Total-Correlation.
- 2) Normal distribution: - Skewness and Kurtosis.
- 3) Arithmetic mean.
- 4) Pearson's Correlation Analysis.
- 5) Regression Analysis.
- 6) Standard Deviation.

## **2- Theoretical framework**

### **2.1 innovation concept**

This term has its roots in the Latin word (Innovove), which means renewal (Gundogdu, 2012: 299). (Yilmaz, 2010:3950) believes that the concepts of organizational innovation and innovation are interconnected, as organizational innovation refers to “the situation that emerges from the ability of individuals to design new ideas and processes”, while innovation refers to “the process of transforming existing products into unique products or obtaining on a unique product” and agrees with this argument (Jugend et al., 2018:55). He sees that innovation is "a multi-stage process in which organizations transform ideas into new or improved products, services, or processes for the purpose of progress, competition, and excellence in their business." It is necessary to know some concepts synonymous with innovation. A distinction should be made between innovation and innovation, as they are important and unique concepts that are tainted by confusion and lack of distinction by many researchers and writers. innovation means “dealing with innovation ideas, innovation and experiences through excellence in the product, service or performance” while innovation “refers to the process of finding and developing a new product, service or performance (ELTallaetal., 2018: 217). innovation has become a primary goal to work in the advanced educational systems, through the development of plans, programs, alternatives and good curricula, the contribution of the specialized teaching method to the curricula, the development of inventive thinking, raising their motivation for innovation, and the application of teaching methods based on the scientific method (Mrayyan, 2016: 82). Therefore, the institutions of Higher education needs to see innovation within the important role it plays in preparing individuals for an uncertain and more complex world of work, a world that requires individuals to use their innovation as well as their analytical abilities (Papaleontiou et al., 2014:136).This indicates that education in educational institutions Higher education is an area in which continuous innovation is required (Akin, 2016: 245), because higher education institutions are more obligated than other educational institutions to adopt programs that encourage innovation that works to improve the level of higher education, as it is the closest gateway through which the graduate student enters the labor market (Hannan, 2005: 980). innovation in higher education institutions depends mainly on the people who make up the higher education community, so the more academics understand innovation, innovation learning and motivation, the more they are able to help enhance the

innovation of their students (Turner & Day, 2012: 8).

## ***2.2. dimensions of innovation***

The researchers and writers presented many studies that enable individuals to perform actions that are characterized by innovation and innovative abilities, and to show the mental potential of individuals and their willingness to show outstanding inventive behavior, which is one of the necessities of life. It represents the processes through which institutions achieve full coordination and cooperation between activities and departments (Purnomo, 2019:13).

Through the literature that dealt with the issue of innovation, the researchers concluded that there is almost agreement between researchers and writers on defining the basic dimensions of innovation, without which it is not possible to talk about the existence of innovation because of its importance in measuring and determining the level of innovation, whether at the level of the individual, group or institution. In their study, most researchers have addressed the following dimensions of innovation, which are:

### ***2.2.1 Originality***

It is described as the topics most related to innovation and is characterized by seriousness and usefulness as it is in continuous renewal and brings unique and rare inventive ideas that no one has (De Dreu & Nijstad, 2008: 740). It is represented in the departure of individuals from the traditional way of thinking and thinking in a more modern way, to discover the original ideas, since originality represents the imagination and anticipation of everything that is new, and the lack of adaptation with the reality and the desire to create new and rare ideas, and individuals with high levels of originality generate high levels of innovation (Song et al., 2017:5).

### ***2.2.2. Flexibility***

It means that the individual presents various ideas in the essence of the meaning so that there is no one type of solution, as he can change the meaning or interpretation, and it also means looking at things with a new perspective other than what people are accustomed to (Shujahat et al., 2017:12). (Majid & Yasir, 2017: 3) believes that the basis of the innovation process in the organization is flexibility, which is a source for facing the challenges of the constantly changing environment and rapid technological changes demanding the provision of new services, and because of these changes, the ability to perform tasks across diverse professional boundaries has traditionally become more strategic for emerging economies.

### ***2.2.3 Sensitivity to Problems***

It means the ability to understand the different aspects of the problem and then create new connections (Giampietro & Carallera, 2007:457). It also represents the willingness of individuals to use advanced scientific methods at work, in order to solve problems and make the right decisions based on extensive scientific studies. The inventive person is the one who can see the problems in the same situation and identify the shortcomings and lack through his view of the problem is unfamiliar and different from the usual (Chirico et al., 2018: 124).

### ***2.2.4 Analysis & Synthesis***

Each of (Amina, 2020: 29; Taura & Najai, 2017: 137) explains the difference between analysis and linkage. The analysis refers to the ability to break up compounds into their primary elements and isolate these elements from each other. The explanation for this is that any topic is not called a problem unless it is complex and composed of parts, some of which are mysterious and ambiguous in others. The first thing that should be done is to analyze the collected material, and then the problem will be resolved into a set of issues that help to

understand the complex element. As for, it Synthesis is the combination of various things that already exist in something that does not exist yet, it represents the ability to form the elements of experience, and form them into a new construction and interconnection, or it is the ability to realize and explain the relationships between effect and cause and then deduce or synthesize new relationships.

### ***2.3 IT concept***

Information technology, with its advanced tools, is of great importance, as nothing has affected human life since the Industrial Revolution as it has (IT), which has become indispensable in the lives of peoples, institutions and countries (Wen et al., 2011: 93). As this term emerged at the beginning of the forties with the development of electronic computer vocabulary with its technologies, software and systems, and with the advent of the information age and the spread of the technology of the digital world and global communication networks (Zaqout et al., 2018:7). As this technology unified the limits of distances and converged forms of transactions (Shamsan & Otieno, 2015:1). Information technology has become the backbone of information systems in all institutions, due to the great support it provides in the implementation of various operations. Especially with regard to the educational process to fit with the developments the world is witnessing, specifically after the 2020 (COVID-19) pandemic, which led to the disruption of all institutions from work, and as a result of declaring emergencies in all countries, educational institutions worked to quickly transition to online education by relying on technological means. Modern (Basilaia & Kvaradze, 2020:1). For the purpose of identifying the concept of information technology, it is necessary to know some concepts related to it, including (technology). The term (technology) refers to an ancient Greek word composed of two syllables *techne*, which means “technical skill” and (*logos*) which means “science or profession.” It refers to the description of the process of organizing technical skill (Webster, 2006:9). Based on the foregoing, the term information technology refers to “it is one of the tools that people use to adapt to changes, and it consists of hardware, software, database and communication network, all of which represent resources and constitute the technological infrastructure of the institution on which it depends to build its information system” (Laudon & Laudon, 2014: 195). Many studies have pointed out the importance of technology in digital transformation. IT is considered the most effective for the success of digital transformation in educational institutions. Digital transformation can only be achieved if it is based on a corporate culture geared to digitization, and the latter can only be embodied through the presence of human capital adapted to this challenge (Leignel et al., 2017:20; Amro, 2022: 2). (Spremic, 2017:222) suggested that if educational institutions wish to commit to digital transformation, it would be very useful to improve information technology tools, especially those related to focusing on investment in (IT) (supporting university leadership for IT management and facilitating the flexibility and standardization of digital infrastructure).

### ***2.4 dimensions of information technology***

The interest in the elements of technology helps to link the different administrative functions to each other, eliminate duplication, reduce errors and improve decision-making capabilities, which leads to more efficient performance (AL-Hawary et al., 2017:149). Given the different opinions of writers and researchers, especially in the field of information technology, defining the dimensions of this technology has become a major requirement. The most important dimensions of (IT) can be presented, which are as follows: -

#### ***2.4.1 Hardware***

It includes all physical devices that are used to process information, and this is done through the process of data entry, processing and output, so it does not include only computers and machines, but also includes printers, scanners, cameras and others (Holagh et al.,

2015:214). As explained by (Zuppo, 2012:16), it includes (desktop computers, laptops, mobile phones, tablet computers, e-readers, storage devices, input devices, and output devices). It must have a good working environment, whether it is ventilation, lighting or electricity, and facilitate its movement and transportation, as it is one of the necessary tools that can enhance the educational process and scientific research (Zakaria & Shariff, 2011: 62).

#### **2.4.2. Databases**

Databases represent the container that contains files stored on computers, which constitute the raw material that is processed, updated and retrieved to access information (Fridawati et al., 2021:695). The goal of the database management system is to work on collecting, classifying, tabulating, storing, and retrieving the organization's data when needed in an appropriate manner and at an appropriate speed (Porter, 2001:30).

#### **2.4.3 Software**

Computers and their accessories as devices will not give the desired benefits from them unless different software is available to operate them or control their work. One of the most important functions of this software is to direct the work of the computer with its various components and help users of the computer and its accessories in obtaining the information required for computer applications, processing data and providing information (Nabhan, 2020: 58). (Schreiber & Bruggemann, 2017: 119) believes that there are two main reasons that prompted organizations today to pay attention to software. The first reason is due to technological developments and the need to store hundreds of thousands of files. The second reason is the need for approved methods for dealing with stored information.

#### **2.4.4 Networks**

(Alvarez et al., 2018: 28) indicates that communication networks include knowledge, skills and abilities that allow people to be used to set, plan and achieve their own learning goals and achieve independent education, as the availability of communication skills in universities adds to the university various advantages, as these networks help Students and academics gain valuable information and experience (Whyte & Hennessy, 2017: 18). Moreover, it has been emphasized by (Hung & Yuen, 2010: 705) that the primary role of communication networks is to create knowledge-sharing experiences in digital environments. As there have been some recent uses of networks to strengthen local communities, in fact networking tools can be good for building virtual professional communities without the presence of local links. But it is always preferred to adopt networks that are officially enhanced to avoid obstacles faced by users such as lack of trust. Therefore, educational institutions that integrate technology in education require them to change the role of the academic to become the basis for facilitating the use of technology in the educational process (Malhiwsky, 2010:27).

### **3- Field frame**

#### **3.1 Examine the nature of the data**

The process of examining the nature of the data is important for the purpose of identifying appropriate statistical tools. Parametric statistical tools (such as the arithmetic mean) are most appropriate when the data are normally distributed. Whereas nonparametric statistical tools (such as the median) are more appropriate when the data are unnaturally distributed (Field, 2009:145). The process of checking the data will be through the Skewness and Kurtosis test. Since the confidence level adopted in administrative studies is less than (0.05), the data will be normally distributed when the Z-value of Skewness and Kurtosis is within ( $\pm 1.96$ ). It is worth noting, that the value of Z is extracted by dividing the calculated values by their standard error (Kerr et al., 2002:49). Table (2) shows the results of examining

the nature of the data:

**Table (2): Data Nature Check Test**

Variables	Skewness			Kurtosis		
	Statistic	Std. Error	Z-Skewness	Statistic	Std. Error	Z-Kurtosis
Academic innovation	0.161	0.128	1.252	-0.434	0.256	-1.697
Information Technology	0.205	0.128	1.602	-0.178	0.256	-0.695

Source: SPSS V. 24 outputs

It can be seen from the above table that the nature of the data distribution was naturally close. Since the value of Z Skewness and Kurtosis for the two variables did not exceed the limits of ( $\pm 1.96$ ), and this is an indication that the parametric statistical tools are the most appropriate.

### 3.2 confirmatory factor analysis

Confirmatory Factor Analysis- CFA contributes to ensuring the validity and reliability of the measures used in this study. It is ascertained through this test about the extent of measuring the measures of concepts for which it is designed (Singh, 2007:203). This is called the Convergent Validity Test, which aims to measure the extent of convergence of measures that measure a single concept as required. The criteria that verify the validity of convergence are: (1) the standard saturation (Factor loading) for the items of each scale, for the items to be acceptable, their value must exceed (0.50), and it is better to exceed (0.70), (2) the value of the average variance extracted (Average Variance Extracted- AVE) to be acceptable it must exceed (0.50) (Hair et al., 2017:112).

Reliability is the second thing to check. Reliability refers to how similar results are when the same measures are used to collect data at another time. Confirmation of stability is by extracting the two values of Composite Reliability and Cronbach's  $\alpha$ . In order for there to be no concern about the stability of the scales, the two values must exceed (0.70) (Hair et al., 2017:112). Tables (3) and (4) show the results of validity and reliability of the two variables, as follows:

The Independent Variable: Academic innovation

The independent variable includes (22) questions divided into four dimensions. Six questions for each of the dimensions of originality and flexibility, and five questions for each of the dimensions of sensitivity to problems and the ability to analyze and link. Table (3) shows the results of the confirmatory factor analysis test:

**Table (3): The results of the confirmatory factor analysis test for the independent variable**

dimension	item	saturates	AVE	CR	Cronbach's $\alpha$
originality	Q1	0.733	0.513	0.825	0.912
	Q2	0.725			
	Q3	0.733			
	Q4	0.753			
	Q5	0.669			
	Q6	0.681			
Flexibility	Q7	0.764	0.510	0.829	0.898
	Q8	0.748			
	Q9	0.711			
	Q10	0.711			
	Q11	0.700			
	Q12	0.643			
sensitivity of problems	Q13	0.762	0.514	0.821	0.915
	Q14	0.702			
	Q15	0.686			
	Q16	0.670			
	Q17	0.760			
Analysis and Synthesis	Q18	0.659	0.537	0.833	0.895
	Q19	0.688			
	Q20	0.772			

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Q21	0.788
Q22	0.750

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Source: Amos & SPSS outputs

The results in the above table show us that the standard saturation values for the questions of this variable and its dimensions were acceptable (not less than 0.60). Also, the AVE value exceeded (0.50) for all dimensions. In the end, this is evidence of the verification of the validity of the assertive structure of this variable. That is, the values of indicators of the hypothetical model match the data for this variable, and this is an indication that the assumed model matches well with the collected data.

***Dependent variable: Information technology***

The dependent variable includes (22) questions divided into four dimensions. Six paragraphs for each of the dimensions of hardware and the database, and five questions for the two dimensions of software, communication networks. Table (4) shows the results of the confirmatory factor analysis test for the dependent variable:

**Table (4):** *The results of the confirmatory factor analysis test for the dependent variable*

dimension	item	saturates	AVE	CR	Cronbach's $\alpha$
Hardware	Q23	0.565	0.502	0.744	0.778
	Q24	0.216			
	Q25	0.771			
	Q26	0.797			
	Q27	0.469			
	Q28	0.679			
Databases	Q29	0.699	0.516	0.759	0.798
	Q30	0.801			
	Q31	0.741			
	Q32	0.717			
	Q33	0.683			
	Q34	0.662			
Software	Q35	0.685	0.520	0.741	0.785
	Q36	0.767			
	Q37	0.713			
	Q38	0.738			
	Q39	0.698			
Networks	Q40	0.716	0.522	0.741	0.795
	Q41	0.744			
	Q42	0.731			
	Q43	0.644			
	Q44	0.770			

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Source: Amos & SPSS outputs

It is clear from the results shown in the above table that the standard saturation values for all items were acceptable (exceeding 0.50), except for the two items (Q27, Q24) from the dimension of physical components, which did not achieve the acceptable value. The extracted average variance AVE exceeded (0.50) to exclude this variable, specifically after deleting the two paragraphs (Q27, Q24). In the end, this is evidence of the verification of the validity of the assertive structure of this variable. That is, the values of indicators of the hypothetical model match the data for this variable, and this is an indication that the assumed model matches well with the collected data.

**3.3. descriptive and inferential statistics**

Table (5) shows the values of the arithmetic mean, standard deviation, and the correlation coefficient between the study variables and dimensions. The arithmetic mean values of the variables and their dimensions were values ranging between (0.180) and (0.778). The standard deviations were very low and indicated good homogeneity in the data. Moreover, the results of the correlation test show us that the relationships between the independent and dependent variable and their dimensions ranged from moderate to strong.

**Table (5): Descriptive statistics tools and correlation test**

	originality	Flexibility	sensitivity to problems	Analysis and Synthesis	Hardware	Databases	Software	Networks	Academic innovation	Information Technology
originality	1									
Flexibility	.677**	1								
sensitivity to problems	.635**	.607**	1							
Analysis and Synthesis	.573**	.469**	.716**	1						
Hardware	.381**	.318**	.250**	.180**	1					
Databases	.533**	.477**	.404**	.311**	.612**	1				
Software	.559**	.451**	.432**	.383**	.481**	.657**	1			
Networks	.595**	.555**	.458**	.364**	.437**	.649**	.640**	1		
Academic innovation	.856**	.716**	.778**	.720**	.334**	.511**	.541**	.584**	1	
Information Technology	.663**	.580**	.509**	.415**	.728**	.764**	.741**	.732**	.642**	1

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS program outputs

### 3.4 Hypothesis testing

Multiple regression analysis will be used for the purpose of testing influence relationships between variables and thus testing hypotheses. According to this test, the hypothesis is accepted when the t-value is greater than 1.96 and the p-value is less than 0.05. The results in Table (6) show the results of hypothesis testing.

**Table (6): Testing the hypotheses of the study**

Model		Unstandardized Coefficients		Standardized Coefficients t	Sig.	F	Sig.	R Square	
		B	Std. Error						
1	(Constant)	0.964	0.129		7.465	0.000	252.619	.000 <sup>b</sup>	0.412
	innovation	0.654	0.041	0.642	15.894	0.000			
	(Constant)	1.021	0.123		8.276	0.000			
	originality	0.402	0.049	0.470	8.132	0.000			
2	Flexibility	0.184	0.048	0.212	3.869	0.000	170.764	.000 <sup>c</sup>	0.475
	sensitivity to problems	0.187	0.054	0.201	3.486	0.000			
	Analysis and Synthesis	0.023	0.048	0.027	0.478	0.633			

Source: SPSS program outputs

Through the results shown in the above table, we can see the following:

- 1) There is a positive, significant and statistical effect relationship for academic innovation in information technology at the level of significant significance (0.01).
- 2) There is a positive and statistically significant effect of originality in information technology at the level of significant significance (0.01).
- 3) There is a positive and statistically significant effect of flexibility in information technology at the level of significant significance (0.01).

- 4) There is a positive, significant, and statistical relationship for the sensitivity to problems in information technology at the level of significant significance (0.01).
- 5) There is no positive, significant, and statistical relationship for the ability to analyze and Synthesis in information technology at the level of significant significance (0.01).
- 6) The coefficient of determination (R2) for the sub-hypothesis model was 47.5%, which is more important than the main hypothesis model, which amounted to 41.2%.

## **4- Conclusions**

- 1) The study concluded that there is a direct and positive impact relationship for academic innovation in information technology. This is explained by the presence of awareness and interest among the respondents about the importance and role of developing inventive methods and abilities in the good, advanced use of information technology in educational institutions. This is considered a fundamental opportunity that leads to effectively improving and developing academic performance.
- 2) The university in question pays good attention to the dimension of originality. This explains that academics have the skills necessary to accomplish the tasks assigned to them in a renewed manner, away from tradition and dependency.
- 3) The study found that there is a high concentration of the sample in obtaining information and detailed instructions before carrying out the tasks assigned to them.
- 4) The study confirmed that the university in question has a forward-looking vision for the future in spreading electronic culture among academics. And that is by continuing to hold training courses related to the skill of electronic transformation in the field of education.
- 5) The study concluded that the communication networks currently available at the university contribute to the process of activating the communication between teachers, students and international universities. The results confirmed the availability of a (Wi-Fi) network for all academics, which helped to support their activities related to (convening meetings, attending conferences and scientific seminars, and giving lectures). This indicates that the university under study possesses communication networks that conduct all academic tasks and duties.
- 6) The results indicated that there is an integrated system for databases in the researched university. It works to store scientific output and reduce duplication and repetition. It helps academics to access it easily.

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