

The Impact of Organizational Learning on Digital Transformation

“An Applied Study on the Administrative Apparatus at Benha University”

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Abstract:

Our research investigates Organizational Learning impact on Digital transformation in the administrative apparatus at Benha university. Further, it aims to identify whether there is variation in the employees' awareness of organizational learning, and digital transformation according to demographic factors.

The study relied on the descriptive analytical approach, where the survey list was used as a tool for collecting data, as the target population represented employees in the administrative apparatus at Benha university. The researcher selected a sample of 299 employees representing the study population and then distributed surveys to the study sample using a questionnaire. The required number of questionnaires was distributed plus 10%, which is 30 additional questionnaires to guarantee obtaining the required sample size. The number of returned ones reached 310, and after examining them, we found 10 questionnaires not suitable for statistical analysis, so 300 questionnaires were relied upon. The obtained responses from respondents were analyzed statistically using SPSS to investigate the research hypotheses.

Based on empirical results, this research showed that organizational learning has a significant positive impact on digital transformation in the administrative apparatus at Benha university. Furthermore, the results indicated that the second and third main hypotheses were rejected, which states that there are statistically significant differences in employees' awareness of organizational learning and digital transformation respectively, according to demographic factors (gender, years of service, and level of education) in the administrative apparatus at Benha university under study and research.

Keywords: Organizational learning; Knowledge acquisition; Information distribution; Information interpretation; Organizational memory; Digital transformation.

1- Introduction

With today's rapidly changing environment and increasing globalization, the competition between organizations has become more intense than before. Thus, if organizations don't make continuous improvements that enable them to provide products and services in new ways, they will not be able to build their competitiveness to assure their survival and continuity. For these organizations to acquire competitive advantages, they should have the ability to learn faster and better than their rivals, learn from their internal and external environment, and learn from their previous experiences. This could be attained through acquiring, sharing, and retaining knowledge. Generally, this knowledge is created and developed through organizational learning processes, which enable organizations to take advantage of this knowledge by transforming individual knowledge into organizational knowledge to enhance innovation and business performance (Toe & Tantasanee, 2021; Abdelwhab, et al., 2019).

Lately, the concept of organizational learning has received a great deal of attention from researchers and practitioners because it is regarded as a cornerstone for organizations that aim to expand their employees' knowledge and experience base to master the required skills at work and enable them to respond quickly to the surrounding changes. It is also considered an effective tool for developing human capital to create and maintain knowledge, which is required to keep these organizations outstanding in the modern knowledge-based economy (Tarawneh & Al-Adaileh, 2021; Abdelwhab, et al., 2019).

In this regard, learning is considered an important and prerequisite to achieving digital transformation, as it builds employees' skills and competencies that help them embrace the digital transformation. Although many organizations strive to transform their businesses digitally, these attempts may fail due to the lack of human capabilities capable of using these technological techniques, as this transformation can't succeed without the presence of competent individuals who realize its importance and seek to develop their capabilities to implement it properly (Persson, & Manas, 2021).

The digital transformation of institutions has become an important issue in the field of organizational research as it represents an institutional change strategy that is carried out by digital competencies within the organization through integrating new digital technologies into all activities and processes to create a new institutional system that provides an opportunity for individuals to facilitate performing tasks and enhance resource planning (Hamdani, et al., 2021; Huang, et al., 2023). Consequently, institutions need to find a new method of creating value for their customers, and one way to do that is by transforming their businesses digitally. As digital transformation comes up with new possibilities such as increasing efficiency and speed of operations, which result in changing the behavior of customers, expect a distinctive customer experience. Hence, organizations must shape and adopt their organization, work environment, and

strategies to meet customer expectations and remain competitive (Persson & Manas, 2021). So, in the light of what have clarified above, the purpose of this study is to explore the impact of organizational learning on digital transformation in the administrative apparatus at Benha University.

2-Literature Review

To achieve the research objectives and construct a proposed framework, the previous studies are divided into **two** main parts according to the nature of the study. Finally, the **summary of literature review** is added:

2.1: Previous studies of organizational learning.

2.2: Previous studies of digital transformation.

2.3: Summary of literature review

2.1 Previous studies about organizational learning

Table (1) Previous studies of organizational learning

No.	Author & year	Objectives	Results
1	Abbas et al., (2020)	This study aims to explore the possible linkages between knowledge management, organizational learning, and sustainable organizational innovation.	Knowledge management shows a significant positive association with organizational learning (knowledge acquisition, information distribution, information interpretation, and organizational memory) which in turn reveals a positive linkage to sustainable organizational innovation.
2	Hosseini et all., (2020)	To examine the possible relationships between leadership style, organizational culture, and organizational learning	1-Leadership styles (transformational, and transactional leader) have a positive effect on organizational culture which in turn, has a positive effect on organizational learning (acquisition, interpretation, application, and institutionalization of information). 2-Furthermore, organizational culture mediated the relationship between leadership style and organizational learning.

No.	Author & year	Objectives	Results
3	Putra et all., (2020)	To measure the effect of hard skills and soft skills towards innovation capability which was mediated by an organizational learning and to measure the effect of innovation capability towards performance.	Hard skills and soft skills have a positive and significant effect on the capability of innovation, both directly and indirectly through mediation of the organizational learning (acquire and transfer knowledge). As well as the capability of innovation has a positive and significant effect on performance.
4	Hina et all., (2021)	To measure the impact of entrepreneurial orientation on firm performance through organizational learning.	Entrepreneurial orientation has a significant and positive impact on firm performance, and organization learning (acquiring, and sharing knowledge) positively mediates this relationship.
5	Lin & Huang (2021)	To investigate the relationship between organizational learning, job satisfaction, and employee turnover.	Organizational learning (acquiring and sharing knowledge) has a positive impact on job satisfaction, which in turn lowers employee turnover.
6	Blaique et all. (2022)	To test the relationship between organizational learning and work engagement and to test the mediating role of employee resilience and psychological empowerment on this relationship.	Organizational learning (acquiring, sharing, and interpreting knowledge) has a significant positive impact on work engagement. Moreover, both constructs- employee resilience and work engagement- were identified as mediators for this relationship.
7	Do et all., (2022)	To examine the underlying theoretical mechanism between resource-based	1-RBMI are positively associated with organizational resilience, which in turn enhances innovation.

No.	Author & year	Objectives	Results
		management initiatives (RBMI) and the resilience and innovation of taking account of the mediating role of organizational learning.	2-Also, organizational learning (information acquisition, distribution, interpretation, integration, and organizational memory) mediates the RBMI-organizational resilience/innovation relationships. 3-Finally, self-awareness of environmental dynamism significantly strengthens the relationships between organizational learning and resilience/innovation.
8	Chung & Lee (2024)	To investigate the effect of organizational learning in achieving digital transformation in family firms in Taiwan.	Digital transformation is positively affected by organizational learning represented in (explorative learning, which encourages the pursuit of new knowledge, risk taking, and experimentation more than exploitative learning, which represents developing existing knowledge).

Source: Prepared by the researcher.

2.2 Previous studies about digital transformation

Table (2) Previous studies of digital transformation

No.	Author & year	Objectives	Results
1	Mubarak et all., (2019)	To explore the impact of digital transformation on business performance.	Digital transformation has a significant positive impact on business performance.
2	Melović et all., (2020)	To determine the impact of digital transformation and digital marketing on promotion and brand positioning.	Digital transformation has a significant positive impact on digital marketing. Furthermore, the more a company relies on the use of digital marketing in its business, the more significant its impact on promotion and brand positioning.

No.	Author & year	Objectives	Results
3	Iriqat & Jaradat (2021)	To identify the impact of digital transformation strategy on customer satisfaction.	Digital transformation strategy has a significant impact on customers' satisfaction.
4	Gaglio et all., (2022)	To measure the effect of digital transformation on innovation and productivity.	Digital transformation has a positive effect on innovation, and innovation has a positive effect on productivity.
5	Gardner, (2022)	To examine the impact of organizational learning on digital transformation.	There is a positive impact of organizational learning (acquiring, sharing, and interpreting knowledge) on digital transformation.
6	Schiama et all., (2022)	To determine the effect of transformative leadership on digital transformation.	There is a significant positive effect of transformative leadership on digital transformation.
7	Tian et all., (2022)	To investigate how the digital transformation affects risk-taking.	Digital transformation has a significant positive effect on corporate risk-taking.
8	Basir (2023)	To examine the impact of digital transformation on organizational agility and competitive advantage.	The results show that digital transformation has a positive impact on both organizational agility and competitive advantage.

2.3 Summary of literature review

From the previous review of literature, it is shown that

- Most of the previous studies mentioned the consequences of digital transformation but didn't focus on its determinants, which contribute to achieving it, so this research will focus on an important determinant, which is organizational learning, and show its impact on digital transformation within the Egyptian environment.
- Although the 3 dimensions of OL (knowledge acquisition, information interpretation, information sharing) are the most frequent in previous studies, the last dimension (organizational memory) is rarely used.
- This study will use 4 dimensions of organizational learning (Knowledge acquisition- information distribution – information interpretation – organizational memory), which combined for the first time within researcher knowledge to measure its impact on digital transformation.

- Current research will investigate the impact of OL (Knowledge acquisition-information distribution – information interpretation – organizational memory) on digital transformation in the administrative apparatus at Benha university for the first time within the researcher knowledge.

3- Research Problem

Recently, organizations operate in complex and rapidly changing environments in addition to being exposed to unprecedented challenges, which requires them to be more resilient and adaptable to ensure their survival and continuity. In this regard, organizational learning is considered one of the most important strategies that organizations can rely on to study the changing business environment, because practicing learning activities produces a wide range of knowledge and experience that helps build the required competencies and skills in order to help employees perform their jobs in a better way.

Hence, the importance of organizational learning as a basic prerequisite for the success of the digital transformation process in organizations is evident, as it contributes to forming the required employees' technological capabilities and competences that help to begin the transformation process properly. Despite the importance of digital transformation and the various benefits it can achieve to organizations, there are many organizations that may fail in its implementation due to a lack of qualified members who recognize its importance and work on developing their skills to adopt it. Thus, forming a culture that supports organizational learning processes within organizations is essential to adopting and activating digital transformation.

Considering the review of previous studies, the problem of the study can be formulated with several questions that the study seeks to answer, as follows:

- What is the impact of organizational learning on digital transformation in the administrative apparatus at Benha University.
- What is the impact of knowledge acquisition on DT in the administrative apparatus at Benha University?
- What is the impact of information distribution on DT in the administrative apparatus at Benha University?
- What is the impact of information interpretation on DT in the administrative apparatus at Benha University?
- What is the impact of organizational memory on DT in the administrative apparatus at Benha University?
- Is there any variation in the employees' awareness of organizational learning according to demographic factors (gender, years of service, and level of education) in the administrative apparatus at Benha University?
- Is there any variation in the employees' awareness of digital transformation according to demographic factors (gender, years of service, and level of education) in the administrative apparatus at Benha University?

4- Research Objectives

Based on the study problem, a set of objectives have been formulated that the study seeks to achieve:

- Measuring the impact of organizational learning on digital transformation in the administrative apparatus at Benha University.
- Identifying the impact of knowledge acquisition on DT in the administrative apparatus at Benha University.
- Identifying the impact of information distribution on DT in the administrative apparatus at Benha University.
- Identifying the impact of information interpretation on DT in the administrative apparatus at Benha University.
- Identifying the impact of organizational memory on DT in the administrative apparatus at Benha University.
- Measuring if there is any variation in the employees' awareness of organizational learning according to demographic factors (gender, years of service, and level of education) in the administrative apparatus at Benha University.
- Measuring if there is any variation in the employees' awareness of digital transformation according to demographic factors (gender, years of service, and level of education) in the administrative apparatus at Benha University.

5- Research Hypotheses and Model

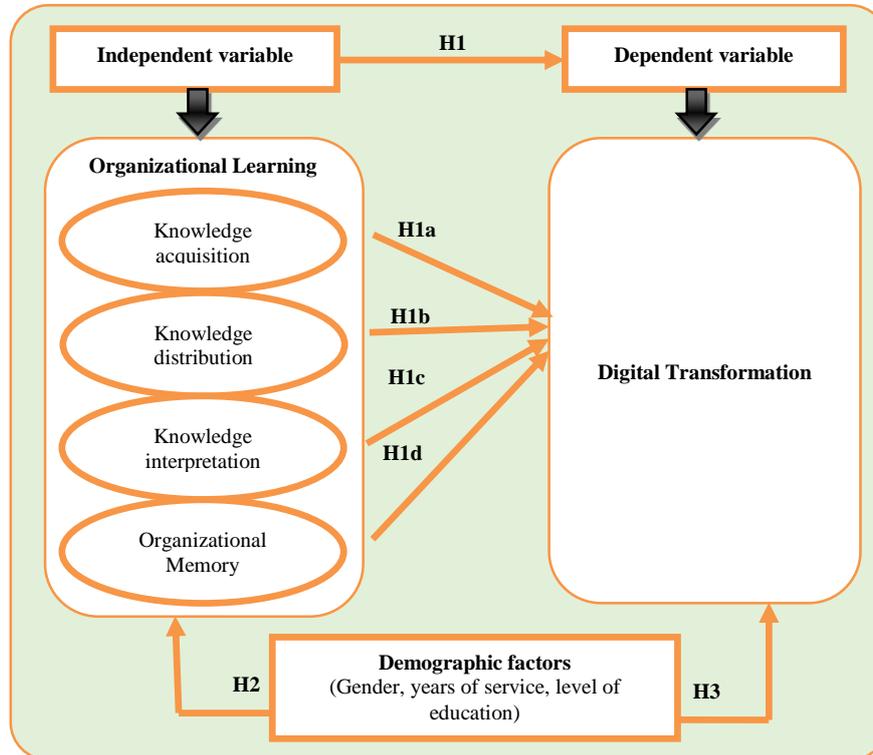
5.1 Research Hypotheses

Considering the following conceptual model (figure1), the research hypotheses are set as follows:

- H1:** Organizational learning has a significant positive impact on digital transformation in the administrative apparatus at Benha University.
- H2:** There is variation in the employees' awareness of organizational learning according to demographic factors (gender, years of service, and level of education) in the administrative apparatus at Benha University.
- H3:** There is variation in the employees' awareness of digital transformation according to demographic factors (gender, years of service, and level of education) in the administrative apparatus at Benha University.

5.2 Research Model

Figure 1
The research model



Source: by the researcher.

6-Research Importance

6.1 Theoretical contributions:

- 1- This study is the first attempt to link (4) dimensions of organizational learning which are (knowledge acquisition, information distribution, information interpretation, and organizational memory) and digital transformation in the administrative apparatus at Benha University within researcher knowledge.
- 2- Most of the previous studies dealt with the consequences of digital transformation but did not address the determinants that contribute to adopting or activating it within researcher knowledge; therefore, this study is considered one of the first studies that helps in fulfilling this aim, which helps to promote the digital transformation in the administrative apparatus at Benha University.
- 3- Presenting a conceptual framework of the impact of organizational learning on digital transformation, which enriches the Egyptian libraries. As there are very few existing researches linking organizational learning with digital transformation in Egypt within researcher knowledge.

6.2 Practical importance:

- 1- This study encourages officials in the administrative apparatus at Benha University to pay more attention to organizational learning and clarify its

impact on digital transformation, because developing the adoption of organizational learning among employees in the administrative apparatus is in turn reflected in raising the level of digital transformation for these employees.

- 2- Presenting a set of recommendations and implementation mechanisms that will help officials in the administrative apparatus at Benha University enhance digital transformation through promoting organizational learning.
- 3- This study contributes to helping officials in the administrative apparatus at Benha University adopt organizational learning and become aware of the variables that may affect it through the scientific framework provided by the study, which enables them to make the necessary adjustments to increase performance efficiency and improve the levels of digital transformation in the organization.

7- Research Methods

The researcher will focus on two types of data to determine and test the research hypothesis.

7.1 Secondary data

Secondary data means the data that has been previously collected by other researchers and can be used to illustrate and describe the research variables. Data are those that contribute to the information of the theoretical framework of the research topic, which covers topics related to organizational learning and digital transformation. It can be found in multiple sources, including thesis, researches, articles, and books.

7.2 Primary data

Primary data represents information that is collected by having direct contact with the sources of information through questionnaires. It is an analytical approach which is conducted through the field visit to the administrative apparatus under study, collecting data from the research sample, and analyzing it. These data complement the secondary data to achieve the objectives of this study.

7.2.1 The questionnaire design

To collect data, the researcher relies on a five-point-Likert scale to develop the questionnaire, which includes 40 questions divided into two parts. The first part consists of 25 questions, and it is related to OL dimensions (knowledge acquisition, information distribution, information interpretation, and organizational memory), the second part includes 15 questions related to DT. Furthermore, the final part of the questionnaire consists of 3 questions about the demographic variables of respondents (i.e., gender - years of service – education level).

7.2.2 Research population and sample:

The target population includes all employees of all administrative levels in the administrative apparatus at Benha University, which consists of general managers, department managers, specialized jobs, and clerical jobs. Thus, the

researcher will rely on the stratified random sampling method through statistical sampling tables to represent the research community. The size of the random sample to be drawn was determined using equation by Steven Thompson was 299 as illustrated in statistical tables, given that population size is 1337 employees at a confidence level of 95%, and the limits of error of $\pm 5\%$, which are acceptable error limits in social studies.

7.2.3 Statistical techniques for analyzing data

The research used different statistical methods through SPSS which are related to the model and hypotheses testing such as:

- Cronbach's alpha coefficient to measure the reliability of the questionnaire.
- Kolmogorov-Smirnov and Shapiro-Wilk tests to examine the normality of study variables.
- Descriptive statistics of data by calculating some measures such as the mean, and standard deviation as well as tabulating the characteristics of the sample in frequency and percentage distributions tables.
- A one-sample t-test to test whether there are differences between the individuals' average responses to each item from the hypothesized average "neutral".
- Pearson correlation matrix to measure the strength and direction of the relationship between the study variables.
- Simple Linear Regression Model.
- Mann-Whitney and Kruskal Wallis tests to study the differences between the groups of demographic and organizational variables.

8- Theoretical Framework

In this part, the researcher will deal with the theoretical framework of the research variables in terms of concept and dimensions.

8.1 The definition of organizational learning and its dimensions:

Hosseini et al. (2020) indicated OL as a dynamic process by which the organization broadens its employees' knowledge and expertise base for the purpose of modifying their actions and advancing required capabilities to build long-term competitive edges. Do, et al. (2022) defined it as an organization's dynamic capability that motivates a learning culture among its members to gain knowledge, which helps in making matching between internal resources and external needs in order to be more resilient towards environmental changes.

The researcher defined organizational learning as: "a process in which organizations expand their knowledge and experience base to develop employees' skills for the purpose of modifying behaviors that help in conducting changes and improvements in activities and strategies to better perform tasks and provide products and services in new ways".

There are four dimensions of organizational learning according to Templeton et al., (2002) that are used in this research:

- 1) **Knowledge acquisition:** Also known as scanning, which is the first step of OL in many learning models. It describes the process through which an entity gains information from intra-and extra-sources like its members' experiences, other firms experiences, and both internal and external environments, and feedback from past actions to guide future endeavors. It takes many forms, including exploratory learning and potential absorptive capacity. Thus, it helps in discovering new ideas and deep understanding of current knowledge, thus enhancing innovation.
- 2) **Information distribution:** Is the process through which individuals, groups, or various units of the institution exchange information and knowledge because, without it, it would be hard for organizations to take advantage of their investments in their abilities to capture and create knowledge. It also benefits firms by transforming individual knowledge into institutional knowledge, which help in decision-making processes. This requires encouraging a culture of social interaction, which in turn enhances exchanging employees' knowledge and experience across departments.
- 3) **Information interpretation:** It is defined as the process by which firms make sense of newly gathered and shared information, in which members of the organization interpret events through mutual negotiation of cognitive maps and discussions. Hence, it is important to develop a mutual understanding and coordination of information that plays a fundamental role in analyzing and comprehending knowledge in the future to reduce equivocality and ambiguity facing the organization and help in effective decision making.
- 4) **Organizational memory:** It is regarded as the ideal result of the organization's learning process, which is about storing information to retrieve and use it again in the future. It can be classified into declarative and procedural memory. The former is related to events and facts, whereas the latter comprises information about an organization's procedures, processes, and routines. To properly manage an organization's memory, managers need to consider who, what, when, where, why, and how information is stored" to achieve organizational success.

8.2 *The definition and dimensions of digital transformation:*

Digital transformation could be defined as: "a strategic orientation for organizations in which digital competences use and integrate technological techniques into all aspects of the organization to build new business models, develop products and services, and deliver better value for users". The digital transformation has two dimensions according to (He et al., 2023) which are:

- 1) **Digital intensity (DI):** Is the organization's investment in technological initiatives to enhance its ability to make the necessary changes in the ways of interaction with its users, the methods of performing activities, and even business models. Therefore, increasing digital intensity encourages organizations to explore the possible digital opportunities, attempting to

engage users and run businesses using these digital technologies. Given this dimension, we can easily differentiate between organizations by their readiness for digital transformation; it can be measured as the ratio of technological research and development expenditures to their revenues.

- 2) **Transformation management intensity (TMI)** Is described as the leadership capabilities needed to apply and drive digital transformation within the organization. Often, organizations with high TMI involve a transformative vision, governance, and culture that aim to coordinate digital initiatives to optimize business results. Accordingly, organizations that are capable of implementing their digital transformation program properly are those that have a digital leader whose main responsibilities are to reshape their products and operations and to provide resources to coordinate digital activities.

9- Field Study

9.1 The survey groups

The total sample size can be determined by the following formula (Thompson 2012):

$$n = \frac{N \times p(1 - p)}{\left[(N - 1) \times \left(\frac{E}{Z} \right)^2 + p(1 - p) \right]} = \frac{1337 \times 0.5(1 - 0.5)}{\left[(1337 - 1) \times \left(\frac{0.05}{1.96} \right)^2 + 0.5(1 - 0.5) \right]}$$

Where:

p	Proportion of population = 0.5
Z	The standard score corresponds to a certain confidence level (95%) = 1.96
E	Accepted error proportion = 0.05
N	Size of the population = 1337
n	Sample size

Source: Prepared by the researcher.

The required number of questionnaires was distributed plus 10%, which is 30, to guarantee obtaining the required sample size. The number of returned ones reached 310, and after examining them, we found 10 not suitable for statistical analysis, so 300 questionnaires were relied upon.

9.2 The Reliability of the questionnaire:

Cronbach's alpha coefficient is used to examine the reliability of the questionnaire. It indicates the extent to which it is a consistent measure that can be relied upon in generalizing results. The accepted lower limit of Cronbach's alpha coefficient is (0.7). The following table shows Cronbach's alpha coefficient for study variables.

Table (3). Cronbach's alpha coefficient for study variables

Variable	Number of items	Cronbach's Alpha
Organizational learning	25	0.924
Digital transformation	15	0.902

Source: Prepared based on statistical analysis results.

The previous table shows that the values of Cronbach's alpha coefficient for organizational learning and digital transformation were (0.924, 0.902). This means that internal consistency is highly acceptable.

9.3 Descriptive statistics of the study variables:

9.3.1 Descriptive statistics of organizational learning:

This variable consists of four dimensions: knowledge acquisition, information distribution, information interpretation and organizational memory, according to the current study. The following table describe this variable through statistical measures (mean, standard deviation, t-test, and items rank).

Table (4). Descriptive statistics for organizational learning items

S.	Items	Mean	Std. Deviation	Sig.	Rank
1	The university uses feedback as a mean of learning.	4.34	0.738	0.000	2
2	The university encourages employees to suggest new ideas for work.	4.28	0.722	0.000	8
3	Employees gain knowledge when talking with other members.	4.32	0.701	0.000	3
4	The university benefits from other universities' experiences in developing its activities.	4.31	0.719	0.000	4
5	The university is keen on hiring qualified individuals.	4.37	0.758	0.000	1
6	The university ensures that its plan is compatible with the competitive environment.	4.31	0.679	0.000	5
7	The university anticipates problems and takes action to prevent them from occurring.	4.24	0.724	0.000	9
8	The university collects information on all performance aspects.	4.28	0.700	0.000	7
9	The university learns new things through direct observation.	4.30	0.738	0.000	6
	Knowledge acquisition	4.30	0.483	0.000	
10	Employees know sources to get the information they need.	4.30	0.666	0.000	4
11	Employees recognize the importance of sharing information.	4.36	0.672	0.000	1
12	Employees share information with each other.	4.34	0.627	0.000	2

S.	Items	Mean	Std. Deviation	Sig.	Rank
13	The university assigns employees among departments for training.	4.28	0.718	0.000	5
14	University units share information with one another.	4.32	0.696	0.000	3
	Information distribution	4.32	0.430	0.000	
15	Managers review their viewpoints of the competitive environment to consistently update them.	4.31	0.693	0.000	3
16	Employees share explanations about university-related events.	4.28	0.671	0.000	5
17	The university encourages employees to interpret information to help them in making decisions.	4.27	0.717	0.000	6
18	Alternatives are evaluated accurately before taking final decisions.	4.29	0.754	0.000	4
19	The university removes unusable information.	4.31	0.670	0.000	2
20	The university encourages employees to try new ways of working.	4.37	0.690	0.000	1
	Information interpretation	4.31	0.455	0.000	
21	The university is interested in retaining information to guide actions.	4.30	0.668	0.000	5
22	Employees use the knowledge bank when they need to make decisions.	4.32	0.669	0.000	4
23	The university has an organizational unit responsible for data management.	4.36	0.687	0.000	3
24	The university retains qualified employees.	4.40	0.713	0.000	2
25	The university continuously develops its expertise.	4.40	0.698	0.000	1
	Organizational memory	4.36	0.492	0.000	

Source: Prepared based on statistical analysis results.

The previous table illustrates that:

- All arithmetic means of organizational learning items and its four dimensions are statistically significant. This means that they differ from the mean of the Likert scale (3), i.e. neutral, and the opinions tended to “strongly agree”.

- The responses indicate “strongly agree” about knowledge acquisition with an average of (4.30) and a standard deviation of (0.483), the most agreeable item for this dimension is “The university is keen on hiring qualified individuals”.
- The responses indicate “strongly agree” about information distribution with an average of (4.32) and a standard deviation of (0.430), the most agreeable item for this dimension is “Employees recognize the importance of sharing information”.
- The responses indicate “strongly agree” about information interpretation with an average of (4.31) and a standard deviation of (0.455), the most agreeable item for this dimension is “The university encourages employees to try new ways of working”.
- The responses indicate “strongly agree” about organizational memory with an average of (4.36) and a standard deviation of (0.492), the most agreeable item for this dimension is “The university continuously develops its expertise”.
- The items of each dimension were ranked according to the average agreement degree.

9.3.2 Descriptive statistics of digital transformation:

The following table describes digital transformation through statistical measures (mean, standard deviation, t-test, and items rank).

Table (6). Descriptive statistics for digital transformation items

S.	Items	Mean	Std. Deviation	Sig.	Rank
26	The university has a supporting infrastructure for digital transformation.	4.35	0.704	0.000	6
27	The university adopts a culture that encourages digital transformation.	4.36	0.693	0.000	3
28	Digital technology helps improve the performance of university tasks.	4.40	0.639	0.000	1
29	The university has technological programs to support the implementation of tasks.	4.37	0.649	0.000	2
30	The university develops employees' skills to use digital technology.	4.36	0.688	0.000	3
31	Employees are assessed in accordance with their abilities to use digital technology.	4.26	0.708	0.000	14
32	The university has a website to offer its services.	4.32	0.682	0.000	9
33	Digital technology contributes to renewing the ways of performing tasks in the university.	4.36	0.757	0.000	3

S.	Items	Mean	Std. Deviation	Sig.	Rank
34	Employees take part in the conversation about digital transformation.	4.30	0.714	0.000	12
35	Managers have a vision for the digital future of the university.	4.33	0.686	0.000	8
36	Managers support the integration of digital technology into the university's activities.	4.30	0.705	0.000	12
37	The university's managers cooperate together to enable digital transformation.	4.34	0.711	0.000	7
38	The university defines individuals' roles during the digital transformation process.	4.31	0.723	0.000	11
39	Digital technology helps the university make better decisions.	4.32	0.724	0.000	9
40	The IT unit supports the digital needs of the university.	4.16	0.698	0.000	15
	Digital transformation	4.32	0.453	0.000	

Source: Prepared based on statistical analysis results.

The previous table illustrates that:

- All arithmetic means of digital transformation items are statistically significant. This means that they differ from the mean of the Likert scale (3), i.e. neutral, and the opinions ranged between “agree” and “strongly agree”.
- The responses indicate “strongly agree” about digital transformation with an average of (4.32) and a standard deviation of (0.453), the most agreeable item for this variable is “Digital technology helps improve the performance of university tasks”.
- The items of digital transformation were ranked according to the average agreement degree.

9.4 Tests of hypotheses

9.4.1 Results of the first main hypothesis test:

The first main hypothesis refers to “Organizational learning has a significant positive impact on digital transformation in the administrative apparatus at Benha university”. This hypothesis has the following sub-hypotheses:

H1a: Knowledge acquisition has a significant positive impact on digital transformation in the administrative apparatus at Benha university.

H1b: Information distribution has a significant positive impact on digital transformation in the administrative apparatus at Benha university.

H1c: Information interpretation has a significant positive impact on digital transformation in the administrative apparatus at Benha university.

H1d: Organizational memory has a significant positive impact on digital transformation in the administrative apparatus at Benha university.

First: Results of the first sub-hypothesis

A. Correlation matrix

Table (7). Correlation matrix between knowledge acquisition and digital transformation

Variable	Digital transformation	Knowledge acquisition
Digital transformation	1	0.865**
Knowledge acquisition	0.865**	1

** . Correlation is significant at the 0.01 level.

Source: Prepared based on statistical analysis results

The previous table illustrates that there is a significant positive correlation between knowledge acquisition and digital transformation. The value of the correlation coefficient is (0.865). This means that increased knowledge acquisition leads to increased digital transformation.

B. Simple linear regression model

The following table shows simple linear regression model estimates for regression of digital transformation on knowledge acquisition:

Table (8). Proposed regression model to measure the impact of knowledge acquisition on digital transformation

Variable	Coefficients	t	Sig.	R ²	F (sig.)
Constant	0.824	6.978	0.000	0.749	888.876 (0.000)
Knowledge acquisition	0.813	29.814	0.000		

Source: Prepared based on statistical analysis results.

The previous table illustrates that:

The proposed regression model is significant as (F=888.876) and (Sig.=0.000). The regression coefficient is also significant at 1% level of significance. The value of the regression coefficient is (+0.813), this means that knowledge acquisition has a significant positive impact on digital transformation.

The coefficient of determination value was (0.749), which means that the independent variable (knowledge acquisition) explains 74.9% of the changes that occur in the dependent variable (digital transformation) and the rest are due to random changes.

The quantitative model:

$$\text{digital transformation} = 0.824 + 0.813 \text{ Knowledge acquisition}$$

This means that an increase in knowledge acquisition by one unit leads to a positive change in digital transformation by 0.813 units. These results support accepting the first sub-hypothesis.

Second: Results of the second sub-hypothesis

A. Correlation matrix

Table (9). Correlation matrix between information distribution and digital transformation

Variable	Digital transformation	Information distribution
Digital transformation	1	0.719**
Information distribution	0.719**	1

** . Correlation is significant at the 0.01 level.

Source: Prepared based on statistical analysis results

The previous table illustrates that there is a significant positive correlation between information distribution and digital transformation. The value of the correlation coefficient is (0.719). This means that increased information distribution leads to increased digital transformation.

B. Simple linear regression model

The following table shows simple linear regression model estimates for regression of digital transformation on information distribution:

Table (10). Proposed regression model to measure the impact of information distribution on digital transformation

Variable	Coefficients	t	Sig.	R ²	F (sig.)
Constant	1.046	5.674	0.000	0.517	319.003 (0.000)
Information distribution	0.759	17.861	0.000		

Source: Prepared based on statistical analysis results

The previous table illustrates that:

The proposed regression model is significant as (F=319.003) and (Sig.=0.000). The regression coefficient is also significant at 1% level of significance. The value of the regression coefficient is (+0.759), this means that information distribution has a significant positive impact on digital transformation.

The coefficient of determination value is (0.517), which means that the independent variable (information distribution) explains 51.7% of the changes that occur in the dependent variable (digital transformation) and the rest are due to random changes.

The quantitative model:

$$\text{digital transformation} = 1.046 + 0.759 \text{ Information distribution}$$

This means that an increase in information distribution by one unit leads to a positive change in digital transformation by 0.759 units. These results support accepting the second sub-hypothesis.

Third: Results of the third sub-hypothesis**A. Correlation matrix****Table (11). Correlation matrix between information interpretation and digital transformation**

Variable	Digital transformation	Information interpretation
Digital transformation	1	0.772**
Information interpretation	0.772**	1

** . Correlation is significant at the 0.01 level.

Source: Prepared based on statistical analysis results.

The previous table illustrates that there is a significant positive correlation between information interpretation and digital transformation. The value of the correlation coefficient is (0.772). This means that increased information interpretation leads to increased digital transformation.

B. Simple linear regression model

The following table shows simple linear regression model estimates for regression of digital transformation on information interpretation:

Table (12). Proposed regression model to measure the impact of information interpretation on digital transformation

Variable	Coefficients	t	Sig.	R ²	F (sig.)
Constant	1.009	6.345	0.000	0.596	438.892 (0.000)
Information interpretation	0.770	20.950	0.000		

Source: Prepared based on statistical analysis results.

The previous table illustrates that:

The proposed regression model is significant as (F=438.892) and (Sig.=0.000). The regression coefficient is also significant at 1% level of significance. The value of the regression coefficient is (+0.770), this means that information interpretation has a significant positive impact on digital transformation.

The coefficient of determination value is (0.596), which means that the independent variable (information interpretation) explains 59.6% of the changes that occur in the dependent variable (digital transformation) and the rest are due to random changes.

The quantitative model:

$$\text{digital transformation} = 1.009 + 0.770 \text{ Information interpretation}$$

This means that an increase in information interpretation by one unit leads to a positive change in digital transformation by 0.770 units. These results support accepting the third sub-hypothesis.

Fourth: Results of the fourth sub-hypothesis**A. Correlation matrix****Table (13). Correlation matrix between organizational memory and digital transformation**

Variable	Digital transformation	Organizational memory
Digital transformation	1	0.819**
Organizational memory	0.819**	1

** . Correlation is significant at the 0.01 level.

Source: Prepared based on statistical analysis results.

The previous table illustrates that there is a significant positive correlation between organizational memory and digital transformation. The value of the correlation coefficient is (0.819). This means that increased organizational memory leads to increased digital transformation.

B. Simple linear regression model

The following table shows simple linear regression model estimates for regression of digital transformation on organizational memory:

Table (14). Proposed regression model to measure the impact of organizational memory on digital transformation

Variable	Coefficients	t	Sig.	R ²	F (sig.)
Constant	1.029	7.664	0.000	0.671	608.811 (0.000)
Organizational memory	0.756	24.674	0.000		

Source: Prepared based on statistical analysis results.

The previous table illustrates that:

The proposed regression model is significant as (F=608.811) and (Sig.=0.000). The regression coefficient is also significant at 1% level of significance. The value of the regression coefficient is (+0.756), this means that organizational memory has a significant positive impact on digital transformation.

The coefficient of determination value is (0.671), which means that the independent variable (organizational memory) explains 67.1% of the changes that occur in the dependent variable (digital transformation) and the rest are due to random changes.

The quantitative model:

$$\text{digital transformation} = 1.029 + 0.756 \text{ Organizational memory}$$

This means that an increase in organizational memory by one unit leads to a positive change in digital transformation by 0.756 units. These results support accepting the fourth sub-hypothesis.

Fifth: Results of the first main hypothesis**A. Correlation matrix****Table (15). Correlation matrix between organizational learning and digital transformation**

Variable	Digital transformation	Organizational learning
Digital transformation	1	0.906**
Organizational learning	0.906**	1

** . Correlation is significant at the 0.01 level.

Source: Prepared based on statistical analysis results

The previous table illustrates that there is a significant positive correlation between organizational learning and digital transformation. The value of the correlation coefficient is (0.906). This means that increased organizational learning leads to increased digital transformation.

B. Simple linear regression model

The following table shows simple linear regression model estimates for regression of digital transformation on organizational learning:

Table (16). Proposed regression model to measure the impact of organizational learning on digital transformation

Variable	Coefficients	t	Sig.	R ²	F (sig.)
Constant	0.061	0.528	0.000	0.820	1361.913 (0.000)
Organizational learning	0.987	36.904	0.000		

Source: Prepared based on statistical analysis results.

The previous table illustrates that:

The proposed regression model is significant as (F=1361.913) and (Sig.=0.000). The regression coefficient is also significant at 1% level of significance. The value of the regression coefficient is (+0.987), this means that organizational learning has a significant positive impact on digital transformation.

The coefficient of determination value is (0.820), which means that the independent variable (organizational learning) explains 82% of the changes that occur in the dependent variable (digital transformation) and the rest are due to random changes.

The quantitative model:

$$\text{digital transformation} = 0.061 + 0.987 \text{ Organizational learning}$$

This means that an increase in organizational learning by one unit leads to a positive change in digital transformation by 0.987 units. These results support accepting the first main hypothesis.

9.4.2 Results of the second main hypothesis test

The second main hypothesis refers to “There is variation in the employees’ awareness of organizational learning according to demographic factors (gender, years of service, and level of education) in the administrative apparatus at Benha university”.

9.4.2.1 Gender:

The Mann-Whitney test was used to compare employees’ awareness according to gender.

Table (17). Variation in the employees’ awareness of organizational learning according to gender

variable	Categories	Mean Rank	Sig.
organizational learning	Male	157.84	0.177
	Female	144.33	

Source: Prepared based on statistical analysis results.

The previous table illustrates that the significance level of Mann-Whitney test is greater than 0.05. Hence, it can be concluded that there are no significant differences between both males' and females' awareness toward organizational learning.

9.4.2.2 Years of service:

The Kruskal Wallis test was used to compare employees’ awareness according to years of service.

Table (18). Variation in the employees’ awareness of organizational learning according to years of service

variable	Categories	Mean Rank	Sig.
organizational learning	Under 3 years	212.81	0.109
	From 3-15 years	151.17	
	Over 15 years	147.25	

Source: Prepared based on statistical analysis results.

The previous table illustrates that the significance level of Kruskal Wallis test is greater than 0.05. Hence, there are no significant differences between years of service groups' awareness toward organizational learning.

9.4.2.3 Level of education:

The Kruskal Wallis test was used to compare employees’ awareness according to level of education.

Table (19). Variation in the employees’ awareness of organizational learning according to level of education

variable	Categories	Mean Rank	Sig.
organizational learning	Intermediate	159.84	0.810
	Graduate (Bachelor)	148.94	
	Postgraduate (MSc/Ph.D.)	152.31	

Source: Prepared based on statistical analysis results.

The previous table illustrates that the significance level of Kruskal Wallis test is greater than 0.05. Hence, there are no significant differences between levels of education groups' awareness toward organizational learning. The previous results support rejecting the second main hypothesis.

9.4.3 Results of the third main hypothesis test:

The third main hypothesis refers to “There is variation in the employees’ awareness of digital transformation according to demographic factors (gender, years of service, and level of education) in the administrative apparatus at Benha university”.

9.4.3.1 Gender:

The Mann-Whitney test was used to compare employees’ awareness according to gender.

Table (20). Variation in the employees’ awareness of digital transformation according to gender

variable	Categories	Mean Rank	Sig.
digital transformation	Male	152.09	0.769
	Female	149.16	

Source: Prepared based on statistical analysis results.

The previous table illustrates that the significance level of Mann-Whitney test is greater than 0.05. Hence, it can be concluded that there are no significant differences between both males' and females' awareness toward digital transformation.

9.4.3.2 Years of service:

The Kruskal Wallis test was used to compare employees’ awareness according to years of service.

Table (21). Variation in the employees’ awareness of digital transformation according to years of service

Variable	Categories	Mean Rank	Sig.
digital transformation	Under 3 years	194.56	0.165
	From 3-15 years	156.82	
	Over 15 years	144.40	

Source: Prepared based on statistical analysis results.

The previous table illustrates that the significance level of Kruskal Wallis test is greater than 0.05. Hence, there are no significant differences between years of service groups' awareness toward digital transformation.

9.4.3.3 Level of education:

The Kruskal Wallis test was used to compare employees’ awareness according to level of education.

Table (22). Variation in the employees' awareness of digital transformation according to level of education

Variable	Categories	Mean Rank	Sig.
digital transformation	Intermediate	155.68	0.207
	Graduate (Bachelor)	154.18	
	Postgraduate (MSc/Ph.D.)	130.32	

Source: Prepared based on statistical analysis results.

The previous table illustrates that the significance level of Kruskal Wallis test is greater than 0.05. Hence, there are no significant differences between levels of education groups' awareness toward digital transformation. The previous results support rejecting the third main hypothesis.

10- Research Recommendations

Based on the research problem, research hypotheses, and results, the researcher can provide several recommendations, an action plan for implementing these recommendations, and identify who is responsible for their implementation.

Table (23) Recommendations

No.	Recommendations	The authority responsible for the action	Estimated time frame for action
1	Enhancing an institutional culture that encourages learning to promote the sharing of opinions and new ideas.	Top management by: - Encourage team discussions to identify lessons learned, areas for improvement. - Implement mechanisms for collecting feedback and suggestions from employees to actively review and implement valuable ideas.	Long-term
2	Encouraging and promoting cross-departmental collaboration to transfer best practices throughout the organization.	Top management coordinates with managers of organizational units through: - Making internal comparisons between departments to determine best practices and experiences in one department and studying the possibility of learning from and applying them in other departments. - Hold periodic meetings to actively seek and consider	Short-term

No.	Recommendations	The authority responsible for the action	Estimated time frame for action
		diverse perspectives and ideas from employees at all levels.	
3	Promoting and developing employees' skills to prepare a workforce capable of using new technologies effectively.	Human Resources Department "Training Department" through: - Providing the required training programs to develop their skills in using digital technologies. - Reviewing training program results and providing the necessary financial support for them.	Medium-term
4	Adopting a flexible organizational structure that allows free communication and broad sharing of information.	Top management by: Encouraging open communication and valuable feedback, emphasizing that learning is valued over failures.	Long-term
5	Increase investment in IT infrastructure.	Top management coordinates with the finance and IT departments by: Supporting network efficiency and enhancing access to the Internet, as well as providing digital platforms and technological programs to improve the performance of university tasks.	Long-term
6	Developing a digital strategy to support the organization's vision for digital transformation.	Top management by: -Providing infrastructure and technological techniques (digital platforms - technological programs) to support the implementation of business digitally. -Continuously update employees' digital skills and remove concerns related to using technology.	Long-term

Source: Prepared by the researcher based on the results and statistical analysis.

11- Future Research

The research represents an extension of the scientific efforts that have been made in this field, and in light of the researcher's knowledge of the literature related to the study variables, the researcher highlights some suggestion for future studies:

- 1- The research is limited to the administrative apparatus at Benha University. The future studies can be applied to other sectors such as banks and hospitals.
- 2- This study adopted survey questionnaires and single-time response collection, researchers can try to modify the methodology by implementing interviewers or archival data.
- 3- This study is based on four variables: The independent variables were OL (knowledge acquisition – knowledge distribution – knowledge interpretation – organizational memory), while Digital transformation is the only dependent variable. Future research can be conducted by adding other dimensions of OL such as knowledge integration or adding some dependent variables or some moderating variables.
- 4- This study uses OL processes theory; future studies can use other theories.

12- Reference

- Abbas, J., Zhang, Q., Hussain, I., Akram, S., Afaq, A., & Shad, M. A. (2020). Sustainable innovation in small medium enterprises: the impact of knowledge management on organizational innovation through a mediation analysis by using SEM approach. *Sustainability*, 12(6), 2407.
- Abdelwhab Ali, A., Panneer selvam, D. D. D., Paris, L., & Gunasekaran, A. (2019). Key factors influencing knowledge sharing practices and its relationship with organizational performance within the oil and gas industry. *Journal of Knowledge Management*, 23(9), 1806-1837.
- Basir, F. (2023). The impact of digital transformation on organizational agility and competitive advantage. *Pakistan Journal of Management & Social Science VO*, 1(01).
- Blaique, L., Ismail, H. N., & Aldabbas, H. (2023). Organizational learning, resilience and psychological empowerment as antecedents of work engagement during COVID-19. *International Journal of Productivity and Performance Management*, 72(6), 1584-1607.
- Chen, G., Wang, J., Liu, W., Xu, F., & Wu, Q. (2022). Knowledge is power: toward a combined model of knowledge acquisition and knowledge application of enterprises. *Nankai Business Review International*, 13(2), 220-245.
- Chung, P. H., & Lee, C. Y. (2024). The Attitude of Family Firms Toward Digital Transformation: From the Organizational Learning Perspective. *Advances in Management and Applied Economics*, 14(4), 1-2.
- Do, H., Budhwar, P., Shipton, H., Nguyen, H. D., & Nguyen, B. (2022). Building organizational resilience, innovation through resource-based management initiatives, organizational learning and environmental dynamism. *Journal of Business Research*, 141, 808-821.
- Do, T. T., & Mai, N. K. (2022). Organizational learning and firm performance: A systematic review. *International Journal of Productivity and Performance Management*, 71(4), 1230-1253.
- Flores, L. G., Zheng, W., Rau, D., & Thomas, C. H. (2012). Organizational learning: Subprocess identification, construct validation, and an empirical test of cultural antecedents. *Journal of management*, 38(2), 640-667
- Gaglio, C., Kraemer-Mbula, E., & Lorenz, E. (2022). The effects of digital transformation on innovation and productivity: Firm-level evidence of South African manufacturing micro and small enterprises. *Technological Forecasting and Social Change*, 182, 121785.
- Gardner, N. (2022). Digital transformation and organizational learning: situated perspectives on becoming digital in architectural design practice. *Frontiers in built environment*, 8, 905455.
- Hamdani, N. A., Maulani, G. A. F., Nugraha, S., Mubarok, T. M. S., & Herlianti, A. O. (2021). Corporate culture and digital transformation strategy in universities in Indonesia. *Studies of Applied Economics*, 39(10).
- Hina, S. M., Hassan, G., Parveen, M., & Arooj, S. (2021). Impact of entrepreneurial orientation on firm performance through organizational learning: The moderating role of environmental turbulence. *Performance improvement quarterly*, 34(1), 77-104
- Hosseini, S. H., Hajipour, E., Kaffashpoor, A., & Darikandeh, A. (2020). The mediating effect of organizational culture in the relationship of leadership style with organizational learning. *Journal of human Behavior in the social environment*, 30(3), 279-288.
- Huang, J., Ling, Z., & Lu, R. (2023). Directors' and officers' liability insurance and digital transformation—the mediating role of explorative innovation. *Business Process Management Journal*, 29(1), 178-201
- Iriqat, R. A., & Jaradat, A. A. (2021). The impact of digital transformation strategy on customer satisfaction in the Palestinian telecom industry. *International Journal of Business Excellence*, 24(2), 169-186.

- Lin, C. Y., & Huang, C. K. (2021). Employee turnover intentions and job performance from a planned change: the effects of an organizational learning culture and job satisfaction. *International Journal of Manpower*, 42(3), 409-423.
- McCartney, G. and McCartney, A. (2020), "Rise of the machines: towards a conceptual service-robot research framework for the hospitality and tourism industry", *International Journal of Contemporary Hospitality Management*, Vol. 32 No. 12, pp. 3835-3851.
- Melović, B., Jocović, M., Dabić, M., Vulić, T. B., & Dudic, B. (2020). The impact of digital transformation and digital marketing on the brand promotion, positioning and electronic business in Montenegro. *Technology in Society*, 63, 101425.
- Mubarak, M. F., Shaikh, F. A., Mubarik, M., Samo, K. A., & Mastoi, S. (2019). The impact of digital transformation on business performance: A study of Pakistani SMEs. *Engineering technology & applied science research*, 9(6), 5056-5061.
- Muskat, B., & Deery, M. (2017). Knowledge transfer and organizational memory: An events perspective. *Event Management*, 21(4), 431-447.
- Persson, J., & Manas, K. (2021). Towards the new normal: digital transformation through digital leadership and digital transformation strategies.
- Putra, A. S., Novitasari, D., Asbari, M., Purwanto, A., Iskandar, J., Hutagalung, D., & Cahyono, Y. (2020). Examine relationship of soft skills, hard skills, innovation and performance: The mediation effect of organizational learning. *International Journal of Science and Management Studies (IJSMS)*, 3(3), 27-43.
- Schiuma, G., Schettini, E., Santarsiero, F., & Carlucci, D. (2022). The transformative leadership compass: six competencies for digital transformation entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 28(5), 1273-1291.
- Tarawneh, A. I., & Al-Adaileh, R. (2021, March 19). The interplay among management support and factors influencing organizational learning: an applied study. *Journal of Workplace Learning*, 33(6), 460-485.
- Thompson, S. K. (2012). *Sampling*. (Vol. 755). Third Edition. John Wiley & Sons. Simon Fraser University, British Columbia.
- Tian, G., Li, B., & Cheng, Y. (2022). Does digital transformation matter for corporate risk-taking?. *Finance Research Letters*, 49, 103107.
- Toe, T. T., & Tantasanee, S. (2021). The impact of organizational learning and organizational innovation on organizational performance: a case of an internet service provider in Myanmar. *ABAC ODI Journal Vision. Action. Outcome*, 9(1), 204-220.