

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/376858535>

THE ROLE OF DIGITAL TRANSFORMATION AND KNOWLEDGE BUILDING IN EDUCATIONAL INSTITUTIONS

Article · September 2023

CITATIONS

0

READS

28

3 authors, including:



Muna Hayder Abduljabbar Al-Taai

University of Baghdad

39 PUBLICATIONS 4 CITATIONS

SEE PROFILE

THE ROLE OF DIGITAL TRANSFORMATION AND KNOWLEDGE BUILDING IN EDUCATIONAL INSTITUTIONS

¹Hiba Riad Abd Al-Khaleq

¹Email: readhhiba@gmail.com

²Assistant Prof. Dr. Muna Haider Abd Al-Jabbar

²Email: muna.haider@coeduw.uobaghdad.edu.iq

^{1,2} College of Education for Women, University of Baghdad, Sociology Department

Abstract

This study aims at identifying the correlation between digital transformation and knowledge building in educational institutions, as well as finding the influence relationship between digital transformation and knowledge building in educational institutions and knowing the dimensions of digital transformation that have the most impact in improving the level of knowledge building, and by adopting the methodological descriptive analysis method in the Ministry of Education. Education and educational institutions in Baghdad. This research deals with digital transformation as an independent variable according to two dimensions (digital adaptability and digital readiness). Knowledge building was adopted as an approved variable using the statistical program (spss. V24), and a set of results were reached, the most important of which are: It was found that there is a weakness in the commitment of some educational institutions to laws and legislation and the absence of government oversight in this aspect, or those institutions focus on other standards that may achieve her most purpose. It was found that there is a weakness in the commitment of some educational institutions to laws and legislation and the absence of government oversight in this aspect, or the focus of these institutions on other standards that may achieve the most purpose accordingly, the study made a set of recommendations, including: educational institutions should focus on knowledge extraction inherent in the minds of its members to benefit from it in the development of the institution. In addition, educational institutions and senior administrations require the development of integrated information systems operations and response to developments, change and transformation in the inputs of modern systems and information technology.

Introduction

The prominent role of knowledge has led to the emergence of societies called knowledge societies, which are based on knowledge and keep pace with the rapid technological transformations that the world is witnessing, whether by using new technologies, or updating and upgrading existing programs and technologies, as well as contributing to the emergence of modern terms in this The aspect as the term digital transformation, as there are many concepts of the term digital transformation, which can be considered a phenomenon resulting from a group of modern digital technologies, which operate simultaneously, and among these technologies are computers, artificial intelligence, and others. As digital transformation leads to the production of large and new amounts of information, it can contribute to decision-making and strategic planning. In line with the Fourth Industrial Revolution, and the modern and effective technologies it offers in improving performance and quality of education, countries

have tended to adapt and use these technologies to suit their multiple needs, as well as innovative technology. Among the most prominent features of this revolution are the techniques of digital transformation, and the most important thing that distinguishes them is the possibility of using them in all different fields and sectors, meaning that benefits they provide are great, whether at the social, political or economic level. The use of the techniques of the Fourth Industrial Revolution was not limited to companies or private institutions, but the government sector and its institutions took the initiative to use them, as the techniques of the Fourth Industrial Revolution represent the most prominent trend in the information technology sector today.

First Topic: Research Methodology

First: Research Problem

The era of digital transformation and digitization and access to the functioning of institutions according to modern trends that aim at accuracy and speed of completion of work and ease of information exchange, which contributes to creating an environmental atmosphere for better work, as human societies are witnessing today a massive information revolution that has cast a shadow on various aspects of scientific life within Iraqi society. And this led to the emergence of the reality of digitization in addition to the traditional reality that was witnessed by the members of society. As scientific and technical innovations became a distinctive mark, which necessitated the use of information technology and the transition of the state of typical education to flexible education.

Therefore, we need professional teams responsible for managing the technical system and network infrastructure so that the ministry can use its resources more efficiently and optimally, especially that this shift and working as a group contributes mainly to the growth and prosperity of the sectors, which leads to an inevitable result that is positively reflected on the development of the education sector in Iraq as a whole, because education in its digital age is to support digital and technological skills to participate in our digitally interconnected society, but skills, especially (digital navigation) have become more capable of overcoming other skills to bridge the gaps in those skills to meet the challenges of digital transformation in building knowledge for the educational institution that has occurred to me Its leadership cadres, so we shed light on crystallizing a set of questions about the repercussions of digital transformation and building knowledge for the leadership cadres in the Ministry of Education and its many educational institutions. Perhaps the most prominent of these questions are the following:

1. How can digital transformation be reflected in building knowledge in educational institutions?
2. What is the overlap between digital transformation and knowledge building when it is adopted by leaders in educational institutions?
3. What is the availability of digital transformation and knowledge building in educational institutions?
4. Are the dimensions of digital transformation (digital awareness, digital acceptance, digital readiness, digital alignment) associated with building knowledge in educational institutions?

5. Do the dimensions of digital transformation (digital awareness, digital acceptance, digital readiness, digital adaptation) affect knowledge building in educational institutions?

Second: Research Importance

The importance of the current research revolves around the following:

1. The study derived the improvement of the necessity of researching and studying the nature of the relationship between digital transformation and knowledge building and its repercussions on educational institutions.
2. Raising the interest of educational institutions to benefit from the repercussions and positive effects of such justifications that work to supply knowledge to all their educational institutions.
3. Most educational institutions that the digital transformation had an impact on the limited implementation or application of building knowledge within educational institutions.

Third: Research Objectives

This study aims to achieve the following:

1. Identifying the digital transformation and its reflection in building knowledge in the educational institution
2. Finding the correlation between digital transformation and knowledge building in educational institutions.
3. Finding the impact relationship between digital transformation and knowledge building in educational institutions.
4. Knowing the dimensions of digital transformation that have the most impact on improving the level of knowledge building.

Fourth: Virtual Diagram of the Study

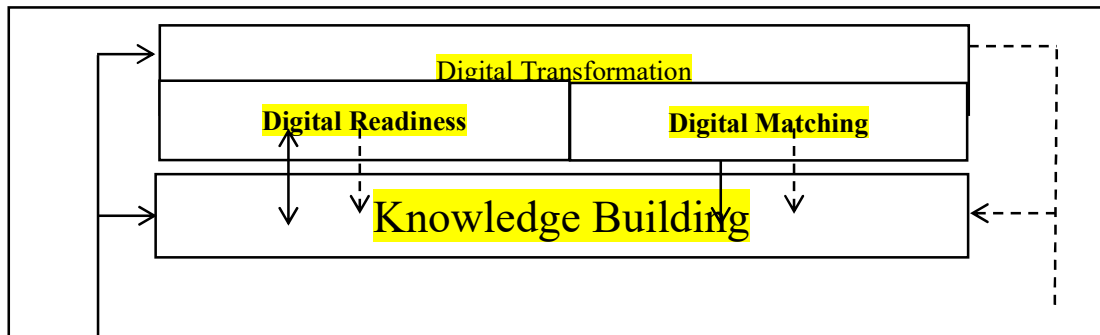


Figure (1): Virtual Diagram of the Study

Relationship/ Impact Relationship

Source: Conducted by both of the researchers

Fifth: Research Hypotheses

The hypotheses of the study are formulated according to the main variables and their dimensions according to the hypothetical scheme that shows the relationship of correlation and influence between the research variables according to the following:

First: The first main hypothesis: There is no statistically significant correlation between digital transformation and knowledge building in educational institutions.

The following sub-hypotheses emerged from the first main hypothesis:

- 1- There is no statistically significant correlation between digital alignment and knowledge building in educational institutions.
- 2- There is no statistically significant correlation between digital readiness and knowledge building in educational institutions.

Second: The second main hypothesis: There is no significant statistically significant effect of digital transformation in building knowledge in educational institutions.

The following sub-hypotheses emerged from the second main hypothesis:

- 1- There is no significant statistically significant effect of digital adaptation on building knowledge in educational institutions.
- 2- There is no significant statistically significant effect of digital readiness in building knowledge in educational institutions.

Second Topic: Theoretical Framework

First: the skills needed to build knowledge

(Al-Dhafiri, 2021, 23) presents a set of skills that must be available in building knowledge for female staff in the educational institution.

1. Communication skills: including creating YouTube videos and the ability to communicate via the Internet with a wide range of people who have ideas and then identify them.
2. Self-learning skills: which aims to take responsibility for knowing everything an individual needs to know and where to find that knowledge, because knowledge is constantly changing.
3. Moral skills: which are required to build trust, especially in informal social networks, because this promotes the dependence nature of most employees in training.
4. Digital skills: Since most knowledge-based radiology is technology-based, the main problem is that skills follow technology as an integral part of the knowledge domain.
5. Knowledge management skills: These are the comprehensive skills of all skills. Thus, knowledge does not change quickly, but the sources of information change with a large amount of variation in the accuracy of the information. The knowledge received by trainees becomes outdated after the passage of years, and from this we conclude that the basic skill is based on knowledge. In its management of how information is found, evaluated, analyzed, applied and disseminated, the institutional training system must create flexible trainees who are able to adapt to rapidly changing conditions.

Second: Learning Digital Knowledge

Learning is the change in the apparent and latent human performance. The three learning theories are as follows, behavioral, cognitive, and constructivist, which emphasize the occurrence of learning and the interactions of the individual with the content and may result in mental, emotional and physiological changes. The following are the most important theories

explaining how learning occurs. (Nabil, 2017, 36), (Elhais and Sabti, 2019, 18):

- 1- Behavioral theory: that learning is unknowable, that is, it is not possible to know what is inside a person (black box theory). This theory is based on several assumptions, the most important of which is that behavior is observable and that it is determined by the relationship between the stimulus and the response.
- 2- Cognitive theory: This theory looks at the information processing model in the computer, as learning is seen as a process by which the inputs are managed in the short-term memory and encoded in the long-term memory.

Knowledge is seen in cognitive theory as the actual, symbolic structure in the learner's mind, and thus the learning process is the means through which the (symbolic cognitive structure is transferred to memory).

- 3- The constructivist theory: This theory believes that learners are not empty vessels that are supposed to be filled with knowledge, but it is possible to choose knowledge and continue learning. The theories mentioned above have resulted in knowledge either expressing an external, objective reality and expressing an interpreted reality that is subject to negotiation between experience and action, or a reality that exists within the learner. Knowledge can be stored and processed by means of technology mechanisms and it has coincided with the rapid flow of information in the internet world that nourishes the value of exploration and research and is more important than acquiring information. Network learning theory.

The old theories failed to understand the complex technological flow and the comprehensiveness of this theory in terms of the integration of its underlying principles, and because institutions today, especially educational ones, seek to create an organized environment that works to generate and transfer modern information that directly affects the building of institutional knowledge.

Knowledge passes through three main stages, i.e. (knowledge generation) through research, creativity and innovation, and the process of dissemination that takes place through education, training and knowledge employment, which is provided by providing developed services to the educational institution, which contributes to all areas of development and with the help of information technology will be the process of registering patents.

Third: Governance of digital transformation in educational institutions

Digital transformation has multiple forms and degrees, as it differs in its forms from one institution to another in the nature of its application and the degree of its activity in terms of its use of technology. Performing transactions electronically, provided that it is a safe digital technology environment based on protected databases. (Laferrière, et.al, 2010, 51). (Makki, 2020, 16). Digital transformation generally takes place through three pillars, as follows:

- 1- **Leadership:** That the management of the institution builds and supports this transformation and follows up on its developments.
- 2- **Strategy:** The process of digital transformation must be included at the highest level of the strategy, the core of the educational institution's vision and mission, and its executive and future strategy.

3- Culture: That is, the repercussions of digital transformation in all the details of the institution at the level of educational culture in terms of administrative staff, employees, work environment, procedures, standards and values that the institution boasts and works with.

As for the stages of digital transformation, the methods of initiating them may differ, but there are several main steps and a mission that desires the desired digital transformation in the educational institution, which are as follows:

- 1- Logistics methods:** that is, the availability of the infrastructure that aims to assist the digital transformation.
- 2- Procedural methods:** which is the availability of applications that can help in the digital transformation process, namely accuracy and objectivity.

The possibility of implementing digital transformation in the educational institution may emerge from the two methods as follows: (Zhu & Jim,2021,37). (Zain, 2020, 18-20):

- A-** That the administrators of the administrative units be acquainted with the nature of digital transformation and the challenges and procedures it includes.
- B-** The reality of the educational institution, its strengths and weaknesses, the possibility of opportunities for development and improvement, appropriate solutions and proposals, and the development of strategies for digital transformation and its mechanisms are studied.
- C-** Assigning tasks and responsibilities to those in charge of the digital transformation process and approving them as administrative references for digital transformation.
- D-** Drawing specific detailed goals, and implementing and relying on them are put in the practical application phase gradually, according to the priority and importance of the institution.
- E-** The implementation of a specific time plan is initiated by involving everyone in the digital transformation process.
- F-** Continuous monitoring of the progress of the digital transformation process and measuring the effectiveness of the technology used by reading and analyzing the extract.

Kalenov, et.al.2020, 76 (Renáta & Koltai, 2021, 49) identifies twelve principles of Knowledge Base as follows:

- 1-** Real Ideas, Real-Life Problems In the classroom, students should be interested in understanding real world problems.
- 2-** Ideas that can be improved/as students' ideas are things that can be improved
- 3-** Diverse ideas in the classroom, it is necessary to have a variety of ideas that students come up with
- 4-** High-level concepts achieved through continuous improvement in ideas and understanding, as students create high-level concepts.
- 5-** Cognitive agency / as students find themselves on their way to progress.

- 6- Community Knowledge, Collective Responsibility Students' contribution to improving their collective knowledge in the classroom is the primary objective of the Knowledge Building class.
- 7- The Democracy of Knowledge/ All people are invited to contribute to the advancement of knowledge in the classroom.
- 8- Symmetrical Advancement of Knowledge The goal of knowledge-building societies is to have individuals and organizations work actively to ensure the mutual advancement of their knowledge.
- 9- Spread of knowledge building/ as students contribute to the collective building of knowledge.
- 10- Constructive use of reliable sources. All participants, including teachers, rely on this advocacy as a natural approach to support their understanding.
- 11- Knowledge Building Conversation Students participate in a conversation to share and improve knowledge in the classroom.
- 12- Parallel, Possible and Transferable Assessment/ Students gain a comprehensive view of their understanding, and then decide how to deal with their grades. They create and participate in assessments in a variety of ways.

Fifth: Building knowledge from the point of view of Wiig

Wiig focused on three conditions required to be able to represent or represent organizations: (Wiig, Karl M.2020,532).

- To have businesses (products) and customers,
- To have resources (individuals, capital, facilities),
- To have the ability to act.

Wiig's knowledge building cycle model focused on the third point, as knowledge is a major force that determines and directs the ability to act intelligently. To develop knowledge, we know better what we are doing, and how we are doing it. Wiig defined the main purpose of knowledge management as efforts to make organizational intelligence effective by facilitating innovation, accumulation, dissemination and use of qualitative knowledge. Working smart means that we must take an approach in our work and tasks based on great experiences, and this requires that we seek to acquire knowledge of high quality whenever possible and apply it in different better ways. Working smart also includes "using all the best knowledge we have." (Kalenov,2017,71).

In the same context (Antopol'skiy, et.al, 2019, 730), (Parinov,2015,221), knowledge building occurs through:

1. Research and development projects, individual innovations to improve the way tasks are performed, experiment, think about existing knowledge, and bring in new people.
2. Importing knowledge (extracting knowledge from experts or through procedural evidence, or transferring individuals between departments).

3. Real-world discovery (doing site visits, discovering processes after the change has been introduced).

As for knowledge analysis, it includes: (Bennett,2019,730)

1. Extract what appears to be knowledge by acquiring material (analysis of transcripts and identification of topics, listening to explanations, and selection of concepts of most consideration).
2. Abbreviating or summarizing the extracted material (eg the form of the model or theory).
3. Identification of elicitation models (trend analysis).
4. Clarify the relationships between parts of (diffuse) knowledge (such as comparison, and causal relationships).
5. Verify that the extracted material conveys the meaning of the original sources (such as not being affected by the meaning after abbreviation, arrangement, etc.).

Finally, knowledge can be organized for a specific use and according to the organizational frameworks that are established (eg standards and fields). This organization is usually done using some form of ontology (the conceptual model) and types (classification rules). Examples contain a formal list of keywords or fields, attributes of specific knowledge topics, and guides to translation. (Laferrière, et.al, 2010, 51).

The third topic

Field Study

This topic highlights the nature of the main variables represented by digital transformation as an independent variable in its two dimensions (digital adaptability, digital readiness) and knowledge building as a dependent variable, who contributed to the formation of the study model and building its hypotheses. The two researchers adopted the SPSS-24 statistical software for the purpose of testing the study hypotheses.

First: Testing the correlation between the study variables

The idea of the correlation hypotheses related to the research variables was based on the absence of a statistically significant correlation between the digital transformation represented by its dimensions (digital adaptability, digital readiness) and knowledge building, and with the aim of reaching an accurate judgment regarding the rejection or acceptance of the hypothesis and the sub-hypotheses that this paragraph seeks To clarify the value of the emerging correlations between these variables, and to indicate the extent of their morale, as stated in the research methodology, as these hypotheses relate to the correlation between the main and sub-variables of the study as follows:

Test the first main hypothesis and its sub-hypotheses

- The first main hypothesis states that (there is no statistically significant correlation between digital transformation and knowledge building in educational institutions)
- A) Presenting the results of the overall correlation at the level of educational institutions between digital transformation and knowledge building, according to the first main hypothesis.

Table (1)

The overall correlation coefficients for digital transformation and knowledge building in educational institutions

Independent Variable	Digital Transformation
Dependent Variable	Educational Institutions
Knowledge Building	*0.815
Sample Size	274

Source: Conducted by both researchers based on the results of the (SPSS) program, $P \leq 0.05$

Through table (1), it becomes clear to us that by analyzing the correlation relationships at the macro level between digital transformation and knowledge building, there is a correlation with a ratio of (*0.815), meaning that the greater the adoption of digital transformation in educational institutions, a tool for development and increasing the effectiveness of knowledge building, and this indicates the presence of Significant correlation between digital transformation and knowledge building, and thus the first main hypothesis will be rejected and the alternative hypothesis accepted, which states (there is a significant correlation with statistical significance between digital transformation and knowledge building in educational institutions).

B) Presenting the results of the partial correlation at the level of educational institutions between each dimension of digital transformation and knowledge building, according to the sub-hypotheses emanating from the first main hypothesis.

Table (2)

Partial correlation coefficients for digital transformation and knowledge building in educational institutions

Dependent Variable	Knowledge Building
Independent Variable	Educational Institutions
Digital Transformation	*0.879
Digital Matching	*0.718
Digital Readiness	274
Sample Size	274

Source: Conducted by both researchers based on the results of the (SPSS) program, $P \leq 0.05$ / *=significant

Second: To test the influence relationships between the study variables

The idea of impact hypotheses (regression) related to educational institutions is based on the

absence of a statistically significant impact relationship between the digital transformation represented by its dimensions (digital adaptability, digital readiness) in building knowledge and with the aim of reaching an accurate judgment regarding the rejection or acceptance of the hypothesis and the sub-hypotheses derived from it This paragraph seeks to clarify the value of the effects arising between these variables, and to indicate the extent of their morale, according to what was stated in the methodology of the study, as these hypotheses relate to the influence relationships between the main and sub-variables of the study as follows:

- 1) To test the second main hypothesis and the sub-hypotheses that emanate from it:
 - The second main hypothesis states that (there is no significant statistically significant impact relationship between digital transformation in building knowledge).

Therefore, the results of the total impact at the level of educational institutions between digital transformation in building knowledge will be presented according to the second main hypothesis.

Table (3)

The overall impact factors of digital transformation in building knowledge in educational institutions

Independent Variable / Dependent Variable	Digital Transformation			F	
	B ₀	B ₁	R ²	Calculated	Tabular
Marketing Opportunities / Educational Institutions	0.512	0.495 (8.753)	0.711	69.248	3.124

Source: Conducted by both researchers depending on the (SPSS) software

(*) denotes the calculated t value df (1,272) N = 274 P ≤ 0.05 *=significant

It is evident from Table (3) regarding the results of the regression analysis that there is a significant effect of digital marketing combined in building knowledge as a whole, as the calculated (F) value reached (69.248), which is higher than its tabular value of (3.124) at the two degrees of freedom (1,272) and the level of significance (0.05). The coefficient of determination was (2) R (0.711), which means that (71%) of the differences explained for building knowledge are due to digital transformation, and the rest (29%) are due to random variables that cannot be controlled or are not included in the regression model at all. By following the coefficients (B) and the (T) test for them, it was found that the calculated (T) value is (8.753), which is a significant value and greater than its tabular value of (1.992) at a significant level (0.05) and two degrees of freedom (1,272). The second main hypothesis was not achieved at the level of educational institutions, so the second main hypothesis will be rejected and the alternative hypothesis accepted, which states (there is a significant statistically significant effect of digital transformation in building knowledge in educational institutions).

2- Testing the sub-hypotheses emanating from the second main hypothesis

- The sub-hypotheses states that (there is no significant statistically significant impact relationship between each dimension of digital transformation in building knowledge combined).

In order to clarify the impact relationships between each dimension of digital transformation in building knowledge at the level of educational institutions and in light of the sub-hypotheses emanating from the second main hypothesis, the impact relationships have been analyzed for each dimension of digital transformation (digital adaptability, digital readiness) in building knowledge combined. and individually as shown in Table (4).

Table (4)

The impact of the dimensions of digital transformation in building knowledge at the level of educational institutions

Source: Conducted by both researchers depending on the (SPSS) software

Independent Variable / Dependent Variable	B ₀	Digital Transformation		R ²	F	
		Matching	Readiness		Calculated	Tabular
	B ₁	B ₂				
Knowledge Building	3.025	0.747 (2.147)	0.921 (3.691)	0.832	56.259	3.130

(*) indicates the calculated t value df(2,271) P≤ 0.05 N = 274 *=significant

Table (4) indicates that there is a significant effect of digital marketing in building knowledge, as the calculated (F) value reached (56.259), which is higher than its tabular value of (3.130) at the two degrees of freedom (2,271) and the level of significance (0.05), and the coefficient of determination reached (R²) (R) has (0.832), and this means (83%) of the explained differences in building knowledge are explained by the dimensions of digital transformation, and the rest is due to random variables that cannot be controlled, or that they are not included in the regression model at all. T) has found that there is a significant effect of the dimensions of digital transformation in building knowledge as a whole. It is clear to us from Table (4) that the highest impact of digital transformation in building knowledge as a whole is represented in digital readiness first, as the value of (B₂) was (0.921) and the value of (T) was *(3.691), which is a significant value and greater than its tabular value of (1.992) at two degrees of freedom (2,271), then the effect of digital alignment in building the combined knowledge came in second place, as the value of (B₁) was (0.747) and the value of (T) was (2.147). It is a significant value and greater than its tabular value of (1.992) at a degree of freedom (2,271). Therefore, the sub-hypotheses emanating from the field will be rejected. The second main issue and the acceptance

of the alternative hypotheses that states (there is a significant statistically significant effect relationship between each of the dimensions of digital transformation in building knowledge combined).

Fourth Topic: Conclusions and Recommendations

Conclusions

- 1) The appropriate organizational structure for the implementation of digital transformation must consist of sub-structures integrated with each other to achieve a common overall goal that includes the role of work teams and work groups within it.
- 2) Knowledge building is an important core component of institutions, and the effectiveness of this variable comes from the institution's ability to teach its members values and beliefs, and through the interaction of a group of factors that are represented by the personal characteristics of employees and the prevailing ethics in the institution, and through the set of laws and procedures affiliated to this purpose.
- 3) It was found through the results of the correlation and impact analysis of educational institutions that there is a correlation and impact between the digital transformation collectively and individually in building knowledge, and that the dimension of digital readiness had the greatest impact in building knowledge.
- 4) It was found that there is a weakness in the commitment of some educational institutions to laws and legislation and the absence of governmental oversight in this aspect, or the focus of these institutions on other standards that may achieve the most purpose.

Recommendations

- 1) Adopting the application of all the main components to facilitate digital transformation, specifically in the main aspects of the development strategy for digital transformation in educational institutions.
- 2) The necessity of introducing and promoting the available electronic services in educational institutions, by exploiting technology such as various media and social networks, in order to be recognized by the beneficiaries and then expand the scope of their use.
- 3) Educational institutions should focus on extracting the latent knowledge in the minds of its members to benefit from it in developing the institution.
- 4) Educational institutions and senior administrations must develop integrated information systems operations and respond to developments, change and transformation in the inputs of modern systems and information technology.

References

1. Al-Dhafiri, Fayez Munshar, (2021). Educational Digital Transformation as a New Educational Model. College of Education, Kuwait University. 3(1).
2. Nabil Fadl, (2017). The Direction of Achieving the Quality of Learning Digital Knowledge, Management and Design of Teaching Research. Faculty of Education, Tanta University.

3. Elhais Abdel-Wahab Gouda, Sabti, Obaidah Ahmed, (2019). Ain Shams University, Egypt, Biskara University, Algeria, *The Arab Journal of Literature and Human Studies*. 6.
4. Makki, Mohamed Fathi, (2020), A Proposed Strategy to Transform Minya University into a Smart University in Light of the Trends of Digital Transformation and the Emirati Model of Hamdan Bin Mohammed Smart University. Faculty of Education, Minya University, *Fayoum University Journal of Educational and Psychological Sciences*, Egypt. 14, 423.
5. Zain, Mohamed Taher, (2020), The Shifts of Journalism in Chad from Paper to Digital. Al Jazeera Media Institute, Al Jazeera Media Fellowship. 18-20.
6. Antopol'skiy, A.B., Bosov, A.V., Savin, G.I., Sotnikov, A.N., Tsvetkova, V.A., Kalenov N.E., Serebryakov, V.A., (2019). Efremenko, D.V.: Printsipy 13. postroyeniya i struktura yedinogo tsifrovogo prostranstva nauchnykh znaniy (YETSPNZ). *Nauchno-Tekhnicheskaya Informatsiya*. 1(4).
7. Bennett, M., Baclawski, K., (2019). The Role of Ontologies in Linked Data, Big Data and Semantic Information System Socionet. *Communications in Computer and Information Science* 518.
8. Gaoxia Zhu, Preeti Raman, Wanli Xing & Jim Slotta, (2021). Curriculum Design for Social, Cognitive and Emotional Engagement in Knowledge Building. *International Journal of Educational Technology in Higher Education*. 18(37).
9. Kalenov, N.E., Savin, G.I., Serebryakov, V.A., Sotnikov, A.N.: (2019). Printsipy postroyeniya iformirovaniya elektronnoy biblioteki "Nauchnoye naslediyе Rossiі". *Programmnyye Produkty, Sistemy i Algoritmy*. 4(100).
10. Laferrière, T., Law, N., & Montané, M. (2010). An international Knowledge Building Network for Sustainable Curriculum and Pedagogical Innovation. Paper presented at the annual meeting of the American Educational Research Association (AERA), Denver.
11. Laferrière, T., Montané, M., Gros, B., Alvarez, I., Bernaus, M., Breuleux, A., Allaire, A., Hamel, C., & Lamon, M. (2010). Partnerships for Knowledge Building: An Emerging Model. *Canadian Journal of Learning Technologies*, 36(1).
12. Nikolay Kalenov & Gennadiy Savin & Alexander Sotnikov, (2020), Fundamentals of Common Digital Space of Scientific Knowledge Building, International Conference "Common Digital Space of Scientific Knowledge" November 10–12, 2020, Moscow, Russia. 147–157
13. Parinov, S., Lyapunov, V., Puzyrev, R., Kogalovsky, M. (2015). Semantically Enrichable Research Prospects. The Impact Factors of Russian Mathematics Journals, *Russian Math. Surveys* 64.
14. Renáta Németh & author Júlia Koltai, (2021). The Potential of Automated Text Analytics in Social Knowledge Building, *Pathways Between Social Science and Computational Social Science*. 49-70.

15. Wiig, Karl M. (2020). The importance of personal knowledge management in the knowledge society, "Personal Knowledge Management: Individual, Organizational and Social Perspectives". Chapter Proposal".