

The Impact of Digital Infrastructure on the Educational Technology Digital Transformation Strategy in the Kingdom of Saudi Arabia

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Abstract

The research aimed to assess the educational digital transformation in the Kingdom of Saudi Arabia. By identifying the concept of digital transformation, analyzing the foundations and mechanisms to achieve educational digital transformation, the extent to which a qualified technological infrastructure exists, and analyzing digital transformation strategies in university institutions in the Kingdom. The quantitative analytical approach was used to examine the significance of the relationship between the readiness of technological infrastructure and the mechanisms of educational digital transformation. To achieve the objectives of the research, the questionnaire was used for collecting data from the research community, which is represented by faculty members at Imam Abdul Rahman bin Faisal University, One of the educational institutions in the Kingdom of Saudi Arabia. The results showed that the Kingdom has a technological infrastructure capable of absorbing the educational digital transformation, as the educational digital transformation in the Kingdom has achieved effective results. There was also a significant relationship between the readiness of the technological infrastructure in the Kingdom and the implementation of the educational digital transformation strategy. The research revealed that there are significant differences in favor of the categories (Females - Doctorates - High Experience), towards the readiness of the infrastructure in the educational field capable of accommodating the educational digital transformation. We recommend adequate privacy and security measures to ensure that the learning process is fully digital.

Keywords: Education Technology - Digital Transformation - Digital Infrastructure - Education Sector - Educational Institutions.

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Introduction

Digital transformation offers greater opportunities for progress in all sectors of the country, especially the education sector. Where digital transformation worked to achieve the objectives of institutions and to connect them to their strategic vision. The Kingdom has adopted the distance education option as one of the strategies to confront the pandemic, although judging distance education experience is very difficult in the absence of statistical indicators, its adoption by the Ministry of Education will enable the construction of successful experiments in the future (Hani,2021). Many countries have a strategic plan for electronic transformation, but it is often surrounded by halting and slow implementation procedures, due to the continued handling of paper services, and the direct presence of workers and employees in government departments. Corona pandemic has had the urgent importance of digital technologies for administration, economy, and society, and the Kingdom is prepared fully to move forward on the path of digital transformation (Brdese,2021).

Digital transformation offers good opportunities to reduce costs and achieve competitive advantages for many parties, because of the capabilities provided by remote communication technology, and the opportunities presented to users. Economic and financial return and cost savings achieved by this technology contribute to improving performance and rationalizing public spending (Ezzeldin,2021). The response of Saudi Arabia to the digital transformation system was well-structured, as the digital transformation system worked on a rapid response to ensure continuity of work during Corona pandemic, working teams were formed in different sectors for follow-up and implementation, technology was largely employed because it is a major component during Corona pandemic, which contributed to the acceleration of digital transformation and its effective practice (Hani,2021).

Kingdom has provided digital mechanisms to ensure business sustainability in all circumstances. It has developed modern business models through which emerging technologies are employed and worked to innovate innovative solutions. Many reasons prompted Kingdom to move towards digital transformation, perhaps Corona pandemic has had credit for accelerating its implementation mechanisms (Alalwan,2021). In addition to achieving alignment and coordination between public and private sectors, unifying efforts to address common challenges, and discovering and analyzing opportunities, have proven the feasibility of digital transformation products and business models. Educational digital transformation is credited with creating effective digital tools that ensure the sustainability of the educational process, enable business continuity after the crisis, ensure the continuity of services for all students, with digital solutions during the curfew period, and ensure continued provision of various educational solutions (Alsahafi,2016).

Educational digital transformation is part of the Kingdom's vision for 2030. However, when implementing this system, it is necessary to ensure the effectiveness of the logistical support tools that qualify the application of this electronic educational system for digital transformation. At the beginning of its implementation, educational digital transformation faced many obstacles that limit its application and reduce its importance (Hassounah,2020). Perhaps the most important of these obstacles are data security, low technological culture, and users' lack of digital transformation systems and tools. But despite these obstacles, digital transformation strategy guarantees many promising opportunities, if they are deliberately applied, through investment in technology and the exploitation of promising human capital, to achieve digitalization in the field of education (Hoq,2020). Given the increasing importance of the phenomenon of educational digital transformation in the Kingdom of Saudi Arabia, we presented this research that analyzed and evaluated the experience of educational technological digital transformation in the Kingdom, monitors the positive points, and attempted to propose solutions to the obstacles facing their application.

Literature review

Many studies dealt with digital transformation. Madani, A., & Boutebal, S. E. (2020) aimed to analyze digitization development, and its priorities in the short term, as one of the ways to confront the effects of advancing the national economy. Analysis of many structural, economic, and global indicators has shown that Algeria suffers from the digitization gap. Relying on the structural and technical analysis methodology, the results showed that there are 18 main factors affecting the dynamics and digitization development and its future perceptions. These factors can be summarized in three interrelated issues, namely improving the governance of the information and communication technology sector, accelerating technological development, and finally intensifying the use and dissemination of this technology. Finally, the importance of digitization in facing the consequences of Corona pandemic, the research concluded by identifying six priorities in the short term.

Arnold, et. al. (2021) examined the impact of digital transformation during the Corona pandemic, and the research aimed to define the digital transformation process, and its understanding, as well as the motives for digital transformation, the research focused on digital management during Corona pandemic, digital services considering Corona pandemic, as the researchers analyzed the most important digital applications during the Corona pandemic.

The research found that digital transformation is one of the most important factors that determine the country's future. Everyone aspires to improve efficiencies, reduce spending, implement new services quickly and flexibly, then build effective and competitive societies through the application of digital transformation mechanisms. In addition to designing applications that contribute to combating the negative effects of the pandemic, by providing government services, and providing technical support teams to ensure the proper functioning of electronic systems. Countries that have reached an advanced stage of digital transformation have been able to contain the spread of disease, as they have used artificial intelligence systems, the Internet of Things, and robotics as an alternative to human and medical staff to provide the necessary services to the patient. It relied on big data, comprehensive surveillance systems, and facial recognition systems in the early detection of infected or potentially infected cases. The strategy of the total or partial ban also called for the closure of government and private institutions, as well as the closure of schools and universities, by providing parallel alternative services, including resorting to electronic services, work, education, litigation, and electronic commerce.

The digital transformation of teaching must involve making the right technological decisions by people and for people, in order to achieve a more inclusive, participatory and humane University supported by technology. Digital transformation is a social requirement for governments, companies, and institutions. (Francisco,2023)

Hani, et. al. (2021) studied the phenomenon of digital transformation during the Corona pandemic and beyond, the concept of digital transformation, and how to apply it in Algeria, through its adoption of communications and information technology systems, and activating its use to reach information society, electronic management, and a digital economy, through the adoption of infrastructure Good digital, to be in the ranks of countries that seek progress and success, through digital transformation, and digital access to all segments of society. The research found that the health crisis caused by the Corona pandemic developed the digital path for most sectors of economic activity, and worked to implement a digital transformation strategy that would encourage communication, as well as work electronically using all digital media available from platforms, applications, and social media. Digital transformation also provides great opportunities for administration, government institutions, and the private sector, enabling them to spread virtually, which facilitates access to services at home or anywhere if the matter is done electronically. (Vicente Díaz-Garcia,et.al,2023)

KAMIŃSKI, J. (2021) aimed to focus on one of the phenomena that were manifested during the Covid-19 pandemic, which is the phenomenon of digital transformation, under the pressure of the pandemic, and due to quarantine, and the wheel of the economy, trade, money stopped, governments, institutions, and individuals turned to digital technologies, to ease the weight of the stone and overcome its difficulties. There has been great reliance on social media and digital platforms to keep the rope of communication possible between people, work practice, and electronic commerce operations. Despite the widespread of this digital transformation, its arrival to new categories, and its entry into sectors that were completely far from it, it was distinguished as a sudden, forced, improvised, random, and unplanned transformation, which made it an incomplete transformation, and unable to achieve the desired benefits, especially in the developing countries. The concepts and methods of digital anthropology have been used as the discipline most capable of analyzing and understanding this phenomenon.

Ratten, V. (2021) sought to identify the role of the Corona pandemic in reshaping the entrepreneurship sector and to identify the opportunities and challenges facing digital entrepreneurship globally and in Oman in particular. Using the qualitative analytical approach, SWOT and PEST methods were used to analyze the opportunities and challenges of digital entrepreneurship. The results indicated that the Corona pandemic has accelerated the trends of entrepreneurship institutions towards digitizing their existing businesses, as well as increasing the number of new and innovative entrepreneurial projects. The results of the research showed that there are many opportunities for the growth of the digital entrepreneurship sector, during the period of the spread of the Coronavirus, due to the role of digitization in enhancing business resilience, in addition to the role of the digital economy in economic growth. Supporting the digital transformation of business models, and policy development for digital infrastructure and ICT-based innovation. Finding ways to spread the culture of using digital technologies in society. By reviewing the literature, we find that there is a dearth of studies that dealt with digital transformation in Saudi Arabia, especially in the education sector, which encouraged the research team to submit this research to cover this research gap.

Digital Transformation

The digital transformation process aims to shorten the time, reduce cost, achieve greater flexibility and more efficiency in the production process, and a great capacity in data processing and artificial intelligence. This importance is working to widen the scope of development and change and the occurrence of unprecedented transformations in the economy, the labor market, and the industrial sector (KAMIŃSKI,2021). Which aims to provide new ways of working for organizations, to achieve speed and flexibility to meet the needs of its rapidly changing customers. It also rolls out technology products and solutions faster, while eliminating many risks. It also improves and regulates operational efficiency, improves quality, and simplifies procedures for obtaining services provided to beneficiaries. Digital transformation also creates opportunities to provide innovative and creative services away from traditional ways of providing services (Madani,2020). Digital transformation helps educational institutions to expand and spread in a wider range and reach a larger segment of customers and audiences. The Internet of Things is one of the mechanisms facilitating the transition of educational sectors to a business model that relies on digital technologies to innovate products and services (Makhlouf,2021).

The flexibility of infrastructure systems to accommodate educational digital transformation in the Kingdom of Saudi Arabia

The Kingdom has been keen to develop five-year plans and strategies to ensure the achievement of digital transformation goals with quality and efficiency, by adopting and implementing the latest telecommunications, information, and communication technology systems, which help facilitate comprehensive mechanisms for digital transformation. In addition, e-government programs are used to empower and support educational

institutions and help them create services that help the digital transformation process (Batayneh,2021). The Kingdom has improved the quality of digital services provided to beneficiaries, by partnering with the private sector to provide fiber-optic network coverage, to more than 3.5 million homes throughout the Kingdom, increased Internet traffic during the pandemic by 30%, and doubled Internet traffic and speed. Because of the comprehensive government support for digital transformation in the Kingdom as part of Vision 2030, the Kingdom has achieved the title of the most advanced country among the twenty countries in digital competitiveness (Ratten,2021).

National Strategy for Educational Digital Transformation

The Kingdom's five-year strategy included three phases, the first dealing with the period from 2006 to 2010, during which the Kingdom sought to enable everyone by the end of 2010, from anywhere and at any time, to obtain government services at a distinguished level, in an integrated and easy way, through Lots of safe electronic means (Althaqafi,2020). The second phase dealt with the period from 2012 to 2016, in which the Kingdom sought to enable everyone to use effective government services, in a safe, integrated, and easy way, through multiple electronic channels. The third stage reflects the period 2020 to 2024, which seeks to reach the concept of "smart government" (Al-Thoblany,2021).

Digital Government Authority in the Kingdom of Saudi Arabia

The Kingdom's Vision 2030 reflects digital transformation, by enabling government agencies digitally, through several programs offered by the Digital Government Authority. Perhaps the most important programs are the Government Integration Channel, the National Center for Digital Certification, the Unified National System for Government Correspondence, the Smart Government Development Center, the Digital Innovation Center, Measurement of Government Digital Transformation, the Information Technology Leaders Portal, the Citizens Interaction Center, and the Digital Transformation Unit (Madani,2020) (Hoq,2020).

Digital Educational Transformation

The digital educational transformation has resulted in the education sector around the world being exposed to many challenges. This transformation is occurring at a slower rate than transformations in other areas, such as e-commerce and digital government. Some schools are taking a modern approach through blended learning, by bringing students back to the classroom and with distance learning together. Distance education depends on the mechanisms of digital transformation and requires mastering the use of digital tools for communication, data collection, processing, document editing, and other technical skills. It also motivates students to manage their time and make responsible decisions while using these tools. Therefore, online learning helps students in many ways, including developing competencies in an environment called the modern workplace (Hassounah,2020) (Alalwan,2021).

Blended learning mechanisms are used to make students access learning experiences through two or more mediums such as the classroom, online, in the field, and asynchronously from home. If government instructions are imposed on schools to reduce the number of students in the classroom, as a precautionary measure during a health crisis, the natural solution is for groups to switch between online and in-classroom learning. This process requires adequate planning and flexibility in allocating resources to the distance education process (Hani,2021) (Ezzeldin,2021).

The process of digital transformation in the educational field requires the involvement of every member of society, ensuring that they gain their trust, encouraging them to adopt digital transformation, adopting innovative technologies, and being part of this transformation in education and work (Brdese,2021). The Kingdom is working to invest in digital transformation and link it to Vision 2030, in study programs, degrees in

advanced digital skills, information and communication technology, cybersecurity, data science, and artificial intelligence, as well as investing in innovation, entrepreneurship, and research, and the Kingdom is ranked second in the world among countries (AlGothami,2021). Committed to cybersecurity, at the global strategic level, and ranks first in the Arab world, and 14th globally, for the largest number of research papers published on the Coronavirus, as major achievements that show the extent of the Kingdom's commitment to progress and development based on evidence, in addition to that 84% of the research conducted in the kingdom was done inside public universities (Al-Thoblany,2021).

The Kingdom focuses on the areas of research and innovation, to ensure that the new digital education developments in the Kingdom transport everyone to the future, to achieve the Kingdom's vision, which provides a lot of attention to the field of digital learning, digital health, smart cities, e-government, e-health, cybersecurity, and research. Scientific (Althaqafi,2020).

The Future Gate program is one of the digital transformation programs in the educational field

The Future Gate program represents a program launched by the Ministry of Education to shift towards digital education, and the program relies on both the student and the teacher, who represent the nucleus of the educational process, in addition to the existence of an educational environment, and depends on technology to deliver knowledge to the student, and to support his accumulated scientific outcome, in addition to It works to strengthen the scientific and educational capabilities of teachers (Ratten,2021). The main objective of this portal is to complete the transition to an electronic learning environment. And then move to the teaching and learning processes outside the traditional scope of the classroom. Thus, this system works to create an enjoyable learning environment with positive interaction between both the student and the teacher (Batayneh,2021; Silvia Farias-Gaytan,et.al.2023)

Through this system, the student can achieve many personal skills, which provide a more ready product for research at the university and penetrate the labor market. Thus, these technologies benefit from the students' attachment to modern technologies. The system was implemented in three phases, the first phase includes the period from 2017 to 2018 and has been applied to 310 schools. While the second phase relied on the period from 2018 to 2019, which coincided with the Corona pandemic, and this period included the application to 1893, and the third phase included the period from 2019 to 2020, which included all schools in the Kingdom (Arnold,2021) (Abdulrahim,2020) (Algothami,2021)

The digitization of higher education institutions and related issues have attracted the attention of many stakeholders in the field of Education. ICT has become a topic of great importance in every context, especially in the workplace; therefore, the main goal of universities and schools is to prepare future professionals who are able to deal with problems and search for effective solutions through their digital competence as a basic skill .(Kunqi Wang, et. Al. 2023).

Data and methodology

To examine the significance of the relationship between digital infrastructure and digital transformation in educational institutions, a questionnaire was used to collect data from the study community, which is represented by Imam Abdul Rahman bin Faisal University as one of the educational institutions. The number of responses reached 64. The questionnaire includes two parts, the first is demographic variables. The second section has two axes. The first axis includes the independent variable represented in the flexibility of infrastructure systems to accommodate the digital transformation in the Kingdom, while the second axis includes the dependent variable of digital transformation

in the field of education. The questionnaire's reliability was verified by Cronbach's alpha coefficient.

Table No. (1): Validity and Reliability Test

Elements	N of Items	Cronbach's Alpha	Validity
Total	16	.901	.949
Independent Variable (Digital Infrastructure)	6	.827	.909
Dependent Variable (Educational Digital Transformation)	10	.914	.956

The reliability coefficient value (Cronbach's alpha) is very high for the total questionnaire and the axes. This reflects the significance of the results that can be reached by analyzing the questionnaire paragraphs, and that the research tool is characterized by high stability.

Table No. (2): Relative Frequency Distribution of Demographic Variables

Demographic Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Age	< 30	12	18.75%	18.75%
	30 – 40	24	37.50%	56.25%
	41 – 50	19	29.69%	85.94%
	> 50	9	14.06%	100.00%
Gender	Male	43	67.19%	67.19%
	Female	21	32.81%	100.00%
Qualification	Bachelor	14	21.88%	21.88%
	Master	12	18.75%	40.63%
	PHD	38	59.38%	100.00%
Experience	< 5	18	28.13%	28.13%
	5 – 10	29	45.31%	73.44%
	10 – 15	11	17.19%	90.63%
	> 15	6	9.38%	100.00%

The percentage of the age group (30-40 years) reached 37.5%, while the age group (41-50 years) reached 29.69%, which are the most representative groups in the research sample. There is also a greater representation of males in the sample than females. The bachelor's rate reached 64.06%, and the highest category of years of experience (5-10 years) reached 45.31%.

Table No. (3): Weighted average of the digital infrastructure resilience axes

Questions	Mean	Std. Deviation	Direction
The Kingdom has a strong digital infrastructure that has contributed to accelerating its digital transformation process.	3.85	0.55	Agree
The Kingdom's digital infrastructure has enabled Kingdom to face crises that disrupt all services in the public and private sectors	3.98	0.94	Agree
The digital infrastructure in the Kingdom has contributed to the continuity of business, educational processes, and all the requirements of daily life for citizens and residents considering the Corona pandemic.	4.02	0.64	Agree
The Kingdom seeks to empower government agencies digitally through several programs provided by the Digital Government Authority to provide easy services to citizens.	4.12	0.95	Agree
The digital transformation in the Kingdom is supported by the necessary legislative and regulatory frameworks to regulate the most prominent aspects of it, such as digital identity, digital signature, and data exchange.	3.93	0.63	Agree
Many government agencies have developed platforms and initiatives to discover the potential and limitations of new technologies.	3.80	0.92	Agree
Overall average	3.95	0.77	Agree

Through the previous table, all the questions are in the direction of "agree", which indicates that the research sample is heading toward the existence of a digital

infrastructure capable of accommodating digital transformation. Where the overall average for the sub-axis was 3.95.

Table No. (4): Weighted average of educational digital transformation

Questions	Mean	Std. Deviation	Direction
The Kingdom is working to invest in digital transformation and link it to Vision 2030.	3.30	0.76	Agree
The process of digital transformation in the Kingdom included academic programs, degrees, and information and communications technology.	3.72	0.64	Agree
The effectiveness of the distance education systems on which the Kingdom relied during the pandemic.	3.32	0.69	Agree
The educational process was not affected during the period of the Corona crisis as a result of the existence of a good digital infrastructure that replaced distance education systems instead of direct education.	3.60	0.78	Agree
Readiness and readiness of digital transformation systems and logistical support tools in the education system in the Kingdom to accommodate distance education systems.	3.49	0.81	Agree
The digital transformation program aims to improve the quality of educational services by raising the value of these services.	4.14	0.93	Agree
The digital education strategy provides full functionality and expanded interoperability.	4.34	0.67	Strongly Agree
The educational sector in the Kingdom has benefited from the spreading of digital transformation due to precautionary measures.	4.28	0.89	Strongly Agree
Programs and work mechanisms have been developed to ensure that both the student and the educational institution receive the necessary facilities for communication and other benefits.	4.49	0.52	Strongly Agree
Educational institutions adopt digital education solutions in their transactions.	3.98	0.84	Agree
Overall Average	3.87	0.75	Agree

Through the previous table, all questions came in the direction of “agree” and “strongly agree” for all questions, which indicates that the research sample is moving toward the effectiveness of educational digital transformation in the Kingdom, with an average power of 3.87.

Table No. (5): T-test (Significance differences according to the gender variable)

		Independent Samples Test				
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
The flexibility of digital infrastructure	Equal variances assumed	41.948	.000	4.611	60	.000
	Equal variances not assumed			2.015	11.423	.010
Digital transformation in the educational sector	Equal variances assumed	10.781	.013	-2.876	60	.183
	Equal variances not assumed			-3.877	11.423	.281

Table No. (5) shows that there are significant differences between respondents according to the gender variable for the axes (the flexibility of digital infrastructure). By examining the average value for both males and females, we find that the female average for the digital transformation axis in the field of education was 4.19, while it was 3.73 for males.

While there is no significant difference between males and females for the digital transformation axes in the education sector.

Table No. (6): ANOVA test for significant differences according to the variables (Age - Educational Qualification - Experience)

			ANOVA				
			Sum of Squares	DF	Mean Square	F	Sig.
Age	The flexibility of digital infrastructure	Between Groups	2070.793	3	690.264	0.313	0.816
		Within Groups	132469.956	60	2207.833		
		Total	134540.7486	63			
	Digital transformation in the educational sector	Between Groups	21849.132	3	7283.044	1.487	0.227
		Within Groups	293938.878	60	4898.981		
		Total	315788.010	63			
Educational Qualification	The flexibility of digital infrastructure	Between Groups	2506308.151	2	1253154.076	5.352	0.007
		Within Groups	14282826.372	61	234144.695		
		Total	16789134.524	63			
	Digital transformation in the educational sector	Between Groups	1908778.833	2	954389.417	4.790	0.012
		Within Groups	12154382.229	61	199252.168		
		Total	14063161.062	63			
Experience	The flexibility of digital infrastructure	Between Groups	1588227.883	3	529409.294	4.220	0.009
		Within Groups	7526514.071	60	125441.901		
		Total	9114741.954	63			
	Digital transformation in the educational sector	Between Groups	1173412.761	3	391137.587	4.960	0.004
		Within Groups	4731192.679	60	78853.211		
		Total	5904605.440	63			

Table No. (6) shows that there are no significant differences between the respondents' attitudes to each of the axes of the educational digital transformation, according to the age variable, while there are significant differences between the sample responses to the variables of educational qualification and experience, and by referring to the weighted average values for the categories of demographic variables, we find The category of Ph.D. holders, as well as those with high teaching experience, have the highest values on the weighted average. This indicates that they are the groups most sensitive to educational digital transformation.

Table No. (7): Regression model to examine the relationship between digital infrastructure and educational digital transformation

Regression Statistics					
Multiple R	0.884099	Standard Error	0.340821		
R Square	0.781631	Observations	64		
Adjusted R Square	0.778109				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	25.778	25.778	221.923	0.000
Residual	62	7.202	0.116		
Total	63	32.980			

Regression Model	Coefficients	Standard Error	t Stat	P-value
Intercept	3.329	0.077	30.193	0.000
Digital Infrastructure	0.339	0.023	14.897	0.000

Table No. (7) shows the results of the regression model for the relationship between educational digital transformation as a dependent variable, and digital infrastructure as an independent variable. The results show the significance of the regression model, the coefficient of the determination reached 78%, which indicates that the digital infrastructure has contributed to the explanation of 78% of the change in the educational digital transformation. The coefficient of the independent variable is positive, which reflects the direct relationship between the two variables. This result is consistent with the previous literature that there is a direct significant relationship between the digital infrastructure and the educational technological digital transformation.

Conclusion

The research examined the significance of the relationship between each the quality of digital infrastructure in the Kingdom of Saudi Arabia, and educational digital transformation. The results concluded that the Kingdom has a technological infrastructure that enables it to implement digital transformation mechanisms. The educational sector has also enabled digital transformation to face the effects of the Corona pandemic. There is a significant relationship between the readiness of the technological infrastructure in the Kingdom and the implementation of the educational digital transformation strategy. Through the statistical analysis of the research tool represented in a questionnaire addressed to faculty members at Imam Abdul Rahman bin Faisal University, many results were reached, perhaps the most important of which is that the research tool is characterized by high Validity and Reliability. There are no significant differences between respondents' attitudes to each of the axes of educational digital transformation and economic digital transformation, according to age. While there are significant differences according to the variables of gender, educational qualification, and experience. Where the high results came in favor of both females, who obtained a doctorate, and those with high experience in the teaching process. The research team recommended the need to provide privacy and adequate security measures to ensure that the educational process is completed in a fully digital manner while preserving the data of educational institutions and students through digital entrepreneurship. Providing infrastructure, good communication systems, and providing various facilities, such as reducing the cost of using the Internet.

References

- Abdulrahim, H., & Mabrouk, F. (2020). COVID-19 and the Digital Transformation of Saudi Higher Education. *Asian Journal of Distance Education*, 15(1), 291-306.
- Alwan, A. A., Baabdullah, A. M., Dwivedi, Y. K., Rana, N. P., Lal, B., & Raman, R. (2021). Et-moone and marketing relationship governance: The effect of digital transformation and ICT during the COVID-19 pandemic. *Industrial Marketing Management*, 98, 241-254.
- Gotham, S. S., & Saeed, S. (2021). Digital Transformation and Usability: User Acceptance of Tawakkalna Application During Covid-19 in Saudi Arabia. In *Pandemic, Lockdown, and Digital Transformation* (pp. 95-109). Springer, Cham.
- Alsahafi, A. J., & Cheng, A. C. (2016). Knowledge, attitudes, and behaviors of healthcare workers in the Kingdom of Saudi Arabia to MERS coronavirus and other emerging infectious diseases. *International journal of environmental research and public health*, 13(12), 1214.
- Althaqafi, T. (2020). The Impact of Corona Virus (COVID-19) on the Economy in the Kingdom of Saudi Arabia: A Review. *IJBMR*, 8, 34-40.

- Al-Thoblany, M. S., & Alyousef, M. I. (2021). The role of digital management in improving the performance of tourism sectors in the Kingdom of Saudi Arabia in the light of 2030 vision. *Journal of Sustainable Finance & Investment*, 1-15.
- Arnold, M. G., Vogel, A., & Ulber, M. (2021). Digitalizing Higher Education in Light of Sustainability and Rebound Effects—Surveys in Times of the COVID-19 Pandemic. *Sustainability*, 13(22), 12912.
- Batayneh, M. T. H., Al-Kouki, R. B. B. S., & Eid Albogam, H. (2021). Economic and social implications of the spread of Coronavirus on the Saudi Community and the scientific and practical solutions to reduce and limit them: Field Research (Study) for Taibah University. *Journal of Sustainable Finance & Investment*, 1-19.
- Brdese, H. (2021). A Divergent View of the Impact of Digital Transformation on Academic Organizational and Spending Efficiency: A Review and Analytical Study on a University E-Service. *Sustainability*, 13(13), 7048.
- Ezzeldin, S. M. Y., & Alsharidah, M. A. M. (2021). Teacher Digital Empowerment Level in Light of the Kingdom of Saudi Arabia s Vision 2030: Reality and Aspirations. *Elementary Education Online*, 20(2), 96-96.
- Francisco José García-Peñalvo(2023). Avoiding the Dark Side of Digital Transformation in Teaching. An Institutional Reference Framework for eLearning in Higher Education, *Sustainability Journal*, Vol. 13, no.4, ISSN 2071-1050.
- Hani, S., Kiram, P. M. L., Laouid, A., & AlShaikh, M. (2021, November). The impact of digital transformation on the work of the Algerian local administration during the Corona-Covid 19 Pandemic. In *2021 International Conference on Artificial Intelligence for Cyber Security Systems and Privacy (AI-CSP)* (pp. 1-6). IEEE.
- Hassounah, M., Raheel, H., & Alhefzi, M. (2020). Digital response during the COVID-19 pandemic in Saudi Arabia. *Journal of medical Internet research*, 22(9), e19338.
- Hoq, M. Z. (2020). E-Learning during the period of the pandemic (COVID-19) in the kingdom of Saudi Arabia: an empirical study. *American Journal of Educational Research*, 8(7), 457-464.
- KAMIŃSKI, J. (2021). DIGITAL TRANSFORMATION OF SERVICES IN LIGHT OF THE COVID-19 PANDEMIC. *Transformacje*, 4(111).
- Kunqi Wang, Bangxi Li, Tian Tian, Norhayati Zakuan(2023). Evaluate the drivers for digital transformation in higher education institutions in the era of industry 4.0 based on decision-making method, *JOURNAL OF INNOVATION & KNOWLEDGE*, Vol. 8, no. 3, ISSN 2444-569X
- Madani, A., & Boutebal, S. E. (2020). Impact of the COVID-19 pandemic on attitudes towards the lifting of confinement through the Algerians people.
- Makhlouf, A. M. E. S. (2021). Saudi Schools' Openness to Change in Light of the 2030 Vision. *American Journal of Educational Research*, 9(1), 52-60.
- Mitchell, B., & Alfuraih, A. (2018). The Kingdom of Saudi Arabia: Achieving the aspirations of the National Transformation Program 2020 and Saudi vision 2030 through education. *Journal of Education and Development*, 2(3), 36.
- Silvia Farias-Gaytan, Ignacio Aguaded, Maria-Soledad Ramirez-Montoya, Digital transformation and digital literacy in the context of complexity within higher education institutions: a systematic literature review, *HUMANITIES & SOCIAL SCIENCES COMMUNICATIONS*, Vol. 10, no. 1, pp. 1 – 11
- Ratten, V. (2021). COVID-19 and entrepreneurship: Future research directions. *Strategic Change*, 30(2), 91-98.
- Vicente Díaz-García, Antonio Montero-Navarro, José-Luis Rodríguez-Sánchez, Rocío Gallego-Losada, *Managing Digital Transformation: A Case Study in a Higher Education Institution*, *ELECTRONICS Journal* Vol. 12, no. 2522, ISSN2079-9292