The Impact of COVID-19 on Sudanese Higher Education System

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Abstract: *The Coronavirus 2019 (COVID-19) pandemic has created significant challenges for the Sudanese higher education community. Through a desktop analysis leveraging Sudanese universities sources where possible, we provide a timely map of the intra-period higher education responses to COVID-19 across 11universities. We found that the responses by higher education providers have been diverse from having no response through social isolation strategies on campus and rapid curriculum redevelopment for fully online offerings. We provide in our discussion a typology of the types of responses currently undertaken and assess the agility of higher education in preparing for the pandemic. We believe there are significant opportunities to learn from the pedagogical developments of other universities, in order to strengthen our collective response to COVID-19 now and into the future. The paper also dealt with the reality of e-learning in Sudan for some Sudanese education institutionsand addressed the recommendations that led to the study, which was represented in the interest in simultaneous e-learning in educational institutions through the adoption of technical teaching methods.*

Keywords: Coronavirus, COVID-19, cross-Sudanese universities comparison, higher education, online education, pandemic

1. Introduction

The Coronavirus 2019 (COVID-19) pandemic had such an extensive impact on the Sudanese higher education sector. Initial responses of universities learning system were focused on the delivery of online education (e-learning) to students who were unable to study in campus due to the social isolation strategies. Faculties rushed to convert curriculum to an online environment, mindful of technology and websites that could be accessed from the universities web-side. The spread to South Korea, then Iran and Italy resulted in the higher education sector in affected countries to change to focusing on their own operations (UNESCO, 2020). It was a test of organisational agility (Wu, 2020), with many initially focused on transitioning content to an online environment, and not necessarily on online education. However, it was also a demonstration of the impact of poorly resourced institutions and socially disadvantaged learners where limited access to technology and the internet impacted on organisational response or students' ability to engage in an online environment (Zhong, 2020). Many scholars questioned if higher education was prepared for the forthcoming digital era of learning (Houlden&Veletsianos, 2020). This paper will explore the first wave of responses from Sudanese universities to summarise collective responses in the face of a pandemic and the ability of these universities to adapt online education.

2. Background

On 31 December 2019, the Wuhan City Health Committee (2019) reported a cluster of 27 pneumonia cases stemming from an unknown aetiology, with a preliminary source linking this to the now closed Wuhan Huanan Seafood Wholesale Market. This was later determined to be a novel coronavirus. By 20 January 2020, there were 295 laboratory confirmed cases, with 291 from Wuhan, China (European Centre for Disease Prevention and Control, 2020). Since these cases, there has been substantial growth across the globe. According to the World Health Organization (2020a),

on 31 March 2020, there have been 697,244 confirmed cases with 33,257 deaths (4.77% mortality rate). The World Health Organization (2020b) has declared COVID-19 a pandemic.

The higher education sector has been confronted by a need to respond to the evolving landscape in terms of Chinese student load, self-isolation guidance from national governments, and supporting staff and students who are unable to move to their local campus. Many universities are responding in diverse ways, and given the speed of the changes unfolding, are not likely discussing and studying the changes evolving, given the importance of educational institutions in the current circumstances towards electronic education, this paper touched upon the application of e-learning in Sudanese universities education institutions, through the experiences presented by a numberofthese universities education institutions, in order to stand on this experience. We also have observed some challenges unfolding with alternate delivery structures, particularly in relation to rapid digitalization of curriculum. This paper begins a conversation to explore the first wave of responses from universities. A desktop analysis at the Sudanese university-level of a selected group of universities and the higher education response highlights the different approaches to higher education taken across the Sudan. We undertake this analysis for the purpose of answering our research questions: 1. how are Sudanese universities responding to COVID-19? We continue to address this in our discussion to provide some preliminary types of current and forthcoming university responses. 2. The ability of Sudanese university to move toward e-education. 3. Address some recommendations to enhance e-education system

3. Method

This manuscript adopts a desktop analysis approach with careful consideration to the quality of the information source. In order to create an effective and rigorous status

update for universities under the study, it is critical that we seek to use reliable sources given the general fluctuation of information regarding COVID-19. For transparency, we used more than 32 sources, and provide a summary of sources used in Table 1.

Table 1: Sources used for finding

Source type	n	%
News Articles	7	
University web-side	11	
Higher education news	1	
Report and papers	4	
University communication	9	

Sudan is the largest country in Africa and Arab world by area before the 2011 South Sudan's secession with a total population of over 42,592,539 (World Population Review, 2020). By Thursday, 18th of 2020 the total number of injuries by COVID-19 since the beginning of the epidemic rose to **8,020** cases, with 487 death, on 13 March, Sudan reported its first novel coronavirus case in Khartoum, a man who died on 12 March 2020 and had visited the United Arab Emerates in the first week of March (World Health Organization (2020a). Similar to other countries, Sudan has temporarily closed universities, and other educational institutions (Minister of Higher Education and Scientific Research, 2020).

Universities in Sudan are divided into government and private universities; the total number of government universities are (36) universities. And the total number of private universities are (22) as a full universities status plus (86) colleges.

To assure that we reviewed across the selected university, we attempted to achieve a rough equality e-education system in the Sudanese university. We present these universities in Table 2, noting that some universities provide a slight skew because they are more affected by the lack of the high technological ability. The aim of this stratification was to support our digital pedagogy strategy. We also attempted to balance universities with high cases and those whose cases are just emerging.What is hoped for by the higher education matters are plans and strategies to advance e-learning technologies, the paper also provided models for a group of Sudanese universities that have applied the system of open and distance education, and those that have benefited from e-learning techniquesand increase the need of establishment of specialized departments E-learning in higher education, and interest in digital libraries, And work to computerize the curricula and launch satellite channels for e-learning.

Table 2: Selecting of some Sudanese universities reviewed

Sudanese University
Al-Neelain University (Government)
Al-Zaeem Al-Azhari University (Government)
Bakht al-Rida University (Government)
Electronic College (Government)
Electronic School (Government)
Khartoum University (Government)
Mashreq University (Private)
Shandi University (Government)
Sudan Open University (Government)
Sudan University of Science and Technology (Government)

The Reality of E-learning in Sudan

Education in its various forms represents the head of the spear in the field of services provided by countries to its citizens. The five-year plan of the Sudanese quarter-century strategy for the years 2012 to 2016 recommended the need to use e-learning and distance education techniques and take advantage of these technologies to meet the large increase in the number of students, the state recently resorted to entering the field of e-learning considering that, this type of education is less expensive than traditional education, so many countries have tended to use information technology to expand the umbrella of distance education, benefiting from this e-learning technologies. The reality of education in Sudan imposed a number of treatments, including resorting to the e-learning option represented in the use of information technology in the educational process, especially since studies have proven that distance learning experiences in educational institutions have benefited greatly from e-learning techniques, in light of the clear increase in the numbers of Students and the acute shortage of basic educational infrastructure in Sudan, where 51% of classrooms in educational institutions in Sudan need maintenance, and the ratio of professors to students reached 40 to 1, and the percentage of untrained teachers reached 40.2% at the basic stage and 37.7% in Secondary school, while 80% of trained teachers are required. (Othman, 2013)

In this regard, the previous Minister of Higher Education and Scientific Research, Professor KhamisKajoKinda, insisted on the need to develop general strategies for e-learning to integrate information and communication technology in education with a focus on the curriculum computing axis as the primary focus of e-learning, and he also indicated the need to develop websites for universities and research centers Scientific and educational institutions in general, especially as Sudan has the basic infrastructure to spread e-learning in light of the presence of modern technology in the field of communications. The third millennium challenges also necessarily require the adoption of a plan of this type of education that is compatible with the Sudanese environment by changing the traditional concept of education to keep pace with the scientific development and the knowledge revolution and benefit from the knowledge circles available on the Internet.

The findings presented in this paper are organised by some of Sudanese universities, in alphabetical order.

Al-Neelain University:

A department for distance education was established at the University of Neelain in the year 1996, under the name of affiliation Department, after that its name changed to the Department of Distance Education (DE) in December 2001, this department works to provide a set of educational opportunities for those who did not have the opportunity to study at university, and this department is affiliated with the Secretariat for Scientific Affairs, where the distance education department consists of two sections - the affiliation section and the external centers section, in which students are accepted through the unified admission office of the Ministry of Higher Education and Scientific Research, where they are selected and accepted according to the comparison between certificates and their estimates so that

all admission procedures are done in The internal affiliation department is provided by faculty supervisors who are affiliated with the distance education department, but the preparation of educational materials for affiliation students is not appropriate for the distance education policy, whereby internal and external affiliation students are given books and notes that are not appropriate to the directives of distance education, and the distance education list also allows For internal affiliation students by attending lectures side by side with regular students, affiliation students undergo the same exams that the university offers to their two regular students, and affiliated students are required to miss for exams and the various works of the year to which regular students are subject, and in terms of educational support, there are so-called student services centers affiliated with the Department of Distance Education at the University ofNeelain, which provide students with educational materials and answer their inquiries, and these centers are located in each of Jordan (Al-Aqsa Center), Saudi Arabia (the Riyadh center) and the Bahrain center, but inside Sudan there is only the main center of the university in Khartoum. (Youssef, 2012).

Department for distance education published a letter on the university that recommended online learning instead of face to face teaching for the rest of the term; on March, a quarantine order for the whole country, This closure affects hundreds of thousands of students, Al-Neelain University took several steps to move from face-to-face classes to online classes. Some of the tools that are used to deliver online classes include Moodle, email, and Whats-up (Al-Neelain University, 2020).

Al-Zaeem Al-Azhari University:
Al-Zaeem Al-Azhari University is the first Sudanese university to seek to develop an integrated plan for the purpose of activating the role of e-learning technology to serve the programs and goals of open education, through the partnership established between the university and the Sudanese Telecommunications Company (Sudatel), whereby the university began designing educational programs and materials through the web browser of the network The Internet - the Web - so that immediate services are provided to learners through educational websites after the university is linked to a major internet server through Sudatel.In the year 2001, the university signed an agreement with a German company to design and produce video and audio software, with a view to computerizing the e-learning curriculum and providing an open education service through electronic technologies.Some of the tools that are used to deliver online classes due to the university closure includes Moodle, email, and Whats-up (Al-Zaeem Al-Azhari University, 2020).

Electronic College:
In completion of the e-learning experience, the National Council for Technical and Technical Education granted initial approval to establish the Technical College, which aims to provide e-learning services to a group of modern programs according to the system of technical and technical education, and this college also aims to qualify qualified technical cadres to keep pace with the technology of the information revolution, Especially as the state directs and its priorities in education to rehabilitate the intermediate cadres

that the labor market needs at the present time, and those responsible for the college's order begin to prepare all the requirements related to studying in this college, the most important of which is to benefit from the experience of simultaneous classroom e-learning, by taking advantage of e-learning techniques in its forms Different, and then applying the idea of an integrated e-learning by providing opportunities to join the college for all groups in accordance with the directions and policy of open education, in application of the principle of education for all.

Some of the tools that are used to deliver online classes due to the university closure includes Moodle, email, and Whats-up (Electronic College, 2020).

Electronic School
It is the first electronic school in Sudan with the approval of the Sudanese Ministry of Education, adopting the e-learning systems in the real school, and the distance education system, as the first school in Sudan to accept the enrollment system for students of basic and secondary levels, as it was certified by the Federal Ministry of Education and the state in the state of Khartoum, The National Center for Curricula and Educational Research, and the Department of Special Education in the state of Khartoum, to accommodate students in the general education stages for all classes (basic - secondary), and to teach the Sudanese curriculum and progress in the stages of general education from anywhere inside and outside Sudan, in coordination with the Organization of Sudanese Workers Affairs Abroad and the General Union of Sudanese students. The factual school opens its doors to students from inside and outside Sudan, and its students study inside the school classes with the latest technology in educational technology, where teaching is interactive whiteboard in addition to computer labs with the latest computers, the school also provides laboratory experiments in scientific subjects in a computerized scientific way that allows each student to conduct experiments By himself, the children of the Sudanese working abroad (residing inside Sudan) and their guardians abroad are provided with an electronic follow-up service to the children, a system that provides the guardian who is abroad with the ability to view and follow all his son's or daughter's records electronically from the attendance book and daily computerized absence in an electronic way. They can also know the scores of exams, tests and general observations. (The website of the electronic school) As for the electronic school system, it is the acceptance of the children of workers abroad to study the Sudanese curriculum and transfer them through the various educational stages from a distance with results approved by the Ministry of General Education, and provides them with the Sudanese curriculum for all academic years in a visual digital form, and they also use the laboratory feature The default is to conduct laboratory tests, and seating for the final exam is arranged for each academic year in coordination with the Sudanese staff working abroad for students in their places of residence. The Secretary-General of the Organization of Sudanese Affairs Working Abroad has invited all those interested in e-learning issues to attend the activities of the workshop on evaluating the idea of the electronic school to teach the decisions of the basic and secondary levels and reflect on the possibility of benefiting the children of

expatriates from this experience, especially children residing in countries whose laws do not allow teaching The National Curriculum. Some of the tools that are used to deliver online classes due to the university closure includes Moodle, email, and Whats-up (Electronic School, 2020).

Mashreq University

Al-Mashreq University is one of the private universities that was established in the year 2003 as a university college for science and technology and was raised to the Mashreq University in the year 2013. The university has been interested in science and technology and the automation of academic and administrative services in addition to student services, and it has adopted the automation of the educational and administrative system through its use of electronic portals through Magnetic cards that identify students with their attendance record to enter the campus and save it in the form of reports by the Department of Scientific Affairs in addition to the property of reading the student's position on the payment of tuition fees according to the validity of the card according to the payment period granted for entry, the university also intent on automating the registration of attendance and student absence for all lectures via fingerprint and linking them Electronically with scientific affairs and recording attendance according to the university's academic regulations, with attendance and absence connected with text messages via the mobile phone sent to parents to find out the position of their children and follow them, in addition to the e-learning experience that the university pursued in the university's materials materials (Islamic Culture 1 and 2, Arabic language 1 and 2, Sudanese studies The experiment has found Ng It is unrivaled since it was launched in the 2017 academic year and all students interact with it according to the strict controls and academic regulations established by the Deanship of Scientific Affairs and Administration for e-learning that the university has developed in a sophisticated way, and the university's e-learning administration and before the Corona pandemic the newcomer is working towards e-learning in a way It is mandatory for all colleges and has already started the process of transformation, as the university has a unique experience in the process of issuing graduation certificates via the mechanism of obtaining automated certificates, which allows the graduate to obtain his university certificates in a short time not exceeding one minute via fingerprint technology with the ability to pay certificates fees through the machine, and it was launched This service is already on the first day of April 2018, under the generous auspices and support of the former Minister of Higher Education and Scientific Research Dr.Samia Abu Kuchh All advertisements, lecture schedules and examination schedules were transferred electronically via a website dedicated to this purpose. (Mashreq website)

This closure affects hundreds of thousands of students. Notable some of private Universities have taken steps to carry out their teaching online during the period of campuses closure. For instance, Mashreq University MU (Mashreq University, 2020). The MU in Sudan also took several steps to move from face-to-face classes to online classes (Mashreq University, 2020). Some of the tools that are used to deliver online classes include Moodle, email, and Zoom Whats-up (Mashreq University, 2020). Some of these tools were well-

known before the crisis, but the crisis has accelerated the plans to use them.

Sudan Open University

As a continuation of the higher education policy and in line with the role provided by higher education, and in keeping with the revolution of open education, the Sudanese Cabinet issued its decision No. (164) on April 14, 2002 corresponding to 2 Safar / 1423 AH approving the Sudan Open University project, and the actual presentation of the university began on 15 / March / 2003 AD in five programs that included the following study programs: Business Administration, Computer Science, Education (teachers only), Information Technology, and Accounting.This university was established to achieve a set of goals, the most important of whichare:

1) Contribute to freeing higher education from complex restrictions.
2) Work to provide justice in higher education opportunities and achieve the principleof education for all.
3) Contribute to preparing cadres and providing qualified human resources.
4) Dr. Bridging the resulting gap in the teaching staff in general and higher education.
5) Reducing the cost of higher education.

And. Establishing a culture of open education through the use of e-learning technology. The university relied on the use of modern technologies to provide educational materials electronically, as these materials included printed curricula that were designed according to the specifications of open education, in addition to visual and audio educational materials, and these materials were developed and designed under the supervision of specialized committees, where the Sudanese University is considered the first Which was adopted as an institution to provide open education, as it focused on the integration of scientific and technical knowledge in the field of e-learning and open education, and the university has moved in that to use other means to broadcast its educational programs electronically, for example, for example: audio radio broadcasts, the Internet and e-mail via the international communications network , Study centers equipped with computer laboratories and various electronic teaching aids, and classroom meetings between experts and students in those centers. (Sudan Open University website)

Sudan Open University have opted for live and recorded sessions (**Sudan Open University**, 2020). Live situations can assess whether the technology infrastructure in state universities can smooth online learning considering the expected traffic and connectivity.

Sudan University of Science and Technology

Sudan University of Science for Science and Technology: The Sudan University of Science and Technology started the experience of distance education in the year 1995, through an external office of the university in the State of Qatar, where the majors offered included trade studies, education with different specializations, forests, and applied statistics, despite the Sudan University's connection with technology and science However, the university relied on the traditional curricula at the beginning through printed notes and

concurrent lectures at the center, and these programs have made huge funds for the university that contributed greatly to improving the university's facilities and infrastructure, after which the university went to establish distance learning centers using e-learning techniques Also, all e-learning services have been activated in the main center of the university, where the university has launched many study programs to receive educational services using e-learning.Sudan University of Science and Technology have opted for live and recorded sessions (Sudan University of Science and Technology, 2020). Live situations can assess whether the technology infrastructure in state universities can smooth online learning considering the expected traffic and connectivity.

University of Khartoum
The University of Khartoum's experience with distance education began in May of the year 1999, through the establishment of the Distance Education Unit at the Faculty of Technical and Development Studies with a view to stimulating the various colleges of the university to enter the e-learning system, and the university has sought to obtain educational outputs with the specifications required for this type of education Through the establishment of seminars, workshops and training courses for supervisors in order to improve the performance of this new technology, the training programs included training for teachers to design and write educational materials for distance education, and the production of visual educational materials in addition to the design and production of educational materials via computer and related technologies. In the year 2001 AD, the university approved a set of study programs to be accepted according to the conditions of distance education using the e-learning technology, and the programs offered included: accounting, management, finance, business administration, forestry, college education programs, and computer studies programs.The university has benefited from the existing electronic technologies represented in the local networks and internet services that have been introduced in the university since 1998. The university also benefited from the implementation of the distance education program from the Video Conferencing Technology, which in turn led to the emergence of the concept of the virtual classroom. This technology has contributed to filling the shortage of faculty members in regional and state universities, and the university has also benefited from online services and online discussion services. (Online Discussion), inaddition to the electronic library services.There might be some issues in implementing online learning by major state university in Sudan like University of Khartoum. This is due in part to the large number of students admitted (Ministry of Higher Education and Scientific Research, 2020). Other issues relate to the availability of the right hardware and software, networks do not allows some universities to move toward online learning.(University of Khartoum)

Bakht al-Rida University
Bakht al-Ruda University launched an e-learning project at the university on Thursday, 2/8/2018. Moodle systems have been installed and hosted on a local server at the University of Bakht al-Rida .. The e-learning server is the first to be hosted by the university data center under the responsibility and supervision of the university's computer center.

Providing servers with excellent specifications for the e-learning service.Some of the tools that are used to deliver online classes due to the university closure include Moodle, email, and Whats-up (Bakht al-Rida University, 2020).

University of Shendi
The university's administration, which included, along with the members of the Council, professors of the College of Computer Science and Information Technology, and the Director of the Information Technology Center where the meeting approved the establishment of an e-learning unit in the Secretariat for Scientific Affairs comprising all relevant authorities to work on submitting a proposal for legislation and regulations governing e-learning Plans are submitted to train and qualify professors and transfer curricula to align with the requirements of e-learning with the maximum benefit of electronic platforms linked to the university's website to be used in conjunction with education in the methods currently used with a commitment to provide all technical aids and rehabilitation of the university's infrastructure. The Council also praised the educational lectures on the prevention of the Corona pandemic and the methods used to treat it, which were presented by Sudanese professors at the American universities cooperating with the University of Shendi, which were participated in electronic platforms on the university's website and benefited a number of university professors and students.To this, the meeting directed the resumption of work for workers in all university departments and colleges at the beginning of next week, in accordance with the health requirements followed in the River Nile State, to allow the academic offices to monitor the final results of graduate students in the colleges of the Education College and the colleges of law and development studies in preparation for their lifting and approval in the Council of Professors, and to create the study environment and early preparation To resume academic activity at the university whenever the health authorities announce the lifting of the health embargo imposed on the country and the return of life to normal.Shandi University is unlikely to be able to engage in training and development at the speed needed for this climate. It is also likely to be difficult for students who are used to conventional classrooms to learn online. The synthesis: a potential decline in learning quality in the short-term, despite best efforts. (Ministry of Higher Education and Scientific Research, 2020)

4. Conclusion

This paper highlights COVID-19 response for some of Sudanese. This analysis demonstrates diverse responses to a complex challenge. With the presence of more accurate information, it would be possible to map out rates of technological adoption among the different universities from extended starting periods as an opportunity to 'wait out' the long period of quarantine. Universities rapidly closed their face-to-face operations and moved to digitalised education. Some universities were already partially prepared for this endeavour given the University had some blended or fully online offerings. Other universities had a lot more ground to cover. The aim of this paper was to discuss universities responses and ability to adapt current situation. The goal: to support a knowledge-sharing activity across universities. At this stage, there is recognition that the sector needs to unite

to postulate a future where students can be supported digitally, without compromising academic quality and standards of the curriculum. Universities have a role in the transition to support a society that needs to stay at home for periods of time, and higher education may be a valuable addition to their productive home environments in the short and potentially medium-term.

In Sudan no universities could be identified as announcing a move to online instruction because of COVID-19 and many are implementing a shutdown or postponement strategy until the end of March. Teaching in Sudan began using chalkboards and soon graduated to transparencies and overhead projectors. Then PowerPoint took root in colleges with slides projected from a computer onto a classroom screen. With e-mail, video conferencing, high-speed internet access, online legal libraries, and the like, education is quickly melding into a new shape. However, offering effective online classes requires more than simply taking the material from the conventional course and posting it onto a web-based repository. To be successful, the course needs to foster effective student engagement and be digitally dynamic. The solution is to offer a course that has a little bit of everything: personalised feedback from professors; discussion boards for interaction between students and law professors; quizzes with immediate feedback; and lessons containing the core reading materials. Online education is a complex issue. It is important to set realistic understandings and expectations of how it can support students affected by COVID-19 measures. Universities are not progressing strategic moves to online teaching. Rather, they are moving to emergency online delivery of in-person content.

5. Recommendations

Open education in general and e-learning in particular need to reassess from its current state, address deficiencies and remove obstacles that hinder its development, because educational institutions that wish to enter the e-learning system must strive to achieve discrimination in the programs they provide, because The e-learning system differs greatly from the traditional education system, where we find that e-learning needs skill, efficiency and knowledge to keep pace with the requirements of the times, because open education using electronic technologies is the best solution for providing education opportunities for all, which in turn is reflected in the labor market, which has become dependent on The basis on modern technology in many of its facilities, and in the coming period the criterion for the survival and continuity of educational institutions will be development and the achievement of competitive advantages and the provision of human resources and make them more skilled, efficient and knowledgeable in light of the slogan of schools and universities without a wall, so we find that the study recommended the following:

1) Conducting simultaneous e-learning in all Sudanese higher education institutions, relying on modern means of information transfer in order to link e-learning to the process of interaction by learners.
2) Launching satellite channels to provide e-learning services with an encryption system for those wishing to receive this type of education, in addition to other open channels that work to consolidate the culture of e-learning.
3) Work to establish a virtual university working to provide e-learning services in its integrated form.
4) Paying attention to the scientific and applied studies that contemporary societies need, by making use of virtual laboratory techniques to conduct scientific experiments.
5) The need to encourage students to enroll in open education in its various forms, and to accredit academic degrees granted by e-learning institutions internationally accredited by those in charge of education in Sudan, especially decision-makers.
6) Establishing a specialized department for admission of students wishing to enroll in e-learning, affiliated with the General Department of Admission and evaluating and documenting certificates in higher education, taking into account the relaxation of restrictions on admission requirements for those who wish to join the open education system.
7) Encouraging labor market institutions of all kinds to enter into academic partnerships with general education institutions and higher education institutions in order to activate the e-learning experience in a sophisticated way in these institutions.
8) The need for attention and activation of the websites of educational institutions in general and university institutions in particular, because the evaluation and classification of educational institutions globally is carried out according to what the websites of these educational institutions contain, especially with regard to adding scientific research within the website.
9) Establishing integrated digital libraries in all institutions of higher education, linking them to the teaching methods of the curricula prescribed in the academic programs, and using computerized programs for libraries when it comes to procedures for searching for books and scientific subjects.
10) Establish a group of electronic schools that work on computerizing all the curricula of the basic and secondary stages using the latest information and communication technology, so that when students join the university stage, they can employ these technologies in technical research processes and devise technology capable of keeping pace with modern technologies.

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