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THE EFFECT OF DIGITAL TRANSFORMATION ON HIGHER EDUCATION DURING COVID-19 PANDEMIC. A CONCEPTUAL LITERATURE REVIEW

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Abstract

COVID-19 Pandemic has brought about an abrupt change in people's lives. Lecturers and students have been forced to change their teaching and learning approaches to e-learning methods due to closure of higher education institutions and disruptions of academic programs. Social distancing and confining movements have significantly disrupted traditional teaching and learning methods. The Covid-19 crisis has offered a chance to embrace digital learning approaches in higher education. Digital transformation has rejuvenated teaching and learning processes during Covid-19 pandemic. The tremendous adversities caused by Covid-19 has forced students and lecturers to use digital technologies in tackling learning adversities. Digital transformation has enormously affected higher education which ultimately has led to creation of innovative learning opportunities. This concept paper begins with a critical literature review on the concepts of digital transformation, higher education and Covid-19, followed by theoretical framework. Subsequent section discusses digital transformation and higher education concepts and their relationships. This is followed by literature review summary and research gaps and concludes with conceptual model and the study hypotheses. The concept paper also describes the effects of digital transformation on higher education during Covid-19 pandemic.

Keywords: *Digital Transformation, Higher Education, Covid-19 Pandemic and e-Learning.*

Introduction

Background of the Study

Gone are the times when lecturers and learners could physically sit in the lecture halls and study entirely by attending to lectures. Modern day learning should be interactional and synergetic. Lecturers have been making far-reaching changes to quickly adopt digital technologies which enhance quality instructional methods in institutions of higher education. Digital transformation positively affects learners by creating learning opportunities, individualized learning experiences and boundless potentialities. Digital transformation has enormously affected higher education which ultimately has led to creation of innovative learning opportunities. Barbero (2020) noted that universities and colleges have adopted teaching methods that enhance innovative educational approaches, through provisions of quality instructional platforms, versed by relevant digital technology as well as the contemporary learning practices.

Digital transformation and emergence of academic technology has inspired lecturers and learners to have rapid changes in the teaching and learning approaches (Newman, 2017). The digital transformation in academics develops the traditional one-on-one teaching and learning environment. There are multiple gains of adopting digital technology in higher education particularly during Covid-19 pandemic. Through digital transformation, lecturers, parents and learners are enhancing a new normal in teaching and learning processes (Šereš, Pavlićević, & Tumbas, 2018).

Corona virus disease 2019 (Covid-19) pandemic has disrupted the teaching-learning activities in higher education besides affecting learning amongst learners and lecturers. Küçükler (2021) asserted that Covid-19 has made it difficult to have face-to-face lectures and higher learning institutions have enhanced the adoption of digital tools for learning. Learners changed to online learning approaches due to closure of higher learning institutions. Pandemics bring about great change, basically disrupting how individuals perceive the universe (Doyle & Conboy, 2020). Digital tools access has become critical for active participation in higher education during lockdowns and periods of quarantine. Burlacu et al. (2021) argued that digital transformation rejuvenates learning processes during Covid-19 pandemic. The tremendous adversities caused by Covid-19 has forced students and lecturers to advance digital tools in tackling learning adversities.

Digital transformation necessitates timely and quick adaptation that improves the positive effects of digitalization, although it requires heavy investments and progressive changes of digital configuration and processes. Higher education sector has to put in place appropriate measures to ensure trouble-free learning during the Covid-19 crisis. Universities must ensure that learners go about with learning activities without exposing themselves to Covid-19 (Doyumğaç et al., 2021). The measures adopted by institutions of higher learning are namely, digital learning and provision of education to learners to prevent contracting Covid-19. Universities embraced administrative changes and digital learning comprising online lectures whereby virtual learning between lecturers and students takes place (Leng et al., 2020).

This concept paper begins with a critical literature review on the concepts of digital transformation, higher education and Covid-19, followed by theoretical framework. Subsequent section discus digital transformation and higher education

concepts and their relationships. This is followed by literature review summary and research gaps. The concept paper concludes with conceptual model and hypotheses.

Digital Transformation

Digital transformation is defined as the usage of technology to enhance firm's performance. Digital technologies have help digitally transformed businesses to attain enhanced operations and new business approaches (Deloitte, 2018). European Commission (2019) described digital transformation as blend of advanced technologies as well as incorporating physical and digital systems, business model innovations, advanced systems and production of inventive products and services. The broader digital transformation concept comprises terms such as digitization and digitalization. These concepts are distinct in definitions, however, studies show that the terms are synonymous (Bloomberg, 2018; Bounfour, 2016). According to OECD (2018) digitization is the changing of analog data and process into digital, while digitalization is the utilization of digital technologies, data and interconnectivity which ends in advanced transformation of current processes and digital possibilities.

Valentin et al. (2013) posited that digital transformation plays a vital role in learning process change from a teacher-centered approach to a learner-based model. It helps lecturers and learners to collaborate in developing the education systems by availing know-how in real time. The digital transformation has offered learning platforms for lecturers and learners to synchronously, asynchronously, or in a hybrid situation aid in participative education (Shurygin et al., 2020).

Therefore, as noted by Tabrizi et al. (2019) technology has a transformational function. Remote access, teleconferencing, e-business, e-learning and telemedicine perform the function of what is currently acknowledged as the new normal. The dimensions of digital transformation are learning management systems, digital content, digital library, virtual learning platforms and virtual classroom (Tahrini et al., 2016, Conway, 2008, Weiss, 1996, Seadle, 2007 & Crawford et al., 2020)

Learning management system (LMS) is a web-based platform that facilitates the delivery of learning applications and tools embraced by higher learning institutes to offer learning in virtual classroom situations as well as managing learning activities (Tahrini et al., 2016). LMS permits lecturers to provide customized instructions that can be obtained by learners anytime and anywhere irrespective of spatial barriers (Jung & Huh, 2019). Timraz (2013) argued that LMS offers tutors and learners with an e-learning classrooms that support educational processes. The learning management systems aids e-learning learning with various levels of formalization, based on computerized design procedures, implementation and appraisal.

Digital content is the provision of learning content and huge repositories of digital educational resources to higher education institutes, lecturers and learners to aid in teaching as well as learning activities, either virtually or in one-on-one classroom learning environment (Conway, 2008). The digital learning is applied within learning and management systems, which allows learners to access the learning resources in real time. Conway (2008) posits that the digital content found in university repositories are published content namely, e-books, e-journals and newspapers. Special collections content: theses and dissertations, rare e-books, archives and manuscripts. Digital content can be accessed through digital libraries

dissemination of digital information in higher education repositories (Branin, 2003).

Virtual classroom is a digital platform where a lecturer teaches learners virtually in real time aided by reading materials and resources such as audio or video as well as PowerPoint. The learners can ask questions and get involved in breakout discussions. Timraz (2013) noted that nearly all teaching activities done in traditional classroom can be done in virtual classroom. Weiss (1996) described virtual classroom as courses provided through the internet. The advancement of digital technology is the reason for virtual classroom. The virtual classroom is essential to guarantee education equality, particularly for the people in remote places or the impoverished and have no regular time to take part in education. Through internet access, the virtual classroom offers students with best lecturers and the same curriculum as the other students hence equality is made certain (Sufeng & Runjua 2013).

Digital library is electronic offering of digital documents in relation with e-learning services, based on the functions of the traditional library, and aids global availability of services through the internet. The digital library is the future of the traditional one (Seadle, 2007). Digital libraries enhance learning competencies and performances of students, lower costs and avail reading materials and ease curriculum implementation. Ali and Gatiti (2020) posits that the closure of physical libraries paved way for digitization, hence emergence of digital libraries which had a duty to disseminate e-learning information to students and teachers to aid learning. In addition to creating awareness to take preventive actions against Covid-19 namely, observe social distancing healthy instructions on usage of masks, sanitizers and hand washing. During the Covid-19 pandemic digital libraries have stepped up to provide library content so that students and lecturers can access e-journal, e-books and peer-reviewed articles without interruptions (Falt & Das, 2020).

Virtual learning platforms such as Google Classroom, Google Meet, Zoom, Moodle, Microsoft class notes and Skype have been adopted in higher education by lecturers and students to enhance digital learning (Crawford et al., 2020). The platforms allow online learning for a specified time frame. Virtual learning has established a positive relationship among lecturers, parents and students than it was in the past (Pokhrel & Chhetri, 2021). Lectures have responsibility to enhance creative initiatives that aid to get the better of virtual learning. Higher education institutions are providing free digital devices to enhance interactive as well engaging educational environment. Digital transformation has offered the possibility to lecture as well as learn in innovative manner contrary to face-to-face classroom environment of teaching and learning (Pokhrel & Chhetri, 2021).

Digital Transformation Models

The learning models are necessary for advancing effective remote-access learning and virtual teaching curriculum to develop learners' education and instructional teaching. This paper reviews digital transformation and e-learning models namely technology acceptance, extended adoption and ADDIE models.

Technology Acceptance Model

Technology Acceptance Model (TAM) originated from Theory of Reasoned Action (Davis, 1989). Numerous studies regarding learners' behavioral intentions along with actual usage have applied the technology

acceptance model. Davis (1989) noted that learners' actual usage is effected directly by behavioral intentions and indirectly by attitudes to technology. The model describes learners' trust in technology application that enhances their performance. TAM indicate that the two dimensions of perceived ease of use and perceived usefulness had a direct effect on the attitude in relation to technology of learners. In addition, Davis (1989) noted that perceived usefulness as well as attitude to technology could be applied to hypothesize learners' behavioral intention. However, TAM model has been criticized since it is hinged on behavioral approaches, and cannot hypothesize actual usage (Chu & Chen, 2016; Ngai et al., 2007).

TAM is used as an approach to operationalize learners' attitudes and behaviors regarding digital technology usage (Vankatesh & Davis, 1996). The students' attitudes towards technology namely e-learning processes, have key positive effect on students' self-efficacy (Liaw & Huang, 2014; Al-Rahmi et al., 2018).

Extended Technology Adoption Model

Alyoussef (2021) developed a technology adoption model, a modified model that helps to comprehend the learning of students in the time of pandemics like Covid-19 in e-learning system. Illeris (2003) indicate that extended technology adoption model states that the stimuli experienced in the digital learning processes could be termed as external environment stimuli and are associated with cognitive responses offered by learning self-efficacy. The model describes that e-learning process actual use is influenced by learners' attitude during Covid-19 crisis as well facilitating control, perceived control, self-efficacy and moderated by perceived ease of use and perceived usefulness (Alyoussef, 2021). Allo (2020) argued that it is hypothesized that learners had a positive attitude towards the actual use of the online learning system, realizing its significance and useful in the course of Covid-19. Based on the technology adoption model, it is hypothesized that attitude have a statistically significant association with the actual usage of the online learning process in the time of Covid-19 crisis (Teo, 2009).

ADDIE Model

The ADDIE model is accepted in instructional as well as curriculum approach to aid lecturers to efficiently administer digital technologies in learning. Thetechedvocate (2020) argues that the model encompasses various procedures namely, analysis, design, development, implementation along with evaluation. For lecturers to apply this model, they need to describe the curriculum objectives, design learning procedures that will aid attain educational objectives, then develop their pedagogy into orderly teaching lessons. The lesson is implemented and evaluation done hinged on pre-determined questions for instance did digital technology embraced enhance learner education and whether the learning objectives were attained (Thetechedvocate, 2020).

Higher Education

Higher education encompasses all post-secondary education, research and training at learning facilities namely universities and tertiary institutions that are officially recognized by countries. However, higher education and universities are concepts applied interchangeably, yet the variables are distinct in their conceptualizations (Assié-Lumumba, 2005). Higher education is committed in the pursuance of knowledge, problem solving and crucial comprehension of accomplishment, as well as training at high levels (Kerr, 2001).

Higher education concept also comprises colleges and polytechnics. A university is referred to as a higher education institute as well as a community of intellectuals which encourages higher level research. Colleges and polytechnics are involved in vocational and middle level training and education (Assié-Lumumba, 2005). Higher learning institutions engage in learning and scholarship via teaching, research and offering services. However, according to Altbach (2006) it is difficult to define higher education in the present era of diverse establishment of learning institutions with no accepted description of their purposes, functions and values.

Miranda et al. (2021) described higher education dimensions namely, competencies, learning methods, information and communication technology and infrastructure. Competency-based curriculum has had notable influence on higher education globally. Competency is basically training and development of vital competencies in our learners. The increase of professional competencies in institutions of higher learning, present the idea of coming up with educational models that help learners to solve problems that need knowledge development. Learning methods involve pedagogical processes for teaching and learning. New academic methods are coming out to address the contemporary urge of generating competent professionals (Jahanmir, 2016).

Higher education is bolstered by appropriate infrastructure for academic processes that embrace learners' needs and aid in the dealing with contemporary educational adversities linked to education and management undertakings. Higher education infrastructure categorized into classroom and institutional. Han, Moon and Lee (2019) noted that the classroom infrastructure comprises customized furniture, access to internet services and facilities connections to the internet while the institutional one are facilities, services and processes present in a learning facility.

Covid-19 Pandemic

The corona virus disease 2019 (Covid-19) is an infectious airborne disease brought about by the lately discovered SARS-CoV-2 (WHO, 2020). It impairs the human respiratory system hence affecting the lungs. The disease was identified in Wuhan China in December 2019 and it is an unparalleled worldwide pandemic that has untold repercussions for the social-economic affluence (Bainess & Elliot, 2020). Covid-19 spread by personal contact, or among individuals in direct contact with each other or by coming into contact with respiratory droplets from a coronavirus infected individual. The disease also escalates via infected surfaces (Doremalen et al., 2020).

Theoretical Framework

This section explains the concept paper's theoretical approach. The theoretical framework summarizes the postulated interrelationships among the concept paper variables. It acts as a guide to have a logical, well described associations among variables, and stipulating the paper variables. Theories explain relationships among variables along with describing and anticipate phenomena (Kerlinger, 1986). This study is anchored on the Theories of Dynamic Capability and Planned Behavior.

Dynamic Capability Theory

Teece (1997) defined dynamic capabilities as the organizations ability to combine, build, and reengineer internal as well as external capabilities to tackle the ever-changing environment. The theory originates from the resource-based view theory and encompasses

the capability of organizations to adjust their resource bases to ensure environmental adaptation and survival. Teece (2007) argued that digital transformation mechanism explains the ability of a firm to continually upgrade and reconfigure resources to ensure enterprises exploit digital possibilities and counter threats. Dynamic capability perspective describes how organizations adapt to ever-changing digital technologies and markets (Tan, Pan & Hackney, 2010). Warner and Wager (2019) posits that digital transformation is considered as enabler of firms' dynamic capabilities which demands to have endless upgrading to have an edge in ever-changing world of business. However, resource base view is criticized for having a narrow approach since it falls short of articulating mechanisms that describe how capabilities are transformed to have competitive edge (Priem & Butler, 2001).

Theory of Planned Behavior

According to Ajzan (1991) the theory of planned behavior emanated from the Theory of Reasoned Action which numerous studies have used to establish learner planned behavior. Planned behavior is determined by key dimensions namely, attitude, perceived behavioral control and subjective norms as well influencing the intention. Perceived behavioral control and intention clearly postulates actual behavior. The theory of planned behavior justifies the predictive model in the usage of online learning processes (Ajzan, 1991). The theory illustrates the association among attitude, subjective norms, perceived behavioral control with intention and behavior (Venkatesh & Davis, 2000; Mathieson, 1991). The theory of planned behavior postulates that the perceived behavioral control dimension could expound the actual behavior that the attitude dimension could not. However, Armitage and Conner, (2001) argued that attitude is termed as an element to operationalize the benefit of learning processes since it could not differentiate between learning results feelings and perceptions regarding education performance.

Empirical Literature Review

Digital Transformation and Higher Education

Digital transformation in institutions of higher learning is basically the paradigm shift in teachers' as well as learners' perception to enhance rethinking, creativity and innovation. Hence, education develop into an environment where lecturing as well as learning could happen no matter when, anyplace with connectivity of digital systems (Van Hoa et al., 2020). Digital transformation in higher education is acknowledged as the transformation of integral design, for instance the strategy, approaches, firm's structure in order to have effective utilization of digital economy opportunities. Digital transformation is positively related to higher education (Adzovie & Jibril, 2022).

Oliveira and Souza (2021) posits that in the context of higher education digital transformation is explained as creation of societal of change by rethinking the digital tools that are utilized in teaching and learning to achieve advanced degree of innovation through the merging of mindset, skills and digital orientations. Digital transformation in education is enhanced by human, technology, institutional and educational drivers in order to improve student and lecturer participation in creating learning institutions of unlimited learning opportunities.

WEF (2020) noted that Learners could get numerous reading information, interchange and willingly deliberate academic subject

matters. At the same time, e-learning programs have become prominent. Learners can have remotely accessed, improved program of studies thus becoming global students. However, various factors impede digital transformation in higher education for learners and instructors. Learners welcome digital transformation on account of having advantageous to them. Learning processes need to impart learners with appropriate technological skills to lead them advance into an increasingly connected universe (WEF, 2020).

Digital transformation boosts digital technology conceptualization and approaches (Mahlow & Hediger, 2019). (OECD, 2018) noted that institutions of higher education need to conform to impart learners with necessary digital knowledge to enhance a broad, coordinated and dynamic world. Schleicher (2016) suggested that digitally equipped learners have the capability to become instruments of change, have a positive impact on solving the challenges that effect on people. Lecturers should apply digital technologies in learning and comprehend the increased advancement of knowledge coming up with solutions of not yet envisioned challenges. In higher education, learners can get academic materials and learning services on mobile applications. The learners can link digital classes via an educational system that helps in course registration and fee payments. Higher education centers have improved their digital processes to enhance learners' experiences and perceptions during studying (Leng et al., 2020).

Internet forums namely, Zoom, Google Meet and social media forums namely Telegram, WhatsApp and Messenger are applied in learning and teaching experiences in higher education. The application of the e-learning platforms can be utilized even after resumption of classroom learning (Doucet et al., 2020). Murgatrotd (2020) noted that the worldwide hindrance to digital learning are affordability, learning pedagogy, accessibility, educational policy and flexibility. Low internet bandwidth and cost of data packages make digital access inadequate (Pokhrel & Chhetri, 2021). Emerging economies are faced by unreliable internet connectivity and digital tools unavailability. Lecturers have a duty of coming up with initiatives that help students get over virtual learning challenges.

Digitization's have impacted on learning undertakings, by complex digital knowledge and by students' behavioral change. Access to digital tools bridges e-learning. Digital transformation in institutions of higher learning need to be done carefully and persistently and be initiated through strategic as well as tactical methods (Kazan, 2020). Libraries in higher education institutions perform a key role in accessing learning and teaching systems. Libraries have been transformed by advancement of digital technology which is critical in support of remote access and e-learning (Mtega & Benard, 2014). University libraries need to create, develop and incorporate their digital library services into e-learning management systems to enhance access to digital resources and services.

Covid-19 Pandemic and Higher Education

The Covid-19 pandemic's impact on higher education, lecturers and learners is of enormous interest to researchers considering the exceptional educational environment brought about by the crisis.

The Covid-19 crisis presented a moment to set the scene for digital transformation in higher education (Dhawan, 2020).

Digital Transformation, Higher Education during Covid-19 Pandemic

Digital learning encompasses online teaching in which lecturers teach learners virtually, in the effort to minimize social interactions amongst learners (Grajek, 2020). Covid-19 pandemic has diverse effects on higher education, lecturers and students globally. The quarantine enforced during the pandemic prompted closure of universities and colleges (Almaiah et al., 2020). Higher institutions of learning banned learners' classroom interactions due to the lockdown effected by nation across the globe (de Boer, 2021; Adedoyin & Soykan, 2020). The higher education sector has adopted drastic digital technology changes to embrace remote access and e-learning systems in ensuring sustainable schooling as well as e-learning. The Covid-19 crisis could be referred as culmination for the digital transformation with regard to higher education. Nevertheless, lecturers, learners and universities are faced by rapid change to a new learning approach that strongly entails numerous digital technologies to create information for customized academic process (Oliveira & Souza, 2021).

Nonetheless, according to Ebner et al. (2020) digital transformation has enabled higher education institutes to adapt to e-learning and the implementation of online learning approaches and its associated digital technologies. Besides, digital transformation towards e-learning relies on online and remote access learning infrastructures. Kuhfeld et al. (2020) predicted that higher education institutions closure negatively affected on learners' educational performance and accomplishment and also had an effect on learners' perceived satisfaction as well as mental health because of the drastic digital transformation to online learning approaches of education during Covid-19 pandemic.

Adzovie and Jibril (2022) noted that Covid-19 crisis has positively and significantly enhanced the adoption of e-learning approaches. Adzovie and Jibril (2022) indicated that digital transformation has a significant mediation influence on the relationship between Covid-19 pandemic and the adoption of digital learning in higher education. In addition, Covid-19 pandemic is positively related to digital transformation and higher education (Adzovie & Jibril, 2022).

The Effects of Digital Transformation on Higher Education during Covid-19 Pandemic

The drastic progress in information technology has immense effect on the changes in educational processes. Distance learning as well as e-learning are concepts acknowledged worldwide as regarding digital transformation in higher learning. However, because of Covid-19 it has been unusual for learners and lecturers to have face-to face learning. The pandemic brought about challenges to learning activities namely how to teach while at the same time keeping social distance. Hence, Covid-19 crisis made the evolution of digital transformation much quicker (Mladenova, Kalmukov & Valova, 2020). The Covid-19 pandemic prompted the utilization of digital services and resulted in positive changes in individuals' attitude of digital transformation in public sector (Shao et al., 2022).

The digital transformation associated with learning process has been challenging for the learners to adopt. The learning approach during digitalization is not as comprehensible as the traditional learning approach in pre-Covid-19 particularly in practical subjects and clearing their uncertainty (Samuel et al.,

2021). The students are not affluent with the digital tools used in e-learning sessions. Students have faced healthy problems from taking part in online learning regularly because the online sessions lack extra-curricular activity. They are complacent in traditional approach of education. Educational digitization has enormous effect on students' behavior in the way they take part in classes and learning enthusiasm. A good number of students face internet disruptions especially students in remotes areas, where access to network is a challenge. Samuel et al. (2021) indicated that digital transformation in higher education do not have a positive impact on learning, with students preferring the traditional approach of education.

In the time of Covid-19 crisis, Almaiah et al. (2020) noted that numerous problems were encountered which affected the higher education learning preparedness to implement online teaching. The hindrances were working under duress, availability of technical personnel and reliability on digital technology processes and e-learning tools (Ebner et al., 2020). The digital transformation in higher educations during Covid-19 led to psychological agony, and depression amongst students who favored physical classroom learning.

In developing nations, the economically disadvantaged learners cannot afford digital devices making it difficult to take part in e-learning classes (Sintema, 2020). Again also, the online sessions create healthy risks due to prolonged screen time for the students. Weak students face challenges since they need maximum supervision. Sintema (2020) indicated that the academic performances have dropped due to reduced contact between students and lecturers and inadequate consultation with lecturers when faced with e-learning challenges. Learner assessments are carried out digitally which attracts doubts and indecision amongst lecturers, learners and the guardians. Online teaching has socio-economic as well as psychological consequences on the learners wellbeing (Doucet et al., 2020). Students are exposed to cyberbullying and online exploitation as well as risks of possible undesirable, toxic and unsafe digital content. The learning processes have been negatively affected by digitalization during Covid-19 crisis.

Empirical Literature Review and Research Gaps Summary

This section focus on past studies' methodology, findings and research gaps. Methodological gap is past studies' designs and methods applied and the research gaps are the context in which past studies were done. The findings show the outcome from past studies and how future research can employ them as source of knowledge. Table 1 indicate past studies, underscoring findings and research gaps in relation to contextual as well as methodological gaps.

Table 1 Empirical Literature Review and Research Gaps Summary.

Year & journal	Author & title	Methodological gaps	Findings	Research gaps
2022	Adzovie, D. E. & Jibril A. B Evaluation of Covid-19	Cross-sectional & quantitative	Covid-19 crisis has positively & significantly enhanced	Digital transformation was not

Journal of cogent education	pandemic impact on the prospects of e-learning in higher education: The mediating influence of education innovativeness & technological development	research method	the adoption of e-learning approaches	integrated in the study
2022 Journal of Global Knowledge, Memory and Communication	Shao. D, Mwangakala. H, Ishengoma. F, Mongi. H, Mambile. C, Chali. F Sustenance of the digital transformations influenced by Covid-19 pandemic outcome in public sector	Snowball sampling method	Covid-19 pandemic has resulted in positive changes in public attitude of digital transformation.	The study did not factor the variable of higher education
2021 International Journal of Recent Research Aspects	Samuel, A. Gideon, G. Reddy, V & Devi, U. A study on impact of digitalisation on higher education during Covid-19 crisis	Exploratory research. Used Primary & secondary data collection methods Random sampling method Convenience & judgemental sampling	Findings indicated that the learners were dissatisfied with the digitalization of education, and preferred traditional learning method	The study did not analyze the digital transformation dimensions
2020 Journal of social sciences	Küçükler. K Online Education in Language Learning in higher education: The Covid-19 & Digital Transformation.	Used survey questions to collect data	The findings showed that higher education institutes engaged in digital learning should add more skills for	The effects of digital transformation in higher education during Covid-19 pandemic

			learners to participate well	not discussed in the paper.
2020 Informatics in Education	Oliveira. S & Souza. R Digital Transformation regarding education	Experimental research	Digital transformation in higher-education is realized only with the integrated use of various kinds of computer based software and not just digital technology by itself	The study did not include the effects of Covid-19 pandemic on higher education
2008 Journal of library Hitech	Conway, P. Modeling the digital content landscape in universities	Used article reviews	The research paper findings indicated that a multivariate digital content model should be employed & tested in higher institutions of learning	The research paper did not integrate the digital transformation and higher education variables in the study
2007 Journal of library Hitech	Seadle, Michael, & Greifeneder Defining a digital library	Primary research	Digital libraries are advancing rapidly for any long term definition	The research paper did not discuss digital transformation and higher education

Conceptual Framework

The conceptual framework depicts the relationships among the study variables namely digital transformation and higher education. The digital transformation is conceptualized as independent variable while higher education is conceptualized as dependent variable. The conceptual model indicates direct and indirect associations between digital transformation and higher education. Covid-19 Pandemic moderates the relationship between digital transformation and higher education variables. Thus, digital transformation and Covid-19 pandemic jointly effect on higher education. The digital transformation is operationalized by digital content, virtual classroom, digital literacy, learning management system and virtual learning platforms. The higher education concept indicators are competencies, learning methods, and infrastructure, while Covid-19 pandemic indicators are infection cases and social distancing.

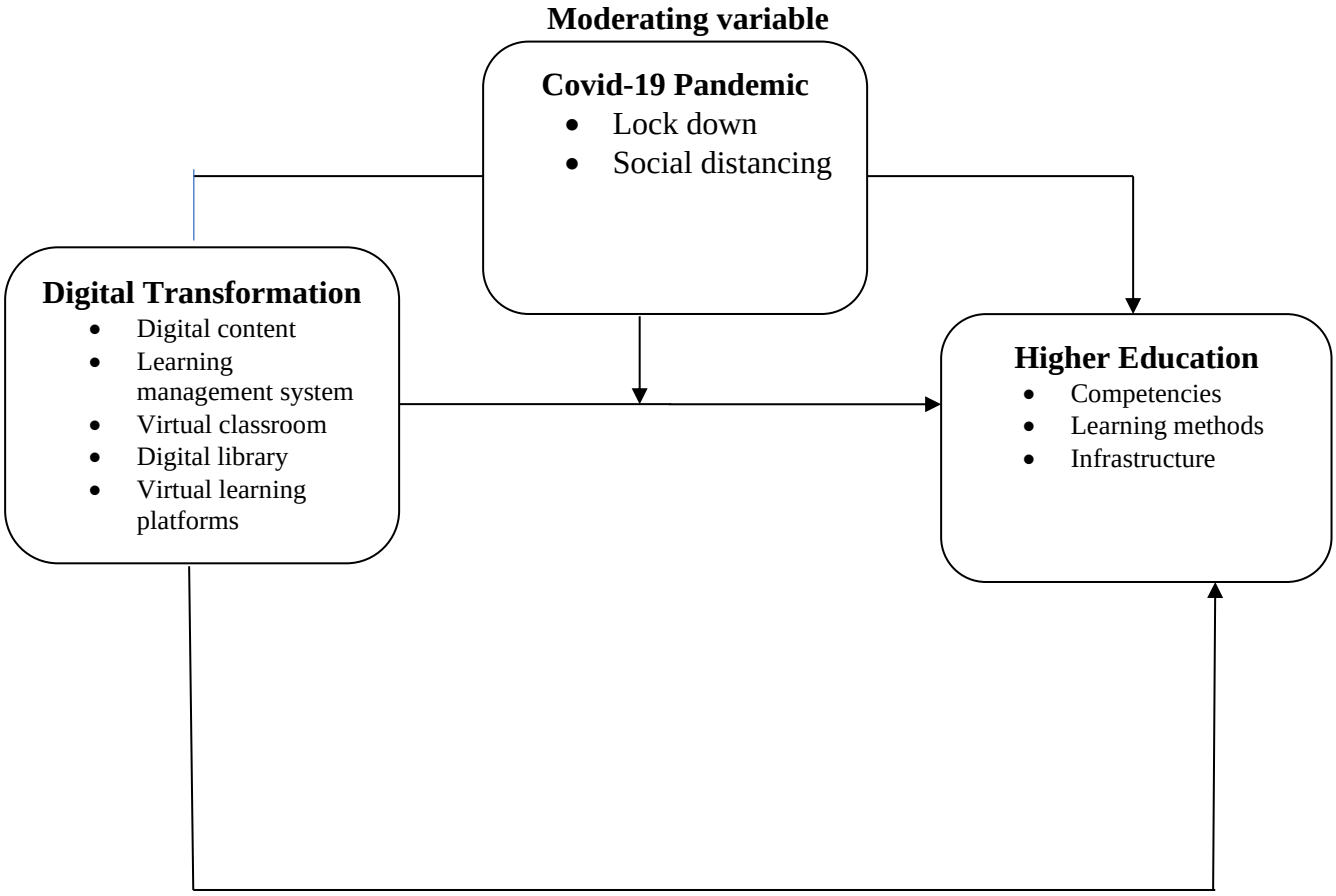

Figure 1 Conceptual Model

Independent Variable
Dependent Variable

Source: Current Author 2023

Hypotheses of the Concept Paper

From the literature review and the proposed conceptual model, the following hypotheses can be deduced:

H1: There is a statistically significant relationship between digital transformation and higher education

H2: Covid-19 pandemic has statistically moderating effect on relationship between digital transformation and higher education

H3: The joint effect of digital transformation and Covid-19 pandemic on higher education is statistically significant.

Summary of the Chapter

This section has depicted relevant literature review on theories on digital transformation, higher education and Covid-19 pandemic. The section also depicts empirical literature on the interrelationships among digital transformation and higher education and joint effect of digital transformation, higher education and Covid-19 pandemic.

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