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Critical Success Factors Influencing the Adoption of Technology for Teaching and Learning by Business Schools

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ABSTRACT

The world is transforming through digitalisation and business schools are predisposed to this transition. Some universities have slickly sailed through the digitalisation challenge, while others have been left behind. The purpose of this research paper is to identify and examine the variables that impact the successful adoption of digitalisation by business schools.Gaining an understanding of these variables will help business schools adopt digitalisationfor long-term improvement.

Analysing gaps in the literature(mostly using sources from 2013–2023) helped identify eight independent variables that can influence the adoption of digitalisation in business schools. Afive-point Likert scale questionnaire containing 56 non-demographic questions was sent to the target population. The survey saw responses from 421 participants worldwide, including academics from flagship business schools and education technology experts. A conceptual model was developed using a structural equation model in ADANCO 2.0.1, which was used to postulate the hypotheses.

Empirically, students'competence has the strongest influence on the adoption of digitalisation by business schools, followed closely by teachers' competence and technology diffusion, in that order.However, industry expectations do not significantly influence this adoption. This reflectsa lapse from business schools in coping with the expectations of the corporate world, thus indicating that future researchers need to study this misalignment. The results from this study display a left shift in the bell-shaped curve of Rogers' (2003) theory of diffusion of innovations, indicating an increase in the category of early adopters of technology from 50% to 90%.

Keywords
Education technology, digitalisation in higher education, business schools, university culture, teachers' competence, students' competence, industry expectations of academia, technology diffusion, university competition, infrastructure, cost of digitalisation, Rogers' theory of diffusion of innovation

1.1 INTRODUCTION

Business schools are caught in a time of disruptive change asdigitalisation is resketching the landscape of education. Emerging technologies have the potential to transform or generate changes in whatever processes they are used for (Sosa et al., 2019). While some universities see the flexibility and adaptability of digitalised education in enhancing and transforming teaching and learning (Beetham and Sharpe, 2013), others are harassed to keep abreast with the nature of new technologies and the needs and requirements of transformation (Losh, 2014). Technology alone cannot improve business school learning and instruction. The implementation of digitalisation in schools is a complex management issue that requires a whole-school approach, taking into consideration the concerns and interests of all stakeholders (Babaheidari and Svensson, 2014).

This paper assists in identifying the variables that influence the adoption of digitalisation for teaching and learning by business schools.

1.2 RESEARCH OBJECTIVES

This study focuses on the determinants of the adoption of digitalisation for teaching and learning by business schools. The literature survey helped recognise eight independent variables. Rogers' (2003) theory of diffusion of innovations was incorporated into the study. The nine research objectives are:

1. To understand the role of university culture in the adoption of digitalisation for teaching and learning by business schools.
2. To ascertain how significantly teachers' competence influences the adoption of digitalisation by business schools.
3. To analyse how students' competence impacts the successful adoption of digitalisation by business schools.
4. To evaluate whether industry expectations influence the adoption of digitalisation for teaching and learning by business schools.
5. To measure the influence of technology diffusion on the adoption of digitalisation for teaching and learning by business schools.
6. To investigate how university competition impacts digital adoption in business schools.
7. To ascertain the role of infrastructure in the adoption of digitalisation for teaching and learning by business schools.
8. To evaluate how significantly cost plays a role in a business school's adoption of digitalisation.
9. To examine whether the findings of this study compare with the findings of Rogers' theory of diffusion of innovations.

1.3 ROGERS' THEORY OF DIFFUSION OF INNOVATIONS

Everett Rogers' (2003) theory of diffusion of innovations seeks to explain how, why and at what rate new ideas and technology spread. According to the theory, adopters of new ideas and technology are categorised as innovators (2.5%), early adopters (13.5%), early majority(34%), late majority (34%) and laggards (16%).

This research paper incorporates Rogers' theory with an added category of*never adopt*. The survey attempts to draw a corollary to check whether Rogers' theory compares with the findings of this study.

2.1 LITERATURE REVIEW

2.1.1 University culture (UC)

University culture involves the organisational life of the university. No two organisations are run the same way. Aasi and Rusu (2017) deliberated on why organisational culture matters and how it influences the performance of information technology (IT). The authors indicated the need to evaluate whether different types of organisational culture influence technological innovation in organisations. Zhu and Engels (2014) studied organisational culture and instructional innovations in higher education from the perspective of teachers and students. The authors called for future researchers to evaluate the need to study organisational culture usingtheoretical models, such as the socio-technical theory, i.e. analysing organisational culture from a social and technical perspective.
Gürfidanand Koç (2016)reported that school culture influences technology integration through technology leadership and support services. These findings were endorsed by Kashada et al. (2018),who documented that proactive top management or leadership has a positive and direct impact on the successful adoption of digital learning technology.Blau and Shamir-Inbal (2017) conducted a study on how technology leaders of educational institutionsperceived the systemic technological

and pedagogical changes that occurred in their school culture.They questioned if a university's technological culture influenced the quality of actual pedagogical outcomes.

Nicoli andKomodromos (2019)suggestedthat corporate social responsibility (CSR) communication using technology has come with its own set of opportunities and obstacles. It is yet to be ascertained whether the CSR culture is unified with digitalisationin universities.

González-Zamar et al (2020) expressed their opinion that educational technology management with reference to higher education of a maintainable nature, need to attain the internalization of ethics and the sustainable development of humanity.

2.1.2 Teachers' Competence (TC)

Ever since the crisis of COVID-19, the significance of ICT and the role of teachers in integrating ICT into the classroom has become obvious (Lomos et al, 2023).

Dougherty (2015) found that there is an apparent misalignment between faculty adoption of technology and student demands. Some facultiesemployed technology only to improve effectiveness in communication and administrative tasks, whereas others were still exploring and investigating novel ways to enhance the learning experiences and outcomes of students.

Uerz et al. (2018) found that teacher educators play a significant role in preparing student teachers to integrate technology into their classrooms. However, Scherer et al. (2018) revealed that there is very little research on the relevant psychological traits (such as adaptability and openness) that indicate teachers' competence with or readiness to embrace technology.Teacher readiness is strongly influenced by school readiness (Petko et al., 2018). The authors reportedthat technology should be incorporated into additional out-of-school activities,such as curriculum development and standardised digital assessments.

Gudmundsdottir and Hatlevik (2018)found that newly trained and qualified teachers have an optimistic approach towards the use of information communication technology (ICT) in classrooms. However, they are critical of the potential distractions and disturbances that technology can bring. Classroom management in a technologysetting should be recognised as an important facet of ICT training. Gudmundsdottir and Hatlevik (2018) added that teachers have both positive and negative experiences with ICT in education. Teachers' technology experience and their certainty about it being beneficial is vital for them to meetinstructional goals and is a solid determinant of the integration of technology with instructional activities (Miranda and Russell, 2012).

Despite the growing advocacy of 21st-century competencies in education, it seems they are not integrated thoroughly into national curricula, school curricula and classroom activities (van de Oudeweetering and Voogt, 2018). Teachers' everyday practices and their perceptions of 21st-century competencies can assist in formulating successful guidelines for 21st-century education.

From (2017) definedpedagogical digital competence (PDC) as the application of and relationship between attitudes, knowledge and skills to technology, learning theory, subject, context and learning. PDC is a skill one can develop and it is expected to improve the more experienced a teacher becomes.

Rubach and Lazarides (2021) expressed how the backdrop of ICT implementation in class is set by teachers' pedagogical and basic ICT competence beliefs.

2.1.3 Students' Competence (SC)

Literature suggests that students' digital competences are not as satisfying as might be expected from 21st-century citizens (del Pozo and González, 2017).Hatlevik et al. (2015) found that students had varying levels of digital competence and the development of their digital competence did not happen automatically. The need for sustaining and equalising students based on their digital competence should be analysed.

Henderson et al. (2017) confirmed that although digital technologies dominatehow students experience their studies, these technologies do not transform university learning and instruction.There is an evident gap between university students' real use of digital technology and the vague rhetoric of technology-enhancedlearning.Selwyn (2016) emphasised that university leaders and educators should take a closer look at the deployment of digital technology in universities and focus on the structural issues pertaining to it, particularly the development of digital pedagogies that fit the wider structures of the curriculum.

Numerous studies have investigated the role and impact of ICT on learning experiences and outcomes in higher education. However, only a little deliberation has been given to the role of ICT in enabling intercultural communication, facilitating interactions among international students and assisting students to adapt to diversity (Tuisk et al., 2015).

2.1.4 Industry Expectations (IE)

Businesses have minimum expectations for values, behaviours and competencies or skills that an individual can bring to a company. Business schools are obliged to appreciate the nuances of the use of advanced technologies by the corporate world that could be unified with business school programmes. This would generate strong links between academia and business (Thomas and Thomas, 2012).Digital literacy is not about being able to operate technology, but rather knowing when to use it and how to set the limits (Griesbaum, 2017). A report by the Business Council of Australia (2016), written as a guide to what employers want, emphasised the development of the minimum required skills as the core responsibility of schools and higher education providers. These skills include digital technology literacy, among many others.

Pucciarelli and Kaplan (2016) analysed strengths, weakness, opportunities and threats (SWOT) and documented low responsiveness to changes within the corporate world as a weaknessthat impacted higher education. Innumerable calls for redesigning and aligning the curricula with corporate needs have been put forward by scholars, practitioners and governments alike, more often than not without a satisfactory response from academia (European Commission, 2013).Deming et al. (2014) found that the probability of employers contacting applicants with business degrees from online, for-profit institutions as compared to degrees from non-selective public institutions was low. The authors presented the research limitation of how industry perceives online degrees from flagship universities vis-à-vis their face-to-face counterparts.

2.1.5 Technology Diffusion (TD)

Diffusion refers to the widespread dissemination of a particular technology, how technology spreads within a group, how the process of ICT adoption takes place and to what extent ICT is used (Babaheidariand Svensson, 2014).Henriksen et al. (2016) proposed that educational technology, along with creativity,was one of the fundamental constructs of learning and instruction. The authors emphasised the need to create a framework that can integrate creative education with technology for today's classrooms in a system-wide manner.

Nguyen et al. (2015) found that although smart devices enhanced learning experiences, they did not significantly improve students' learning outcomes. The authors expressed a lack of clarity on how best to align or integrate smart devices with academic programmes, pedagogical guidelines and the curriculum.Davies and West (2014) indicated the necessity for improving learning through personalised instruction. One approach to personalised instruction is through adaptive technologies that use information gained about individual students, including data on their formative and diagnostic assessment, to adapt the way instruction is provided. The authors underscored that future research efforts should be focused on incorporating more progressive approaches for adaptive instruction.

Flipped learning refers to when students are introduced to learning material before class, while classroom time is used to deepen learning through discussions with the teacher and peers. Intending to facilitate seamless flipped learning, Hwang et al. (2015) emphasisedthat future research should look into the need for, the effectiveness of and engagement with emerging technologies, such as big data, cloud computing, learning analytics and augmented reality.Furthermore, they suggested that future researchers should evaluate whether flipped learning can encourage students' higher-order thinking, such as the ability to create, solve problems, think critically and perform creatively.

2.1.6 University Competition (CP)

Universities are multifaceted,therefore, the dimensions of competition are diverse and relate to universities' rivalry in attracting students, increasing their market share and research funding, etc. (Reitz, 2017).
Thomas and Thomas (2012),found that in several business schools, online learning approaches are perceived to be of much lower quality than face-to-face learning. However, Gašević et al. (2015), in their research on preparing for the digital university, inferred that online learning, if correctly planned, organised and facilitated by a suitable mix of pedagogy and technology, is comparable to,or in some situations more effective than, conventional face-to-face classroom instruction. Pucciarelli and Kaplan (2016),in their SWOT analysis, identified the need to enhance prestige and market share as one of the three key challenges faced by higher education institutions. The authors documented that the market share of higher education institutions, among many other factors, applies to its potential to keep up with advancements in ICT.

In a market devoid of competition and being able to generate satisfactory economics, the default for family-owned businesses is to reserve their present stock of socioemotional wealth (Chua et al., 2015). This inference was endorsed by Souder et al. (2017) who found that with an increase in competition, family-owned firms were relatively more skewed towards the adoption of new technology.Palacios-Marqués et al. (2015) showed a negative correlation between vertical competition and web knowledge exchange. How horizontal competition, i.e. the threat from prevailing rivals and the risk of new entrants, impacts business schools and how they respond is yet to be evaluated.

Cattaneo et al. (2019) found that schools functioning in highly competitive environments engaged in diversification strategies, thus adopting more risk-taking behaviour. Diversification relates to the necessity of meeting the demands of the labour market resulting from increased mechanisation while upholding an educational system that can appraise, uplift and re-train the current labour force (Frey and Osborne, 2017).

2.1.7 Infrastructure (IN)

Infrastructure represents an essential, but not an adequate, condition for ICT integration into the classroom (Gil-Flores et al., 2017). Kashada et al. (2018)underlined that information technology infrastructures have a positive and direct effect on the successful adoption of digital learning technology. Moore and Fodrey (2018) presented the idea that a well-designed technology infrastructure has four critical components – systems, objectives, evaluation and personnel – and that the absence of any one of these will likely result in unsuccessful technology integration. However, newly qualified teachers have reported the substandard quality and contribution of ICT training during their teacher education (Gudmundsdottir and Hatlevik, 2018). There is an urgency to address the continuous professional ICT training of professors, staff and other stakeholders, besides the transformation of the institution's infrastructure and its key processes (Pucciarelli and Kaplan 2016).

ICT policy,which is a blueprint or roadmap for ICT implementation strategies, is a set of predefined actions with the intent to encourage the use of ICT in every socioeconomic endeavour (IGI Global, 2019). ICT policies that identify variables critical to the integration of ICT promote improvement in ICT-supported teaching and learning (Gil-Flores et al., 2017).Ferris and Riveros (2019) stated that the advent of cloud-based computing architecture has opened up new opportunities for the rapid and scalable deployment of virtual web stores and other online services. With education embracing digitalisation for global teaching and learning, such technology becomes a critical component of the available infrastructure.

2.1.8 Cost (CO)

Education is an industry that is fairly labour intensive and thus, costs per student have soared faster than inflation and are likely to increase even more in the future (Baum et al., 2013). Withdigitalisationin universities, the focus is often on cost. A considerable amount of money is expended on technology with the expectation of improving educational outcomes (Bulman and Fairlie, 2016). Piper et al. (2016) reasonedthat in selecting ICT investments for the education sector, cost considerations should be of paramount importance.They conducted a quantitative study to analyse whether investments in technology have a positive effect on literacy outcomes. They inferred that investments in ICT do not significantly enhance literacy outcomes further than non-ICT instructional programmes.

Gašević et al. (2015) found that distance education, or online education, if properly planned and facilitated, can be associated with reduced costs. Deming et al. (2015) alsofound that in higher education, digital (online) technology can bend the cost curve.The authors suggested that digital (online) learning can reduce the cost of higher education but were uncertain about the impact this had on the quality of instruction. Furthermore, Griesbaum (2017) highlighted a lack of clarity regarding the long-term effects and impact of the massification of learning.

Chulkov (2017) conducted a study to evaluate the basis on which managers make their decisions about selecting and adopting new technology. He inferred thatin addition to the monetary cost of different technology options, the key determinant is switching cost (in addition to adoption reversibility).

2.1.9 The Benefits of Adopting Digitalisation (BE)

There is a firm agreement on the substantial advantages of the assimilation of information and the effortless worldwide communication that can be achieved using ICT. The benefits of digitalised education, reflected in the research gaps and findings of the literature, were used as a measure of the research outcomes.

Rabah (2015), studied the benefits and challenges of ICT integration in schools and noted glocalisation of 21st-century education as one of the three main benefits. It allows the teacher to connect a local classroom to a global landscape. Two other significant benefits that the author cited were higher student engagement levels (supported by McKnight et al., 2016) and the enhancement of the student learning process. Henderson et al. (2017) indicated that the adoption of digitalisation can facilitate faster technology-enabled assessment, thus fulfilling the needs of student engagement.

Henderson et al. (2017) argued that digital technologies do not disrupt student experience. Students use technology more for the logistics of university study than matters directly related to student learning. However, Tuisk et al. (2015) confirmed that the adoption of digitalisation facilitates a reciprocal relationship among cross-cultural stakeholders.

Navimipour and Soltani (2016) stated that companies require hard evidence about the return on investment before agreeing or committing to any technology investment and application. A view from industry experts may summarise that digitalisation provides a higher return on investment to business schools.

3.1 RESEARCH METHODOLOGY

3.1.1 Data Collection

The first stage of the study involved a detailed literature review from secondary sources, methodically exploringarticles published (mostly between 2013 and 2019)on international platforms such as ISI Thomson and ABDC Journals, among others. Relevant articles with research gaps or limitations were analysed from various sources such as ProQuest, EBSCO Host and Google Scholar, in that order.

Primary data was sought in the second stage of the study, when the survey,which had 56 questions (excluding demographic variables), was ready for circulation. Each of the 421 respondents was contacted personally via email addresses published on university websites and through LinkedIn. The questionnaire was uploaded to Google Forms. Each query from a respondent, before or after taking the survey, was replied to meticulously and to the respondent's satisfaction.

3.1.2 Demographic Profile of the Respondents

The sample was complete in terms of quality and quantity and effectively brought about the reliability and validity of the model.The survey included responses from the leaders of flagship business schools across various regions, veteran professors from business schools, CEOs of multinational companies, students of MBA/doctoral programmes and experts in the field of educational technology (edtech). The survey was completed by the highest-ranking authorities of schools and universities, e.g.deans, deputy deans, presidents, vice provosts, vice-chancellors, faculty directors, heads of campus and faculties. Consultants and strategists, disruptive technologists, chief technology officers, chief disruption officers and other veterans from the edtech industry alsoresponded, as well as students and alumni of leading business schools. A synopsis of the demographic profile of the respondents is given in Table 1.

Table 1: Demographic Profile of the Respondents

Age		**Gender**		**Occupation**		**Geography**	
18y–30y 30y–40y 40y–60y 60y+	9.20% 26.40% 51.60% 12.80%	Male Female	74.2% 25.8%	Student Teacher Uni. Mgmt. Corporate/alumni Tech. provider	10.70% 27.30% 23% 32% 7.10%	APAC Europe M. East & Africa America	40.20% 18.60% 8.10% 33.10%

4.1 DATA ANALYSIS: MEASUREMENT MODEL

4.1.1 Construct Reliability

Construct reliability is the degree to which a research instrument consistently measures a construct across items (e.g. internal consistency, split-half reliability) and time points (e.g. test-retest reliability).ADANCO 2.0.1 gives three construct reliability quotients,as shown inTable 2.

For a construct to be considered internally consistent and reliable, Dijkstra and Henseler (2015) indicate that its rho value must be greater than 0.7. Any value above 0.8 is considered good and above 0.9 is excellent (also supported byJöreskogandSörbom, 2006). The minimum satisfactory threshold of Cronbach'salpha (α) is 0.6, with values above 0.7 being preferred (Burgess and Steenkamp, 2006; Cronbach, 1951).

Table 2: Construct Reliability

Construct	Dijkstra and Henseler's rho (ρ_A)	Jöreskog's rho (ρ_c)	Cronbach's alpha (α)
BE	1.0000	0.9266	0.9033
UC	1.0000	0.9074	0.8700
TD	1.0000	0.9263	0.9041
TC	1.0000	0.9349	0.9190
CP	1.0000	0.8758	0.8218
IE	1.0000	0.8145	0.6576

SC	1.0000	0.8682	0.7961
IN	1.0000	0.9041	0.8585
CO	1.0000	0.8826	0.8332

Considering the above norms for all three tests, the reliability levels of this study are good or excellent.

4.1.2 Convergent Validity

Convergent validity ascertains the degree to which two measures of constructs that theoretically should be related are, in fact, related. Average variance extracted (AVE) figures were analysed to test the convergent validity of the model. The satisfactory threshold for this measurement is 0.5 (Hair et al., 2011);a construct with an AVE greater than 0.5 can be safely assumed to explain a substantial proportion of the variance in the model.

Table 3: Convergent Validity using AVE

Construct	Average variance extracted (AVE)
BE	0.6795
UC	0.6643
TD	0.6773
TC	0.6446
CP	0.5859
IE	0.5945
SC	0.6231
IN	0.7022
CO	0.6011

As the AVE figures for all constructs range from 0.5859 to 0.7022, itindicates the presence of convergent validity within the model.

4.1.3 Discriminant Validity

Discriminant validity ascertains the degree to which constructs that theoretically should be unrelated are, in fact, unrelated. ADANCO 2.0.1 offers the Fornell and Larcker (1981) criterion,which suggests that a construct'sAVE should be greater than its squared correlations with all other constructs in the model.

Table 4: Fornell and Larcker's Discriminant Validity

Construct	**BE**	**UC**	**TD**	**TC**	**CP**	**IE**	**SC**	**IN**	**CO**
BE	**0.6795**								
UC	0.4157	**0.6643**							
TD	0.4890	0.3068	**0.6773**						
TC	0.4580	0.3509	0.4072	**0.6446**					
CP	0.3922	0.2841	0.3233	0.2590	**0.5859**				
IE	0.2485	0.2041	0.2551	0.2500	0.2393	**0.5945**			
SC	0.4755	0.3113	0.3688	0.3015	0.3228	0.1726	**0.6231**		
IN	0.4201	0.2991	0.3669	0.3227	0.3033	0.2499	0.3554	**0.7022**	
CO	0.4426	0.2774	0.3909	0.2851	0.3112	0.2384	0.2754	0.3394	**0.6011**
Squared correlations; AVE on the diagonal									

Table 4 shows the discriminant validity of the model. Discriminant validity is regarded as agreed if the highest absolute value of each column and row is found in the main diagonal. This means the diagonal values (AVEs) should be greater than the non-diagonal values foreach corresponding row and column (squared correlations). Discriminant validity thus exists within the model.

4.2 DATA ANALYSIS: STRUCTURAL EQUATION MODEL

4.2.1 Structural Equation Model and Coefficient of Determination (R^2)

Figure 1 shows the structural model using path coefficients. An R^2 value of 0.707 for the dependent variable,which is the adoption of digitalisation for business schools, reflects that 70.7% of the variance in this latent variable is explained by the contributing factors included as antecedents in this model. This number is considered comparatively high for a partial least-squares regression model (Henseler and Fassott, 2010).

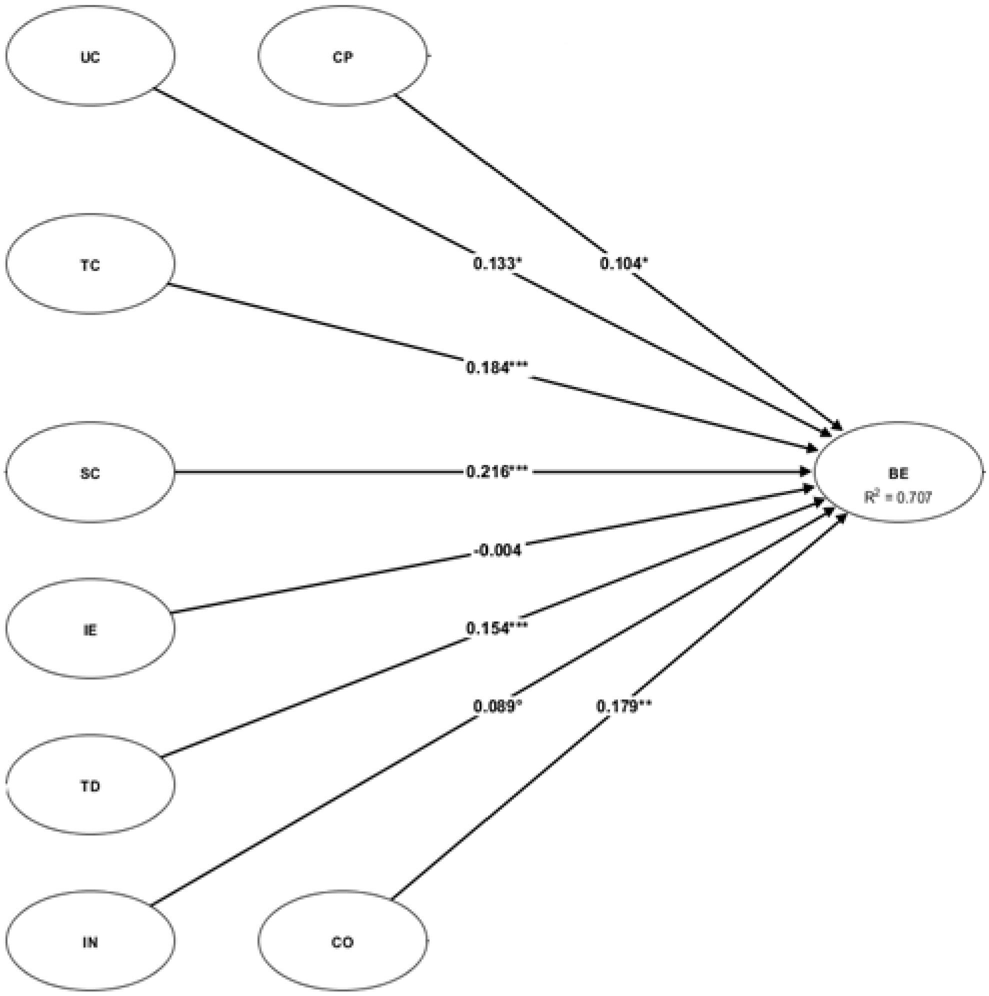

Figure 1: Structural Equation Model

4.2.2 T-Values and Direct Effects Inference

T-tests play a critical role in determining whether significant relationships exist between the various constructs in the model (Hair et al., 2010). In this study, two-tailed t-tests were evaluated and measured at 10%, 5% and 1% significance levels. Significance levels are measured using t-values and p-values, as depicted in Table 5.

Table 5: Table measurement of t-values

Significance	t-values	Decision
$p > 0.10$	$t < 1.65$	Not significant
$0.10 > p > 0.05$	$1.65 < t < 1.96$	Moderate
$0.05 > p > 0.01$	$1.96 < t < 2.59$	Significant
$p < 0.01$	$t > 2.59$	Very significant

For unknown population data, a bootstrapping method was used for modelling, as documented by Efron (1987). Table 6 shows the direct effect of each independent variable on the dependent variable.

Table 6 Direct effects inference

Code	Effect	Original coefficient	Standard bootstrap results				
			Mean value	Standard error	t-value	p-value (2-sided)	Supported?
H1	UC -> BE	0.133	0.132	0.053	2.527	0.012	Yes
H2	TC -> BE	0.184	0.182	0.055	3.357	0.001	Yes
H3	SC -> BE	0.216	0.218	0.048	4.491	0.000	Yes
H4	IE -> BE	-0.004	-0.004	0.057	-0.071	0.943	No
H5	TD -> BE	0.154	0.161	0.047	3.301	0.001	Yes
H6	CP -> BE	0.104	0.108	0.045	2.338	0.019	Yes
H7	IN -> BE	0.089	0.088	0.054	1.656	0.098	Yes
H8	CO -> BE	0.179	0.180	0.057	3.156	0.002	Yes

4.2.3 Constructs and Their Determinants

The structural equation model used loading estimates to indicate the importance of the respective determinants of each construct, as represented in Table 7.

Table 7 Constructs and their determinants along with loadings

Variable	Determinants of the variable	Loading (path coefficients)	Effect*
University culture	Types of university cultures	0.864	Strong
	Socio-technical viewpoint	0.837	Strong
	Technology leadership	0.861	Strong
	Pedagogical outcomes	0.841	Strong
	Corporate social responsibility	0.651	Moderate
Teachers' competence	Alignment with student learning needs	0.663	Moderate
	Personality traits	0.664	Moderate
	Technology competence	0.800	Strong
	Curriculum assessment	0.856	Strong
	Classroom management	0.823	Strong
	Pedagogical digital competence	0.862	Strong
	ICT experience	0.858	Strong
	Perception of 21^{st}-century digitalisation	0.866	Strong
Students' competence	Technology use and enhanced learning	0.769	Moderate
	Fitting of digital pedagogies	0.851	Strong
	Cross-cultural interactions	0.818	Strong
	Sustenance and equalisation	0.713	Moderate

Industry expectations	Digital literacy	0.798	Strong
	Responsiveness to corporate organisations	0.728	Moderate
	Industry perceptions: online vs. face-to-face	0.786	Moderate
Technology diffusion	Creativity with technology	0.811	Strong
	Universal standards	0.799	Strong
	Smart devices	0.761	Moderate
	Adaptive intelligent tutors	0.866	Strong
	Big data, augmented reality	0.859	Strong
	Flipped learning	0.836	Strong
University competition	Face-to-face and online learning	0.691	Moderate
	Market share	0.804	Strong
	Family-owned universities	0.762	Moderate
	Acquisition of competitors	0.744	Moderate
	Risk-taking abilities	0.820	Strong
Infrastructure	ICT policy	0.848	Strong
	Well-designed ICT infrastructure	0.854	Strong
	Orientation training	0.810	Strong
	Cloud computing	0.839	Strong
Cost	Importance of cost considerations	0.782	Moderate
	ICT investment	0.823	Strong
	Reduction in cost	0.777	Moderate
	Alignment with quality	0.712	Moderate
	Replacement costs	0.779	Moderate

* A loading estimate of 0.5 to 0.8 signifies a moderate effect of the determinant on the construct (Bullmore et al., 2000) and an estimate above 0.8 signifies a strong effect (Wright, 1934).

4.2.4 Assessment of Hypotheses

University Culture

H1. University culture significantly influences a business school'sadoption of digitalisation for teaching and learningfroma socio-technical perspective, technology leadership and pedagogical outcomes.

H1 is accepted at $\beta = 0.1333$, t-value = 2.5273 and $p < 0.05$. This result confirms the previous findings by Gürfidanand Koç (2016) that a positive university culture lends adequate support and encouragement for the increased use of technology.

Teachers' Competence

H2: Teachers' competence significantly influences a business school's adoption of digitalisation, through alignment with students' learning needs, personality traits, a curriculum with digitised assessment, classroom management and pedagogical digital competence.

H2 is accepted at $\beta = 0.1835$, t-value = 3.3572 and $p < 0.01$. This confirms the findings of Dimitriadis et al. (2013), who stated that to achieve orchestration in mobile-integrated education, strengthening of teacherdevelopment and teacher technology competencies needs to come to the fore. This is the second-strongest variable that impactsdigitalisation after students' competence.

Students' Competence

H3: Students' competence significantly influences business schools' adoption of digitalisation for teaching and learning through alignment with digital pedagogies, cross-cultural interaction and sustenance and equalisation.

H3 is accepted at β = 0.2163, t-value = 4.4909 and $p < 0.01$. It is important to highlight that among all the variables impacting the adoption of digitalisation, students' competence was the most influential. The literature reflected that students' digital competences are not as satisfying as might be expected from 21st-century citizens (del Pozo and González, 2017). Considering thisand the significance of H3, it is a critical point of action for all decision-makers to enhance students' levels of digital competence for successful technology adoption.

Industry Expectations

H4: Industry expectations have a significant influence on a business school's adoption of technology, through digital literacy, the responsiveness of universities and the perception of online degrees.

H4 isrejected as negative values β = −0.0041 and t-value = −0.0713 indicate that industry expectations have an insignificant influence on the adoption of digitalisation for teaching and learning bybusiness schools.

Literature indicatesthe expectations that industry has of digitalisation in education. However, the rejection of H4highlights that academia is yet to fully respond to, match or fulfil these expectations. Thisconfirms the findings of Pucciarelli and Kaplan (2016), who described the low responsiveness of universities to the corporate world as a weakness, thus implying the need for academia to respond to industry expectations.

Technology Diffusion

H5: Technology diffusion significantly influences the adoption of digitalisation for teaching and learning by business schools, through the integration of creativity, smart devices, adaptive intelligence, augmented reality and flipped learning.

H5 is accepted at β = 0.1536, t-value = 3.3014 and $p < 0.01$. Technology diffusion in this study has been explained by the integration of creativity, smart devices, adaptive intelligence, augmented reality and flipped learning. This enhances the quality of educational technology experiences and could prove to be a positive predictor of academic achievement (Petko et al., 2018). Of all the variables included in this study, technology diffusion emerged as one of the top three influencers in the adoption of digitalisation by business schools. This indicates that technology diffusion is penetrating gradually and digital transformation is taking place.

University Competition

H6: University competition significantly influences a business school's adoption of digitalisation, through market share, family-owned universities, acquisition of competitors and risk-taking abilities.

H6 is accepted at β = 0.1045, t-value = 2.3380 and $p < 0.05$. Macher et al. (2015), in their study on competition and technology adoption, found that competition limits the ability of firms to appropriate the benefits of new technology. However, this empirical study contradicts the findings of these authors by demonstrating that university competition is a positive influence on reaping the benefits of technology adoption. In contrast, Cattaneo et al. (2019) stated that universities operating in extremely competitive environments begin to adopt more risk-taking behaviour by engaging in diversification strategies (digitalisation can be implied here). This study confirms the findings of these authors, thus reflecting that in an increasingly competitive market, universities are keener to resort to digitalisation.

Infrastructure

H7: Infrastructure significantly influences the adoption of digitalisation by business schools, through ICT policy, orientation and edge.

H7 is accepted at β = 0.0889, t-value = 1.6560 and $p < 0.10$, indicating that infrastructure has a moderate influence on adoption. Kashada et al. (2018) found that information technology infrastructures have a positive, direct effect on the successful adoption of digital learning techniques. The significance of H7 thus ratifies the work of the previous authors.

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Cost

H8: Cost significantly influences a business school's adoption of digitalisation, through alignment of cost reduction with quality and replacement costs.

H8 is accepted at β = 0.1795, t-value = 3.1555 and $p < 0.01$. Bowen (2012) suggested that a cost-cutting effect is ascribed to digitalisationin universities and described how most educators considered online learning technologies as the best innovation for saving costs in higher education. Deming et al. (2015) found that in higher education, digital (online) technology can bend the cost curve. H8 thus endorses the findings of previous research.

5.1 CONTRIBUTIONS

5.1.1 Contribution to Literature

This research reviewed literature from articles published mostly between 2013 and 2019. Constructs were built based on the literature review, which identified possible research gaps and filled most of them. It also contributed to the literature by reconfirming and reinstating some findings in the area of education technology in business schools.

An encouraging aspect of this research has been the presentation of a model as a research artefact in the area ofdigitalisationin business schools. The research highlights the importance of the model and proposes that users apply this to solving the problems of digital transformations, or proactively considering the explained variables to ensure smooth and effective integration.

5.1.2 Contribution to Theory

The comparison between the findings of this research and that of Rogers (2003) sees the trend change hugely. Almost 90% of the respondents in this studyadopted technology immediately or in the early stages, thus leaving only 10% of respondents accepting technology late or in a delayed fashion.Rogers (2003)found that 50% of his respondents accepted technology late or in a laggard manner, as shown in Table 7 and graphically represented in Figure 2.

Table 7 Comparison of Rogers' theory findings with research findings

Rogers' theory	Innovators	Early adopters	Early majority	Late majority	Laggards	Never adopt
	2.5%	13.5%	34%	34%	16%	NA
Findings from this study	Immediately adopt	Adopt after seeing the trend	Adopt gradually	Adopt only after a friend recommends	Adopt leisurely at my own pace	Never adopt
	14.76 %	39.93%	34.23%	2.01%	8.39%	0.67%

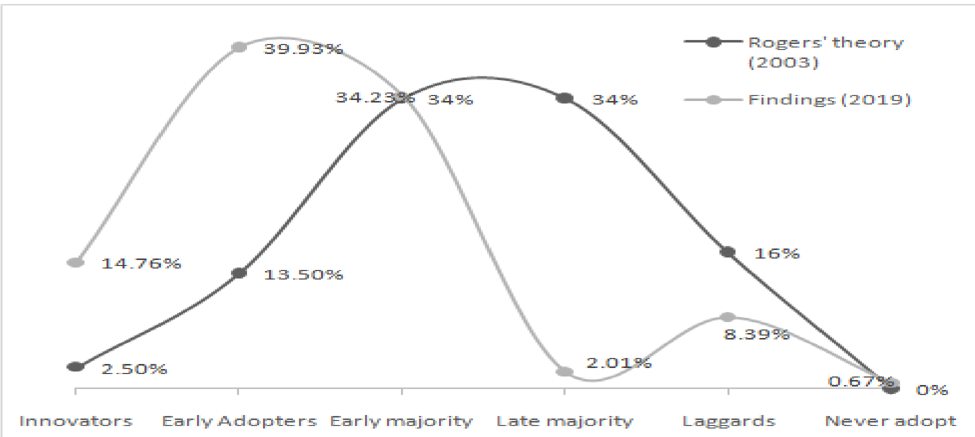

Figure 2: Graphical Comparison of Rogers' Theory (2003) with the Findings of this Study (2019)

The digital era is having an impact on all sectors: no individual or institution in higher education can evade the disruptive changes that technology has brought about. Stakeholders are left with almost no choice but to embrace and adopt new approaches to various digital practices that would have been considered unthinkable for most institutions even ten years ago.

5.1.3 Contribution to Practice

University actors, decision-makers and technology experts have several implications and recommendations to consider from these findings:

a. There wasan apparent misalignment of faculty adoption of digitalisation with students' learning needs, thus endorsing the findings of Dougherty (2015). Bridging this gap and aligning teachers' and students' needs, goals and objectives would help improve student learning outcomes through using technology.
b. Experience (positive or negative) in the classroom guided a teacher's approach towards the use of ICT. Classroom management in the 21st-century technology-rich environment was thus recorded as an important facet to be incorporated into teacher training, taking forward the findings of Gudmundsdottir & Hatlevik (2018) and Selwyn (2016).
c. Integrating technology-driven assessment was yet another implication for universities to improve the teaching and learning experience in business schools, reinstating the findings of Henderson et al. (2017). Digital assessment would facilitate prompt and logical feedback, allowing faster corrective learning. Teachers' time saved from assessment chores could be used for more important classroom brainstorming and discussions, thus giving more time for teacher-student interaction and enhancing the quality of student learning (McKnight et al., 2016).
d. Digital pedagogies need to be neatlywoven into the curriculum. This study highlighted the fact that iPads and smartphones are not completely blended with the curriculum.Their efficacy and benefits can be enjoyed or utilised in the truest sense only when these devices are tightly and efficiently integrated into the curriculum, thus taking forward the findings of Nguyen et al. (2015).
e. This study endorsed the findings of Hatlevik et al. (2015). Students come to university from varied backgrounds with diverse skill sets. Universities need toequalise and then maintain students' digital competence. This recommendation would assist business school education policymakers to initialise personalised digital learning that caters to an individual's needs and pace of learning.
f. There isa gap between students' current use of technology and technology-enhanced learning, thus confirming the findings of Davies and West (2014).This could mean that students use technology more for logistical and transactional purposes than for holistic learning experiences. This is, once again, anote to university academics to incorporate technology into the curriculum in a more structured and beneficial way.
g. Edtech stakeholders must work on the development of adaptive intelligent tutors(Davies and West, 2014) and the deployment of evolving technologies like cloud computing and augmented reality to fulfil the requirements of 21st-century digital education.
h. A point of action that needs attention is the integration of creativity with digitalisation into education, as creativity is emerging as one of the most imperative and noteworthy skills for success in the 21st century, thus reinstating the findings of Henriksen et al. (2016).
i. Results show the need to examine universityculturefrom a socio-technical perspective, thereby confirming the findings of Zhu and Engels (2014). This is a strategic recommendation to university technology leaders. Technology leadership also emerged as a strong determinant of university culture, further to the findings ofGürfidan and Koç (2016) and Kashada et al. (2018).
j. An interestingfinding that emerged from this study is that although industry expectations shared an insignificant direct relationship with adoption, it significantly impacted the adoption of digitalisationindirectly. Industry expects digital literacy as a minimum skill from graduates (Business Council of Australia, 2016) and it expects a swift response from universities to changes in the corporate world of today (Pucciarelli & Kaplan, 2016). Industry also expects the quality of digital education to be on a par with its face-to-face counterparts, i.e. traditional classroom delivery. Industry expectations certainly put implied pressure on universities to digitalise, seeking a response from university leaders.

k. This brings to the fore yet another aspect: cost. This research re-established the findings of Deming et al. (2015) that technology could bring down the cost of business education and that this reduction in cost needs to be aligned with the quality of education. However, the impact on quality is yet undetermined.
l. Education actors at all levels (national or university) note the critical need to develop ICT policies to serve as a roadmap for effective implementation of digital strategies, thus reconfirming the findings by Gil-Flores et al. (2017).
m. In acompetitive environment, universities with higher risk-taking abilities can resort to the adoption of digitalisation to increase their market share, thereby re-establishing the findings of Cattaneo et al. (2019).

6.1 LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

The scope of this study was not restricted by geography asdifferent countries and continents are at various stages of access to and adoption of technology. The results of this study are, thus,potentially too generalised and national culture and a country's standing on the curve of *developing to developed* could hugely skew or change the results.

Industry expectations were concluded to have an insignificant relationship with the adoption of digitalisation for teaching and learning by business schools. Though literature briefly touches on the expectations industry has from digitalisation in academia, this research emerged with contradicting results. Future researchers need to plunge deeper into this subject to find out why universities have not fully responded to industry expectations and provide solutions for them to do so. While universities have understood the significance of other elements such as culture, students' competence, teachers' competence and the importance of industry expectations from academia, these are not fully aligned. Research can help bridge the gap and bring about a more complete digital transformation.

7.1 CONCLUSION

Thisstudy developed a coalition between theory and practice by drawing on academic and practitioner literature in the area ofdigitalisation in education and by collaborating with academia, industry and technology providers, for the development, employment and assessment of research artefacts.

This research had eight objectives pertaining to the eight independent variables: university culture, teachers' competence, students' competence, industry expectations, technology diffusion, university competition, infrastructure and cost. The influence of each variable was tested on the adoption of digitalisation for teaching and learning by business schools, which was the dependent variable. Students' competence was empirically found to have the strongest impact on adoption, with teachers' competence and technology diffusion following closely, in that order.

Industry expectations were found to have an insignificant relationship with the adoption of digitalisation for teaching and learning by business schools. This indicates that future researchers shouldstudy the alignment ofindustry expectations with digitalisation in academia, as it is either unventured or is at its teething stage and still needs more in-depth analysis.
The findings of this study were compared with the findings of Rogers' (2003) theory of diffusion of innovations and found that, in 2019, more than 90% of technology users were categorised as early-stage adopters, vis-à-vis 50% in 2003. This paper contributes not only to theory but also to practice.

REFERENCES

1. Aasi, P. and Rusu, L. (2017) 'Facing the digitalisation challenge: Why organisational culture matters and how it influences IT governance performance',in Paspallis, N., Raspopoulos, Barry, M., Lang, M., Linger, H. and C. Schneider (eds), *Information systems development: Advances in methods, tools and management*, Larnaca,Cyprus, ISBN: 978-9963-2288-3-6.

2. Babaheidari, S.M. and Svensson, L. (2014), ‘Managing the digitalisation of schools: An exploratory study of school principals’ and IT managers’ perceptions about ICT adoption and usefulness’,*E-Learn: World Conference on e-learning in corporate, government, healthcare and higher education.*New Orleans, 27–30 October, Association for the Advancement of Computing in Education, pp. 106–113.
3. Baum, S., Kurose, C. and McPherson, M. (2013) ‘An overview of American higher education’, *The Future of Children*,vol. 23, no. 1, pp. 17–39.
4. Beetham, H. and Sharpe, R. (Eds.), 2013. *Rethinking pedagogy for a digital age: Designing for 21st-century learning*, Routledge, New York.
5. Blau, I. and Shamir-Inbal, T. (2017), ‘Digital competences and long-term ICT integration in school culture: The perspective of elementary school leaders’, *Education and Information Technologies*, vol. 22, no. 3, pp. 769–787.
6. Bowen, W. G. (2012) *The ‘cost disease’ in higher education: Is technology the answer?*, Stanford: CA, The Tanner Lectures.
7. Bull, S., Johnson, M.D., Masci, D. and Biel, C. (2015) ‘Integrating and visualising diagnostic information for the benefit of learning’, in Reimann, P., Bull, S., Kickmeier-Rust, M., Vatrapu, R. and Wasson, B. (eds), *Measuring and visualising learning in the information-rich classroom*,New York, Routledge, pp. 167–180.
8. Bulman, G. and Fairlie, R.W. (2016) ‘Technology and education: Computers, software and the internet’, in Hanushek, E.A., Machin, S.J. and Woessmann, L. (eds), *Handbook of the Economics of EducationVol. 5*, Elsevier, Amsterdam, pp. 239–280.
9. Bullmore, E. T., Horwitz, B., Honey, G. D., Brammer, M. J., Williams, S. C. R. and Sharma, T. (2000) ‘How good is good enough in path analysis of fMRI data?’*NeuroImage*, vol. 11, pp. 289–301.
10. Burgess, S. M. and Steenkamp, J. B. E. (2006) ‘Marketing renaissance: How research in emerging markets advances marketing science and practice’, *International Journal of Research in Marketing*, vol. 23, no. 4, pp. 337–356.
11. Business Council of Australia (2016) *Being work-ready: A guide to what employers want* [Online]. Available athttps://www.bca.com.au/being_work_ready_a_guide_to_what_employers_want (Accessed 18 December 2017).
12. Cattaneo, M., Horta, H., Malighetti, P., Meoli, M. and Paleari, S. (2019) ‘The relationship between competition and programmatic diversification’, *Studies in Higher Education*, vol. 44, no. 7, pp. 1222–1240.
13. Chua, J.H., Chrisman, J.J. and De Massis, A. (2015) ‘A closer look at socioemotional wealth: Its flows, stocks, and prospects for moving forward’, *Entrepreneurship Theory and Practice*, vol. 39, no. 2, pp. 173–182.
14. Chulkov, D.V. (2017) ‘On the role of switching costs and decision reversibility in information technology adoption and investment’, *Journal of Information Systems and Technology Management*, vol. 14, no. 3, pp. 309–321.
15. Cronbach, L.J. (1951) ‘Coefficient alpha and the internal structure of tests’, *Psychometrika*, vol. 16, no. 3, pp. 297–334.
16. Davies, R.S. and West, R.E. (2014) ‘Technology integration in schools’, in Spector, J.M.,Merrill, M.D.,Elen,J. and Bishop M.J. (eds), *Handbook of research on educational communications and technology*, Springer, New York, pp. 841–853.
17. del Pozo, M.M. and González, M.C. (2017) ‘Study on the personal indicators that influence the development of digital competence in primary education students’, in Mena, J., García-Valcárcel, A., Peñalvo, F.J. and Martín, M. (eds), *Search and research: Teacher education for contemporary contexts*, Ediciones Universidad de Salamanca,Salamanca, pp. 1071–1080.
18. Deming, D.J., Goldin, C., Katz, L.F. and Yuchtman, N. (2015) ‘Can online learning bend the higher education cost curve?’, *American Economic Review*, vol. 105,no. 5, pp. 496–501.
19. Deming, D.J., Hastings, J.S., Kane, T.J. and Staiger, D.O. (2014) ‘School choice, school quality, and postsecondary attainment’, *American Economic Review*, vol. 104, no. 3, pp. 991–1013.
20. Diener, E. and Crandall, R. (1978) *Ethics in social and behavioural research*, Chicago: IL, University of Chicago Press.
21. Dijkstra, T.K. and Henseler, J. (2015) ‘Consistent and asymptotically normal PLS estimators for linear structural equation’, *Computational Statistics & Data Analysis*, vol. 81, pp. 10–23.
22. Dimitriadis, Y., Prieto, L. P., & Asensio-Pérez, J. I. (2013) ‘The role of design and enactment patterns in orchestration: Helping to integrate technology in blended classroom ecosystems’,*Computers & Education*, vol. 69, pp. 496–499.

23. Dougherty, K, (2015) 'Factors that influence college faculty to adopt digital technologies in their practice',*Higher Education in Transformation Conference, Dublin, Ireland*,pp.307–318.
24. Efron, B. (1987) 'Better bootstrap confidence intervals', *Journal of the American Statistical Association*, vol. 82, no. 397, pp. 171–185.
25. European Commission (2013) *Modernisation of higher education*, Luxembourg,Publications Office of the European Union.
26. Ferris, J.M. and Riveros, G.E. (2019) US Patent Application No. 10/181,990.
27. Fornell, C. and Larcker, D.F. (1981) 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, vol. 18, no. 1, pp. 39–50.
28. Foulger, T.S., Graziano, K.J., Schmidt-Crawford, D. and Slykhuis, D.A. (2017), 'Teacher educator technology competencies', *Journal of Technology and Teacher Education*, vol. 25, no. 4, pp. 413–448.
29. Frey, C.B. and Osborne, M.A. (2017) 'The future of employment: How susceptible are jobs to computerisation?', *Technological Forecasting and Social Change*, vol. 114, pp. 254–280.
30. From, J. (2017) 'Pedagogical digital competence: Between values, knowledge and skills', *Higher Education Studies*, vol. 7, no. 2, pp. 43–50.
31. Gašević, D., Kovanović, V., Joksimović, S. and Siemens, G. (2014) 'Where is research on massive open online courses headed? A data analysis of the MOOC Research Initiative', *The International Review of Research in Open and Distance Learning*, vol. 15, no. 5, pp. 134–176.
32. Gil-Flores, J., Rodríguez-Santero, J. and Torres-Gordillo, J.J. (2017) 'Factors that explain the use of ICT in secondary-education classrooms: The role of teacher characteristics and school infrastructure', *Computers in Human Behavior*, vol. 68, pp. 441–449.
33. González-Zamar, M.D., Abad-Segura, E., López-Meneses, E. and Gómez-Galán, J., 2020. Managing ICT for sustainable education: Research analysis in the context of higher education. *Sustainability*, *12*(19), p.8254.
34. Griesbaum, J. (2017) 'Trends in e-learning: Impacts of social mobile technologies on information behaviour, formal learning and the educational market', *International Journal of Information and Education Technology*, vol. 7, no. 2, p. 123.
35. Gudmundsdottir, G.B. and Hatlevik, O.E. (2018) 'Newly qualified teachers' professional digital competence: Implications for teacher education', *European Journal of Teacher Education*, vol. 41, no. 2, pp. 214–231.
36. Gürfidan, H. and Koç, M. (2016) 'The impact of school culture, technology leadership, and support services on teachers' technology integration: A structural equation modelling', *Education & Science*, vol. 41,no. 188, pp. 99–116.
37. Hair, J.F., Ringle, C.M. and Sarstedt, M. (2011) 'PLS-SEM: Indeed a silver bullet', *Journal of Marketing Theory and Practice*, vol. 19, no. 2, pp. 139–152.
38. Hatlevik, O.E., Guðmundsdóttir, G.B. and Loi, M. (2015) 'Digital diversity among upper secondary students: A multilevel analysis of the relationship between cultural capital, self-efficacy, strategic use of information and digital competence', *Computers & Education*, vol. 81, pp. 345–353.
39. Henderson, M., Selwyn, N. and Aston, R. (2017), 'What works and why? Student perceptions of 'useful' digital technology in university teaching and learning', *Studies in Higher Education*, vol. 42, no. 8, pp. 1567–1579.
40. Henriksen, D., Mishra, P. and Fisser, P. (2016) 'Infusing creativity and technology in 21st-century education: A systemic view for change', *Journal of Educational Technology & Society*, vol. 19, no. 3, pp. 27–37.
41. Henseler, J. and Fassott, G. (2010) 'Testing moderating effects in PLS path models: An illustration of available procedures', in Esposito Vinzi, V., Chin, W.W., Henseler, J. and Wang, H. (eds), *Handbook of partial least squares*, Berlin, Springer, pp. 713–735.
42. Hwang, G.J., Lai, C.L. and Wang, S.Y. (2015) 'Seamless flipped learning: A mobile technology-enhanced flipped classroom with effective learning strategies', *Journal of Computers in Education*, vol. 2, no. 4, pp. 449–473.
43. IGI Global (2019)*What is ICT policy?* [Online]. Available at https://www.igi-global.com/dictionary/gender-ict-policy-development-empowerment/13656 (Accessed 12 August 2019).
44. Jöreskog, K.G. and Sörbom, D. (2006)*LISREL 8.80*, Chicago: IL, Scientific Software International.
45. Kashada, A., Li, H. and Koshadah, O. (2018) 'Analysis approach to identify factors influencing digital learning technology adoption and utilisation in developing countries', *International Journal of Emerging Technologies in Learning*, vol. 13, no. 2, pp. 48–59.

46. Lomos, C., Luyten, J.W. and Tieck, S., 2023. Implementing ICT in classroom practice: what else matters besides the ICT infrastructure?. Large-Scale Assessments in Education, 11(1), p.1.
47. Losh, E., 2014. *The War on Learning*, MIT Press, Cambridge, MA.
48. Macher, J., Miller, N. H. and Osborne, M. (2015) *Finding Mr Schumpeter: Concrete evidence on competition and technology adoption*.
49. McKnight, K., O'Malley, K., Ruzic, R., Horsley, M.K., Franey, J.J. and Bassett, K. (2016) 'Teaching in a digital age: How educators use technology to improve student learning', *Journal of Research on Technology in Education*, vol. 48, no. 3, pp. 194–211.
50. Miranda, H.P. and Russell, M. (2012) 'Understanding factors associated with teacher-directed student use of technology in elementary classrooms: A structural equation modelling approach', *British Journal of Educational Technology*, vol. 43, no. 4, pp. 652–666.
51. Moore, R.L. and Fodrey, B.P. (2018) 'Distance education and technology infrastructure: Strategies and opportunities', in Piña, A. A., Lowell,V. L. and Harris, B. R. (eds.)*Leading and managing e-learning: What the e-learning leader needs to know*, Springer, Cham, pp. 87–100.
52. Navimipour, N.J. and Soltani, Z. (2016) 'The impact of cost, technology acceptance and employees' satisfaction on the effectiveness of the electronic customer relationship management systems', *Computers in Human Behavior*, vol. 55, pp. 1052–1066.
53. Nguyen, L., Barton, S.M. and Nguyen, L.T. (2015) 'iPads in higher education - hype and hope', *British Journal of Educational Technology*, vol. 46, no. 1, pp. 190–203.
54. Nicoli, N. and Komodromos, M. (2019 'CSR Communication in the digital age: A case study of the Bank of Cyprus', inAlexandros, A. and Evi, D. (eds), *Cases on Corporate Social Responsibility and Contemporary Issues in Organisations*, Pennsylvania, IGI Global,pp. 71–89.
55. Palacios-Marqués, D., Soto-Acosta, P. and Merigó, J.M. (2015) 'Analyzing the effects of technological, organisational and competition factors on Web knowledge exchange in SMEs', *Telematics and Informatics*, vol. 32, no. 1, pp. 23–32.
56. Petko, D., Prasse, D. and Cantieni, A. (2018) 'The interplay of school readiness and teacher readiness for educational technology integration: A structural equation model', *Computers in the Schools*, vol. 35, no. 1, pp. 1–18.
57. Piper, B., Zuilkowski, S.S., Kwayumba, D. and Strigel, C. (2016)Does technology improve reading outcomes? Comparing the effectiveness and cost-effectiveness of ICT interventions for early grade reading in Kenya', *International Journal of Educational Development*, vol. 49, pp. 204–214.
58. Pöntinen, S., Dillon, P. and Väisänen, P. (2017) 'Student teachers' discourse about digital technologies and transitions between formal and informal learning contexts', *Education and Information Technologies*, vol. 22, no. 1, pp. 317–335.
59. Pucciarelli, F. and Kaplan, A. (2016) 'Competition and strategy in higher education: Managing complexity and uncertainty', *Business Horizons*, vol. 59, no. 3, pp. 311–320.
60. Rabah, J. (2015). 'Benefits and Challenges of Information and Communication Technologies (ICT) Integration in Québec English Schools', *Turkish Online Journal of Educational Technology-TOJET*, vol. 14, no. 2, pp. 24-31.
61. Reitz, T. (2017) 'Academic hierarchies in neo-feudal capitalism: How status competition processes trust and facilitates the appropriation of knowledge', *Higher Education*, vol. 73, no. 6, pp. 871–886.
62. Rogers, E.M. (2003) *Diffusion of innovations*, 5thedn, New York, Free Press.
63. Rubach, C. and Lazarides, R., 2021. Addressing 21st-century digital skills in schools–Development and validation of an instrument to measure teachers' basic ICT competence beliefs. Computers in Human Behavior, 118, p.106636.
64. Scherer, R., Tondeur, J., Siddiq, F. and Baran, E. (2018) 'The importance of attitudes toward technology for pre-service teachers' technological, pedagogical and content knowledge: Comparing structural equation modelling approaches', *Computers in Human Behavior*, vol. 80, pp. 67–80.
65. Selwyn, N. (2016) 'Digital downsides: Exploring university students' negative engagements with digital technology', *Teaching in Higher Education*, vol. 21, no. 8, pp. 1006–1021.
66. Sosa, E., Salinas, J. and De Benito, B. (2019) 'Emerging technologies (ETs) in education: A systematic review of the literature published between 2006 and 2016', *International Journal of Emerging Technologies in Learning*,vol. 12, no. 5, pp. 128–149.

67. Souder, D., Zaheer, A., Sapienza, H. and Ranucci, R. (2017) 'How family influence, socioemotional wealth and competitive conditions shape new technology adoption', *Strategic Management Journal*, vol. 38, no. 9, pp. 1774–1790.
68. Thomas, M. and Thomas, H. (2012) 'Using new social media and Web 2.0 technologies in business school teaching and learning', *Journal of Management Development*, vol. 31, no. 4, pp. 358–367.
69. Tuisk, T., Nekrassova, N. and Miller, L. (2015) 'Digitization and student communication patterns in higher education', *Australian & New Zealand Journal of European Studies*, vol. 7, no. 2, pp. 87–100.
70. Uerz, D., Volman, M. and Kral, M. (2018) 'Teacher educators' competences in fostering student teachers' proficiency in teaching and learning with technology: An overview of relevant research literature', *Teaching and Teacher Education*, vol. 70, pp. 12–23.
71. van de Oudeweetering, K. and Voogt, J. (2018) 'Teachers' conceptualisation and enactment of twenty-first-century competences: Exploring dimensions for new curricula', *The Curriculum Journal*, vol. 29, no. 1, pp. 116–133.
72. Wright, S. (1934) 'The method of path coefficients',*Annals of Mathematical Statistics*, vol. 5, no. 3, pp. 161–215.
73. Zhu, C. and Engels, N. (2014) 'Organisational culture and instructional innovations in higher education: Perceptions and reactions of teachers and students', *Educational Management Administration & Leadership*, vol. 42, no. 1, pp. 136–158.