Revista Argentina de Clínica Psicológica
2024, Vol. XXXIII, N°1, 91-105
DOI: 10.53555/03276716.2024.09

Decoding Technostress: How Institutional Factors Shape E-Learning Adoption Intentions in School Education Through the Lens of The Digcompedu Model

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ABSTRACT
It is crucial to investigate the elements that influence the adoption of e-learning systems as the quick development of digital technology has impacted educational practices. Educators' digital competencies and their ability to incorporate e-learning into their pedagogical strategies are significantly influenced by institutional variables.With a focus on the DigCompEdu paradigm, this study investigates the ways in which institutional variables impact the use of e-learning in classroom instruction. A quantitative descriptive study employed questionnaires to collect data from 500 Erode, India, school teachers. We used structural equation modeling to examine the connections between DigCompEdu dimensions, institutional features, and instructors' e-learning intentions.According to the results, teachers' behavioral intention to adopt e-learning without feeling technostress is influenced by the DigCompEdu sub-dimensions, which are in turn influenced by institutional variables.The study emphasizes how important it is to improve digital capabilities in educational settings by taking into account factors like student access to technology, teacher training, IT support quality, and ICT budget. Future research needs to look at a broader variety of elements influencing DigCompEdu, such as pedagogical and technical effects.

Keywords: Institutional factors, e-learning adoption, DigCompEdu, school education

Introduction

A diverse array of abilities is necessary to effectively employ digital media and information and communication technology (ICT) abilities, mindsets, and methods, which are all part of digital competency.These abilities enable people to do tasks, communicate, handle information, solve issues, work together, produce content, and learn. In order to accomplish goals like employment, pleasure, participation, learning, and social contact, these activities should be conducted effectively, efficiently, critically, creatively, flexibly, ethically, and with self-reflection [29]. Self-efficacy, based on personal perceptions, does not always reflect an individual's actual abilities. It is essential to differentiate the various levels at which factors may shape educators' behavioral patterns, such as their beliefs, attitudes, self-efficacy, subjective norms, and intentions, which ultimately guide their actions. A crucial element is the conviction that one can do certain activities on one's own, known as self-efficacy [58]. A person's decision-making, willingness, and commitment to engage in a behavior are significantly impact by self-efficacy, or confidence in their ability to complete an activity [58]. Digital competence may be evaluated by assessing instructors' confidence in their digital abilities, as Antonietti [36] points out. Referred to as perceived behavioral control in the context of educational technology, teachers' assurance in their ability to employ technology for teaching and learning.

Since the Industrial Revolution, technology has had a profound influence on businesses and continues to shape them in the era of Industry 4.0, which is defined by advancements in information technology and big data. Technology integration in education has been crucial with the introduction of personal computers and the internet. From elementary school through higher education, ICT has radically changed the environment for learning and brought it closer to the demands of business.The educational environment of today is becoming more complicated and difficult for teachers, students, and school administrators to navigate [1;2]. Both professional and recreational pursuits now need the use of ICT [3]. Consequently, countries such as the United States, Australia, Korea,Hong Kong, Japan, Belgium,and Norway are examining the impact of ICT on education and educational institutions [4]. The development of policies and initiatives to improve digital competency in schools is becoming more and more popular worldwide [1; 6; 7].

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Education technology adoption study examines digital technology integration in schools and its effects on teaching and learning[2]. Schools have made significant efforts to incorporate ICT to meet educational goals, a task that is seen as both essential and demanding [9,10]. Educators often use technology for administrative tasks, communication with parents and students, and improving subject-specific content delivery. However, they seldom integrate technology into the curriculum in a way that aligns directly with learning objectives [11; 12; 13].Education is crucial in fostering digital skills, but the primary responsibility for preparing students for digital social and professional environments rests largely with teachers. Educators need to have digital competence, which includes both a solid understanding of technical aspects and the ability to effectively use modern technologies in teaching [16]. As noted by [17], individual, technical, organizational, and institutional issues are the several categories of obstacles to ICT implementation. Additionally, Becta [18] distinguishes between two primary categories of impediments: institutional difficulties at the school level and personal barriers at the teacher level.

As technology becomes more and more integrated into business and society, the importance of digital competency in educational initiatives has grown.The abilities, information, mindsets, and tactics required for use of digital technology that is efficient and considerate, both individually and in collaboration, are collectively referred to as digital literacy [29]; [30]; [31]. Teachers are now required to be proficient in teaching essential digital skills and using digital technologies to improve student learning. The increased emphasis on instructors' digital abilities is a result of the growing need for teachers to be proficient in digital technologies. This is because it is becoming more and more important to equip pupils with these competences.

Education providers encountered unique and intricate difficulties during the COVID-19 pandemic. Individuals and small groups have begun to take steps to address educational inequalities and meet the essential needs of learners [22,23]. Governments around the world, particularly in developing countries, implemented emergency lockdowns to reduce virus transmission, leading to temporary closures of educational institutions.The sudden shift to remote learning exposed students to unfamiliar technology, adding pressure on teachers, students, and parents [19]. Educators were required to use new technologies and platforms without prior training or support. In times of crisis, it is essential to adopt innovative methods of thinking and teaching [20]. Teachers are essential in assisting children in developing their competences, talents, and communication abilities throughout these trying times. Innovative teaching strategies must be used in emergency situations.Teachers may then see how important their pedagogical and technical skills are. Online education presented teachers with a number of difficulties, such as uneven access to technology, a dearth of tools and resources, issues over the quality of their instruction, as well as a lack of assistance and training [21].

The European Framework for the Digital Competence of Educators (DigCompEdu) and the European Digital Competence Framework (DigComp) are two frameworks for evaluating digital competence in education [25,26]. The first framework, which was introduced in 2013, digital resources, professional contacts, teaching and learning, evaluation, and student empowerment, and assisting students become digitally proficient are the 22 digital skills [51]. Released in 2017, the second framework provides a comprehensive review of these skills, focusing on the need for new teaching and learning approaches as well as instructors' digital pedagogical capacities.It emphasizes the significance of effectively incorporating digital technology into educational practices, highlighting the value of both the technical and pedagogical aspects of digital competence[28, 27].

Perceptions of the simplicity and utility of technology, as well as general attitudes about it, have a substantial impact on instructors' desire and intention to accept it, according to Davis' 1989 Technology Acceptance Model (TAM). Although TAM was not originally designed for educational contexts, it is frequently used to clarify educators' intentions regarding technology use in the classroom. However, a meta-analysis conducted by [33] reveals inconsistent findings related to the application of TAM in education. Different levels of explained variation in the desire to utilize technology are associated with distinct TAM characteristics, according to this research.

At a vocational school in Switzerland, a research investigation was conducted with 2011 instructors, integrating the DIGCOMPEDU and TAM frameworks. Utilizing structural equation modeling, the study demonstrates that the TAM effectively clarifies the factors that affect teachers' willingness to use digital resources in vocational education. Teachers' perceptions of their digital competency, their appraisal of the technology's utility in the instruction and all of them show strong and substantial correlations with their assessment of the ease of use.Teachers' readiness to employ technology is highly correlated with these factors. The emotional and contextual elements that influence a person's cognitive views, such as their degree of digital competency, these factors were not considered during the investigation [36]. As educators negotiate complex situations where several variables impact technology usage, to examine at the relationship between socio-contextual, emotional, and cognitive elements (such as support,

institutional infrastructure, and digitalization policies), additional research is necessary [37].A recent study found that some instructors felt they received significant support from their educational institution for online teaching; however, they continued to harbor reservations regarding their abilities to effectively utilize technology [38]. As a result, even with adequate support, instructors' perceptions of their skills can still hinder their use of technology.

The concept of **technostress**, as defined by Brod, refers to the stress that utilizing technology causes on people's physically and psychological[66]. Research has shown that technostress has a negative impact on personal outcomes, job satisfaction, and the willingness to adopt technology [67]; [68]. In the context of educators, stress and anxiety related to technology use can decrease their motivation and intention to incorporate ICT (Information and Communication Technology) into their teaching [69]; [70]. This indicates the importance of managing technostress to facilitate successful technology integration, particularly in educational environments.

The future of education will be significantly influenced by the response of instructors to the implementation of e-learning in school.An extensive research was thus required to evaluate the preparedness for e-learning, taking into account both present and future circumstances, such as institutional variables, instructors' digital competency, and their behavioral objectives for e-learning.The following research concerns were the focus of the current study:

1. To investigate how institutional factors influence each sub-dimension of DigCompEdu.
2. To evaluate the behavioral intention to utilize e-learning systems in connection to DigCompEdu.

This research investigated teachers' opinions on their degrees of digital competency and the availability of institutional elements linked to e-learning. It looked at the connection between the particular circumstances in which teachers teach and their opinions on e-learning. Furthermore, it assessed how teachers' digital proficiency affects their willingness to effectively integrate technology into their teaching.Earlier studies have investigated the associations between using and using technology in emergency e-learning and instructing[14]; [15]. This research aims to increase scholars' and policymakers' comprehension of the difficulties faced by educators, including their attitudes, levels of digital competence, and behavioral objectives when engaging with online learning. As a result, it will provide insightful information for developing next educational projects.

This research examines the relationship between digital competence and instructors' behavioral intentions and how institutional features impact digital competency in e-learning.Through the utilization of the DIGCOMPEDU paradigm to examine the relationship between institutional characteristics, digital proficiency, and behavioral intents, it aims to improve the efficacy of e-learning. While there has been considerable research on digital competency, there are few research that concentrate on how institutional factors affect digital competence in e-learning.

RESEARCH METHDOLOGY

Type of research: This investigation employs a quantitative methodology and a descriptive research design.

Data collection: While secondary data was obtained from scholarly papers and websites, the 2017 iteration of the European Framework for the Digital Competence of Educators was utilized to collect primary data through the use of a questionnaire.

Sampling design: A convenience sampling method was implemented.

Sampling universe: The research was conducted Erode.

Sample size: According to the 2011 census data, Erode city had a total of 82,537 school teachers across various types of institutions, including government, private, and aided schools. Based on Andrew Fisher's method, it is decided that 383 is the minimal sample size required for this investigation. To meet this requirement, 10 schools were randomly selected from 5 government-designated zones.

Sampling framework: The study's target population consisted of 70 people selected from each of the ten schools. There were 502 valid samples available, with 140 samples particularly chosen from each of the five zones.To reflect the ultimate sample size for this research, the sample size was rounded to 500 for rounding considerations.Teachers from the east zone (96), west zone (102), north zone (98), south zone (99), and center zone (105) made up the 500 samples that were collected.

Reliability of the study: All five of the factors had values over 0.70, indicating internal consistency, according to the reliability evaluation of Brand Personality Congruence conducted using Cronbach's alpha.Using SPSS, the sample responses were further examined for internal consistency. In terms of internal consistency and scale reliability, the first results showed that all constructs had respectable reliability ratings [30].

Tools used for the study:

The study uses a descriptive analysis to evaluate the mean, standard deviation, skewness, and kurtosis. The influence of institutional factors, DIGCOMPEDU dimensions, and behavioral intents will also be evaluated by a structural equation modeling (SEM) study.

LIMITATIONS:

- The research includes drawbacks that make it difficult to extrapolate the results to a broader population, such as an insufficient representation of the diversity of instructors in Indian school education or a potentially limited sample size.
- Another drawback is the dependence on instructors' self-reporting, which may create bias and lead participants to provide answers that are more socially acceptable than ones that correctly represent their actual behavior or experiences.
- The study's cross-sectional approach limits long-term assessment of technology usage's effects on teacher effectiveness and may hinder cause-and-effect interactions.
- In addition, since the research is based on instructors' self-evaluations, it depends on subjective effectiveness metrics. Personal prejudices or subjective opinions about their efficacy might affect these assessments.

HYPOTHESIS DEVELOPMENT AND THE CONCEPTUAL MODEL

This research presents a conceptual model that uses the TAM and DIGCOMPEDU framework to examine the impacts of incorporating ICT in school instruction. The approach uses a structured questionnaire to evaluate these elements and emphasizes the connections between various topics.The DIGCOMPEDU framework, behavioral intention, and ICT adoption are some of its components. Teaching and Learning, Digital Resources, Professional Engagement, Assessment, Empowering Learners, and Supporting Learners' Digital Competence are all included in the DIGCOMPEDU framework.The study focuses at how DIGCOMPEDU characteristics and the behavioral intents connected to ICT-driven school education are influenced by factors connected to ICT adoption. The unidirectional arrows in the integrated framework show how these aspects relate to one another.

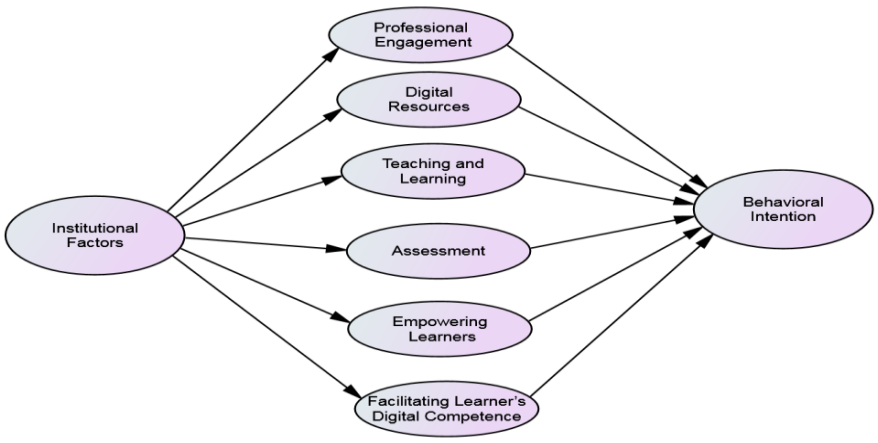

Figure 1. Conceptual framework

Institutional factors' effects on behavioral intentions and DIGCOMPEDU sub-dimensions such as instruction and learning, evaluation, expert involvement, online resources, and empowering students, and supporting digital competency are examined using structural equation modeling.

Institutional factors and Teachers Digital Competences

Improving the digital abilities of working professionals and people is necessary to be ready for the digital revolution [26]; [55]. Improving teachers' digital competency is the main emphasis in educational institutions; this issue has developed over the course of many decades.Establishing the required technology infrastructure and ensuring accessibility were the main objectives in the 1980s.The 1990s saw a change in emphasis toward enhancing educational abilities and expertise [55]. This was followed by discussions on environmental and contextual factors. Nevertheless, as the OECD said in 2019, teachers' digital competency remains a crucial component of international educational methods.

Digital competence has been defined in a variety of ways using various conceptual frameworks and associated assessment instruments. Self-assessment tools for digital competence are available to teachers and school administrators, as indicated by [47] and [51]. These materials are mostly for pre-service teachers [52], although new research emphasizes the need of studying digital competency outside of primary and lower secondary school [46].At present, there is an absence of a comprehensive and current assessment of the digital skills of currently employed

secondary school teachers. Schools must become proficient in utilizing digital technologies to effectively manage and harness resources and institutional infrastructures in order to promote technology integration and support educational change[40].

Individual factors have been the primary focus of Teacher Digital Competency (TDC) studies, ignoring school-related concerns. TDC is not much studied in relation to organizational infrastructure, leadership support, and school digital advancement, despite the fact that technical infrastructure and support are crucial for promoting TDC in education [44]. According to research, there may not be a direct correlation between the amount of technology use or TDC in schools and the availability and quality of digital infrastructure [45; 46]. Technology availability for students is essential for all assessed digital skills, while curriculum support positively influences specific competencies related to empowering learners and developing digital skills. However, there remains a lack of sufficient data to clearly show the direct effects of technological advancement in schools on TDC. This gap underscores the necessity for further research into the individual characteristics and environmental elements that impact secondary school teachers' digital competency.

H1: Professional engagement is greatly impacted by the institutional element.

H2: Digital resources are significantly impacted by the institutional element.

H3: Teaching and learning are greatly impacted by institutional variables.

H4: An assessment is greatly influenced by the institutional factor

H5: Empowering learners is highly impacted by the institutional component

H6: Facilitating learners' digital competency is greatly influenced by institutional variables.

Teachers' Behavioral Intentions and Digital Competencies

Bandura [58] contends that beliefs predict the future more effectively behavior than actual knowledge and skills, and he highlights the importance of self-perception in maximizing one's potential. This concept has found widespread application in a variety of fields, including education, where it aids in understanding the motivations of educators to integrate technology into their teaching methods [62]. Teachers' attitudes regarding technology use are highly connected to their digital competency evaluation, and this in turn affects their desire to use technology for teaching. However, it is uncertain how precisely digital competency affects this willingness, either directly or indirectly [63].

Scherer [64] proposed a cascade model that links self-efficacy beliefs with elements of the Technology Acceptance Model (TAM), demonstrating how beliefs about utility can influence behavioral intentions. This concept is supported by empirical evidence from various studies [65; 61]. There is a substantial correlation between people's desire to use technology, their views about computer-assisted learning, and their perceived computer abilities, according to research [60]. Teachers' attitudes toward technology (ATT), perceived ease of use (PEU), and perceived utility (PU) all increase their probability of utilizing computers, and there is a strong positive association between these factors and their self-assessed capacity to teach using computers (59).

Backfisch [63] shown that teachers' opinions of TPACK self-efficacy shows how well teachers integrate technology into their courses, which affects their use of it.The TAM and TPACK frameworks were used in a thorough research with Vietnamese educators to investigate their readiness to continue teaching online during the epidemic.School support, infrastructure, training, and individual creativity were all noted in this research have an impact on instructors' online learning objectives. Khong [57] emphasized that to improve teachers' TPACK and their preparedness for online instruction, they need continual training, technical assistance, and a positive school environment.

H7: The influence of professional involvement on behavioral intention is substantial.

H8: Behavioral intention is significantly impacted by the use of digital resources.

H9: A person's behavioral intention is significantly impacted by the teaching and learning processes.

H10: Behavioral intention is significantly shaped by assessment.There is a substantial correlation between behavioral intention and learner empowerment.

H12: A learner's behavioral intention significantly changes as their digital competency increases.

The application of digital competency frameworks by secondary school teachers is not well covered in the literature. University, pre-service, and primary school teachers and pupils have been the focus of the majority of earlier research. Consequently, Teachers' desire to include technology into their teaching at secondary schools and their level of digital competency have not been thoroughly studied. Further study in this field is crucial.

HYPOTHESIS DEVELOPMENT

H1: Institutional factors have a significant impact on Professional Engagement.

H2: Institutional factors significantly affect Digital Resources.

H3: Institutional factors have a notable effect on Teaching and Learning.

H4: Assessment is greatly influenced by institutional variables.

H5: Empowering learners is significantly impacted by institutional variables.
H6: An important aspect in facilitating learners' digital competency is institutional.
H7: Behavioral intention is strongly impacted by professional engagement.
H8: The impact of digital resources on behavioral intention is significant.
H9: The influence of teaching and learning on behavioral intention is substantial.
H10: The impact of assessment on behavioral intention is substantial.
H11: Behavioral Intention is strong when learners are empowered.
H12: Behavioral intention is significantly impacted by fostering learners' digital competency.

RESULTS AND DISCUSSION

Among the 500 teachers surveyed, 320 (63.9%) were female, while 181 (36.1%) were male. Approximately 39.7% of the instructors, or 199 people, were in the 20–30 age range. 160 people, or around 32 percent of the teachers, were between the ages of 30 and 40. Additionally, 24.7% of the teachers, totaling 124 individuals, were between 40 and 50 years old. Finally, 18 people, or a tiny 3.6% of the total, were aged than 50.

The institutional factors influencing the adoption of ICT in school education

A scale ranging from 1 to 5 was used in the research to gauge participants' satisfaction with institutional elements influencing ICT use in schooling.The results showed that IF1, IF2, and IF3 had a negative skew, while IF4 had a positive skew, most of the responses were in the center of the range. The low kurtosis of the data implies that responses were widely spread around the average, suggesting that teachers had diverse perspectives on the institutional factors impacting ICT adoption in their institutes.

Table1.The institutional factor index's descriptive statistics

Sr. No	Index for Institutional Factor	Variable Name	Mean	Std Dev	Skewness	Kurtosis
1	ICT Budget	IF1	2.76	0.85	-0.032	0.688
2	ICT training	IF2	2.96	0.807	-0.151	0.473
3	Quality of IT support	IF3	3.04	0.88	-0.153	0.597
4	Students regular access to technology	IF4	3.03	0.906	0.079	-0.082

In terms of institutional aspects, 55.6% of instructors said they were happy with the training their institution provided, and 57.1% said they were satisfied with the ICT budget.In contrast, 44% of instructors expressed discontent with student's continuous access to technology, and only 49.2% were satisfied with the quality of IT assistance.

The DIGCOMPEDU sub-dimensions

Education establishments use the DIGCOMPEDU framework to assess digital competency in e-learning. This evaluation covers topics including teaching and learning, assessment, professional engagement, digital resources, empowering learners, and fostering digital competency in addition to the e-learning system's behavioral objective.A rating of 1 shows no skill, a rating of 2 suggests some competence, a rating of 3 indicates moderate competence, a rating of 4 indicates strong competence, and a rating of 5 indicates very high competence. The results are shown in the next section.

Professional Engagement

Interacting with students and colleagues in their school's e-learning platform via digital technologies was practicable for 44% of participants, according to the assessment. Additionally, 63% demonstrated proficiency in using digital tools for communication, 65% were actively working on enhancing their digital teaching skills, and 54% engaged in training facilitated by technology.

Table2.The Professional Engagement index's descriptive data

Sr. No	Professional Engagement	Variable Name	Mean	Std Dev	Skewness	Kurtosis
1	PE1	PE1	3.47	0.986	-0.59	0.313
2	PE2	PE2	2.9	0.868	-0.658	0.481
3	PE3	PE3	3.66	1.025	-0.585	0.272
4	PE4	PE4	1.66	0.766	-0.644	-0.297

In terms of professional participation, 44% of participants demonstrated that they could communicate in the e-learning system at their school with students and colleagues using digital technology. Moreover, 63% displayed competence in collaborating with colleagues, including those from other institutions, using digital tools. Approximately 65% of respondents said they were actively working to improve their abilities to use digital tools for instruction. Furthermore, 54% of respondents said

they actively participated in training opportunities based on technology.

Digital Resources

Concerning digital resources, while 30% of instructors felt comfortable altering and changing selected digital resources depending on pertinent criteria, 27% of instructors showed that they could utilize the Internet to look for and choose a variety of digital resources. Furthermore, independently safeguarding sensitive information about the school and its students was a competency shown by 29% of the instructors.

Table3.Characteristic data of the digital resource indicators

Sr. No	Digital resources	Variable Name	Mean	SD	Skewness	Kurtosis
1	DE1	DR1	2.89	.926	-.317	.382
2	DE2	DR2	1.82	1.014	.188	-.198
3	DE3	DR3	2.57	.915	-.371	.256

The study revealed that teachers exhibited lower proficiency in using the web and ensuring data security. Additionally, their skills in SA2 were limited, indicating difficulty in properly adapting and modifying digital resources. The feedback was predominantly negative, suggesting that most educators were not well-versed in their school's e-learning system.

Teaching and Learning

In terms of teaching and learning, 52% of the instructors indicated they were skilled in using technology within the classroom, while 61% acknowledged that they were not proficient in overseeing students' activities in digital collaborative environments. To generate resources, knowledge, and materials together, over 51% of the instructors showed that they could utilize digital technology for group projects and collaborative work.Additionally, 75% of the teachers demonstrated proficiency in using digital resources to support students in their learning.

Table4.The Teaching and Learning index's descriptive statistics

Sr. No	Teaching and Learning	Variable Name	Mean	SD	Skewness	Kurtosis
1	TL1	TL1	2.79	.961	-.438	.019
2	TL2	TL2	2.71	1.022	-.521	.003
3	TL3	TL3	1.73	1.011	-.359	-.153
4	TL4	TL4	3.69	0.702	-.510	.025

The Teaching and Learning index's quantitative characteristics are shown in Table 4. In the context of the DIGCOMPEDU dimension's instruction and learning element, students benefited from the usage of digital technology in school, according to studies, yet the majority of aspects earned average ratings below 3.The e-learning system at their institution was stated to be utilized by teachers with a certain level of proficiency, as shown by the responds' low kurtosis and negative skewness.

Assessment

Regarding the Assessment component, 75% of the teachers indicated that the e-learning system effectively employed digital assessment tools to monitor students' progress. More than 85% of participants recognized the capability of these systems to analyze current data to pinpoint learners who may require additional assistance. Furthermore, these systems provide students appropriate feedback by using digital technology.

Table5.Descriptive statistics of the index for Assessment

Sr. No	Assessment	Variable Name	Mean	SD	Skewness	Kurtosis
1	AS1	PR1	3.60	.919	-.419	.378
2	AS2	PR2	3.55	.943	-.505	.435
3	AS3	PR3	3.52	.953	-.384	.344

Mean scores over 3 and low kurtosis values indicate that most teachers were convinced their school's e-learning system could effectively assess students, identify those who needed help, and provide appropriate recommendations (Table 5).

Empowering Learners

The survey found that 67% of participants were proficient in resolving practical or technical issues in their education by using digital resources. However, just 30% said they were capable of offering customized learning experiences. Additionally, 65% demonstrated proficiency in using digital technologies to engage

students.

Table6.Descriptive statistics of the index for empowering learners

Sr. No	Empowering Learners	Variable Name	Mean	Std Dev	Skewness	Kurtosis
1	EL1	EL1	3.89	0.926	-.602	.382
2	EL2	EL2	1.82	1.024	-.488	-.198
3	EL3	EL3	3.57	0.897	-.371	.256

The average D
R1 and DR3 ratings were higher than 3, as Table 3 demonstrates, suggesting that respondents thought they had the necessary abilities to use a variety of resources efficiently.To engage and actively involve students, teachers must handle any practical or technical issues while presenting information to them and use digital techniques into their lesson plans.Their restricted capacity of providing students a diverse and personalized learning experience through the use of digital technology, however, was shown by their inadequate EL2 proficiency.Descriptive statistics reveal a low kurtosis and a mostly negative skew in replies, show of an absence of proficiency in the utilization of digital resources within their institution's e-learning system and a varied selection of instructor perspectives.

Facilitating Learners' Digital Competence

According to the report, 74% of teachers could advise students on how to recognize false or misleading material and how to trust information found online. Additionally, 76% effectively organized tasks that involved digital communication and collaboration. Furthermore, 78% were able to create assignments focused on digital content. It is impressive that 80% of teachers could teach pupils about internet responsibility and safety. Furthermore, 74% of educators were able to inspire students to tackle problems in the real world by using digital technologies in innovative ways.

Table7. Descriptive statistics of the index for Facilitating Learners' Digital Competence

Sr. No	Facilitating Learners' Digital Competence	Variable Name	Mean	Std Dev	Skewness	Kurtosis
1	FL1	FL1	3.17	.846	-.590	.313
2	FL2	FL2	3.38	.868	-.658	.481
3	FL3	FL3	3.67	.793	-.585	.272
4	FL4	FL4	3.89	.766	-.644	.397
5	FL5	FL5	3.47	.804	-.208	.409

Indicating that e-learning successfully met learners' demands, the majority of instructors gave the Facilitating Learners' Digital Competence construct index rates above 3. While teachers generally expressed negative opinions, the majority demonstrated proficiency in assisting students with their digital studies within the e-learning system at their school.

Behavioral Intention

The majority of research studies incorporate behavioral intention into the DIGEDUCOMP model. By analyzing behavioral intention, this study assesses the overall effectiveness and value of e-learning. Instructors expressed satisfaction with the behavioral objectives of e-learning, according to more than 84% of respondents, they were content with the e-learning system's usefulness and its efficient operation.

Table8. Descriptive statistics of the index for Behavioral Intention

Sr. No	Behavioral Intention	Variable Name	Mean	SD	Skewness	Kurtosis
1	BI1	BI1	3.55	.934	-.647	.654
2	BI2	BI2	3.67	.974	-.600	.401
3	BI3	BI3	3.60	.967	-.443	.331

Teachers' behavioral intention ratings were higher than 3, as shown in Table 6, suggesting that they were actively using the e-learning platform at their school. The replies showed low kurtosis and negative skewness. The data reveals that all teachers concurred that their school's e-learning system was user-friendly and that they effectively integrated technology into their teaching objectives.

Structural Equation Modeling

This section examines the relationships between the elements of the conceptual model using structural equation modeling and confirmatory factor analysis. The model establishes quantitative connections between constructs and their indicators. Digital resources, professional engagement, learners' empowerment, teaching and learning, and assessment, and developing digital competency are all influenced by institutional elements within the DIGCOMPEDU framework. The results of the model are illustrated using path diagrams, regression weights, and error estimates.

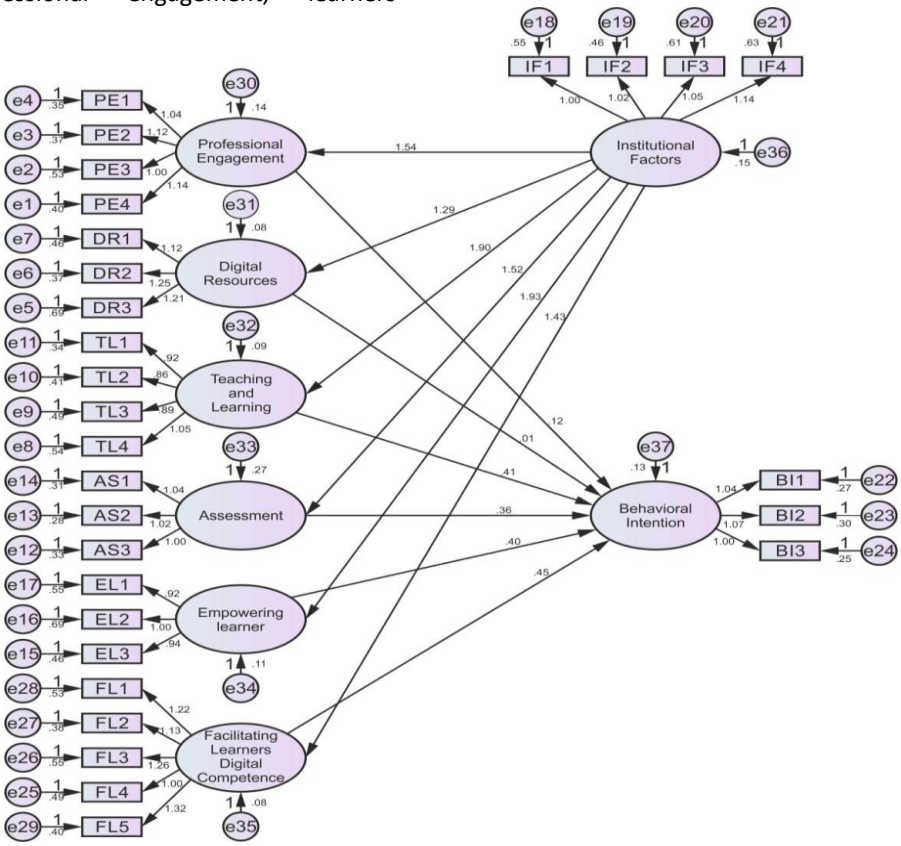

Figure 2. Path diagram of the conceptual framework

Table9. Result of regression analysis

			Estimate	S.E.	C.R.	P
Professional Engagement	<---	Institutional Factors	1.541	.178	7.885	***
Digital Resources	<---	Institutional Factors	1.289	.167	7.451	***
Teaching and Learning	<---	Institutional Factors	1.901	.239	8.178	***
Assessment	<---	Institutional Factors	1.520	.169	7.676	***
Empowering Learners	<---	Institutional Factors	1.928	.229	8.388	***
Facilitating Learner's Digital Competence	<---	Institutional Factors	1.427	.193	7.796	***
Behavioral Intention	<---	Professional Engagement	.108	.068	5.605	***
Behavioral Intention	<---	Digital Resources	.009	.101	6.451	***
Behavioral Intention	<---	Teaching and Learning	.414	.069	4.551	***
Behavioral Intention	<---	Assessment	.357	.080	7.377	***
Behavioral Intention	<---	Empowering Learners	.402	.110	5.451	***
Behavioral Intention	<---	Facilitating Learner's Digital Competence	.447	.069	6.581	***
IF1	<---	Institutional Factors	1.000	.129	6.704	***
IF2	<---	Institutional Factors	1.019	.159	6.558	***
IF3	<---	Institutional Factors	1.047	.189	6.698	***
IF4	<---	Institutional Factors	1.139	.167	6.904	***
PE4	<---	Professional Engagement	1.136	.073	14.504	***
PE3	<---	Professional Engagement	1.000	.079	14.518	***

PE2	<---	Professional Engagement	1.116	.076	14.700	***
PE1	<---	Professional Engagement	1.036	.071	14.465	***
DR3	<---	Digital Resource	1.116	.110	10.404	***
DR2	<---	Digital Resource	1.247	.106	11.422	***
DR1	<---	Digital Resource	1.117	.115	10.826	***
TL4	<---	Teaching and Learning	1.046	.075	13.951	***
TL3	<---	Teaching and Learning	0.890	.105	10.021	***
TL2	<---	Teaching and Learning	0.861	.116	11.322	***
TL1	<---	Teaching and Learning	0.924	.115	10.876	***
AS3	<---	Assessment	1.000	.060	16.068	***
AS2	<---	Assessment	1.017	.069	16.683	***
AS1	<---	Assessment	1.043	.061	17.117	***
EL3	<---	Empowering Learners	0.940	.060	16.025	***
EL2	<---	Empowering Learners	1.000	.065	16.603	***
EL1	<---	Empowering Learners	0.921	.064	17.248	***
FL5	<---	Facilitating Learner's Digital Competence	1.321	.060	14.528	***
FL4	<---	Facilitating Learner's Digital Competence	1.000	.069	14.705	***
FL3	<---	Facilitating Learner's Digital Competence	1.257	.062	13.823	***
FL2	<---	Facilitating Learner's Digital Competence	1.129	.060	13.449	***
FL1	<---	Facilitating Learner's Digital Competence	1.220	.067	16.937	***
BI1	<---	Behavioral Intention	1.042	.051	18.045	***
BI2	<---	Behavioral Intention	1.069	.057	18.409	***
BI3	<---	Behavioral Intention	1.000	.054	19.465	***

The study revealed that institutional factors such as ICT funding, training, the quality of IT support, and students' regular use of technology significantly influence DIGCOMPEDU, which is a digital competence framework for education. These elements' regression weights are statistically significant when the p-value is 0.01. These components affect e-learning digital competence by affecting Digital Resources, Teaching and Learning, Assessment, Empowering Learners, Professional Engagement, and Facilitating Digital Competence.Teachers' behavioral intentions are also influenced by the DIGCOMPEDU dimension and its sub-dimensions. According to the regression study, the institutional component significantly affects behavioral intentions as well as the DIGCOMPEDU dimensions.DIGCOMPEDU's impact on behavioral intention was confirmed by the results of hypotheses H1, H2, H3, H4, H5, and H6. According to the results, e-learning digital competency is significantly shaped by institutional variables.

Table10.Model Fit Summary

Measure	Cutoff for Good Fit	Result from SEM	Interpretation
(AGFI)	GFI > 0.95 AGFI >0.90	0.957 0.913	Good Fit
(NNFI)	NNFI >0.95	0.91	Notagoodfit
(CFI)	CFI >0.95	0.96	Good fit
(RMSEA)	RMSEA< 0.08	0.079	Good fit
(SRMR)	SRMR<0.08	0.055	Good fit

The structural equation model in Table 10 satisfies the requirements for the majority of model fit evaluations. All the Adjusted Goodness of Fit Index (AGFI) and the Goodness of Fit Index (GFI) are over the 0.90 criterion, with 0.913 and 0.957, respectively.The fit is 95% better than the null model, with a Normed Fit Index (NFI) of 0.95. An acceptable model fit is indicated by the Comparative Fit Index (CFI), which is 0.95, above 0.90.Furthermore, since it is less than the 0.08 threshold, the Root Mean Square Error of Approximation (RMSEA) of 0.079 suggests an acceptable match.The Standardized Root Mean Square Residual (SRMR) score of 0.055 (less than 0.08) further supports a satisfactory fit. The Structural Equation

Model (SEM) aligns well with the proposed Confirmatory Factor Analysis (CFA) framework, confirming the statistical significance of hypotheses H1, H2, H3, H4, H5, H6, H7, H8, H9, H10, H11, and H12.

CONCLUSION AND DIRECTIONS FOR FUTURE RESEARCH

The influence of institutional determinants on e-learning digital competence is examined using the DIGCOMPEDU framework.Teach and learn, assessment, learner empowerment, professional engagement, digital resources, and fostering digital competency are just a few of the areas that are greatly impacted by these institutional factors. Key institutional factors encompass ICT funding, training, quality of support, and access to technology. Given that e-learning enhances control and value, these elements have a substantial effect on behavior. Future research could focus on exploring pedagogical dimensions.The results indicate that principals of primary and secondary schools should offer administrative support and establish collaborative professional learning communities to enhance teachers' digital competencies and computer self-confidence, thereby minimizing their technostress. Pedagogical aspects may be the subject of further study.

Professional development serves as the vehicle that helps teachers acquire both pedagogical and technological competencies. A well-rounded PD program will address all these areas, enabling teachers to stay current with educational best practices, adapt their teaching methods, and utilize technology in ways that foster student engagement and understanding.

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ANNEXURE

Professional Engagement

PE1- I utilize digital technologies to communicate with learners and colleagues

PE2-I utilize digital technologies to collaborate with colleagues, also from other schools.

PE3- I am proactive in developing my skills in utilize digital technologies for teaching.

PE4- I take part in training opportunities through technology.

Digital resources

DE1-I utilize the Web to find and select different digital resources

DE2-I adapt and change selected digital resources based on relevant criteria.

DE3-I keep safe sensitive school and learners' data.

Teaching and Learning

TL1- I think exactly about how, when and why to use digital technologies in the classroom, making sure that they are utilized for the benefit of the learning process.

TL2- I observe and moderate the activities and interactions of learners in the digital collaborative environments we use at school

TL3- I teach learners to utilize digital technologies in collaborative processes and group work for the mutual construction and forming of resources, knowledge and content.

TL4- I integrate digital tools towards the inside of my teaching that help learners to plan, monitor and reflect on their own learning. .

Assessment

AS1- I utilize digital assessment tools to observe learners' progress.

AS2-I examine all the data I have available to point out which learners may need further support.

AS3-I utilize digital technologies to deliver effective feedback to learners.

Empowering Learners

EL1-I look at any practical or technical difficulties when making deliveries for learners

EL2- I utilize digital technologies to offer learners personalized and differentiated learning occasions.

EL3-I utilize digital technologies in my teaching practice to refreshing learners and actively engage them.

Facilitating Learners'

FL1- I teach learners criteria and strategies for evaluating the reliability of information gathered online and for point out fabricated, misleading, or distorted information.

FL2-I arrange deliverables that require learners to use digital tools to communicate and collaborate with each other.

FL3-I assemble deliverables that involve the creation of digital content by learners.

FL4-I teach learners to utilize digital technologies safely and responsibly.

FL5-I uplift learners to utilize digital technologies creatively to solve concrete problems.

Behavioural Intention

BI1-I intend to utilize digital technologies towards student centre for increasing their ICT skills.

BI2-I intend to recommend to my colleagues to be using ICT in their class.

BI3-I intend to utilize ICTs for general teaching purposes regularly.