Exploring the Influence of Digital Technology on Administrative Service Delivery in Tertiary Institutions: An Empirical Insight from The Federal Polytechnic, Ilaro

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ABSTRACT

This study examines the influence of digital technology on administrative service delivery in the Federal Polytechnic, Ilaro. Survey design was adopted and the population comprised all administrative staff of the Institution. Two hypotheses were formulated and a 4-point Likert questionnaire was administered on 100 senior Registry staff of the Institution who were randomly selected as the sample. Descriptive data were analysed with frequency count, percentage and mean while the hypotheses were tested with regression analysis at 0.05 level of significance. The results showed high digital technology use for administrative functions and that it contributes significantly to rate of administrative service delivery (T-value = 3.583; P-value = 0.001<0.05) and quality of administrative service delivery (T-value 2.641; P-value = 0.000<0.05). The study revealed that digital technology facilitates administrative workflow and enhances the rate and quality of administrative services to a wide range of stakeholders, including students, alumni, and external organizations. It was recommended, among others, that the Federal Polytechnic, Ilaro and other similar institutions should intensify their digital transformation drive in terms of resources, platforms, processes and capacity enhancement with a view to providing satisfactory administrative services.

Key Words: Digital technology, Administrative service, Rate of service delivery, Quality of service delivery

INTRODUCTION

Globally, tertiary educational institutions have the responsibility of developing skills, competence and characters that are needed by individuals to participate in productive engagements relevant to the growth and development of their society. In doing this, they provide services that are essential to the wellbeing of stakeholders – students, alumni, communities, organisations, government agencies and other institutions. At every organ of tertiary institutions, the performance of the different levels and cadres of workers is critical to meeting the core and other objectives, both in the short or long run.

Higher educational institutions provide a range of services in line with their goals and objectives (Ogunode & Zalakro, 2023). Fulfilling the mandates for which tertiary institutions are established makes the utilization of human, material and technological resources critical concern (Abid et al., 2022; Acido & Kilongkilong, 2022). In the context of public or state-owned tertiary institutions, an important expectation is the provision of efficient and quality services (OECD, 2024). When services offered by public organisations are effective and efficient, the objectives of such organisations are partly met as people offered the services derive satisfaction (Victor & Steven, 2020). Given this, in the pursuit of the key mandates of teaching, learning, research, innovations, skill acquisition and development, tertiary educational institutions are giving attention to effective administrative service delivery with cost efficiency and reduced resources (Ekere, 2019; De Lara & Santos, 2024).

In modern days, technology, especially digital tools are acknowledged as inducing changes in the administration of tertiary institutions, and more importantly, effective administration and how stakeholders access institutional facilities and services (Ojo et al., 2024). The pervasive use of technology is expected to serve as a pathway in

generating significant or even massive benefits (Abubakar, 2023), with technology offering bundle of resources and platforms for optimal workflow and activities (Sharmin et al., 2017; Giri, 2020). However, despite several efforts, including the provision of technology resources and supportive work environment (Agbesanya et al., 2024) aimed at revamping service delivery in most public organisations, including tertiary institutions, poor work attitude, low adaptability, limited innovation readiness, and digital culture pave way for unsatisfactory service delivery on one part (Luthuli et al., 2024), and on the other part, poor internet facilities and connections, unstable power supply, lack of up-to-date digital tools and grossly inadequate finance, frustrate the benefits of digital technology use of most tertiary institutions in Africa (Takafumi, et al., 2022). Such unsatisfactory services in the administrative components of tertiary institutions are capable of thwarting the attainment of their core mandates and pose challenges to general institutional performance (Zainun et al., 2018).

As digital tools are becoming more integrated into the administrative functions and workflow of tertiary institutions and given the vital role of administrative services in supporting academic activities and the interrelated organs of the institutions, it is essential to examine the extent to which digital technology utilisation contributes to the improvement in their administrative service delivery. This study focused on the Federal Polytechnic, Ilaro and sought to have empirical insights into how effectively the adoption and utilisation of digital technology in its administrative functions meet the needs of students, staff, and other stakeholders. Despite the digital transformation efforts, human capacity building and competence enhancement, and the growing concern for service efficiency and effectiveness as reflected in the evolving digital environment and the fundamental changes in the way administrative tasks are carried out in the Institution, there is dearth of empirical studies on digital technology utilization with particular focus on administrative service delivery in the context of the Institution. With particular insight into the service delivery ecosystem of the institution, the study aimed to determine the extent to which digital technology use impinges on the rate and quality of administrative services. Assessing these will offer knowledge-based perspectives on digital technology-driven work models and administrative service delivery of the institution and provides a pathway for scalable suggestions and recommendations that could foster better digital culture, technology-driven administration, goal achievement and stakeholders' satisfaction from the administrative service delivery of the polytechnic and other similar higher educational institutions.

LITERATURE REVIEW

Service delivery is the process of offering a service to customers or the internal clients of an organization. Usually, it consists of activities relating to creating, developing, deploying, and running services (Juka, 2020). Parasuraman et al. (2015) posit that service delivery is effective when some key elements such as "reliability, assurance, tangibility, empathy, responsiveness and other features which conduce to customer confidence and satisfaction are present". According to Obikwelu (2014), providing quality services in a consistent way is the focus of ensuring total quality management in an organisation, offering values to stakeholders and enhancing users' care and satisfaction from the services rendered. This implies that the service delivery component of total quality management is quality-centred, customer-focused and team-driven process for achieving an organization's strategic goals and maintain same over time. Thus, effective service delivery is aimed at providing high quality and professional services to stakeholders, while those saddled with rendering services being open, well-mannered, showing knowledge about their services and the organisation, and demonstrating integrity, decency, uprightness and integrity in providing such services (Achimugu et al., 2017).

Service systems are integral to the functioning of businesses, organizations and institutions, it encompasses the processes and technologies used to deliver the services (Kumar & Pansari, 2016; At the core of effective service systems lies the engagement of staff, which is pivotal in ensuring the delivery of exceptional service experiences and creating substantial value for employers, businesses, or organizations (Homburg et al., 2017). This means that service is not effective until they are excellently delivered, customers see the delivery process as reliable and friendly, and all stakeholders experience satisfaction. According to Berry et al. (2019), the rate at which services are delivered significantly influences users' satisfaction. In today's fast-paced environment, people increasingly expect prompt and efficient services, and any delay can lead to dissatisfaction, loss of trust, and potential attrition (Osei-Assibey, 2019). Conversely, timely service delivery enhances the user or customer experience, fosters positive perceptions and strengthens the provider-user relationships (Homburg, et al., 2017). The rate of service delivery is usually quantified using various metrics, including service time - the average time

taken to complete a service request from initiation to fulfillment (Lovelock & Wirtz, 2016); response time -the time taken to respond to a customer inquiry or request (Kim, 2020); and throughput - the number of services delivered within a specific timeframe (Osei-Assibey, 2019).

Quality of services rendered pertains to the degree to which a service meets or exceeds customers' expectations. It encompasses various attributes such as reliability, responsiveness, assurance, empathy and tangibles (Parasuraman et al., 1988). While high-quality services differentiate organizations from their competitors, enhance customer retention, and drive positive word-of-mouth referrals (Zeithaml et al., 2018; Chong & Bai, 2021), inconsistent or poor-quality services can lead to diminished organisational reputation and erode customers' trust (Chong & Bai, 2021). Service quality can be assessed through various methods, including the SERVQUAL Model which measures service quality in terms of reliability, responsiveness, assurance, empathy, and tangibles (Parasuraman et al., 1988), surveys of customer feedback on their perceptions (Fornell, 1992) or other means such as net promoter score which gauges customer likelihood of recommending the service to others (Reichheld, 2003).

Administrative service delivery is an important goal of organisations, it is perceived as one of the means of ensuring smooth running and coordination of organisation's organs, meeting the needs and demands of people and government agencies, and ensuring stakeholders' satisfaction (Giri, 2020). Administrative services remain the propelling force for various functions of the interconnected organs of public organisations, for the implementation of policies, enforcement of compliance to service standard, and utilisation of resources for goal achievement (Prince-George, 2022). Essentially, effective and efficient service delivery are key concerns of public organisations including educational institutions (Giri, 2020). In higher educational institutions, administrative functions range from admissions advertisement, student enrollment, registration, financial services, students and staff records management, policy communication, resource utilisation, office coordination, internal and external communications, etc. (Luthuli et al., 2024). The adoption of digital tools and restructuring of service delivery platforms to allow for smooth administrative functions and user satisfaction have been found to be correlated with organisational efficiency and administrative service effectiveness (Nwinyokpugi & Dornanu (2022).

Digital technology refers to electronic tools, systems, devices, and resources that generate, store, or process data in digital formats (Brynjolfsson & McAfee, 2014; Abid et al., 2022). It encompasses all forms of technologies that make use of computing and communication processes through digital devices, software or applications (Ashmarina & Mantulenko, 2021). These technologies are designed to facilitate communication, data analysis, business processes, workflow and even entertainment (Brynjolfsson & McAfee, 2014). Personal computers, scanners, digital cameras, software, database programmes, multi-media, and telecommunication tools like phones, fax machines, videoconferencing equipment, and the internet are examples of equipment and applications that fall under the broad category of digital technology (Newhouse, 2018). These tools are used to access, retrieve, store, organize, manipulate, present, send material, and communicate locally and globally (Anderson & Van, 2006). The adoption of artificial intelligence, big data analysis, cloud computing, internet technologies and other innovations facilitates transactions and the exchange or transmission of huge data and information between individuals and corporate entities (Obukhova, et al., 2020). These changes in work tools and models have significant contribution to the unprecedented use of digital platforms to enhance service delivery and satisfaction (Ashmarina & Mantulenko, 2021).

According to Sharma (2010), the foundation of an efficient and effective administration is knowledge and the decision-makers' acknowledgement of such knowledge. The conversion of this knowledge into digitized format, the creation and adoption of digital networks that connect people and allows universal access and utilization of knowledge, open the door for digitalized processes and service delivery in organisations (Obukhova, et al., 2020). The innovations in digital technology are altering the known methods and practices of organisational activities and thus leading to stiffer competition among organisations who explore the same opportunities in offering value propositions. Therefore, to remain competitive, organisations leverage on digital resources to drive their activities and change the ways employees, managers and owners think and work (Edna et al, 2014).

The drastic adoption of digital connectivity, automation and the unprecedented global growth in the emergence and deployment of technology, have tremendously changed organisational activities, business operations and

competitiveness (Sharmin et al., 2017). Accordingly, Achimugu et al. (2017) posit that an important driver of organisational activities and processes which affect rate and quality of service in most firms are the emerging technologies. Progressively, there has been unprecedented transformational change in policy, processes and functions of public enterprises regarding the use and application of digital tools, and essentially service delivery. This is supported by a number of empirical evidences which portends that digital technology facilitates information sourcing and usage, improves operational efficiency and administrative effectiveness of public enterprises (Obukhova, et al., 2020; Giri, 2020; Ashmarina & Mantulenko, 2021). Digital technologies present potential way out of service delivery issues such as high service or operational costs, poor service quality and patchy desirability of services rendered (Haldrup, 2022).

One theory commonly used to underpin administrative service delivery, and on which this study is anchored, is the New Public Management Theory which emerged in the late 20th century as a response to perceived inefficiencies and bureaucracies in traditional public administration" (Pollitt & Bouckaert, 2011; Dunleavy et al., 2015). It emphasizes the principles borrowed from private sector management practices to improve the effectiveness and efficiency, rate of service, responsiveness, quality of service rendered and feedback mechanisms in the administrative activities and service delivery of public enterprises (Pollitt & Bouckaert, 2011). By aligning administrative service delivery with NPM principles, government enterprises can enhance efficiency, effectiveness, and responsiveness in delivering administrative services (Dunleavy et al., 2015). Hence, the present study adopts rate and quality of administrative service as measures employed to assess the effectiveness and efficiency of administrative service delivery.

The new changes seen in the culture of providing service prompt public organisations to embrace the use of digital tools and electronic platform for their deliverables. In line with this trend, universities, polytechnics, colleges of education in Nigeria adopt digital technology in rendering services. These services, for example, range from classroom delivery, processing of students' registration, administration of examination, computation of results, processing of academic records of current and ex-students, assessment and payment for services by clients and suppliers, etc. (Jayanetti, 2014; Haldrup, 2022). The radically increased efficiency and effectiveness in the delivery of services and the online services reduces bureaucracy, paperwork, and saves time (Edna, 2014; Adeboye, 2015).

METHODOLOGY

The population of this study comprised all Senior Registry staff of the Federal Polytechnic, Ilaro, Ogun State. From a total of 356, a sample of 100 senior Registry staff across different units and sections of the Institution was selected with simple random sampling approach in accordance with the Krejcie and Morgan sample size determination for a known population. The sample drawn from the Registry Department serves as representative of the entire administrative staff members of the Institution. In line with the objectives of the study, it was postulated that digital technology use does not have any significant relative impact on the rate and quality of administrative services.

The questionnaire method was used for data collection. Apart from the demographic data, the questionnaire consisted of Digital Technology scale with 7 items adapted and modified from Achimugu et al. (2017) and Service Delivery Scales - Rate of Administrative Service Delivery and Quality of Administrative Service Delivery with 6 items each which were adapted from Parasuraman et al. (2015) and Jukka (2020). All the items were designed on a 4-point Likert rating scale ranked as 1 – 4 from lowest to the highest. The reliability of the instrument was determined with test-re-test method using Pearson Product Moment Correlation which gave a correlation co-efficient of 0.81.

RESULTS AND DISCUSSION

Out of 100 questionnaires administered, 86 were completed and returned, and were used for data analysis. Given the nature of the data, all analysis were conducted via SPSS Version 25. Hypotheses formulated were tested with regression statistics at 0.05 level of significance. For the acceptance or otherwise of the hypotheses, the criterion was to reject the null hypotheses if the P-value is greater than 0.5 level of significance and accept the Alternative Hypotheses.

Table 1: Summary of mean response on the level of digital technology use for administrative functions

Inputs factors	Item	Observ.	Mean	Stand. Dev.	p-value
7	Level of Digital Tech. Use (DTech)	86	3.021	0.113	0

The results above reflect data on the level of digital technology use (denoted as DTech) as indicated by the 86 respondents. The average response of 3.021 suggests that respondents agreed that the level of digital technology use was moderately high. The standard deviation of 0.1130 indicates a relatively low variation in the responses, suggesting that most respondents shared similar views about the extent of digital technology use. The p-value of 0.000, which is less than the standard significance threshold of 0.05, indicates that the observed results are statistically significant. This implies that the level of digital technology use in the organization is significant, and possibly has influence on the outcome being measured. The result suggests a significant and consistent level of digital technology utilization for administrative services in the Federal Polytechnic, Ilaro.

This high adoption rate of digital technology suggests that the Institution has successfully integrated digital tools and resources into its operational framework and across various administrative activities. The results revealed that the institution has embraced digital processes and modernization of administrative practices. It is evident that the administrative staff are equipped with the necessary digital resources and platforms, which play a crucial role in facilitating their day-to-day tasks, fostering a more responsive and efficient administrative environment.

Hypotheses 1

H01: Digital technology use does not have any significant impact on the rate of administrative service delivery in The Federal Polytechnic, Ilaro.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.630a	0.396	0.392	0.27574
a. Predictors: (Constant), DTech; Dep. Var, Rate of Admin Serv.				

The statistical relationship between the variables is depicted in the model above. The R value of 0.630 indicates a moderate positive correlation between digital technology use and the rate of administrative service delivery. This means that as the level of digital technology use increases, the rate of administrative service delivery also tends to increase, suggesting that higher utilization of digital tools can lead to improved rate of administrative outcomes. The R2 value of 0.396 means that approximately 39.6% of the variability in the rate of administrative service delivery can be explained by the level of digital technology use, indicating a moderately strong relationship, and suggesting that while digital technology usage has a significant impact, there are many other factors (about 60.4%) that also influence the rate of administrative service delivery but not captured in this model.

Table 3: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.026	1	0.026	0.339
	Residual	6.387	84	0.076	
	Total	6.412	85		

a. Dependent Variable: RAS
b. Predictors: (Constant), DTech

The ANOVA table above shows F-value of 0.339 and P-value of 0.001<0.05 which positions the model as statistically adequate and sufficient in relating the dependent variable (rate of administrative service delivery) with independent variable (digital technology use).

Table 4: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.392	0.395		8.578	0
	DTech	0.225	0.111	0.63	3.583	0.001
a. Dependent Variable: RAS						

The estimate of the impact of digital technology use on the rate of administrative service delivery is provided in the table above. The constant value of 5.392 represents the predicted value of the rate of administrative service delivery (RAS) when digital technology use (DTech) is zero. This means that, if no digital technology is utilized, the baseline rate of administrative service delivery is approximately 7.392. The DTech coefficient of .225 indicates that for every one-unit increase in digital technology use, the rate of administrative service delivery is expected to increase by 0.225 units, assuming all other factors are constant. This positive coefficient suggests that enhanced digital technology usage is associated with enhanced rate of service delivery. The standardized coefficient for DTech is 0.630 suggests a strong positive relationship, indicating that digital technology use has a considerable impact on the rate of administrative service delivery relative to other predictors. The t-value of 3.583 for the DTech coefficient suggests that the relationship between digital technology use and the rate of administrative service delivery is significant. The p-value of 0.001 is well below the conventional threshold of 0.05, indicating that the relationship is statistically significant. This result implies strong evidence to reject the null hypothesis and suggests that digital technology use positively impacts the rate of administrative service delivery.

The results revealed a significant influence of digital technology use on rate of administrative services in the institution, implying that digital technologies use contributes vastly to the rate at which administrative services are being provided. It was revealed that the adoption of digital tools, techniques and processes in different areas of the administrative services, the availability of reliable and functional information and communication networks to support administrative workflow, and the integration of digital platforms and new technologies into work processes enhance the administrative services, leading to prompt and secured payment of fees, efficiency in transcripts processing, provision of academic records of current and past students, internal administrative communications, etc. This results support Edna (2014) and Sharmin (2017) that the deployment and effective use of digital resources and technologies drastically change the process and rate at which services are being rendered and facilitates how organisations' administrative and operational functions are being rendered. These results also affirm that digital technology significantly contributes to the efficiency and effectiveness of administrative services at the institution, aligning with Achimugu (2017) and Newhouse (2018) that digital resources improve task execution, completion rates, and timely issue identification in service delivery system.

Hypotheses 2

H02: Digital technology use does not have any significant impact on quality of administrative service delivery in The Federal Polytechnic, Ilaro.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.470a	0.22	0.218	0.26364
a. Predictors: (Constant), DTech				

Table 5 shows the model summary of the relationship of the digital technology use and quality of administrative service delivery. The value of 0.470 indicates the strength and direction of the linear relationship between digital technology use (DTech) and the dependent variable, quality of administrative service (QAS). It suggests a moderate positive correlation, and implies that as digital technology use increases, the quality of administrative service delivery tends to increase as well. The R2 value of 0.220, which is the coefficient of determination, indicates that approximately 22.0% of the variance in the quality of administrative service can be explained by digital technology use (DTech). This value suggests that while DTech has an impact on QAS, a significant portion (about 78%) of the variance could be linked to other factors not captured in this model.

Table 6: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.029	1	0.029	0.411
	Residual	5.839	84	0.07	
	Total	5.867	85		
a. Dependent Variable: QAS					
b. Predictors: (Constant), DTech					

Table 6 shows F-value of 0.441 and P-value of 0.000<0.05 which depicts that the model used for the test is statistically adequate in relating the variables (digital technology use and quality of administrative services).

Table 7: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.369	0.378		4.909	0
	DTech	0.168	0.106	0.47	2.641	.000b
a. Dependent Variable: QAS						

Table 7 gives the co-efficients of the influence of digital technology use on quality of administrative service delivery. The constant value of 5.369 means that if no digital technology is utilized, the baseline quality of administrative service is approximately 5.37. The coefficient of 0.168 indicates that for every one-unit increase in digital technology use, the quality of administrative service is expected to increase by 0.168 units, assuming all other factors remain constant. This positive coefficient suggests that increased usage of digital technology correlates with improved quality of administrative services. The standardized coefficient of 0.470 for DTech suggests a moderate positive relationship, indicating that digital technology use has a significant impact on the quality of administrative service. With the t-value of 2.641, suggesting meaningful relationship between digital technology use and the quality of administrative services and the p-value of 0.000 which is well below 0.05, the null hypothesis is rejected and it is upheld that digital technology use positively impacts the quality of

administrative service.

The results of hypothesis two indicate that the use of digital technology significantly influences the quality of administrative services at the Federal Polytechnic, Ilaro. This finding underscores the importance of integrating digital tools, resources, and processes in enhancing the overall quality of administrative services, characterized by effectiveness, reliability, and stakeholders' satisfaction. The improvement in service quality can be attributed to several factors, including the availability of information, when required, to efficiently execute administrative tasks, a reduction in physical effort and associated stress, and the overall simplification of administrative activities. These enhancements not only streamline processes but also contribute added value to the quality of administrative services provided. The findings align with Newhouse (2018) and Bhavan (2020) that digital technologies and the expertise in utilizing them are essential for delivering high-quality services and that organizations leveraging digital resources can achieve higher levels of service satisfaction and effectiveness. The ability to access real-time information and the automation of routine tasks allow administrative staff to focus on more complex responsibilities, further elevating the quality of services rendered. As such, the integration of digital technology into administrative functions is not just a trend but a necessity for tertiary institutions aiming to improve service delivery and meet the expectations of stakeholders in an increasingly digital landscape. This evolution in service quality reflects a broader shift towards more efficient, responsive, and user-centric administrative practices that are essential for the success of contemporary higher educational institutions.

CONCLUSION

This study examined the influence of digital technology use on administrative service delivery within the Federal Polytechnic, Ilaro. It reveals insights into the transformative role that digital technology play in enhancing the rate and quality of administrative service delivery. Based on the findings, it is concluded that the adoption and strategic utilization of digital technologies significantly contribute to administrative service delivery in the institution.

The effective and appropriate application of digital resources have aid the performance of various administrative functions, thereby enhancing both the rate and quality of service offered. This underscores the importance of not merely integrating technology into administrative processes, but also ensuring that staff are well-equipped to leverage these tools to their fullest potential. This stresses that innovation in technology and administrative process optimization streamline workflows and ensure prompt and accurate discharge of administrative duties and responsibilities to a wide range of stakeholders, including students, alumni, and external organizations.

Moreover, the findings emphasize the broader implications of digital technology adoption, suggesting that it improves administrative efficiency and enhances the overall stakeholder experience. With digital tools in place, administrative staff can respond to inquiries more swiftly and manage services more effectively, thus increasing satisfaction among service users. The seamless integration of digital technologies fosters a responsive administrative environment capable of adapting to the evolving needs of its clientele.

In conclusion, this study affirms that the integration of digital technology into administrative service delivery at the Federal Polytechnic, Ilaro is not merely a trend but a fundamental shift that positively affects operational performance. The findings particularly emphasize the necessity for investment in digital resources and continuous professional development for administrative staff. As digital technologies continue to evolve, tertiary institutions' commitment to enhancing their administrative services through digital innovations will be crucial in maintaining their competitive edge and fulfilling their mission to provide quality education, support diverse community, and effectively meet the needs of stakeholders in an evolving digital world.

Based on the finding of this study, it is concluded that digital technology is essentially needed to stimulate timeliness and quality of administrative services in an organisation and that tertiary institutions cannot deliver well in their services to its clients (past and present students, staff, community members, government agencies and other institutions) without the use of digital technologies.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

1. The Management of the Federal Polytechnic, Ilaro should intensify its digital innovation drive in terms of resources, tools and processes with a view to providing effective and timely administrative services.

2. Staff should be encouraged to update their knowledge in digital devices and applications with a view to ensuring that they possess up-to-date technological competence on the use of digital tools in providing services to students, ex-students, organisations, other institutions, clients, contractors, etc.

3. Internet facilities should be provided to offices to increased access to the internet connections by staff and students and to enhance provision of services.

4. Adequate funding should be provided by government to tertiary education sector for the purpose of digital transformation.

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