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Utilization of Paperless Technology as Predictor of Staff Performance in Technical Colleges in Osun State, Nigeria

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Abstract: The performance of staff in disseminating and retrieving information in Government Technical Colleges in Osun State, Nigeria appears to be ineffective in this period despite the global trend in utilization of paperless technologies. The ineffectiveness could be traced to level of utilization of paperless technologies. This study therefore investigated whether utilization of paperless technologies actually predicted the performance of the staff. Two research questions and one hypothesis guided the study. The study was a quantitative type that utilized descriptive research design. A total of 256 staff comprising teaching and administrative staff of the nine Government Technical Colleges in Osun State, Nigeria formed the population of the study out of which 179 staff were randomly selected. Data collected with questionnaire were analyzed using simple mean, while hypothesis generated was tested at 0.05 level of significance using regression analysis. The study found that: paperless technologies were used at a small extent; staff performance was slightly efficient and the extent of utilization of paperless technology significantly predicts staff performance. Based on the findings, it was recommended, among others that technical college staff should realize the new trend in usage of paperless technology and keep themselves abreast of the prevailing digital situation.

Keywords: Paperless technology, utilization, staff performance

1. Introduction

Improving the performances of its workforce is one of the main objectives of management of any organization, including educational institutions like technical colleges. The success of a school lies on the people who form the workforce (Fejoh & Faniran, 2016). Workers and staff are the most valuable assets for schools' growth and development. Staff of educational institutions, including technical colleges encompass teaching and administrative employees. Both teaching and administrative staff are responsible for the students' educational programmes and great expectations are often placed on them for greater efficiency. In California Teaching Performance Expectations, teaching staff are expected to be able to engage students in learning, motivate and sustain their interest, and ensure active participation in teaching/learning activities. Both teaching and administrative staff are supposed to be able to maintain effective communication and timely flow of information. They are supposed to be able to access resources as well as provide easy access to resources in other to support students' learning. Several factors can be responsible for improving staff performance including financial motivation, comfortable environment, regular training and development, among others. Use of right technology can also improve organization's overall efficiency and performances as well as employees' productivity (Coppersmith, 2019). Similarly, the use of technology in teaching/learning environment has been shown to increase productivity and efficiency of staff (Runnels & Rutson-Griffiths, 2013). New technologies constantly make their

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ways into the society with paperless technology and its capabilities at improving organizational effectiveness becoming prominent in the technological evolution. The quest for paperless office technology started in the 20th century and coincided with the introduction of Personal Computer (Ragnet, 2008).

The word "paperless" is coined from two words: paper and less. It connotes restrictions and/or elimination of paper usage. A paperless system is one in which the use of paper is eliminated or greatly reduced (Genesis & Oluwole, 2018). Paperless is concerned with the restrictions of communication and information flow to digital and electronic forms. Paperless technologies essentially mean technologies for drastically reducing the use of paper. They are digital and electronic technologies.

Over the last couple of years, and especially with the COVID-19 pandemic situation that placed restrictions on physical classroom learning that is highly paper-based, educational system is being faced with the challenge of transforming teaching/learning activities into electronic form. Combating this challenge, utilization of emerging technologies for electronic communication and information flow in the school system appears to be a viable option. Access to and use of right digital/paperless technologies improves connectivity, and communication flow amidst staff and between staff and students (Romdhane, 2013). Thus, efficiency of staff in educational institutions, technical colleges inclusive, can be greatly improved with the adoption and utilization of paperless technologies. However, educational system in Nigeria is considered lagging behind in the adoption of new technologies for paperless information processing (Tajudeen, Udende, Azeez & Olaboye, 2021).

Developing countries are characterized with lack of enough skills, tools and machines. The use of modern technologies is viewed as not being well adopted in developing countries and this backward state of technology adoption and utilization results in low productivity, high cost and waste of time (Ahsan, 2011). Digital technologies are seen to be less diffused and less commonly adopted into the classrooms in developing countries. Reasons why developing countries need to go digital abound. In this era of technological revolution, businesses are being transformed, governments and societies alike strive to pace up with technological advancement, and we are all being challenged to adapt and keep up with the technological changes (Mocan, 2015). In his opinion, failure to embrace digital and paperless tools brings about inefficiency, promotes corruption and continues to generate high transaction costs and low productivity in businesses, in government as well as in educational institutions among others.

Leading digital technologies in developing countries are identified to include cell phones, computers and internet (Elkins, 2015). Although technologies required for paperless office operation are not limited to these, but include electronic tablets, iPads, scanners, electronic facsimile machine, e-mailing technology and Optical Character Reader (OCR) software which is required to convert hard copy document to text document for editing purposes as well as smart board/interactive white board and overhead projector (Ross, 2020). Cloud storage which provides more secured back up, is also considered paperless technology that is readily available. Approaches to creating paperless classroom include the use of iPads instead of paper books and pens, and supplementing the iPads with whiteboard software as well as using overhead projector. Smart boards or interactive whiteboard (IWB) system is designed to provide a platform to boost the interactivity of lessons. IWB, obvious have the advantage of reinforcing students' motivation and engagement in learning (Shi, Yang, Yank & Liu, 2012). It was observed that IWB is capable of attracting and retaining students' attention and concentration during teaching/learning process and thus enhancing learning outcomes. With electronic faxing, an organization no longer need paper-using fax machines as incoming faxes are converted to digital images and sent directly to e-mail boxes. This is considered more secure as paper copies can be lost or left on the fax machine for everyone to see. Acquisition of document management software to facilitate organization of data and capture of digital file material is also necessary (National Computer Board, n.d.).

Other technologies considered to be very relevant to paperless operations in educational institutions are digital signature (e-signature) and PDF annotation application. Digital signature is a form of electronic signature which is a digital equivalent of a handwritten signature or stamped seal, but with far more inherent security. It has same legal significance as the traditional form of signing documents. Digital signature help saves time spent on tedious administrative procedures and thus increases productivity (Rouse, 2016). Through the use of digital signature, they opine, educational institutions can effortlessly facilitate the administrative process of enrolling students regardless of geographical dispersion and also accelerate students' registration process. PDF annotation application also saves time, and turns literacy and numeracy classroom activities into an interactive experience. PDF Annotator is a window program that lets user mark up and revise existing PDF document on their screen and user can even insert handwritten comments in the document while revising (GRAHL, 2016). It allows students and teachers save documents in the cloud, lets teachers edit and save in just few seconds and students can see these changes and make annotations of their own. This makes it easier for both teacher and students to keep track of the learning documents, making giving feedback on students' work a much more efficient process.

Utilization of paperless technology is considered to directly influence both teaching and administrative staff's performance in saving time. Teaching and learning activities become more effective and efficient when both teachers and students use paperless technology platform, thus enhancing quality of education (Dieck-Assad, 2018). Paperless system is one of the innovations to equip staff with right technological skills to enhance their performance (Amegboe, 2019). Employees' time that could have been used performing administrative tasks like filing, organizing and retrieving filed documents is greatly reduced and the time saved is used for other administrative activities (Laserfichc, 2020). In a

similar vein, applying paperless technology saves time both for teachers and the admins as it eradicated the traditional system of printing all our classroom learning materials which is both chaotic and inefficient (Cohen, 2018; Samson, 2018). About 10% of time in school is used for reporting and managing student services. The time saved through the use of paperless technology could be used in professional development of staff. Utilization of paperless technologies creates more time that can be used for supporting students. Using paperless technology in educational institutions improves assessment and evaluation process. Students will normally bring their assignments to class, teacher takes the piles of students' assignments home, assesses and writes comments by hand, and teacher takes the pile of students' work back to the classroom for distribution. But when paperless technologies are used, assessment and evaluation processes become much more efficient and easier.

Applying paperless technology in educational institution prepares students for highly automated work environment (EducationWorld, 2020). Applying paperless technologies in schools exposes students to prevailing technologies and sets students up with the right foundations to succeed in our increasingly technology-driven world. By involving students more and more with paperless technology, we prepare them in a way for a highly automated work environment (Cohen, 2018). The greatest preparation for students, especially technical education students, would be to make everything be on digital platform. In addition, internal flow of information, information retrieval and delivery of teaching materials in educational institution, especially in technical education, have to leverage on paperless technologies as effective tools for information dissemination and real-time communication process (Cohen, 2018 and Tajudeen *et al,* 2021)

Technical education, according to UNESCO is defined as education designed to prepare technicians at upper secondary level and also to prepare engineers and technologists for higher management positions at university level and therefore has a vital role to play in technological advancement of any country (David, 2014). Technical education is described as education that aims at providing trained manpower in applied science and technology; training young men and women to have understanding of increased complexity of technology; and providing technical skills necessary for industrial development among others. However, modern digital technologies are not being adopted and used systematically and effectively in higher education system (Marques, Villate and Carvalho, 2015). The growing popularity of paperless and digital technology in developing country all over the world makes compliance a necessity for organizations/institutions targeting improved organizational performance and high productivity. It is against this background that the study seeks to determine the extent of utilization of paperless technology in the technical colleges and whether the level of utilization predicts the performance of the staff.

1.1 Statement of the Problem

New technologies are constantly making their ways into academic environment to improve teaching/learning experiences. Discourse on the relevance of paperless technology to electronic learning systems has been intense in the last few decades. The intensity increased as educational institutions across the country consider the effects of current COVID-19 pandemic situation on educational sector with restrictions to physical teaching/learning situations and thus affecting the efficiency of both teaching and administrative staff of educational institutions. While the pandemic lockdown was in full force, it appears that some campuses were Wi-Fi enabled and quite a number of students made use of paperless technologies like tablets, laptop and smartphones among others for online interactive learning. However, it appears that students of Government Technical Colleges in Osun State were almost totally disconnected from academic activities while the lockdown lasted despite the proliferation of paperless and digital learning technologies. It appears there was non-utilization of paperless technologies such as personal computer, electronic fax machine, digital signature, smart board interaction, scanners and internet connections. The non-utilization, therefore seems to have hampered the flow of communication between staff and students. Therefore, the performance of the teaching and administrative staff in the area of information dissemination, information retrieval and sharing of learning materials appears to be inefficient due to lack of utilization of paperless technologies. Whereas utilization of paperless technologies in the schools supposed to have exposed the students to the prevailing technologies, set them up with right foundation to succeed and made them prepared for highly automated work environment while everything they need will be on digital platform. It is against this background that the study sought to find out the extent to which paperless technologies are being utilized by the staff of Government Technical Colleges in Osun State, Nigeria, and also to determine if this utilization significantly predict staff performances in the technical colleges.

1.2 Purpose of the Study

The main purpose of the study was to determine whether the utilization of paperless technology could predict the job performance of Technical College staff in Osun State, Nigeria. Specifically, the study sought to:

(i) Determine the extent to which paperless technologies are being utilized by the staff of Technical Colleges in Osun State
(ii) Determine the extent of efficiency of the performances of staff in the Technical Colleges in Osun State;
(iii) Determine if utilizing paperless technology will significantly predict the performance of staff in the Technical Colleges.

1.3 Research Questions

The following research questions were raised and answered:

To what extent do staff utilize paperless technologies in Technical Colleges in Osun State?
To what extent are staff of Technical Colleges in Osun State efficient in their job performance?

1.4 Research Hypothesis

The following hypothesis was tested in the study:

H_o1: Utilization of paperless technology does not significantly predict staff performance in Technical Colleges in Osun State.

1.5 Methodology

The study was a quantitative type that utilized descriptive research design. A total of 256 staff comprising teaching and administrative staff of the Government Technical Colleges in Osun State, Nigeria formed the population of the study out of which 179 staff (70%) were randomly selected. A set of questionnaire titled Questionnaire on Utilization of Paperless Technology and Staff Performance (QUPTSP) subjected to face and content validity was used for data collection. The reliability test conducted through test-retest method yielding correlation coefficient of 0.82. The questionnaire was structure into three sections: Section A consisted of bio-data of the participants, Section B consisted ten items on the extent of utilization of paperless technologies by the staff, while Section C measured job performance of the staff. The items in Sections B and C were structured in 4-point rating scale ranging from Very Great Extent (VGE)/Very Efficient (VE) – 4 points to Very Small Extent (VSE)/Not Efficient (NE) – 1 point. Out of the 179 copies of questionnaire administered manually with the help of three research assistants, 178 were returned duly completed. Data collected for Research Questions 1 and 2 were analysed using frequency count and mean. Mean responses of 3.50 and above were regarded as Very Great Extent/Very Efficient, those between 2.50 and 3.49 were regarded as Great Extent/Efficient, while mean responses between 1.50 and 2.49 were interpreted Small Extent/Slightly Efficient, and mean responses of 1.49 downward were regarded as Very Small Extent/Not Efficient. The hypothesis generated was tested at 0.05 level of significance using multiple linear regression analysis.

1.6 Results

Table 1 - Extent of utilization of paperless technologies

S/N		*VGE*	*GE*	*SE*	*VSE*	*X*	*Decision*
1.	Personal Computers	1	88	89	-	2.51	Great extent
2.	Internet	5	101	54	18	2.52	Great extent
3.	iPads and Tablets	37	50	78	18	2.54	Great extent
4.	Electronic fax machine	7	24	85	62	1.87	Small extent
5.	Smart board/Interactive whiteboard	-	5	86	87	1.54	Small extent
6.	Scanners	-	8	110	60	1.71	Small extent
7.	Optical Character Reader Software	-	9	83	86	1.57	Small extent
8.	Digital Signature	-	6	32	140	1.25	Very small extent
9.	Overhead projector	-	23	75	80	1.68	Small extent
10	PDF Annotation Software	-	6	65	107	1.43	Very small extent
	Grand Mean					1.86	Small extent

Qualitative interpretation legend: 1-1.49 = Very Small Extent (VSE); 1.50 – 2.49 = Small Extent (SE); 2.50-3.49 = Great Extent (GE); 3.50-4.00 = Very Great Extent (VGE)

Table 1 revealed that items 1 to 3 were utilized to a great extent with mean responses ranging between 2.51 and 2.54. Items 4 to 7 and 9 were utilized to a small extent with mean responses ranging between 1.54 to 1.87. While items 8 and 10 were utilized to a very small extent with means of 1.25 and 1.43 respectively. The grand mean of 1.86 revealed a small extent utilization of paperless technology by the participants.

Table 2 - Efficiency of staff performance

S/N		*VE*	*E*	*SE*	*NE*	*X*	*Decision*
1.	I can produce, store and easily retrieve information from the computer	44	62	58	14	2.76	Efficient
2.	I can promptly disseminate information to staff and students via the internet	22	137	13	6	2.98	Efficient
3.	I can access and share e-books/learning materials and upload learning instructions to students online	22	126	26	4	2.93	Efficient
4.	I can send and receive documents through electronic fax machine and e-mail technology	3	48	103	24	2.17	Slightly efficient
5.	I can stimulate and maintain students' interest, concentration and participation during teaching/learning activities.	22	103	43	10	2.77	Efficient
6.	I can convert hard copies documents to electronic form	6	10	142	20	2.01	Slightly efficient
7.	I can edit e-document converted from hard copy document	9	32	92	38	2.07	Slightly efficient
8.	I can sign students' registration form online	3	37	100	38	2.03	Slightly efficient
9.	I can teach or instruct students using overhead projector	18	91	61	48	2.67	Efficient
10	I can create and maintain digital and interactive classroom	13	36	110	19	2.24	Slightly efficient
	Grand Mean					2.46	Slightly efficient

Qualitative interpretation legend: 1-1.49 = Not Efficient (NE); 1.50 – 2.49 = Slightly Efficient (SE); 2.50-3.49 = Efficient (E); 3.50-4.00 = Very Efficient (VE)

Results in table 2 revealed that technical colleges staff in Osun State are slightly efficient in the performance of their paperless technology-related duties with the grand mean of 2.46. They are however efficient in the usage of personal computers (X=2.96), in dissemination of information via the internet (X=2.98), in accessing and sharing e-books online (X=2.93), in stimulating, and maintaining students' interest and participation during teaching/learning activities (X=2.77) and in the use of overhead projector (X=2.67). The staff are slightly efficient in sending and receiving document through e-fax (X=2.17), in converting hard copies documents to electronic form (X=2.01), in editing converted e-documents and in signing forms online (X=2.03). The staff are also slightly efficient in creating and maintaining digital interactive classroom (X=2.24).

Table 3 - Regression of utilization of paperless technology on staff performance

Model	*Unstandardized coefficient*		*Standardized Coefficient*	*T*	*F-Sign*
	B	*SE*	*B*		
(Constant)	1.398	.172		8.148	.000
Personal Computers	.010	.051	.013	.188	.851
Internet	-.015	.040	-.029	-.382	.705
iPads and Tablets	.075	.030	.181	2.459	.015
Electronic fax machine	.005	.042	.011	.122	.903
Smart board	.234	.062	.347	3.756	.000
Scanners	-.051	.046	-.074	-1.100	.273
OCR Software	.033	.046	.052	.710	.479
Digital Signature	.116	.061	.157	11.920	.057
Overhead projector	.087	.036	.161	2.426	.016
PDF Annotation	.184	.046	.277	4.035	.000

R=.645, R^2=.416, Adjusted R^2=,381, F=11.889, P=.000^b

Table 3 showed F=11.889 and P=.000 (P<0.05), therefore the null hypothesis is not accepted. Therefore, utilization of paperless technologies significantly predicts staff's performance in Government Technical Colleges in Osun State. The table also showed utilization of smart interactive board as the single best predictor of staff performance (34.7%). This is followed by PDF Annotation (27.7%), iPads and Tablets (18.1%), overhead projector (16.1%) and digital signature (15.75). Utilization of other five paperless technologies have their prediction levels below 15%. However, utilization of all the paperless technologies in the table jointly account for about 38.1% (R^2=.381) of variations in staff performance. Therefore, utilization of paperless technologies has joint significant prediction on staff performance in Government Technical Colleges in Osun State, Nigeria.

1.7 Discussion of Findings

On the extent of utilization of paperless technologies by staff in the GTC in Osun State, the study found that staff of Government Technical Colleges utilizes paperless technologies only to a small extent. This corroborates the opinion of Ahsan (2011) that the use of modern technologies is not well adopted in developing countries. It also conforms with the findings of Marques, Villate and Carvalho (2015) that paperless technologies are not used systematically and effectively in higher education system. This could perhaps be as a result of unavailability of these technologies or probably because the staff are not equipped with necessary skills for utilizing the paperless technologies.

On the level of efficiency of staff performance in the GTC of Osun State, the study found that the staff are slightly efficient in performing their paperless technology-related duties. Probably this resulted from small extent usage of paperless technologies by the staff in the colleges. This affirms the view of Coppersmith (2019) that employees' performance and productivity can be immensely improved when right technologies are available for use. It could be assumed that when paperless technologies are very much available and workers can make great extent utilization of them, they will be very efficient in their job performance.

On whether utilization of paperless technologies significantly predict staff performance, it was revealed that utilization of all the paperless technologies identified jointly account for about 38.1% (R^2=0.381) of variations in staff performance. This conforms with vintegrisTECH (2019) that the use of paperless technologies facilitates administrative process and increase staff efficiency. The prediction level, though significant, is low. This low prediction level could be as a result of small extent usage of paperless technologies by the staff. Expectedly, great extent utilization of paperless technologies will highly predict high efficiency of staff performance.

1.8 Conclusion

The study sought the extent to which staff of Government Technical Colleges in Osun State utilize paperless technology and whether the level of utilization significantly predict staff performance. From the findings, it could be concluded that the staff utilized paperless technologies to a small extent and that the staff are slightly efficient in performing their technology-related duties. The extent of utilization of the paperless technologies significantly predict staff performance though in a low level. This implies that when paperless technologies are very much available, and staff makes use of them to a great extent, there would be tremendous boost in the efficiency of staff performance. Conclusively, when paperless technologies are well utilized, staff will perform more efficiently.

It is believed that the results of this study will be an eye opener to government, teachers and other stakeholders in technical education on the need to wholly adopt paperless technologies for optimal performance of staff as these technologies emerge. This, it is believed, will enhance the quality of technical education and thus impact on national development. This study however, studied general staff performance but did not cover all the necessary details in specific areas of performance. Future researcher may look at level of predictions of utilization of paperless technologies in specific constructs of performance such as information dissemination and retrieval, online instructions and evaluation system.

1.9 Recommendations

Management of Government Technical Colleges should make available necessary paperless technologies for staff and afford them training opportunities on the utilization of the technologies in order to make learners technologically competent to contribute meaningfully to national development. Staff of Government Technical Colleges should be encouraged to make use of prevailing paperless technologies to achieve production of graduates who are prepared for jobs involving applied modern technology. Staff of Government Technical Colleges should realize the new trends in e-learning/paperless technology as it affects their job performance and should intensify efforts to develop themselves to keep abreast of the prevailing digital situations.

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