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ACADEMIC USES OF DIGITAL TECHNOLOGY BY TEACHERS AT HIGHER EDUCATION LEVEL: AN EXPLANATORY STUDY

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Abstracts

Digital learning is any type of learning that is facilitates by technology or by instructional practices that makes effective use of technology, but it only makes sense to have digital technology in classroom. In this study, academic uses of digital technology by teachers for their teaching and professional development were analysed. Sixty college teachers from four government and government aided college of Odisha who are taught in regular basis were selected purposively for the study. Survey method was used for collection of demographic information and use of digital technology for teaching and for professional development. The results indicated that teachers are using digital technology very often in teaching. Teachers are making proper use of desktop, laptop, smartphone, internet, software etc. So in overall view teachers gave positive opinion towards using digital technology. But there are many barriers for not using digital technology that is insufficient time, lack of resources and also pressure from administration. Results of present study revealed that teachers are getting many helps from digital technology in their professional development such as they are doing action research, assessment, doing online course etc. So teachers are saying that digital technology is not only useful in teaching but also becoming an integral part of professional development.

Key Words: Digital Technology, Higher Education, Teacher, Professional Development

RATIONALE OF THE STUDY

Digital Technology is becoming a most demanding necessity of the world. The impact of digital technology is giving a remarkable result in every field. So using digital technology in educational field is a complementary thing and if teachers and students are using digital technology in their teaching-learning process, the education will get a progressive direction. Teachers and students can use digital technology for teaching learning as well as teacher's professional development. There is currently a tendency to suggest that today's higher education teachers are different from those of previous generations in terms of the way they learn, teach and their professional developments, use digital technology and interact with each other, students and peers. This idea is so firmly entrenched that many researchers and educators treat it as if it were a self-evident truth. We use the term "digital technology" to refer to a wide range of tools, devices, programs and resources that store and transmit information in digital format, such as computers, the Internet, e-mail, mobile phones and other mobile devices, cameras, video games and what have become known as Web 2.0 technologies (e.g. blogs, wikis and social networks; Abbott, 2007; Hague & Williamson, 2009).

Digitalization in Higher Education (HE) is an issue that concerns many educational stakeholders. ICT skills are becoming increasingly relevant in every context, especially in the workplace, therefore one of the prime objectives for HE has become preparing future professionals to be able to deal with problems and search for solutions, including digital competence as a vital skill set.

With the number of 'wicked challenges' growing around the world, the need for higher education to possess a range of collaborative and interdisciplinary skills is ever increasing (Oliver & Jorre, 2018). Recognition of the importance of ICT skills and digitalization of higher education (HE) is likewise growing, with national and international policies (e.g., International Society for Technology Education, 2016, 2017; OECD, 2015a, 2015b; Redecker, 2017) acknowledging "the need to equip all citizens with the necessary competences to use digital technologies critically and creatively" (Redecker, 2017, p. 12). Given the link that higher levels of ICT skills has with higher wages (Falck,Wiederhold, & Heimisch, 2016), and the risk of job losses in the future due to computerization and automation (Hajkowicz et al., 2016), An onus is on HE to implement digitalization strategies that will foster a range of twenty-first century skills, enabling students to use technology in flexible, adaptive and innovative ways (Claro & Ananiadou, 2009; Oliver & Jorre, 2018; Redecker, 2017). Despite earlier claims that the current generation innately possesses these skills (e.g. Prensky, 2001), a range of international empirical evidence shows this is not the case.

Mohaliket.al. (2018)studied that 88.8% of trainees have smart phone, 57.4% of trainees do not have internet connection but all training institutes have computer with internet connection. Majority of trainees are familiar with the uses of different digital devices but not familiar with its use for teaching and learning.

Li(2015)revealed thatthe student teacher use technology in the classroom was significantly correlated with their self-efficacy, perceived computer skill and technology access and support. It also suggests that the student-teachers were not more likely keeping pace with the change in the technology.

Singh (2014) studied that majority of teachers has good knowledge in MS Excel, Word package and PowerPoint application. 14% of teachers agreed that computer helps teachers to teach in more effective way. Teachers often use ICT, but due to lack of resources, majority of teachers face problem in school. Finally the study found that most of the teachers have positive attitude towards ICT use and more knowledge create more positive attitude towards ICT.

Mndzebele (2013)revealed that Ministry of education has to built an education and training system that will support the training ICT as a subject and ICT integration in teaching-learning. The suggestion of the study was, Technology should integrate in training period so that teachers can able to know how to use ICT in classroom transaction.

So all these studies conducted distinctly and less study conducted at higher education level for examining the uses of technology by teachers at higher education level. Very few studies have been conducted to examine the uses of technology by teachers for their professional development. After going through all these researches the investigator concluded at the point that no study has been conducted particularly for examining the uses of digital technology by teachers for their teaching-learning process and their professional development, especially at higher education level. Therefore, from this analysis the investigator decided to conduct a study on higher education teachers on their uses of digital technology for their teaching-learning process and their professional development.

OBJECTIVES

1. To examine the uses of Digital Technology by the teachers of higher education for teaching.
2. To examine the uses of Digital Technology by the teachers of higher education for Professional Development.

RESEARCH QUESTIONS

1. Whether teachers are using digital technology for teaching and professional development?
2. What are the hardware and software used by teachers for teaching and professional development?

DELIMITATION OF THE STUDY

The present study i.e. Academic uses of Digital Technology by Teachers at Higher Education Level has wider scope, but this study will reflects the opinion of few higher education teachers to know the uses of digital technology at higher education level by teachers. The current study delimited to 60 higher education teachers in Government and Government aided college of Odisha.

METHODS OF DATA COLLECTION

Quantitative as well as qualitative survey method was adopted for the conduct of the study. The population of the study was four government and government aided college i.e. Nayagarh (Auto) College, Nayagarh, BJB (Auto) College, Bhubaneswar, MPC (Auto) College, Jajpur, SCS (Auto) College, Puri. The sample was composed of 60 higher education teachers from four government and government aided college of Odisha. Fifteen teachers from each college who worked in regular basis were selected purposively in government and government aided college of Odisha. The researcher implemented self-developed and self standardize questionnaire for higher education teachers about social and academic uses of digital technology to collect the data from various higher education institutions. The questionnaire contains 30 items consisting of both close-ended; open-ended and checklist that is 22 items are for use of digital technology by teachers for teaching and rest eight items are for professional development.

TECHNIQUES OF DATA ANALYSIS

Quantitative and qualitative techniques were used in the analysis of data. The data collected through structured questionnaire were analysed with the help of simple quantitative analysis tosupplement and substantiate qualitative analysis. The researcher followed following steps for data analysis:

- Tabulation of collected data according to the dimension of the pre-planned objective. The table will contain the response, frequency of responses and percentage of responses.
- Factor wise analysis of data from the given table will be done.
- After analysis of those data the researcher is going to formulate findings of the study.

ANALYSIS AND INTERPRETATION

The analysis and interpretation was divided into two parts that is use of digital technology by higher education teachers for teaching and professional development. Here investigator tried to know the academic use of digital technology by teachers at higher education level on the basis of self developed questionnaire for teachers. To see the effect of uses digital technology by teachers at higher education level; percentage was carried out. Results were presented in tabular form on the basis of objectives of the study.

Uses of Digital Technology by Higher Education Teachers for Teaching Purpose

The first objective of the study is to examine the uses of digital technology by higher education teachers for their teaching purpose. The collected data are analyzed using frequency and percentage and presented in following tables.

Table 1: Availability of Digital Devices

SL. No.	Digital Devices	Residence (N=60)	College (N=60)
		Frequency (%)	Frequency(%)
1.	Desktop	45 (75%)	60 (100%)
2.	Laptop	38(63.33%)	0(0%)
3.	Tablet	9 (15%)	0(0%)
4.	I-Pad	2(3.33%)	0(0%)
5.	Smartphone	60 (100%)	0(0%)
6.	Whiteboard	0(0%)	52 (86.67%)
7.	Camera	23 (38.33%)	48 (80%)

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8.	Internet	55 (91.67%)	60 (100%)
9.	Scanner	13 (21.67%)	60 (100%)
10.	Printer	21 (35%)	60 (100%)
11.	Computer Lab	0(0%)	60 (100%)

Table 1 revealed that 91.67% of teachers have internet connection at their residence and 100% of teachers have Smartphone. Further, it is revealed that63% of teachers have laptop and 75% of teachers have desktop at their residence; 38% of teachers have digital camera and 15% of teachers have tablet at their home. Only 3.33% of teachers have i-Pad and 35% of teachers have printer at their residence. On the other hand, the above table revealed that 100% of colleges have desktop, scanner, printer, internet connection and computer lab. 86.67% of schools have interactive whiteboard and 80% of colleges have digital camera, but no colleges have laptop, tablet, i-Pad and smartphone.

Table 2: Activities Done with Desktop and Smartphone

Sl. No	Activities	Frequency (%) N= 60
1.	Preparation of PPT	53 (88.33%)
2.	Browsing e-Content	49 (81.67%)
3.	Preparation of Question paper	29 (48.33%)
4.	Practical work with students	18 (30%)
5.	Collecting TLM online	21 (35%)
6.	Administrative work	5 (8.33%)
7.	Getting sample paper	43 (71.67%)
8.	Storing information	53 (88.33%)
9.	Reading PDF/e-mail	60 (100%)
10.	Video animation	4 (6.67%)

Table 2 revealed that 88.33% of teachers use desktop and Smartphone for preparing presentation;48.33% of teachers use desktop and Smartphone for preparing question paper; 35% of teachers collect TLM online with the help of desktop and Smartphone. Further, it is revealed that8.33% of teachers do their administrative work with desktop and Smartphone; 100% of teachers read their e-mail through desktop and Smartphone. Only 81.67% of teachers uses desktop and Smartphonefor browsing e-content, again 30% of teachers do practical work with students through desktop and Smartphone.

Table 3: Various uses of Digital Technology (DT)

SL. No.	Question	Frequency(%)N=60
1.	Develop TLM digitally	47 (78.33%)
2.	DT increase teaching efficiency	57 (95%)
3.	DT increases learner's understanding	53 (88.33%)
4.	Done any online course	37 (61.67%)
5.	Participation in online community	15 (25%)
6.	Attend any seminar using DT	44 (73.33%)
7.	Need training for improvement	54 (90%)
8.	DT helps in Professional Development	60 (100%)

Table 3 revealed that 78.33% of teachers use digital technology to prepare teaching-learning materials;61.67% of teachers have done online courses; 25% of teachers have participated in online community;73.33% of teachers have attended seminar that used digital technology. Further, it is revealed that90% of teachers need training for improvement in technical competencies. Again, it is revealed that 95% of teachers think that use of digital technology increases teaching efficiency and 88.33% of teachers also think that teaching with digital technology also increases student's understanding;100% of teachers agreed that use of digital technology helps in their professional development.

Table 4: Activities Done With DT for Teaching

SL. No.	Activities	Frequency (%)N= 60
1.	Collecting information	58 (96.67%)
2.	Collecting resource materials	46 (76.67%)
3.	Preparation of presentation	56 (93.33%)
4.	Prepare tasks for students	42 (70%)
5.	Collect reference	51 (85)
6.	Getting new strategy	41 (68.33%)
7.	Preparation of TLM	39 (65%)
8.	Scanning image	42 (70%)
9.	Giving feed back	23 (38.33%)
10.	Provide assignment	28 (46.67%)

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Table 4 revealed that 96.67% of teachers use digital technology for collecting information;76.67% of teachers use digital technology to collect various resource materials;93.33% of teachers use digital technology to prepare presentation; 85% teachers use digital technology to collect reference. Further, it is revealed that 68.33% of teachers use technology for getting new strategies of teaching; 65% of teachers use digital technology to prepare TLM; 70% of teachers use technology to scan image. Again, it is revealed that 46.67% of teachers use digital technology for providing assignments to the students.

Uses of Digital Technology by Teachers at Higher Education level for their Professional Development

The second objective of the study is to examine the uses of digital technology by teachers at higher education level for their professional development. The data are given through tables which has been collected using self-made questionnaire and analyses are done using frequency and percentage.

Table 5: Activities Done with DT for Professional Development

SL. No.	Activities	Frequency (%)N= 60
1.	Action Research	49 (81.67%)
2.	Assessing learners	32 (53.33%)
3.	Admission work	60 (100%)
4.	Administrative work	36 (60%)
5.	Publishing Articles/ chapters/ books etc.	55 (91.67%)
6.	Presented/ participated in seminars/ conferences/ workshop etc	42(70)
7.	Different online courses	41(68.33%)
8.	Getting information about PD activity	45(75%)
9.	Self study	51 (85%)

Table 5 revealed that 81.67% of teachers do action research through technology;53.33% of teachers use digital technology for assessing the learners;100% of teachers do admission work with the help of digital technology. Further, it is revealed that 91.67% of teachers use technology for publishing articles/ chapters/ books etc. and 42% of teachers use technology for presenting/ participating in seminars/ conference etc. Again, it is revealed that 75% of teachers get information about professional development. Among all these, 85% of teachers use digital technology for self-study.

DISCUSSION

The study found that teachers are using digital technology very often in teaching. Teachers are making proper use of desktop, laptop, smartphone, internet, software like MS Word, MS PowerPoint and applications like WhatsApp, facebook, twitter, khan Academy and e-Pathshala etc. Teachers have positive perception toward teaching with interactive whiteboard. So in overall view teachers gave positive opinion towards using digital technology. But there are many barriers for not using digital technology that is insufficient time, lack of resources and also pressure from administration.This result is supported by Li, Lan (2015), who conducted a study on how and why digital generation teachers use technology in the classroom and found that most of the teachers have competency in technology and they are using significantly in classroom, but this study also oppose that some teachers are not aware of the regular development in technology. Sigh (2014) conducted a study on teachers' readiness on ICT integration in teaching-learning: a Malaysian case study and found that most of the teachers have positive attitude towards using ICT in teaching-learning process. But result of this study is contradicting the findings of Mohalik (2018) who conducted study on digital literacy among teacher trainees at reflected that though majority trainees are familiar with digital technology, but they don't know how to use it in teaching-learning process. Mndzebele (2013) conducted a study on Teachers readiness in using ICT in classroom and found that though teachers have interest to use technology in teaching-learning process, but school does not have enough resource to support it.

The second important findings indicates that are teachers are getting many helps from digital technology in their professional development such as they are doing action research, assessment, doing online course, finding new job and also getting higher degree etc. So teachers are saying that digital technology is not only useful in teaching but also becoming an integral part of professional development.The result is supported by Mwalongo(2011) who conducted a study on teacher's perception about ICT for teaching, professional development, administration and personal use and found that teachers are using ICT more in professional development and are getting various kinds of benefit in their profession when digital technology is integrated.

From the findings of the present study and the supported research it is concluded that, it may be due to the fact that teachers are getting more benefits in teaching when use digital technology, as it gives quick and accurate access of answers, it may be due to lack of resources at school which causes lack of interest in teacher to use digital technology in teaching. It may be due to that teachers are getting so many pressure from administrative department to complete the course, prepare students for exam etc, so they are not getting enough time to use digital technology in teaching, but they are still admitting that digital technology is really very helpful in teaching especially in higher education.This finding also may be due to teachers are comparing the developmental rate in their profession with and without integrating digital technology and got the answer that digital technology is really helpful in their professional development. It may be due to any teacher who has sufficient knowledge in digital technology and use it in their professional development that may be for getting new higher degree or to do any online course and after getting positive impact s/he may have suggested other teachers to use digital technology in their professional development.

EDUCATIONAL IMPLICATIONS

- Now every classroom is constructivist and integrating digital technology, so teacher should aware about new strategies of teaching.
- Technology becomes that much advance that various courses can be done online for professional development and for getting higher degree. So teachers should take orientation programme to aware about the benefits of online course and professional development.
- Digital technology is not only helpful for teaching but also used in professional development.
- Teacher should take extra class or seminar to teach students about new social networking applications especially their features in learning areas.
- Teachers should take more class to teach in an effective way using digital technology and try to increase student's interest towards using digital technology.
- Proper training should be given how to prepare PPT and for that they can get ideas from Slid share application, training should be given on preparing TLM online and how to develop e-content, so that it would be helpful for their professional development.
- Digital technologies can be included in teaching as well as administrative work. Educational planner should include these teachers in curriculum development, so that curriculum can formed according to student's need and also it will include subject containing technical knowledge.
- Government should provide training programme not only for teacher but also for student-teacher and teacher educators in teacher training institute to give them ideas about the uses of these applications in teaching-learning process.

CONCLUSION

The study on uses of digital technology by teachers at Higher education level conducted on government and government aided college of Odisha is a survey research who gave a positive result that is teachers were using digital technology. The study uncovers that teachers were aware of using digital technology in teaching-learning process, but all teachers are not familiar with digital technology. But teachers need orientation programme to get updated with various emerging uses of digital technology in teaching as well as professional development. The study has been conducted in a short period so the investigator cannot cover all possible dimensions, but if further study is done on this issue then many changes can bring in the area of digital technology in teaching-learning process. Every classroom can be converted to digital classroom and every subject will include digital strategies to make the learning more practical an effective.

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