

Teachers Perception of Instructional Technology Integration in the Classrooms in Colleges of Education in Borno State, NIGERIA

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Abstract: Descriptive survey design was used for this study. The population of the study comprised of 150 lecturers (105 males and 45 females) from two colleges of education in the state, which was obtained through random sampling. The colleges are: College of Education, Waka Biu and Sir Kashim College of Education, Maiduguri, while Umar Ibn Ibrahim Elkenemi College of science and Technology, Bama could not be reached due to insecurity. The instrument used for data collection was a structured questionnaire adopted from Mills and Tincher (2003). The instrument was pilot tested on twelve teachers, from Federal College of Education, Yola, Adamawa state. The internal consistency was determined using cronbarch alpha reliability coefficient, which yielded 0.89. The data gathered from the questionnaire were analyzed using mean, standard deviation, Z-test and ANOVA. The mean and standard deviation was used to answer research questions, while the Z-test and ANOVA were used to test the hypothesis at 0.05 level of significance. The result shows that teachers use technology for professional productivity and to facilitate and deliver instruction, but do not integrate technology as well into teaching and learning. It also showed that age, gender and years of teaching experience has no significant effect on teachers' technology integration and use in the classroom. The study recommends among other that professional development opportunities such as seminars, workshops conferences should always be organized for teachers to bring teachers together to discuss and share ideas and learn new technology for integrating technology into the classroom.

1. INTRODUCTION

Effective integration of technology is determined by many factors, but the most important factor is the teachers' competence and ability to shape instructional technology activities to meet students' needs. Teachers know their content and pedagogy, but when it comes to technology, teachers often learn along with students. Teachers focus on teaching students first-level technology skills, which include how to work with the technology, but many teachers ignore the second level skills of knowledge integration and a deeper understanding of analyzing information (Fulton, 1997). Sheingold (1990) said integrating technology in the classroom is not about teaching students to operate computers, but integrating technology is about helping teachers to use technology as a tool for learning. Fulton (1997) used technology fluency to describe the changing definition of what students need to know about technology. Fulton indicated that teachers model technology fluency by using technology in the classroom, applying technology across the curriculum, and integrating technology to facilitate collaboration and cooperation among students. Bauer and Kenton (2005) said that computer technology is an effective way to widen educational opportunities, but teachers are not using technology as an instructional delivery system. Bauer and Kenton's found that teachers were highly educated and skilled with using technology, but teachers were not integrating technology on a consistent basis in the teaching and learning process.

Ertmer, Conklin, Lewandowski, Osika, Selo, and Wignall (2003) indicated that beginning teachers wanted to use technology and have adequate technical skills, but teachers lacked knowledge on how to integrate technology in teaching and learning. Technology integration is not a 'one size fits all' (Wepner, Tao, & Ziomek, 2006) where teachers do the same thing for their students or where teachers possess the same specific skills to be competent technology users. Teachers need to know how and why to use technology in meaningful ways in the learning process for technology integration to work. Borno state government has made initiatives to integrate technology into teaching and learning processes. Amongst such initiatives is compulsory ICT literacy for all teachers. Several important objectives of the initiative were that teachers (a) developed technology-supported activities that promote, worthwhile learning, (b) used integration practices related to instructional technology, and (c) modeled life-long learning using technology amongst others. This initiative was to establish a growing cadre of highly trained educators who change teaching and learning through the integration of technology into the curriculum. From the above background, this study tends to assess teachers perception of integration of instructional technology in the classroom in higher education in Borno state

2. RELATED LITERATURE

Dockstader (2009) indicated that integrating technology in the classroom is a complex process that includes (a) learning the technology, (b) using technology in the teaching and learning process, and (c) integrating technology to enhance student learning. Sherritt and Basom (1996) said schools were becoming ineffective at preparing students for life and work because the requirements of successful life and work conditions changed. Schools did a good job of educating students for an industrial age but not for the information age. Jaffee (2017) outlined four highly valued pedagogical principles practiced in the classroom where technology is integrated: active learning, mediation, collaboration, and interactivity. Active learning using technology involves student interaction with the content that allows knowledge building and construction. Mediation is interaction between the teacher and the students to solve problems, respond to questions, and discuss topics relating to the course. Collaboration is interaction among students through questions and information sharing. The principle that represented the greatest pedagogical potential for learning using technology is interactivity. Interactivity is the master concept where active participation is building the understanding and knowledge through interaction with other students, teachers, and resources using technology.

Active Learning: Alley and Jansak (2001b) identified several characteristics of active learning using technology in the classroom: (a) students engaged in active learning using technology focus attention on the activity and (b) students motivated by using technology actively in different contexts apply the new skills. Barak, Lipson, and Lerman (2006) indicated that using technology for active learning keeps students focused, engaged, and motivated.

Mediation: Schroeder (2013) believed that technology is the mechanism for increasing the amount of human-to-human interaction between teachers and students in the classroom and is used by teachers for interaction to meet the needs of the students' changing learning styles. Hawkey (2002) said information and communication technology enables learners to acquire transferable skills and use their learning styles in the educational process. Fitch (2004) said if the teacher learner ratio is such that learners do not have opportunities to interact with other students or teachers, technology works to increase interaction. Collaboration: Jurist (2009) found that technology changed teacher practices in teaching and learning because the classroom became more student-centered rather than teacher-centered. Teacher roles moved from lecturer and expert to collaborator and facilitator. Student roles changed from passive listener to collaborator and occasional expert. Educational goals changed from memorization of facts to inquiry, invention, and investigation.

Interactivity: Alley and Jansak (2001a) stated that the teachers' best strategy to prepare for teaching is to use important teaching principles, translate these principles into practices, and think creatively while using technology instruction methods. Padgett and Conceicao-Runlee (2000) believed interactive hands-on sessions are critical for mastering new computer technology skills. Pantasiz (2002) indicated that technology-enabled learning is becoming an integral part of the learning process because the power of technology leverages information to eliminate the one-size fits all approach and customizes content to meet individual needs and learning styles. The integration of technology into the course design and assignments is the critical point for using technology to improve learning (Sherer & Shea, 2002).

The difference between technology use and technology integration for learning is that integration implies full-time, daily operation within lessons. Integration of technology is dependent on technology for delivery of classroom lessons (Hooper & Rieber, 1999). Technology integration is not about the availability of technology, but more about the teachers' effective use of technology that makes a difference in reforming the classroom. The teacher is the most important ingredient for

success when using and integrating technology (Mandell, Sorge, & Russell, 2002). Beckett, Wetzel, Chishlom, Zambo, Buss, Padgett, Williams and Odom (2003) said teachers are central to the creation of a technology-integrated environment that is learner-centered and motivating. Without teachers who can integrate technology? Students' exposure to technology remains limited and inequitable.

3. OBJECTIVES OF THE STUDY

The main objective of this study is to assess teachers' perception on instructional technology integration in classroom in colleges of education in Borno state. The specific objectives are to:

1. determined how teachers integrate and use technology
2. compared teachers' integration of instructional technology based on characteristics of gender, age, and years of teaching experience.

4. RESEARCH QUESTIONS

1. How do teachers currently use and integrate technology for teaching and learning in the classroom?
2. How do teachers differ in the extent to which they integrate instructional technology based on the characteristics of gender, age and teaching experience?

Scope of the Study

This research is confined to integration of instructional technologies in colleges of education only in Borno state.

5. METHODOLOGY

Descriptive survey design was used for this study. The population of the study comprised of 150 lecturers (105 males and 45 females) from two colleges of education in the state, which was obtained through random sampling. The colleges are: College of Education, Waka Biu and Sir Kashim College of Education, Maiduguru, as Umar Ibn Elkenemi College of science and Technology, Bama could not be reached due to insecurity. The instrument used for data collection was a structured questionnaire adopted from Mills and Tincher (2003). Mills and Tincher developed Technology Integration Standards Configuration Matrix (TISCM) as a model for determining technology integration by teachers. Mills and Tincher's survey was organized and developed by identifying instructional strategies that demonstrate appropriate use of technology for enhancing student learning in the classroom. The instructional strategies were set up along a continuum from using technology as a tool for productivity to using technology for enhancing student learning to using technology as a tool for professional productivity. The process of developing the instrument attempted to show a true and accurate gradient of technology integration with reasonable validity and reliability. The results of the data analysis of the study supported the construct validity of the TISCM and showed that the TISCM was an effective tool to determine technology integration by teachers (Mills & Tincher, 2003). Mills created another version of the Technology Integration Matrix (TICM) that is more user-friendly and emphasizes what teachers do and what students do in a technology-rich classroom (Mills, 2004). The Technology Integration Matrix (TICM) was used in this study to determine technology integration by teachers. The instrument was pilot tested on twelve teachers, from Federal College of Education, Yola, Adamawa state. The internal consistency was determined using cronbarch alpha reliability coefficient, which yielded 0.89. The instrument was distributed to the respondents personally by researcher and was retrieved one week after administration. The data gathered from the questionnaire were analyzed using mean, standard deviation Z-test and ANOVA. The mean and standard deviation was used to answer research questions, while the Z-test and ANOVA were used to test the hypotheses at 0.05 degree of level of confidence. When the Z-calculated is greater than or equal to the Z-table values, the hypothesis was rejected and where otherwise, the hypothesis was accepted

6. RESULTS

Findings are presented according to the research questions for the study. The tables are associated with a particular research question. The appropriate mean and standard deviation data are shown for the items on the survey. Responses are listed in the tables in descending order by means.

Technology Integration and Use

For the research question on teachers' integration of technology for teaching and learning in the classroom (survey items 1-19). The results in Table 1 showed that survey items 1-6 identified teachers as operators who use technology for professional productivity. Survey items 7-12 identified teachers as facilitators who deliver instruction using technology, and survey items 13-19 identified teachers as those who integrate technology into student learning. The Table shows the technology integration means and standard deviations for the survey items. The items are ordered by means within the three phases with teachers' responses on the items as (1) never, (2) seldom, (3) sometimes, (4) often, and (5) always to technology integration. For teachers as operators who use technology for professional productivity, respondents agreed most strongly (M= 4.41) that they perform basic file management tasks. For teachers as facilitators who deliver instruction using technology, respondents agreed most strongly that they practice and model responsible use of technology (M = 4.26). For teachers as those who integrate technology into student learning, respondents agreed most strongly that they use technology resources to provide learning context using problem solving and critical thinking (M = 3.40). The lowest mean for teachers as operators who use technology for professional productivity as indicated by the respondents was applying trouble-shooting strategies (M = 3.73). The lowest mean for teachers as facilitators who deliver instruction using technology was demonstrating strategies to assess the validity and reliability of data gathered with technology (M = 3.28), and for teachers as those who integrate technology into student learning, the lowest mean was engaging learners in the development of electronic portfolios (M = 2.21). Standard deviations increase as responses get closer to the scale midpoint, while the means decrease.

Table 1: Mean of Teachers 'Integration of Technology in the Classroom

S/N	Survey Items	X	SD
1	Perform basic file management tasks	4.41	0.84
2	Operate common technology	4.20	0.95
3	Use technology to communicate and collaborate	4.11	0.93
4	Use software productivity tools	3.83	1.00
5	Use technology to locate, evaluate, and collect educational research	3.79	0.96
6	Apply trouble-shooting strategies	3.73	1.00
7	Practice and model responsible use of technology	4.26	0.84
8	Facilitate equitable access to technology	4.09	0.95
9	Manage student learning activities in a technology-enhanced environment	3.95	0.93
10	Evaluate and select informational and educational	3.72	1.00
12	Use multiple technology contexts and a variety of productivity tools	3.67	0.96
13	Demonstrate strategies to assess the validity and reliability of data gathered with technology.	3.28	1.00
14	Use technology resources to provide learning context requiring the use of problem solving, critical thinking	3.40	0.98
15	Employ technology with students use to solve authentic problems	3.36	1.03
16	Implement technology-based learning experiences that utilize a variety of grouping strategies	3.35	1.00
17	Apply multiple methods of evaluation and assessment	3.22	1.02
18	Use technology resources and productivity tools to collect, analyze, interpret, and communicate learner performance	2.88	1.18
19	Engage learners in the development of electronic portfolios	2.21	1.19

Table 2: Mean of Teachers' Current Uses of Technology

S/N	Survey Items	X	SD
20	Word processing software	4.14	0.84
21	Internet research or searches in the classroom	3.68	0.98
22	Presentation software	3.65	1.03
23	Digital camera	3.37	1.02
24	Graphics software	2.84	1.14
25	Spreadsheet software	2.83	1.13
26	Computer-based digital presentation technology	2.83	1.43
27	Email in course delivery	2.47	1.46
28	Database software	2.30	1.14
29	Concept mapping	2.24	1.07
30	Student web page/multimedia	2.06	1.28
31	Course management software	1.93	1.34
32	Electronic portfolios	1.76	1.06
33	Specialized, discipline specific software	1.70	1.14
34	video conferencing	1.69	1.17
35	Web-based collaboration programs	1.64	0.93
36	Wikipedia	1.49	0.81

Survey questions 20-36 in the technology integration survey focused on teachers' use of technology for teaching and learning in the classroom. The technology used by teachers with the mean of responses and standard deviations on the survey corresponding to use in the class were weighted as never (1), seldom (2), sometimes (3), often (4), and always (5). The applications of word processing (M = 4.14), Internet browsers (M= 3.68), presentation software (M =3.65), digital cameras/scanners (M= 3.37), and graphics program (M= 2.84) were the most commonly used technology software by teachers in the classroom. The least used technology software was video conferencing (M = 1.69), web-based collaboration programs (M = 1.64), and blogs/Wikipedia (M =1.49).

Table 3: Differences in Perceptions Regarding Technology Integration and Uses Based on Gender

Items	Mean		Z- Cal.	Z-Crit.
	Male	Female		
Technology Integration	3.52	3.67	0.86	1.96
Technology Uses	2.51	2.51	-0.05	1.96

From Table 3 above, the independent-samples Z-test indicated that the Z-calculated values (0.86 and – 0.05) are less than t critical value (1.96), implying that there are no significant differences in the means of males and females when looking at technology integration and use.

Table 4: Differences in Perceptions Regarding Technology Integration and Uses Based on Age

Items	Mean			F-Cal	P-value
	0-30 years	31-50years	50 Above		
Technology Integration	3.97	3.67	3.58	0.91	0.44
Technology Uses	2.78	2.44	2.54	1.07	0.35

Table 4 shows a one-way ANOVA comparing the means of age ranges of teachers who completed the survey. The means, values of F, and significance levels are listed in the table. No significant differences were found for technology integration and technology uses based on age.

Table 5: Differences in Perceptions Regarding Technology Integration and Uses Based on Years of teaching Experience

Items	Mean			F-Cal	P-value
	0-10 years	11-20years	21 Above		
Technology Integration	3.73	3.65	3.58	0.602	0.614
Technology Uses	2.41	2.52	2.50	0.608	0.611

Table 5 above shows a one-way ANOVA comparing the means of years of teaching experience for respondents. The result shows no significant difference for technology integration and technology uses based on teaching experience.

7. FINDINGS OF THE STUDY

1. Teachers use technology for professional productivity and to facilitate and deliver instruction, but do not integrate technology as well into teaching and learning.
2. Based on research the teacher is considered an important factor for success when using and integrating technology. The findings indicated that teachers are able to use technology for professional productivity and to facilitate and deliver instruction better than they are able to use technology for integration into teaching and-learning.
3. The findings also shows that age, gender and years of teaching experience has no significant effect on teachers technology integration and use in the classroom.

8. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

From the result of these findings, it is concluded that teachers do not integrate technology into teaching and learning but use technology only for professional productivity.

Recommendations

1. Professional development opportunities such as seminars, workshops conferences should always be organized for teachers to bring teachers together to discuss and share ideas and learn new technology for integrating technology into the classroom.
2. Administrators and school leaders must recognize that it takes time to integrate technology. Teachers are busy teaching in the classroom and need more time for learning, planning, and preparation to integrate technology.
3. Administrators need to identify ways to help teachers find more time during the day or give extra rewards for using the teachers' weekends and summers to integrate technology into classroom lessons.
4. Administrators should continue to look for effective and efficient means to assist teachers in helping each other learn new technologies.

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