

**TEACHING STAFF PRODUCTIVITY AN HINGE ON INFORMATION AND
COMMUNICATION TECHNOLOGY (ICT): A CASE STUDY OF BENSON
IDAHOSA UNIVERSITY, BENIN CITY, EDO STATE.**

ABSTRACT: *The burden and assertion on the quality of teaching staff in an academic institution has recently become a discussion nationwide and this is owned to the claim of a possible huge resources committed to education sector without commensurate results. The cry for the integration of Information and Communication Technology into school learning curriculum has further raised the hope of people on maximum productivity of teaching staff in tertiary institution. However, this seems to be eluding because, institution on a yearly basis produces students who are not ICT oriented, thereby, leaving the general public with question of teacher's productivity. In this paper, a survey was conducted to ascertain the level of ICT compliance on teaching staff productivity and in addition, review was carried out to know if ICT has direct impact on teaching quality as well as proffer possible solutions that could aid smooth delivering of lecture methodology that is ICT compliance. From the analysis, it was observed that most of the respondents agreed with the fact that ICT role has tremendous impact on the quality of teaching staff productivity. The standard value of 2.5 mean showed clearly that the respondents calculated value which is 2.66 empirically demonstrated that the majority of the respondents are in agreement that ICT plays a tangible role in the teaching staff productivity.*

Keywords: *Productivity, Respondents, ICT, Quality, Empirical and Assertions*

I. INTRODUCTION

Information and Communication Technology (ICT) is an electronics revolution that is sweeping across all spheres of human endeavors and has bridged the gap in academic learning and other aspects of human existence. Today, thousands of different computer devices can communicate without barrier and this is owned to the handshaking technology (Synchronous and Asynchronous). Several aspects of human such as capacity building and others have increased due to the knowledge of Information and Communication Technology (ICT). Haman endeavors such as business transactions, industrial operations, educational program, research and development have all gained exponential awareness.

[1] In his view, sees Information and Communication Technology (ICT) as revolution that involves the use of computers, internet and other telecommunication technologies in every aspects of human endeavour. From his view, it is opined that there is hardly any home or organization without ICT. In another view by [2], ICT is seen as a processing and sharing of information using all kinds of electronic devices, an umbrella that includes all technologies for the manipulation and communication of information. To further buttress the above claim, [3] said that ICT as an electronic or computerized devices, directly assisted by human and interactive materials can be used for a wide range of teaching and learning as well as for personal use.

44 Education is an emblem which has direct impact on how human live, work, think, and
45 socialize. It is accumulative process to which society evaluate morals, value, skills as well as
46 the echo of systematic instruction that facilitate learning. Education is incomplete without
47 instructors or instructional materials that generate and instill endow basic knowledge, skills,
48 ideals, attitude, lifestyle, and policy into human norms. Education is built around setting
49 objectives and principles. These objectives are usually the roadmap to achieving societal
50 development and attainment. Information and Communication Technology (ICT) in recent
51 times has become formidable tool in the attainment of these objectives.

52 **II. RELATED WORK**

53 Accesses to research material and information exchange across all networks have become so
54 tangible with modern gadgets. Information and Communication Technology (ICT) is a tool
55 which enables information decentralization across geographical boundaries. ICT facilitates
56 knowledge base exploration and this is often seen from content base sharing. The past few
57 decades saw information relegated to geographical boundaries but this was majorly owned to
58 system engender. The era saw different gadgets communicate separately and handshaking
59 between devices was considered a barrier. However, the era also saw the introduction of
60 Open System Interconnection (OSI) model to which was the adherence model by all
61 manufacturers and this model over the years has bridged the gap. OSI is a seven layer model
62 which demonstrate how information is to be transmitted between two or more connected
63 devices [4, 5]. The OSI model has largely revolutionized data communication thereby giving
64 room for communication exploration in an out of remote areas. The integrated platform
65 engineered by the OSI model is the root of modern development in ICT. According [6] ICT
66 cross sessional session involves retrieval, storage, translation, access, processing and
67 transmission of information with coherent effective devices. ICT provides fundamental
68 guidelines for social and economic blue print which in turn create sustainable and people
69 oriented development.

70 [7] Noted that ICT is the roadmap to improvement in the buildup of effective and efficient
71 enterprises resource allocation which translates to evidential development in a society. In the
72 other hand, [8] said that ICT role in higher education and development is twofold. They
73 explained that ICT allows countries to systematically grow their economic into a modernized
74 production chain system. ICT role in higher education cannot be overemphasized and this is
75 due to the social economy benefit it brings to ford that is directly felt by all irrespective of
76 age. [8] Stressed that outside classroom use, ICT enrich content base curriculum as well as
77 teaching techniques of instructors. In their view, they said researches that translate to viable
78 development are some of the merit of ICT which cannot be ignored by countries who pride
79 on sustainable education for her citizens. Modern education in 21st century (from primary to
80 higher education) sees ICT as an integral part. Different levels of modern school uses ICT to
81 streamline the downfall associated with ancient education. [9] Revealed that ICT usage by
82 academics within universities was low. In their remarks, even when it is obvious of its merit
83 to educational sector such as enhancing and facilitating quality teaching but it usage in
84 Nigeria's higher institutions is indeed an issue for concern. [10] In a published paper agreed
85 to the above assertion of [9] by stating clearly that the benefit ICT offers is well understood
86 by academics but several complains on ICT competence. [8] In a survey of selected higher

87 institutions in Nigeria observed that the usage of ICT facilities was based on the affordable
88 nature. From the study, it was observed that the institutions survey though, equipped with
89 modern ICT facilities but its accessibility has begun to be a serious setback to the objectives of
90 e-learning. On the same vein, they said though, the institutions could boast of their attainment
91 in ICT compliance but many offices, classrooms, laboratories are totally blank to its access
92 which indeed is a worrisome situation. In the submission of [11], it was clarified that time
93 delivering of information is paramount to meeting the set goal of model development and
94 ICT serves as a means of conveying speedy, timely and concise information. [12, 13] In
95 separate assertions said the low level of ICT attitudinal change by both policy maker and end
96 users in various higher institutions is worrisome. To foster rapid ICT usage, the process to
97 attitudinal change must be addressed from grassroots. Attention should be given to training
98 and retraining of staff so as to instill the mentality of not just the benefit of ICT but as
99 production chain of modern development. [14] Showed that ICT plays vital role in the
100 efficiency of educational process by way of study and teaching methodology reengineering
101 which cut across students learning assessment and other aspects that facilitate and enhance
102 student teachers relationship [15]. Bringing to the understanding of readers, [16] reported that
103 ICT has found an increasing factor in its daily usage by teachers.
104 [17] Showed that ICT facilities such as computer base programs for marking student's script
105 could save time teachers used in marking script if adopted. This claim by [17] has seen the
106 light of day with modern method of administering examination and marking script. The
107 Computer Base Test (CBT) currently being conducted by Joint Admission and Matriculation
108 Board (JAMB) and General Studies Test (GST) Computer Based Examination (CBE)
109 conducted by Benson Idahosa University, Benin City is an attestation to the postulation of the
110 above claim by [17]. [18] Identified the role of ICT in teacher's innovative enhancement. A
111 research by [15] showed that on the average, teachers agreed to the fact that ICT has
112 increased student and classroom academic performance.

113 114 **III. EDUCATIONAL EVOLUTION**

115 Education evolution has been a long term process in Nigeria. Prior to modern educational
116 method or evolution, Nigeria had long found a means of ensuring transmission of knowledge
117 from one generation to another. Though, faced with enormous barriers but several
118 mechanisms such as observation, experience, authority and mentorship have been adopted thus
119 far which indeed has yielded positive remarks since the era of our forefathers. This long age
120 method of teaching is known to be the old method of teaching [19, 20]. According to [21]
121 'Traditional Education is a direct order by teacher to students learning through memorization
122 as well as other techniques which increases their mental ability/capacity needed for problem
123 solving. This method develops student quest for critical thinking ability to problem solving as
124 well as risk awareness [22]. Notwithstanding, education in Nigeria is in a transition state and
125 knowing fully that education evolution is more of process than a method the old method has
126 yielded to the evolutionary process of transformation which has given way to modern and
127 technological impact in the educational institution in Nigeria [23, 24].
128 Early education in Nigeria saw the informal education where learning was done by
129 observation; a typical example to the informal learning is learning method used in raising
130 children at home. This could be via authority, observation, practice etc. this method, though

131 still in use in modern education, however, so much emphasis has been placed on the formal
132 education which to the author has attributed to the increase in social vices affecting the
133 Nigeria as a country. Many parents have left their duties of parenting to school teachers and
134 administrators with the idea of getting the best out of them but this is necessary not true
135 because, no matter how good formal education can be it still would not solve the problem of
136 informal education. Notwithstanding, this advancement in education has created better
137 methods of teaching in all levels of education. Formal education that used to be stereotype in
138 the late 80s and 90s has suddenly become dynamic as a result of Information and
139 Communication Technology (ICT) introduction to all levels of education institution [25, 26].

140

141 **IV. ICT AND TEACHING STAFF**

142 Naturally, Information and Communication Technology effective output is centre on the task
143 accomplishment as well as its application. It serves as a means of improving efficiency in all
144 aspects of human endeavour not necessary academic institution only. ICT for more than a
145 decade has become a vehicle for data transmission and storage. There are more to ICT
146 expansion of world view; its facilities has gone beyond world expectation to more profound
147 area such as data exchanging, teaching, distance learning, electronics learning, all round
148 research storage, artificial intelligence etc [27, 28]. However, **in spite** of these attributes
149 associated with ICT there are few questions and answers that have negated the speedy
150 progress and its impact on teaching staff and these are:

151 **1. Competence**

152 It is true that one can get job by way of merit and luck but in Nigeria it has been observed to
153 be the closeness to prominent members of the society but **in spite** of this, the only thing that
154 keeps one on the job as well as the right book of the employer is the competence nature of
155 employee. Computer as a field could be seen as complex when not with the technical ability.
156 However, computer as electronics machine has an embedded guidelines or procedure of
157 usage which teaches users what to do. In this paper, we shall define competence as the extra
158 ordinary ability to carry out an assigned duty with little or no supervision. But in case of
159 computer competence it deals with being able to carry out divers function of computer
160 operation and it is based on this premise that computer users as classified as followed:

- 161 i. Application Oriented User
- 162 ii. Goal Oriented User
- 163 iii. Computer Oriented User

164 These classifications centered on different types of users; while some do well with the
165 computer applications some uses it to attain a goal base on the specific nature of the set goal
166 but most versatile among the users is the computer oriented user which specializes in almost
167 all aspects of the computer. Teacher competence in computer is the ability to use ICT
168 curriculum base to not only communicate to the student but also to teach and enhance their
169 academic capabilities via relevant research instruments [29].

170

171

172 **2. Effectiveness**

173 Being competent using computer to teach student is one aspect, it is also another aspects to be
174 effective and being competence does not translate to effectiveness. However, it is a thin line
175 separating them. Effectiveness using ICT means the technical translation of ICT competence
176 to timely and perfect delivering of the desire goal of ICT integration into educational
177 curriculum. Teachers that are not effective with assigned courses will definitely have issue
178 with using ICT to aid the knowledge to students. Directly or indirectly, teacher's
179 effectiveness is proportional to the level of teaching quality [30].

180

181 **3. Experience**

182 This is one aspect of teaching that cannot be acquired through class room or certificate. To a
183 very large extent, experience is regarded as one of the best teachers because it enables first
184 hand information of what the nitty-gritty of the task ahead. Though, there is no collaboration
185 of its influence in the use of ICT but it could be ascertained that teachers that have use ICT in
186 one way or the other will likely know the impact on students compare to a teacher without
187 ICT teaching experience. So, Teacher experience is significant and proportional to use of ICT
188 facilities. Computer is one of the ICT facilities and any teacher in 21st that still could not use
189 it neither have experience or what so ever because those with the experience find it easy with
190 the integration of ICT based curriculum [31] .

191

191 **4. Motivation**

192 Motivation is one key aspect of ICT class room or curriculum based integration that has over
193 the years met brick wall. While many academic institutions focuses on the acquisition of ICT
194 facilities to enhancing students capacity in learning little attention is gear towards staff
195 motivation on the use of ICT. Research had it that many schools abide with the policy of ICT
196 based student education but has failed in the area of staff motivation on the need to making it
197 part of the daily teaching. No company succeed without motivation, some organization used
198 several means such as additional incentives to encourage staff for maximum productivity. It
199 may be argued that the use of motivation and ICT usage has no correlation. This claim might
200 not be true base on the fact that for every task motivation is a catalyst to achieving the desire
201 result. Teachers with ICT ability needs encouragement because it foster the zeal to continue
202 teaching students and integrating all aspects of ICT in classroom [32].

203

204 **V. ANALYSIS OF SAMPLE DATA**

205 To ascertain the role of ICT in staff of Benson Idahosa University, a descriptive survey
206 research was used. It involves a one-time observation of independent and non manipulated
207 variable. Data collected was organized in line with standard best practices, in this research;
208 direct survey was used to give clear information as well as answers to the role of ICT in staff
209 productive. Furthermore, the study was narrowed down to Benson Idahosa University Staff
210 because it is believed that the result from the survey will show the true picture of ICT role in
211 her staff enhancement. To do this, a population of both male and female teaching staff of
212 Benson Idahosa University was sampled. It was observed that the number of teaching staff in
213 Benson Idahosa University is between the ranges of 300 to 400.

214 **a. Research Instrument**

215 This study employed questionnaire as the instrument for direct data collection and it was
216 made up of several sections that enabled all rounds data gathering as well as vital information

217 from respondents on the role of Information and Communication Technology on teaching
 218 staff productivity in Benson Idahosa University.

219 **b. Method of data analysis**

220 Data collected from the field was analyzed using SPSS to ascertain the frequency
 221 distribution, mean, standard deviation. While the hypothesis was tested using T – test at a
 222 0.05 level of significance.

223 **c. Decision Rule**

224 A mean value of 2.41 was used as the basis upon which results were accepted for the purpose
 225 of generalization. The decision rule is in line with the three methods used to specify a good
 226 bet of any case.

227 **VI. RESULTS TABULATION**

228 The presentation of results of the study was analysis using SPSS as the analysis tool.
 229 Percentage, frequency distribution and mean which were based on the total number of
 230 response obtained from the respondents were evaluated and tabulated accordingly. At the end
 231 of the analysis, conclusions were drawn on the basis of the obtained data from the
 232 respondents on the role of Information and Communication Technology on teaching staff
 233 productivity in Benson Idahosa University.

234 **a. Research Respondents.**

235 The table below showed the analysis of data obtained through the questionnaires as well as
 236 the distribution and retrieval of questionnaires.

237 Table 1: Number of respondents

| S/N | INSTITUTION | NUMBER OF QUESTIONNAIRES ISSUED | NUMBER OF QUESTIONNAIRES RETRIEVED |
|-----|------------------------|---------------------------------|------------------------------------|
| | Male Academic staffs | 100 | 100 |
| | Female academic staffs | 100 | 100 |
| | Total | 200 | 200 |

238
 239 Table 1 showed that 100% response rate was obtained from the respondents. What this means
 240 is that the total number of questionnaires distributed as indicated in Table 1 were completed
 241 and returned.

242 **b. Research Question 1:**

243 The section focused on extent of ICT role in Benson Idahosa University (BIU) with one to six
 244 sub questions. The answers obtained were analyzed using the mean, and standard deviation
 245 benchmark set in the decision rule above

246 Table 2: Extent of ICT role on Staff of BIU

| S/N | ITEMS STATEMENT | \bar{x} | SD | REMARK |
|-----|-----------------|-----------|----|--------|
|-----|-----------------|-----------|----|--------|

| | | | | |
|----|---|------|------|----------|
| 1. | BIU academic staff are compliant with ICT | 2.47 | 1.06 | Disagree |
| 2. | BIU academic staff are efficient with the use of ICT | 2.39 | 1.05 | Disagree |
| 3. | BIU academic staff are resourceful with the use of ICT | 3.90 | 1.44 | Agree |
| 4. | ICT is used on a regular basis by the academic staff of BIU | 2.47 | 1.20 | Disagree |
| 5. | BIU teaching staff are computer literates | 2.41 | 1.05 | Disagree |
| 6. | BIU academic staff have access to computer and other ICT Device | 2.30 | 0.94 | Disagree |

247 **Key: Mean \bar{x} , Standard Deviation (SD)**

248 As indicated in Table 2 it showed that item 3 is the only area the staff agreed following the
 249 2.41 benchmark. From the Table 2 it could be said that Benson Idahosa University (BIU) has
 250 failed to comply fully with the educational policy of ICT integration into classroom activities.

251 **c. Research Question 3:**

252 Question sort to know how the use of ICT affect Benson Idahosa University Staff
 253 productivity. The collected answers span through items seven to fifteen and were analyzed as
 254 stated in Table 3 below.

255 Table 3: ICT effect on Staff Productivity

| S/N | ITEMS STATEMENT | \bar{x} | SD | REMARK |
|-----|--|-----------|------|----------|
| 7 | BIU academic staff are competent with the use of ICT | 2.37 | 0.93 | Disagree |
| 8 | BIU have adequate qualified ICT teaching staff | 2.47 | 1.06 | Disagree |
| 9 | BIU ICT laboratory is not up to standard | 2.45 | 1.07 | Disagree |
| 10 | BIU ICT laboratory are up to date | 3.15 | 1.09 | Agree |
| 11 | The use of ICT has affected academic staff productivity | 2.41 | 1.05 | Disagree |
| 12 | The quality of ICT facility has positively affected the standard of teaching and learning. | 2.43 | 1.22 | Agree |
| 13 | BIU academic staff are passionate with the use of ICT | 2.49 | 0.93 | Disagree |
| 14 | BIU academic staff evaluate the teaching and learning of ICT | 2.38 | 1.06 | Disagree |
| 15 | BIU teaching staff perform poorly in the teaching-learning of ICT | 3.47 | 1.14 | Agree |

256 **Key: Mean \bar{x} Standard Deviation (SD)**

257 As indicated in Table 3, majority disagree with the statement in the item description on how
 258 the use of ICT in Benson Idahosa University affects staff productivity. This indeed is not
 259 good for a modern education because at the receiving end are the students.

260 **d. Research Question 4:**

261 This section aimed at knowing the impact of ICT on teaching staff productivity at Benson
 262 Idahosa University and the data collected from items sixteen to twenty three were
 263 harmoniously analyzed as showed in Table 4.

264 Table 4: Impact of ICT on Staff Teaching ability

| S/N | ITEMS STATEMENT | \bar{x} | SD | REMARK |
|-----|---|-----------|------|----------|
| 16 | Are steps being taken by BIU teaching staff to ensure effective use of ICT in teaching-learning | 2.45 | 1.07 | Agree |
| 17. | The use of inefficient ICT academic staff affects the teaching-learning productivity | 2.37 | 0.93 | Disagree |
| 18. | ICT enhance curriculum content and teaching methods of teacher | 2.47 | 1.20 | Agree |
| 19. | BIU staff are motivated with a good teaching condition | 2.41 | 1.05 | Agree |
| 20. | BIU staff enjoy good conducive teaching-learning environment | 2.42 | 0.92 | Disagree |
| 21. | BIU staff poor attitude towards ICT affects teaching-learning productivity | 2.33 | 0.97 | Disagree |
| | Lack of funding affects the impact of ICT productivity in teaching-learning process | 3.71 | 1.33 | Agree |
| 22. | BIU staff do not participant in ICT training | 3.53 | 1.17 | Agree |
| 23. | Steps are been taken by BIU teaching staff to ensure effective use of ICT in teaching-learning | | | |

265 **Key: Mean \bar{x} , Standard Deviation (SD)**

266 It was observed from Table 4 that staff agreed with the findings of Table 3 which is ICT
 267 effect on staff teaching ability because majority agreed that there is a serious impact on staff
 268 teaching ability at Benson Idahosa University.

269 **e. Research Question 5:**

270 Staff motivation is a factor in any establishments and this section examined the extent of ICT
 271 on staff productivity advancement and motivation at Benson Idahosa University? The section
 272 examined 24 to 37 items and analyzed them as indicated in Table 5.

273 Table 5 indicated that a large number of respondents agreed with the statements in the item
 274 description on the extent of advancement and motivation of the use of Information and
 275 Communication Technology on teaching staff productivity at Benson Idahosa University.

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280 Table 5: ICT motivation of staff productivity

| S/N | ITEMS STATEMENT | \bar{x} | SD | REMARK |
|-----|---|-----------|------|----------------|
| 24. | BIU environment encourage ICT compliance of all academic staff | 2.30 | 0.94 | Disagree |
| 25. | BIU academic staff are professionals in the use of ICT | 2.41 | 0.92 | Disagree |
| 26. | BIU teaching staff seldomly use the ICT facility available | 4.00 | 1.50 | Strongly Agree |
| 27. | BIU teaching staff are not motivated with the use of ICT teacher | 3.96 | 1.49 | Agree |
| 28. | BIU academic staff find the use of ICT very complicated | 3.01 | 1.09 | Agree |
| 29. | The age of some academic staff is a challenge in the use of ICT | 2.32 | 1.06 | Disagree |
| 30. | BIU academic staff are consistent with the use of ICT | 2.86 | 1.00 | Agree |
| 31. | BIU academic staff are skillful with the use of ICT | 2.62 | 1.20 | Agree |
| 32. | There are ICT facilities for lecturers in the office | 2.01 | 1.04 | Disagree |
| 33. | BIU ICT facility is available for teaching staff | 2.12 | 1.05 | Disagree |
| 34. | BIU has ICT laboratory | 2.50 | 1.24 | Agree |
| 35. | BIU has very good ICT facility | 2.47 | 1.06 | Disagree |
| 36. | BIU academic staff makes use of ICT in advancing academic activity. | 2.39 | 1.05 | Disagree |
| 37. | BIU academic staff find the use of ICT effective in research. | 3.19 | 1.11 | Agree |

281 Key: Mean \bar{x} , Standard Deviation (SD)

282 VII. CONCLUSION AND RECOMMENDATIONS

283 Sensing the benefits of ICT in modern education and its role in societal development this
284 paper therefore has demonstrated the role of ICT on teaching staff productivity at Benson
285 Idahosa University to a certain degree which is in line with the above findings. As shown
286 above, ICT role on teaching staff productivity could be seen from the centered value of the
287 mean index of 2.66. The mean index showed clearly the agreement when placed side by side
288 with 2.41 mean value benchmark set above. On the basis of the results obtained it therefore
289 imperative to know that irrespective of educational level, ICT is an essential tool in modern
290 education because it fosters staff productivity. In addition, this work identified that the
291 elements showed in Section 4 of this paper (ICT and Teaching Staff) such as motivation,
292 competence, efficiency and experience have direct link to the use of ICT in enhancing
293 teaching staff productivity. The lack of concentration on the staff ability to use ICT by school
294 owners and administrators has largely translated to the drawback of ICT on teaching staff
295 productivity. This is in line with the theory of [33] which stated that Readiness to learn is
296 dependent upon maturity and experiences. In another work by [34], it is understood that
297 learning environments require staff to use their prior knowledge and experience to formulate
298 new and adaptive concepts in learning.

299

300 From the responses as tabulated in Table 4, item 23 showed distinctively serious efforts being
301 made to integrate ICT into the process of academic activities. Consequently, it is empirically
302 and profoundly cleared that the role of ICT affects teaching staff productivity at Benson
303 Idahosa University. This is collaborated by [35] in a work title “Which Factors Obstruct or
304 Stimulate Teacher Educators to Use ICT innovatively” and Knowing fully the associated role
305 ICT plays in enhancing the development of the educational institution it is therefore
306 necessary to conclude that Information and Communication Technology in Benson Idahosa
307 University must be given critical attention for productive teaching and learning as well as
308 enriching the effectiveness of staff productivity.

309 Based on the forgoing, the following recommendations are made:

- 310 1. From the study it is empirically cleared that there are some levels of ICT facilities in
311 Benson Idahosa University but its full integration across Faculties and Departmental
312 teaching staff has been worrisome and it is on this premise that this work recommends
313 that full integration of ICT into curriculum based teaching by teaching staff is highly
314 imperative to enhancing the teaching process of staff productivity.
- 315 2. The survey though, gave the blueprint to the ICT skillful nature of teaching staff but
316 area such as motivation as well as the principle of best practices has eluded the school
317 teaching staff in recent times and effort should be made to create and instill in
318 teaching staff the value of retraining because it is believed that this will go a long way
319 to improving teaching staff productivity at work.

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321 REFERENCES

322

- 323 [1] Bandele, S. O. (Ed.). (2006). Development of modern ICT and internet system. Abuja,
324 Nigeria: Panof Press.
- 325 [2] Oye, N.D; Obi, M.C; Ninggal, T.B; &Amos B; (2012). Guidance and Counselling in
326 Nigerian Secondary Schools: The Role of ICT. *I.J. Modern Education and Computer
327 Science* Published online at <http://www.mecs-press.org>. doi: 10.5815/ijmecs.2012.08.04
- 328 [3] Ofodu, G. O. (2007). Nigeria Literary Educators and their technological needs in a digital
329 age. *Educational Focus 1* (1):22 - 30.
- 330 [4] Osagie, M. S. U., & Osagie, A. J. (2019). The Architectural Dynamics of Encapsulated
331 Botnet Detection (EDM). *arXiv preprint arXiv:1904.07145*
- 332 [5] Maxwell, O. S. U., Obahiagbon, K. O., & Amenze, O. J. (2018). 5PEN TECHNOLOGY:
333 A New Dawn in Homogeneous and Heterogeneous Computing. *arXiv preprint
334 arXiv:1804.10651*.
- 335 [6] Gay, G. and Blades, R. (2005). Information Technology for CXC CSEC. Oxford, UK:
336 Oxford University Press.
- 337 [7] Mansell, R., When, U. (1998). *Knowledge societies: information technology for
338 sustainable development*. London: Oxford University Press.
- 339 [8] Bello, S.A; & Johnson, S; (2011). Role of ICT in Managing Higher Education for
340 Sustainable Development; Makerere Journal of Higher Education. ISSN:1816-6822; 3(1)
341 (2011) doi: 10.4314/majohe.v3i2.5 Benson Idahosa University;
342 <https://www.biu.edu.ng/faculties>
- 343 [9] Okon, A., Jacob, E. (2002). Use of Information Technology by Academics in selected
344 universities in Nigeria. *Global Journal of Mathematics and Science*. 2(1) 57-63.
- 345 [10] Akpan, C. P. (2008). Lecturers’ perception of the Role of ICT in the Management of
346 University Education for Sustainable Development in Nigeria. *Nigerian Journal of
347 Educational Administration and Planning*. 8 (1),113-127.

- 348 [11] Agabi, O. G., Uche, C. M. (2006). ICT adoption and information quality in effective
349 university management. *Nigerian Journal of Educational Administration and Planning* 6(2)
350 148 – 160.
- 351 [12] Rosswell, T. (1999). *The role of ICT in higher education at the beginning of this new*
352 *millennium*. Retrieved 15 June, 2019 from <http://onlinekennis.org/eva/cra06/ictlu.htm>.
- 353 [13] Ballantyne, P, Labelle, R., Rugard, S. (2000). *Information and knowledge management:*
354 *Challenges and capacity builders*. Retrieved 10 June, 2008 from:
355 <http://www.chhs.ubc.ca/iprv/PDF/iprv0075.pdf>
- 356 [14] Wheeler, S. (2000). The role of the teacher in the use of ICT Learning Technology
357 Research. Keynote speech delivered at the National Czech Teacher’s Conference, University
358 of Western Bohemia, May 20, 2000.
- 359 [15] Omenyi, A. Agu, N. N. & Odimegwu, C. O. (2007). Increasing Teacher Efficiency
360 through ICT usage in Tertiary Education. *Nigerian Journal of Educational Administration and*
361 *Planning (NAEAP)*. 7 (2), 107-119.
- 362 [16] Balanskat, A., Blamire, R. & Kefala, S. (2006). The ICT Impact Report. [Online]
363 Available: www.insight.eun.org. (June, 2013).
- 364 [17] Holdich, C. E. (2002). Assessing aspects of Children’s Written Grammar: Automating
365 the process. *Computer and Education*. 39(1), 37-50.
- 366 [18] Back, y.G., Jong, J. & Kim, B “what makes teachers use of technology in the classroom?
367 Exploring the factors affecting facilitation of technology with a Korean sample”, *computers*
368 *and education*, vol 50, no 8, pp 224-234, 2008.
- 369 [19] Brantford, J.D., Brown, A.L., & Cocking, R.R. “How people Learn: Brain, mind,
370 experience and School”: expanded edition, Washington, D.C: National Academy Press 2000
- 371 [20] Castro, C. (2003), *Education in the information age: promises and Frustrations*, (Online)
372 Available: <http://www.iadb.org/sds/doc/edu&Tech2pdf> (2005, April 07)
- 373 [21] Sunal, D., MacKinnon, C., Raubenheimer, C. D. & Gardner, F. (2004). A case study of a
374 national undergraduate science reform effort (In Sunal, D. & Wright, E. (Eds.) *Research in*
375 *Science Education: Reform in Undergraduate Science Teaching for the 21st Century*.
376 Greenwich, CT: Information Age Publishing, 225-240.
- 377 [22] Veenhof, B., & Cindy, L “Are Internet users tuning out traditional media?” *Innovation*
378 *Analysis Bulletin*, Statistics Canada Catalogue no. 88.003. XIE. Vol. B, no. 3, 2006,
379 <http://www.statcan.ca/osolcenglish/socI?catn0=88.003-X20060039533>
- 380 [23] Miller, J. W., Martineau, L., P, & Clark, R., C. “Technology Infusion and Higher
381 Education: Changing Teaching and Learning, *Innovative Higher Education*”, Vol. 24 No. 3,
382 Spring 2000.
- 383 [24] Obahiagbon, K; & Otabor, J.O; (2014). Information and Communication Technology
384 (ICT) Key Tool for Enhancing Teaching and Learning in Nigeria: A Study of Two Tertiary
385 Institutions in Benin Metropolis. *American Journal of Educational Research*, 2014, vol.2, No.
386 12, 1257-1259. Available online at <http://pubs.sciepub.com/education/2/12/20> doi:
387 10.12691/education-2-12-20
- 388 [25] Bauer, J. & Kenton J. “Toward technology integration in the schools: why it isn’t
389 happening”, *journal of technology and teacher education* vol. 13, no 4, pp 519-546 2005
- 390 [26] Garder, L.M “A study of teacher perceptions of instructional technology integration in
391 the classroom”. *Delta Pi Epsilon journal*, vol. 50, no, 2, pp, 63-76, 2008
- 392 [27] Becta, (2004). What the research says about ICT and reducing teachers’ workloads.
393 [Online] Available: www.becta.org.uk/research. (June, 2013).
- 394 [28] Breuleux, A. Laferriere, T., & Bracewell, R.J “Networked learning communities in
395 teacher education”, in S. McNell, J.D. Prine, S. Boger, Mehall, B. Robin, & J. Wills (Eds),
396 *Proceedings of SITE 9B, the 9th international conference of the society for information*
397 *technology and teacher education* (pp 1170-1175). Charlottesvile, VA:ACCE, 1998

398 [29] Diehi, D.E “A study of faculty-related variables and competence in integrating
399 instructional technologies into pedagogical practices”. Unpublished doctoral dissertation
400 Texas southern university, 2005

401 [30] Brinkehoof, “Effects of a long-duration, professional development academy on
402 technology skills, computer self-efficacy and technology integration beliefs and practices”,
403 journal of research on technology in Education, vol. 39, no 1, pp 22-43, 2006

404 [31] Zidon, S., & Miller, H, “Affiliations of attitudes and experience with need for learning
405 computer skills”, journal of research on computer in education, 35(2), 180-193, 2002.

406 [32] Levin, T., & Wadmany, R. “Teachers” views on factors affecting effective integration of
407 information technology in classroom developmental scenery”. Journal of technology and
408 teacher education, vol. 16, no. 2, pp. 233-236, 2008.

409 [33] Thorndike, E. (1932). The Fundamentals of Learning. New York: Teachers College
410 Press.

411 [34] Richey A (1992) designing instruction for the adult learner: systemic training theory and
412 practice. London: Kogan page, Ltd.

413 [35] Drent, M., & Meelissen, M. “Which Factors Obstruct or Stimulate Teacher Educators to
414 Use ICT innovatively”. Journal of computers & education, (ARTICLE in Press), 2007

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