

## **EXPLORATION OF ICT SOFTWARE IN MODERN CLASSROOM BY 21<sup>ST</sup> CENTURY TEACHERS**

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### **ABSTRACT**

The empirical study was a survey type aimed at evaluating the degree or extent to which teachers in the present ICT age utilize the avalanche of supportive software that adorn the education scene. The software include; productivity, research communication, problem solving and educational, realizing their supportive role in facilitation and improvement of learning. Thus, five research questions guided the study. An instrument tagged ICT Software System (ICTSS) was used in the study. A major finding of the study is that teachers utilize word processing and research software (Browser, search engines and plug-ins) very well in their lessons while other productivity software (spreadsheet, presentation, database, graphic, digital audio and digital video editing); communication, software problem solving software and educational software, are yet to be truly explored. However, a major recommendation is that teachers should learn how to use these software because they will boost productivity in terms of learning outcome.

**Keywords:** Productivity, research, communication and interaction.

### **BACKGROUND**

ICT software; productivity, research, communication, problem-solving and educational software, amongst others have imparted significantly on learning ever since the advent of these hardware complementary and dependent digital tools. Their supportive role in the teaching/learning process has in no way endeared them to the 21<sup>st</sup> century teacher in facilitating learning as they promote such tenets of technology as; speed, accuracy, reliability, effectiveness and efficiency amongst others. The fact remains that the dominant presence of the teacher and learners in their conventional role, even in the present age is a sure indication that these ICT software are yet to be explored in the real sense of the word.

A hand written document falls prey to numerous grammatical and structural errors which a simple productivity software serves to eliminate. In the same vein, error-free and accurate calculations, ease of delivery of rich presentations, records bank, simple or complex concept map and enriched audio or video aids that support learners and improve their performance are among the numerous benefits inherent in the array of productivity software that we have. This confirms the creative function of productivity software in enriching and supporting learning (Lever-Duffy & McDonald, 2011).

Research software overcomes the burden associated with conventional libraries in research activities and offers a richer, wider, authoritative and primary source of research materials. The browser, search engines and the like have revolutionized research and contributed in no small measure to today's global knowledge economy.

Communication software in turn has revolutionized the talk-and-chalk role of the teacher where the face-to-face factor must come to bear. The email and chat software for instance when properly tapped can support teaching/learning in no small measure. The current status of the modern classroom, e-conferencing is courtesy the presence of these software.

Problem-solving software like games and simulations, have made an appreciable enroot into the modern classroom. The competitive and motivational attributes of games software via drill and practice approaches have made them very relevant in today's world. Simulations on the other hand make it possible for models, real or imaginary systems to be shown on their operational principles, making related concepts to be learned with ease.

It is therefore obvious that if these and other gains are what these ICT software stand to accomplish for us teachers, then it suggests that their place in the 21<sup>st</sup> century classroom need to be explored if the today's teacher must improve on his/her pedagogical responsibility.

## **REVIEW OF RELATED LITERATURE**

Productivity software include word processing, spreadsheets, presentation, database, graphic organizer, digital audio and digital video editing software, amongst others that enable users to create something new, confirming the productivity name they bear. After all, Educational Technology has "creating" as one of the essential elements it contains in its current definition and quest of facilitating learning and improving performance. Word processing software for instance has such as; basic, desktop publishing, language, web and support features (Roblyer & Doering, 2014). According to the authors, the basic features include; saving time, writing text and making changing text easier and more flexible; desktop publishing covers making flyers, reports, newsletters, brochures and student handouts. The language features help teachers and students correct their work, language spelling and usage exercises, and while web features help both teachers and students connect documents with internet resources, the support features make using the programme easier and more flexible. So, it is obvious that the classroom uses of this software are limitless corroborating the position of Morrison and Lowther (2010) who have also shown evidence, that the use of word processing on a regular basis improves the writing skills of school students. Spreadsheets on the other hand can be used to organize data, test formulas or be used in graph information. Students can use an electronic spreadsheet to test their hypotheses and perform what –if analysis (Lever-Duffy & McDonald, 2011). In the words of Roblyer and Doering (2014), five distinct features of spreadsheets were identified; basic, formatting, graphics/interactive, web features and support. The characteristics of these features as named include; making it easier to display and manipulate budget, grade or survey data and do mathematical problem solving (basic); alignment, changes styles/appearance and insert automatic headers (formatting); allow spreadsheet data to be shown in more visual formats (graphics/interactive); allow teachers and students to connect document with internet resources (web); and make using the programme easier and more flexible (support).

PowerPoint allows display of frames of information in a set sequence, offers various ways to view slideshows, and allows variation in text spacing and frame occurrence, amongst others (Roblyer & Doering, 2014). The software which includes preprogrammed backgrounds animations, sounds, and functions that can be formulated to create limitless slides provides a user-friendly interphase that lets students create colorful and informative displays in any subject area (Morrison & Lowther, 2010). Databases generally are applications which help us to store sets of related information in data files. It is obvious that when information are

stored in a database, they can be retrieved with ease in a variety of formats. Specially, databases as they relate to teaching and learning; assist students in thinking through and creating logical data organization, easily entering of data for subsequent organization and reporting while helping the teacher in creating customized data organization that suits their specific needs as well managing students and content data (Lever-Dutty & McDonald).

Graphics software enable teachers and students to support teaching and learning through visuals created or enhanced electronically. Geometric shapes, curves and polygons, graphs are generated with ease using this application. Digital audio editing, and digital video editing software like graphics software, productivity software function in the same manner only that they differ in their sensory focuses. While the former is concerned with hearing aids, the latter deals on seeing aids and images. So, while we use digital audio editing software to edit audio files, digital video editing software is used to edit video files. The essence is to produce an audio or video work that is rich in content vis-à-vis the objectives that guided the project. Another productivity software, research software explorer, search engines and plug-ins have boosted research in education because of their numerous and limitless pros. Initial access to the Web commences with a browser while the primacy type of software tools used within a browser are search engines. However, plug-in is typically free and easily downloaded and installed software that may be needed to access some files located during internet research (Morrison & Lowther, 2010).

Communication software occurs in two forms, asynchronous and synchronous or real-time. Email, lists, discussion boards, blogs, wikis and podcasts are asynchronous. Electronic mail or e-mail for short can be read at receiver's convenience and avoids the possibility of calling at the wrong time, lists on the other hand enable the same information to be sent to subscribers on a teacher's list while discussion boards create an environment that permits users to read or post comments and questions relating a research topic (Morrison & Lowther, 2010). The same authors maintain that blogs enable personal nomination on topics on the Web. Wikis however are collaborative websites created with "open editing software that allows users to easily create, add or remove webpage content without using complicated programme language, while podcasts are a popular means of sharing digital multimedia files over the internet. Synchronous communication typified by chat allows users to engage in some text-based 'chat room' conversation, while instant messaging (IM) which offer such service to fewer users who must be a "member" on a "buddy list" of the same IM system, distinctive features that make it different from chat (Morrison & Lowther, 2010).

Problem-solving software like-games software present and review instructional content in a game format using sequence of game rules and graphics (Lever-Dutty & McDonald, 2015). They offer competitive and motivational advantage to teachers and learners while in a game environment (Clark, 2007). Some game software offer reinforcement for current answers than in current ones Chang, Wang and Hung (2009); others include elements of adventure and uncertainty, and levels of complexity matched to learners abilities (Ward, 2006). Simulation on the other hand is a computerized model of a real or imagined system designed to teach how the system works. Two types of simulation applications are common; those that teach about something and those that teach how to do something (Alessi & Trollip, 2001). The reports by Eskrootchi and Oskrochi (2010), Evagoroua, Nicolaoub and constantinoub (2010), and Lane and Lyle (2011), amongst others speak volume on the benefits of simulations.

Tutorials and Integrated learning system (ILS) are very relevant software in today's classroom. Tutorials present new materials, usually in a carefully instructional sequence with frequent opportunities for practice and review. Whether linear or branched, the feedback mechanism ensures mastering before progress. A good tutorial software should offer extensive interactivity, thorough user control; other appropriate pedagogy; provides adequate answer-judging and feedback capabilities; appropriate graphics, amongst others. Hence the limitless advantages were reported by works of Steinberg and Oberem (2000), Rich (2007) and Oflner and Pohlman (2010), amongst others.

The catalogue of software showcased in this review and what they hold for teaching and learning in today's classroom confirm that they offer a rich resource that when appropriately tapped should be able to achieve assignment of facilitating learning and improving performance. The teachers of this age stand at liberty to explore these software as to benefit from their numerous gains.

### **Statement of problem**

The advocacy for ICT software integration in facilitating learning and improving performance remains a clarion call in Nigeria. To match word with action, different capacity development workshops are usually put in place by different institutions, organizations and settings, believing that we should move beyond advocacy to integration and adoption.

Conscious of the very fact that the role of ICT software in supporting learning is obvious, how come that teachers' and students' written text are still replete with grammatical and spelling errors; how come; teaching approaches are still the talk-and-chalk prevalent, amongst others. There appears to be absence of available ready-made school records of whatever kind by teachers that could be retrieved with ease on demand, just as teachers find it difficult to show and present real life science and difficult concepts to the comprehension of our learners. This scenario has promoted the didactic approach to learning that we still notice today even in the age we now find ourselves. These and others spurred the researchers to conducting this study.

### **Research questions**

1. How often do teachers use productivity software to support learning?
2. How much do teachers use research software to support learning?
3. What extent do teachers use communicating software to support learning?
4. How frequent do teachers use problem solving software to support learning?
5. How many times do teacher use educational software to support learning.

### **Significance of the study**

Teachers stand to benefit from this study in that the outcome will awake them from slumber in ICT software application while appreciating their supportive role in teaching and learning. Learners also stand to benefit from the study, as they will tap into the rich potentials of ICT software in facilitating learning and improving performance. The essence is making learning easy, a shift from age long impression that learning is hard. Parents and other stakeholders in education stand to gain from the study as their ultimate desire which is improvement in the academic achievement of their children/wards would always be met.

## METHODOLOGY

**Design:** The study is a survey design, aimed at eliciting responses of teachers on their use of ICT software in supporting their pedagogical role.

**Population:** All teachers in University of Port Harcourt (Uniport) International secondary school, Nigeria, constituted the population of the study.

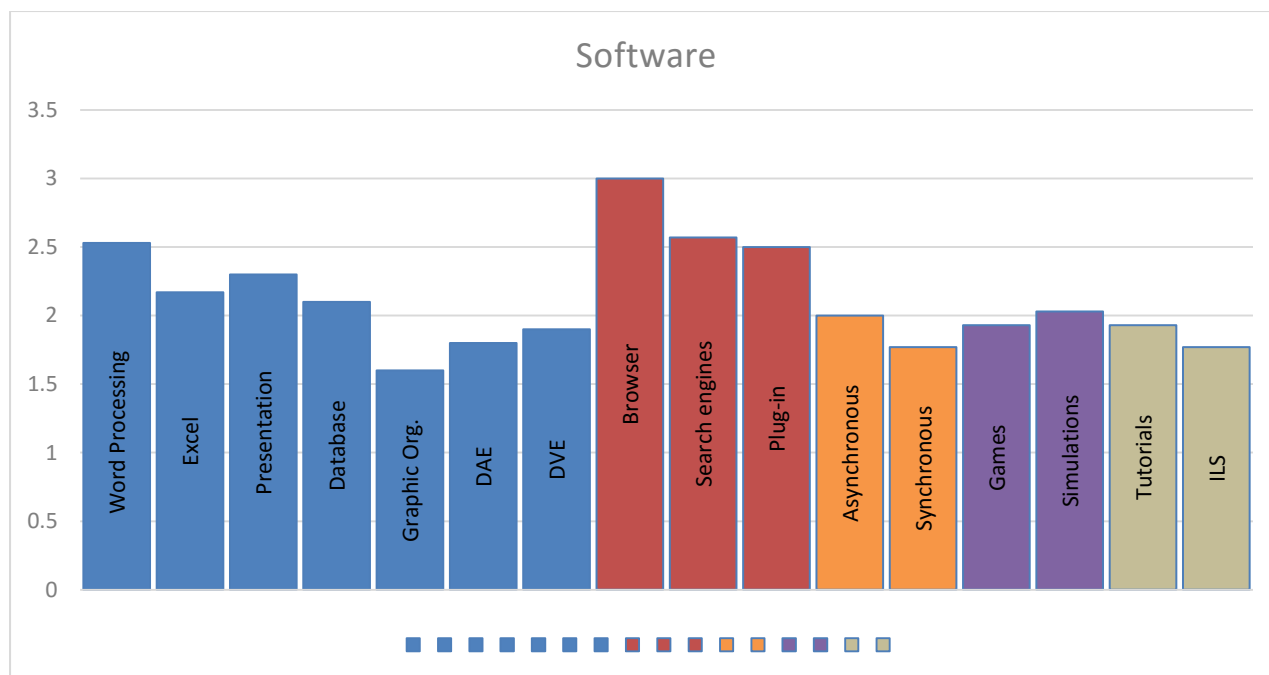
**Sample:** Thirty (30) teachers present in a three day workshop organized by Institute of Education, Faculty of Education, Uniport for staff of the International school formed the sample. The theme of the three day workshop (September 2<sup>nd</sup> – 4<sup>th</sup>) 2015 was “updating teachers knowledge to meet recent challenges in education sector”.

**Instrumentation:** A questionnaire, the (ICTSS) under five subheads was used in the study. They subheads were; productivity software, research software, communicating software, problem-solving software and educational software, made up of seven (7), three (3), two (2), two (2), two (2) items, respectively. The instrument was designed in the likert-scale format, but with 4-scales, ranging from very often (VO), often (O), undecided (UD) and rarely (R) with such weighting as; (4, 3, 2 & 1) respectively. An acceptable mean (x) of 2.50 was set as minimum mean for an item that met desired status.

**Table: Data organization**

No	Software	Very Often	Often	Undecided	Rarely	X	$\bar{X}$
1.	<b>Productivity</b>						
i.	Word Processing	6(4)(24)	10(3) (30)	6 (2) (12)	10(1)10	76	2.53
ii.	Spread sheet (Excel)	6(4)(24)	5(3)15	7 (2) (14)	12(1)12	65	2.17
iii.	Presentation	5(4) 20	6(3)18	12 (2) 24	7 (1) 7	69	2.30
iv	Database	3(4) 12	9(3)27	6 (2) 12	12(1)12	63	2.10
v	Graphic Organizer	5(4) 20	5 (3) 15	7 (2) 14	16(1)13	49	1. 60
vi	Digital Audio Editing	2(4) 8	5 (3) 15	8 (2) 16	15(1)15	54	1. 80
vii	Digital Video Editing	3 (4)12	6 (3) 18	6 (2) 12	15(1)15	57	1. 90
2.	<b>Research Software</b>						
i.	Brower (Explorer or any other )	11 (4) 44	6 (3) 18	5 (2) 10	8 (1) 8	90	3 .00
ii.	Search engines (Google, Ask or Yahoo)	10 (4) 40	7 (3) 21	3 (2) 6	10 (1) 10	77	2 .57
iii.	plug-ins (Acrobatt reader etc)	9 (4) 36	7 (3) 21	3 (2) 6	11 (1) 11	74	2. 50
3.	<b>Communication</b>						
i.	Asynchronous (E-mail)	6 (4) 24	4 (3) 12	3 (2) 6	17 (1) 17	59	2. 00
ii.	Synchronous (chat)	5 (3) 15	5 (3) 15	4 (2) 8	18 (1) 18	53	1. 77
4.	<b>Problem-Solving</b>						
i.	Games	6 (4) 24	4 (3) 12	2 (2 ) 4	18 (1) 18	58	1. 93
ii	Simulating	5 (4) 20	6 (8) 18	4 (2) 8	15 (1) 15	61	2. 03
5.	<b>Educational</b>						
i.	Tutorials	3 (4) 12	6 (3) 18	7 (2) 14	14 (1) 14	58	1. 93
ii	Integrated learning System	2 (4) 8	6 (3) 18	7 (2) 14	15 (1) 15	53	1. 77

The table above can be represented graphically as shown in the Figure below.



**Figure:** Graphic representation of ICT software usage

### Data analysis and discussion of findings

On how often teachers use productivity software to support learning, which is the concern of RQ1, the table shows outright non utilization of these software except word processing which has a mean ( $\bar{x}$ ) value of 2.53. The rest productivity software; spreadsheet, presentation database, graphic organized, digital audio and digital video have mean ( $\bar{x}$ ) values of, 2.17, 2.30, 2.10, 1.60, 1.80 and 1.90, respectively, which are below our acceptable mean ( $\bar{x}$ ) value of 2.50. The Figure depicts that trend in the software usage. That means, a major finding of the study is that the aforementioned productivity software are yet to be explored by teachers in their teaching/learning role even in this present age. Hence the positions of Roblyer and Doering (2014), Morrison and Lowther (2010) on the strength of these software are yet to be tapped by teachers.

Secondly, the table shows that research software (Browser, search engines and Google are very much used by teachers. This answers the second research question that guided the study. This is the second finding of the study. The table referred has mean ( $\bar{x}$ ) values of 3.0, 2.57 and 2.50 as against the items housed under the research software subhead. Refer also to the Figure above. The finding above is in tandem with earlier positions of Lever-Duffy and McDonald (2011).

The third research question which focuses on communicating software (asynchronous and synchronous) shows from the table that they are not being used by the teachers. This is the third finding of the study. The table shows that both software have mean ( $\bar{x}$ ) values of 2.00 and 1.77 respectively, which are below the 2.50 acceptable mean ( $\bar{x}$ ), and as expressed shown on the Figure.

Concerning the fourth research question, from the table, and from the figure it is obvious that the software are not being frequently used by some teachers. The table shows games and simulation software record mean ( $\bar{x}$ ) values of 1.93 and 2.03 respectively, indicating that they

are not been explored as expected by the teachers. The strength of these software in supporting learning is confirmed (Clark, 2007; Ward, 2001; Alessi & Trollip, 2001).

Finally, tutorial and integrated learning systems (ILS) are not well integrated by teachers to support teaching and learning. The two software as seen from the table record mean (x) values of 1.93 and 1.77 respectively far below 2.50 acceptable mean (x). This position is also corroborated by the Figure referred above, supported by (Steinberg & Oberem, 2000; Rich 2007; Ollner & Pohlmon, 2010).

## CONCLUSION

ICT software utilization status by teachers in the present age is not encouraging, that is, they are yet to tap from the rich endowment which these software promise. If teaching and learning must be easy, if richness in content knowledge and technological knowledge must be assured, the utilization of these resource software should be explored to its fullness. Teaching and learning become difficult where the teacher does the work simple software could render needed support. Hence if the pedagogical role of the teacher must be enhanced, and the objectives of instruction which include facilitating learning and improving performance must be achieved, full exploration of ICT software should not be underestimated.

## RECOMMENDATIONS

These recommendations are based strictly on the five findings unveiled by the study.

- Teachers of today's digital age should integrate productivity software in their teaching and learning processes to minimize common errors and ensure the achievement of accurate, concise, meaningful and reliable processes, courtesy the productivity software.
- Teachers should continue to integrate research software to its fullest to surpass the gains such offer them already. The essence is that rich and qualitative research is guaranteed by such research software.
- Email and chatting should be explored by teachers because teaching and learning in this age must not be face-to-face, for they do not only serve the purposes of text and calls only but could be a sure dependable teaching/learning support.
- The fourth recommendation is that games and simulations software should be explored by teachers because of their rich educational value, promoting teaching/learning with every element of fun. While games present content in a game format, simulations present the user with a model or situation in a computerized or virtual format. What a good promised and values learning asset?
- The fifth recommendation is that tutorial and integrated learning system (ILS) should be explored by teachers because tutorials like drill-and-practice give students one-on-one interactive reviews of target concepts while ILS as the name implies provides an integrated or amalgam of resources which definitely support teaching/learning.

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