



Research Article

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Evaluation of Extent of Computer Appreciation Skills Acquired by Secondary School Students for Economic Empowerment

Peter Uzochukwu Obichukwu¹

Chijioke Jonathan Olelewe^{1*}

Peter Nwafor Igboamalu¹

Chima Ugo²

Abdulkadir Abdulrahman³

Okechukwu Oliver Okanazu⁴

Joshua Onyedikachi Ike⁵

Mohammed Abdullahi⁶

¹Department of Computer & Robotics Education, University of Nigeria,
410001, Nsukka, Enugu State, Nigeria

²Department of Computer and Robotics Education, Alvan Ikoku Federal College of Education,
Owerri, Imo State, Nigeria

³School of Business Education, Federal College of Education (Technical), Gombe State, Nigeria.

⁴Department of Business Education, University of Nigeria, 410001, Nsukka, Enugu State, Nigeria

⁵Department of Industrial Technical Education, University of Nigeria,
410001, Nsukka, Enugu State, Nigeria

⁶Department of Science Education, Federal University of Kashere, Gombe State, Nigeria

*Corresponding Author

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Abstract

This study is focused on college students' computer appreciation skills acquired for economic empowerment. The study employed survey research design and was guided by three research questions. Purposive sampling technique was used to select 272 students drawn from three secondary schools out of the seven schools that offer computer studies. Computer Appreciation Skills Acquisition Questionnaire (CASAQ) was instrument used for data collection made up of 29 items with a reliability coefficient of .94, .83 and .96 obtained using Cronbach Alpha reliability test. Results showed that college students are moderately skilled in data processing, spreadsheet and database skill acquisition required for economic empowerment. It was recommended among others that more time be allocated in the timetable of Computer Studies/ICT subject to enable students have enough time for drills and practice that will guarantee quality skills training.

Keywords: Computer appreciation skills; data processing skills; spreadsheet processing skills; database processing skills; economic empowerment

1. Introduction

In Nigerian and beyond, school systems are “under increasing pressure to use Information and Communication Technology (ICT) to teach students the skills required to function in the knowledge driven economy” (UNESCO in Omariba, Ayot & Ondigi, 2016: 201). Therefore, many educational institutions are today using computers to process their examination results, payment of tuition fees and post assignments through the Internet so that students can access them from the comfort of their rooms. Furthermore, teachers are increasingly using computers and their associated resources to prepare their lessons, implement instructional delivery and evaluate learning outcomes. Perhaps, the increasing widespread use of computers in every aspect of our social and work lives has necessitated its introduction in teaching and learning at all levels of education in Nigeria as enshrined in the 2004 National Policy on Education. One of the specific goals of Nigerian education is “to promote information and communication technology (ICT) capabilities at all levels of education with a view to attain economic empowerment in form of job creation and poverty reduction through skills acquisition” (FGN, 2013:2). It is therefore pertinent that serious attention be given to ICT skill acquisition process of empowering secondary school students for sustainable economic life upon graduation.

Information and communication technologies (ICTs) refer to any system that stores, retrieves, process and transmits information electronically in a digital form (Aibara, 2017; Bailey, 2013; Olelewe & Nzeadibe, 2015). According to Olelewe and Nzeadibe (2015), technological revolutions have created diverse ICT media that are essential for teaching and learning. These ICT media consist of multimedia projectors, mobile phones, websites, portals, and learning management systems like Blackboard, LearnMate, Moodle, etc. as well as other media for data generation, storage, processing, presentation and communication of information (World Bank, 2002). These technologies have virtually permeated into the classroom and thus determine how teaching and learning is conducted in the 21st Century. Therefore, developing an appreciable knowledge of computer and the prerequisite skills for its effective utilization by the teachers and students is not only key to technology acceptance and integration in school curriculum as a subject of study but also as a tool for teaching and learning of computer appreciation skills which is the basis for meaningful work participation in a knowledge-based economy. Literature has shown that the success of any private and public sector employees depends strongly on the adoption of ICT (Rehouma, 2020). Recognizing this fact, the Federal Government of Nigeria introduced the new secondary school curriculum in 2011 with a view to professionally train students in entrepreneurship and vocational skills aimed at equipping them with relevant ICT skills for self-reliance.

Secondary education according to the National Policy on Education (2013) is the type of education children receive after primary education and before tertiary education. It is the formal education for adolescents between ages 11 to 18 (Torane, 2010) which enables them discover their strengths and weaknesses as they are engaged in school activities. Given the recent economic recession facing the Nigerian state, more adolescents are seen not to have access to higher education. It therefore becomes imperative that secondary education should be able to provide students with adequate vocational skills and training opportunities such as the use of new technologies (e.g., computer appreciation), business processes, management of assets (e.g., poultry and livestock), and entrepreneurial skills for socio-economic empowerment upon graduation. Economic empowerment is the ability to make and act on decisions that involve the control and allocation of financial resources (Golla, Malhotra, Nanda & Mehra, 2011). Torane (2010) posits that one of the ways to achieve economic empowerment is through the acquisition of digital skills that can enable them earn a living, support their families and contribute to the development of their immediate environment.

Furthermore, given the need to ensure that both male and female students effectively acquire computing skills, extant studies have shown that factors such as gender, access to and extent of computer utilization, among others significantly influence acquisition of computing skills (Aesaert, & van Braak, 2015; Alakpodia, 2014; Bundsgaard & Gerick, 2017; Punter, Meelissen & Glas, 2017).

Specifically, gender-related studies on ICT skills acquisition have shown that female students acquire more ICT skills than male students (Australian Curriculum, Assessment and Reporting Authority, 2015). Whereas, Gebhardt, Thomso, Ainley and Hillman (2019) posit that male students acquired computing skills and utilize computers more frequently than female students, other studies (e.g. Claro, et. al., 2012; Hatlevik & Christopherson, 2013; OECD, 2011; Punter, Meelissen & Glas, 2017) showed no significant difference in computing skills acquired by senior secondary school students. Thus, in line with the purpose of the study, the authors sought to gauge if gender difference exists with respect to college students' computer appreciation skills acquired for economic empowerment in a bid to uncover other plausible explanations that could influence acquisition of computing skills at secondary level of education.

In Nigerian secondary schools, computer appreciation is one of the ICT/computer studies topics taught to students. The rationale behind the integration of computer skills acquisition in the programme of secondary education is to ensure that students are equipped with relevant ICT skills in addition to the general education component of the curriculum for economic empowerment upon graduation (NERDC, 2011). However, less is known regarding the extent to which secondary school students acquires computer appreciation skills for economic empowerment given the rising youth unemployment in Nigeria. For instance, the unemployment rate of Nigeria rose from 6.4% in 2014 to 10.4% in 2015, 13.9% in 2016, and 17.6% in 2018 and is projected to reach 33.5% by the year 2023 (National Bureau of Statistics, 2017). Apparently, the Nigerian youths (45% of the population) account for the majority of the unemployed with the underemployed estimated at 17.6 million representing 49.7% of the population. The lack of empirical data regarding the extent to which Nigerian secondary school students possesses computer appreciation skills for economic empowerment have continued to hinder ICT policy actions that can help ameliorate the consequences of youth unemployment such as kidnapping, terrorism, prostitution, armed robbery, rural-urban migration, among other social problems. This problem is perceived to get bigger as the youth population continues to grow, and as the Nigerian economy continues to depend heavily on oil revenues (National Bureau of Statistics, 2018). In view of the foregoing, the major purpose of this study was to determine the computer appreciation skills acquired by secondary school students in Nsukka metropolis for economic empowerment.

1.1 Research Questions

1. To what extent is data processing skills acquired by secondary school students in Nsukka metropolis for economic empowerment?
2. To what extent is spreadsheet processing skills acquired by secondary school students in Nsukka metropolis for economic empowerment?
3. To what extent is the database management skills acquired by secondary school students in Nsukka metropolis for economic empowerment?

1.2 Research Hypotheses

- **Ho₁:** Male and female SS₃ students of Nsukka metropolis will not display statistically significant mean difference on the extent of data processing skills acquired for economic empowerment.
- **Ho₂:** Male and female SS₃ students of Nsukka metropolis will not display statistically significant mean difference on the extent of spreadsheet processing skills acquired for economic empowerment.
- **Ho₃:** Male and female SS₃ students of Nsukka metropolis will not display statistically significant mean difference on the extent of database management skills acquired for economic empowerment.

2. Literature Review

2.1 Skills Acquisition Programme of Secondary Education

Indeed, the role of skill acquisition cannot be overlooked in the development process of any economy. This is because skill acquisition is prerequisite for economic empowerment of any nation; hence every citizen should be equipped with saleable skills to contribute to the economic growth of the nation. Skill acquisition involves different ways of training the youth to become self-reliant instead of depending on non-existing white-collar jobs. Given the role skill acquisition play in economic empowerment, several authors perceive it as a means to eradicate abject poverty and hunger by creating avenues for self-employment opportunities for the teeming youths (Gumbari, 2009; Isaac, 2011; Iroegbu, 2017; Nwanaka & Amaehule, 2011).

In 2011, the Federal Government of Nigeria introduced the new secondary school curriculum (NSSC) aimed at ensuring that secondary school students are professionally trained in entrepreneurship and vocational skills and equipped with relevant ICT skills to function optimally in the digital era. According to the NERDC (2011), “the new secondary school curriculum is comprised of five compulsory core subjects namely English Language, Mathematics, ICT, Civic Education, and Entrepreneurship Education that must be offered by all students” (p.4). Additionally, the new curriculum identified another thirty-five skill acquisition elective subjects for students such that if properly implemented will help them acquire skills needed to become self-reliant upon graduation. These elective vocational skills subjects according to NERDC (2011), includes among others “auto body repairs and spraying, air conditioning and refrigerator repairs, brick laying and concrete works, carpentry and joinery, catering, cosmetology, electrical installation and maintenance, radio and TV works, furniture making, painting and decorating, plumbing and pipefitting, machine, woodwork, upholstery, garment making, textile trade, keyboarding, data processing, book keeping, GSM maintenance, photography, marketing and salesmanship” (p.6).

The thrust of this new curriculum reform holds that every student upon graduation would have acquired and become competent in at least one vocational trade area that will make him functionally useful, become ICT literate, and fully prepared either for higher education or successfully fit into the world of work. Ukala (2018) posits that if the curriculum is well implemented, it will help to eradicate poverty, create jobs, generate wealth and above all strengthen societal values which are on the decline. This is true given that the survival of any nation depend on her ability to develop her human resource. In recognition of this, Section 5 of the national policy on education states that the goal of secondary education is the provision of trained manpower in the applied science, technology, vocational and entrepreneurship towards raising a generation of productive workforce that can provide technical and vocational skills necessary for economic development. To achieve this goal, secondary education needs to be taken through a learning process that will inculcate in the recipients the skills to become self-reliant.

2.2 ICT Skills Acquisition for Work Participation in the Digital Age

Computer appreciation is an introductory course offered to computer users and students to teach them the basics of computing. It entails the knowledge of and ability to use computer and its related technologies efficiently covering a wide range of skills from the basics such as booting and shutting down computers, application of software packages, to troubleshooting, installation and maintenance (Ajayi, 2000; Candy, 2002; Olelewe & Igboamalu, 2017). According to Achuonye (2003), computer appreciation is the level at which a computer user is operating in using computers and the associated software application packages in his day-to-day activities or work functions. This therefore underscores the need to develop college students computing skills required for entering and succeeding in the world of work. The topics covered include: “the understanding of basic computer components and functions (like hardware parts e.g. system unit, motherboard, screen, RAM, overhead projectors, etc.); booting

and shutting down of computer to working with the application packages like Microsoft packages (Microsoft Word, Microsoft Excel, Outlook, Access); presentation tools (like PowerPoint, and electronic boards e.g. Blackboard, Starboard etc.); Graphic packages (like Corel Draw, Bender, Auto CAD); Database software (like Microsoft Access, Dbase, Fox Base, etc.); Spreadsheet software (like Excel, SPSS, G-Power, etc.); and Games packages” (Olelewe & Igboamalu, 2017:217). A firm understanding of this level of knowledge (skills development) will enable students to develop a wide range of computing skills such as data processing skills, graphic processing skills, spreadsheet processing skills, word processing, graphic skills, among other skills most sought after by the employers of labour.

Presently, acquisition of data processing skills has offered many graduates a decent means of livelihood given that it is one of the skills highly sought after by the employers of labour. Data processing is the process through which data are collated, processed, communicated to other users and stored for future use (Effiong, 2008; Sharma, 2018). Regardless of the type of facilities in use, various data processing activities which need to be carried out can be grouped under six basic categories: collation of data, conversion, manipulation, managing the output, communication and reproduction. Collation of data could emanate in form of business transactions or mere observations. Thus, data may be captured and recorded on paper and then converted into a machine readable form for processing. Conversion of big data or information has to do with changing the collected data from its source documents to a form that is more suitable for processing (Suvarnamukhi, & Seshashayee, 2018).

Manipulation has to do with converting data into information. Managing the output entails storing and retrieving data from storage devices when needed while communication aspect involves the process of sharing information with those who need it. Thus, the importance of computer as a tool for data processing includes increased accuracy, efficient storage facilities, fast and enhanced access to information, efficient handling of repetitive tasks, among others (NERDC, 2007; Ojumu, 2016). It presupposes that all these could only be possible if secondary school students are equipped with data processing skills to enable them become efficient computer users.

Similarly, spreadsheet is an application package that simulates a paper accounting worksheet as it displays multiple cells usually in a two-dimensional matrix. According to Peterlin (2010), “spreadsheet software like Excel, Quattro Pro or OpenOffice Calc contains basic functions required for data analysis and plotting of graphs” (p.1). Sciglar (2017) posits that spreadsheet is constantly updating its features to meet the needs of contemporary professionals in the digital era. Other studies posit that spreadsheet is extensively supporting auditing tasks in public and private establishments (e.g. Pongpattrachai, Cragg & Fisher, 2014; Ragland & Ramachandran, 2014). Spreadsheet processing skills entail the ability to use formulas to create simple and complex mathematical functions designed to handle financial needs of businesses such as salaries, taxes, preparation of daily sales, budget, computation of examination results, payroll and many more; ability to use standard editing features such as Bold, Italics, Underline, Move, Copy and Paste; ability to work on several sheets at a time and accessing information from any of the sheets in the workbook; ability to create charts from the numeral manipulation of the results as well as the ability to apply colour to rows, cells, column; insert graphics into a cell and create items in a series in cells (Grass Root Design, 2004; Ibezim, 2007; NERDC, 2007).

Furthermore, database management skill is another important aspect of computer appreciation skills required by college students for gainful employment upon graduation. Database management system (DBMS) is computer software designed for the purpose of managing databases based on a variety of data models (Raymond, 2005). It is a set of software programs that control the organization, storage, management, and retrieval of data in a database. Database software such as File Manager Pro allows users to manipulate large amount of information and retrieve any part of the information that is of interest (Computer World, 2002). According to Raymond (2005), the benefits of DBMS include elimination of data redundancy, enhanced data integrity, data independence and security, reduction of development and maintenance costs, increased access and availability of data and information, as well as the provision of central control on the system. Thus, the database skills required of college students include: the ability to explain the concept of database, start and open an existing database,

the ability to load and exit database package, the ability to query, retrieve or modify information stored in a database as well as the ability to print data/or information from a given database (Spacey, 2019; NERDC, 2007). These skills when acquired by secondary school students will enable them appreciate and efficiently utilize computers in their day-to-day work functions thus making them market ready for seamless transition from school to work.

In all, computer appreciation skills such as data processing, spreadsheet processing, database management skills, among others are today recognized as important digital skills required to efficiently function in the world of work. For instance, studies have shown that most public establishments are today implementing the electronic file IT initiative to enhance their service delivery which entails the services of employees with digital skills (Abdulkadhim, Bahari, Bakri & Ismail, 2015; Kunis, Runger & Schwind, 2007; Rehouma, 2020). Thus, the ability to recognize and effectively utilize software packages such as database, spreadsheet, word processing, etc. in more transparent ways (Grass Root Design, 2004; Marcovecchio, Thinyane, & Estevez, 2019; Weaver, 2000) necessitates this study. It is assumed that every student who has completed secondary education should possess the computing skills needed to function in the world of work, hence the need for its introduction at secondary level of education.

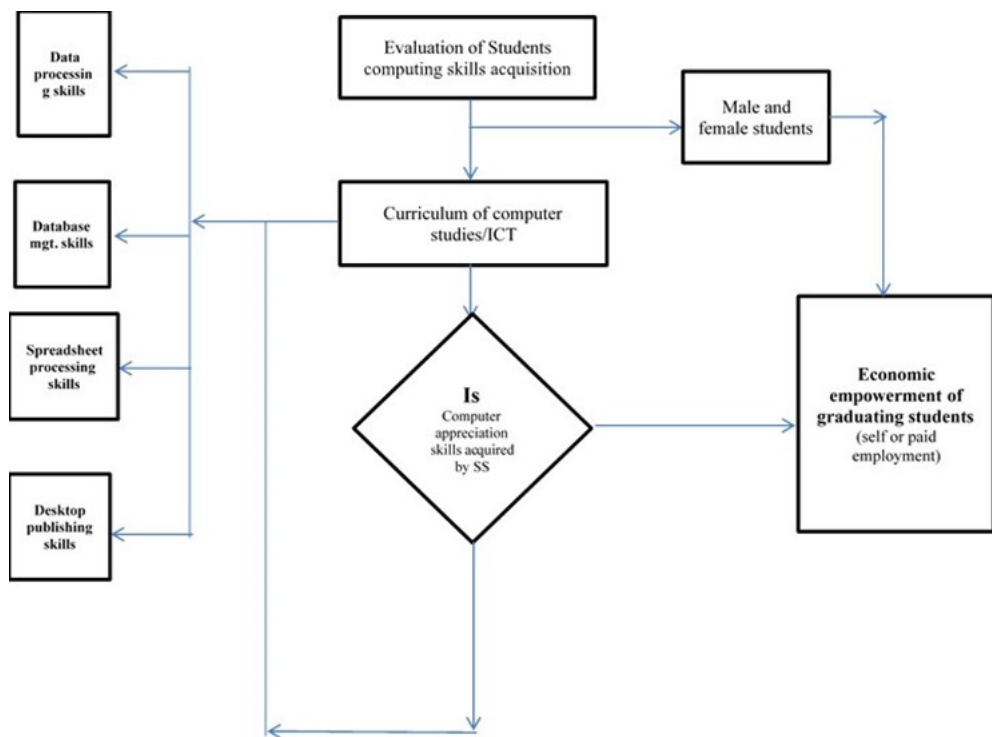


Figure 1: Schematic representation of Conceptual Framework

2.3 Theoretical Framework

This study is anchored on experiential learning theory (ELT) developed by David Kolb in 1984. ELT states that “learning is a process whereby knowledge is created through the transformation of experience” (Kolb, 1984:38). ELT was built on the works of John Dewey (1916/1944) who believes that “an ounce of experience is better than a ton of theory.” Thus, ELT lends itself to skills training in that

it presents a way of structuring and sequencing the curriculum of computer appreciation as well as indicating how a training session may be taught to improve students learning. According to Kolb (1984), "ELT constitutes of a four stage of learning cycle namely concrete experience (CO), reflection observation (RO), abstract conceptualization (AO), and active experimentation (AO)" (p.38). Hence, some of the theory's appeal is that it provides a rationale for a variety of learning by doing. Moreover, the theory has a wide range of application in computer studies such as helping students to become self-aware (Bradbeer, 1999), assisting teachers to become reflective teachers (Burkill, & Healey, 2000), assist students become reflective learners (Birnie & Mason O'Conner, 1998), identifying students' learning styles (Hertzog & Lieble, 1996), developing and teaching key skills (Chalkley & Harwood, 1998), designing group projects (Brown, 1999), deciding how learning resources can support the learning process (e.g. Healey, 1998; Shepherd, 1998).

Experiential learning is hinged on the basis that for real learning to occur, students need to be actively involved in the learning process rather than being passive recipients of the information provided by the instructor. Perhaps, developing computer appreciation skill of students can be achieved through "real life learning experience". It is believed that active involvement of secondary school students in the drills and practice aspect of computer appreciation skills learning will provide the basis for transforming their experience into knowledge through reflective observation and active participation. Similarly, utilizing learning resources such as computer laboratory, production workshop, home computers, and Students' Industrial Work Experience Scheme (SIWES) will help to stimulate learners' skills development given the opportunity to engage in meaningful hands-on experience. Furthermore, it is believed that skills mismatch is a major cause of rising youth unemployment; hence the availability of ICT resources and their effective utilization in teaching and learning at secondary school level of education can help to close the widening gap between the industry needs and what the institutions are producing.

3. Methodology

3.1 Study Design

The study employed survey design which is deemed appropriate for this study because it permits the collection of data from college students on the computer appreciation skill acquisition for economic development thus allowing only a representative sample of the population.

3.2 Study Setting

The study was conducted in Nsukka metropolis of Enugu State, Nigeria. The metropolis is located at the city centre of Nsukka Local Government with 13 secondary schools located within Nsukka metropolis out of the 30 colleges found in the entire local government area.

3.3 Population and Sampling

The population for the study consists of 2,229 senior secondary school students (SS₃) drawn from the 13 secondary schools in Nsukka metropolis. Out of the 13 secondary schools, only 7 schools offer computer studies at the senior secondary school level. Purposive sampling technique was therefore used to select 3 colleges having 843 SS₃ students from the 7 colleges that offer ICT/computer studies in their curriculum. These schools are: Nsukka High School with 436 SS₃ students, St. Catherine's College Nsukka with 228 SS₃ students and University of Nigeria Secondary school having 179 SS₃ students. Taro Yamane formula was used to select 272 senior secondary students (SS₃) as the sample size for the study (Yamane, 1973). Simple random sampling through the use of balloting was used to select the respondents from the various schools to ensure that each student has equal chance of being selected.

3.4 Data Collection Tool

Structured questionnaire titled Computer Appreciation Skill Acquisition Questionnaire (CASAQ) was used for data collection. The questionnaire contains 29 items divided into three subscales based on the three research questions that guided the study. The questionnaire was divided into two sections. Section One was for respondents' demographic data while Section Two was sub-divided into 3 subscales: A, B and C. Subscale "A" is made up of 9 questionnaire items to elicit information on the data processing skills acquired by secondary school students. An example of item in subscale A is "Ability to carry out data presentation and reporting". Subscale "B" is made up of 11 questionnaire items to elicit information on the spreadsheet processing skills. An example of item in subscale B is "Ability to format text, cells and columns in a worksheet". While subscale "C" is made up of 9 questionnaire items designed to elicit information on the database management processing skills acquired by secondary school students for economic empowerment. An example of item in subscale C is "Ability to write programs with different database packages". The instrument was designed based on 4-point scale rating of very low extent, poor extent, high extent, and very high extent with assigned weights of 1, 2, 3, and 4 respectively.

3.5 Data Collection Procedure

The authors obtained approval from the Faculty of Vocational and Technical Education Research Ethics Committee, University of Nigeria, Nsukka. To ensure timely collection of data, six research assistants were engaged in the collection of data. Furthermore, the research assistants obtained approval from the school Principals prior to the distribution of the questionnaire to the students. Also, secondary school students' informed assent prior to the questionnaire administration was obtained. The participants were requested to fill the questionnaire on the spot. However, for those who could not complete theirs on the spot, the research assistants returned two days later to retrieve the questionnaires.

3.6 Data Analysis

The instrument was face-validated by five research experts. The reliability of the instrument was established using Cronbach's Alpha reliability test conducted on each of three subscales. A pilot study of 35 senior college students from Government Technical College, Ikem which is outside the study area was used to establish the reliability of the instrument. The result of the Cronbach's alpha revealed the following: data processing skills acquisition ($\alpha = .94$, $n = 35$), spreadsheet processing skills ($\alpha = .83$, $n = 35$) and database management processing skills ($\alpha = .96$, $n = 35$) while the overall reliability index yielded ($\alpha = .91$, $n = 35$), thus, "indicating that the reliability index was good and consistent in measuring what it intends to measure" (Sekaran, 2003: 311). Out of the 272 copies of questionnaire distributed, 256 copies were retrieved representing 94%. The data collected was analysed using mean for the research questions while the null hypotheses were analysed using t-test at 0.05 level of significance. Thus, any item with p-value greater than 0.05, the hypothesis of no significant difference was upheld at 0.05 level of significance and at 254 degree of freedom but where the p-value is less than 0.05, the hypothesis of no significant difference was rejected.

4. Results

Table 1: Mean and standard deviation ratings of the level of data processing skills acquired by secondary school students for economic empowerment

S/N	Item statements	n	\bar{x}	SD	Rem
1	Ability to store data and information for future use	256	3.15	.85	VHE
2	Ability to identify and apply the different stages of data processing	256	2.42	1.05	PE
3	Ability to perform data conversion (changing to a usable or uniform format).	256	2.18	1.06	PE
4	Ability to perform data separation and sorting (drawing patterns, relationships, and creating subsets)	256	2.28	1.10	PE
5	Ability to copy and duplicate data or information	254	1.76	1.07	VPE
6	Data cleaning and error removal	256	2.33	.74	PE
7	Ability to perform data validation (checking the conversion and cleaning).	256	2.02	.26	PE
8	Ability to perform data summarization and aggregation (combining subsets in different groupings for more information)	256	1.84	1.01	VPE
9	Ability to carry out data presentation and reporting.	256	1.94	.70	VPE
Subscale mean		256	2.25	.39	PE

Key: REM = Remark, VLE= Very Low Extent, PE = Poor Extent, HE = High Extent, VHE = Very High Extent

The result of Table 1 indicates the mean and standard deviation of secondary school students' on data processing skills acquired for socio-economic empowerment. The values of the mean ranged from 1.76 to 3.15, thus indicating that the participants' responses for all the 9 items fall under poor extent as shown in the cluster mean of 2.25. Also, the values of the standard deviation ranged from .26 to 1.10 which shows that the participants' responses were clustered around the mean. It can therefore be deduced from Table 1 that college students have not acquired adequate data processing skills required for economic empowerment upon graduation.

Table 2: Mean and standard deviation ratings of acquisition of spreadsheet processing skills by secondary school students for economic empowerment

S/N	Item statements	n	\bar{x}	SD	Rem
10	Ability to load a spreadsheet application (open with a new, blank spreadsheet).	256	2.71	1.31	HE
11	Ability to identify columns (letter labels) and rows (number labels)	256	2.54	1.18	HE
12	Ability to identify and use active cell (using cursor keys to move around the spreadsheet and continue to identify the active cell)	256	2.62	1.03	HE
13	Ability to open, enter and edit data in a worksheet	256	2.53	1.00	HE
14	Ability to copy and paste cells in a worksheet	255	2.28	.97	PE
15	Ability to format text, cells and columns in a worksheet	256	2.32	.95	PE
16	Ability to save data from a given worksheet	254	2.59	.82	HE
17	Ability to perform addition, multiplication and division in a worksheet	253	2.49	.90	PE
18	Ability to create more worksheets from a workbook	256	2.50	.91	HE
19	Ability to use print preview to see the page layout for your spreadsheet	256	2.35	.73	PE
20	Ability to interpret simple spreadsheets and data analysis results, charts and tables	256	2.32	1.11	PE
Subscale mean		256	2.36	.34	PE

Data on Table 2 presents the mean and standard deviation of secondary school students on spreadsheet processing skills acquired for socio-economic empowerment. The result presented on Table 2 indicates that the mean values ranged from 2.32 to 2.71, thus indicating that the participants' responses for all the 10 items fall under poor extent (2.36) as shown in the grand mean computed for the subscale. Similarly, the values of the standard deviation ranged from .73 to 1.31 which shows that the participants' responses clustered around the mean. Thus, it can be inferred from Table 2 that college students have not acquired sufficient spreadsheet processing skills required for self-sustenance upon graduation.

Table 3: Mean and standard deviation ratings of college students on database management skills acquisition for economic empowerment

S/N	Items	n	\bar{x}	SD	Rem
21	Ability to start and open an existing database	256	2.55	1.09	HE
22	Ability to use structured query language (SQL)	256	2.34	1.24	PE
23	Ability to write programs with different database packages	256	2.76	1.10	HE
24	Ability to debugging procedures, triggers and database structures using SQL	256	2.61	.80	HE
25	Ability to use Visual Basic programming language skills for program design	256	2.40	.92	PE
26	Ability to use data dictionaries and data integrity.	256	2.52	.95	HE
27	Ability to create multiple table systems with screens, updates and reports	256	1.89	1.15	VLE
28	Ability to design and implement normalization of databases using database reports and creating forms and tables.	256	2.36	1.07	PE
29	Ability print data/or information from a given database	256	2.38	1.17	PE
Subscale mean		256	2.44	.40	PE

The result presented on Table 3 shows the mean and standard deviation of college students on database management skills acquired for socio-economic development. The values of the mean ranged from 1.89 to 2.76, thus indicating that the participants' responses for all the 9 items fall under poor extent of skills acquired as shown in the grand mean of 2.44 computed for the subscale. Also, the values of the standard deviation ranged from .73 to 1.31 which shows that the responses of the respondents were clustered around the mean. It can therefore be inferred from Table 3 that college students possess weak database management skills required for economic empowerment.

4.1 Hypothesis Testing

Table 4: Summary of t-test results on data processing, spreadsheet processing and database management skills acquired for economic development with respect to gender

Hypotheses	Group	N	M	SD	95%CI	t	Df	Sig.	Rem
H ₀₁	Female	136	2.23	.70	28.667 - 31.038	-0.667	252	.497	NS
	Male	118	2.27	.40	27.504 - 30.084				
H ₀₂	Female	136	2.38	.33	28.895 - 31.609	1.229	252	.220	NS
	Male	118	2.32	.34	29.834 - 30.469				
H ₀₃	Female	136	2.41	.38	28.489 - 30.354	-1.523	252	.129	NS
	Male	118	2.49	.43	27.885 - 29.784				

The t-test analysis on Table 4 showed the study outcomes for the female and male senior secondary school (SSS₃) students on the data processing skills acquisition for economic empowerment. The t-test analysis of the responses of male and female college students on the data processing skills acquired for economic empowerment revealed that no significant gender difference exist for all the 9 items $M(2.23, 2.27) = t(-0.667, p = .497)$. Therefore, the hypothesis of no significant difference was upheld for all 9 items of the cluster. Also, Table 4 showed the t-test analysis of the responses of participants on the spreadsheet processing skills with respect to gender. The result showed that the p-value is greater than .05 level of significance $M(2.38, 2.32) = t(.220, p = .809)$. Therefore, the hypothesis of no significant gender difference was upheld for all the 11 items.

Furthermore, Table 4 showed the t-test analysis of the responses of female and male participants on the database management skills acquired by college students for economic empowerment. The result revealed that the p-value is greater than 0.05 level of significance $M(2.41, 2.49) = t(-1.523, p = .129)$. Therefore, the hypothesis of no significant gender difference was upheld for all the 9 items of the cluster.

5. Discussion

Findings of the study shows that SS₃ students have not acquired adequate data processing skills such as the ability to perform data conversion (drawing patterns, relationships, and creating subsets); the ability to copy and duplicate data or information; the ability to perform data validation; the ability to perform data summarization and aggregation as well as the ability to carry out data presentation and reporting thus indicating poor extent of data processing skill acquisition by college students. Furthermore, the result of hypothesis one corroborates the findings of research question one given that no significant difference exists in the mean responses of male and female college students on data processing skills acquired for sustainable economic development. This finding is in line with Dada (2006) who asserted that there is profound lack of ICT skills and training required for effective use of e-government systems.

With regard to spreadsheet processing skills acquisition by college students for self-sustenance, the findings of the study shows that students' acquisition of spreadsheet skills were poor with respect to the use of spreadsheet application packages like Excel, Lotus 1-2-3, SPSS, among others as shown in their abilities to format text, cells and columns in a worksheet, perform addition, multiplication and division in a worksheet, application of print preview and ability to interpret simple spreadsheets and data analysis results, charts and tables. Similarly, the students seem to be highly skilled in some other operations such as the ability to open, enter and edit data in a worksheet which are not adequate enough compared to the skills set that the students perform at a moderately poor level. Furthermore, the result of hypothesis two showed no significant difference in the mean responses of male and female college students on spreadsheet management skill acquisition for economic empowerment thus corroborating the findings of research question two. This finding is in line with result of Olelewe and Igboamalu (2017) who found that secondary school students' acquisition of computer appreciation skills such as graphics skill is moderately low as shown in their inability to use diverse graphics tools. Also, the finding supports the views of NERDC (2007) that students' ability to acquire computing skills such as graphics, spreadsheet packages, desktop publishing packages, word processing etc. is requisite for creating streams of income for sustainable livelihood.

With respect to database management skill acquisition by college students, the findings show that college students are poorly skilled in using database packages as demonstrated in their inability to efficiently use structured query language (SQL), write programs with different database packages, create multiple table systems with screens, updates and reports, design and implement normalization of databases using database reports and creating forms and tables among others which are considered essential work skills required for economic empowerment. Additionally, the result of hypothesis three showed no significant difference in the mean responses of male and female participants on the database management skills acquired for economic empowerment. This finding is in line with the Nigerian Educational Research and Development Council NERDC (2007) which asserts that secondary school students are expected to use computers and its diverse application packages efficiently to function in today's world of work. The finding is also in support of Marcovecchio, Thinyane, and Estevez (2019) who opined that the utilization of digital technologies by employees is essential for efficient work performance in more transparent and accountable ways.

Moreover, the study findings have serious implications for the type of training offered to college students in the digital era given the very low level of computer appreciation skills possessed by students. The low acquisition of high order level of computer appreciation skills like data processing, spreadsheet and database skills by college students' calls for programme review in terms of hours allotted for drills and practice, availability of computer systems for practical learning, home computer usage as well as qualified computer studies teachers in the secondary schools. Also, the findings have serious implications for employability of secondary school leavers by the industry given that workers employability is to a great extent dependent on the level of digital skills possessed. This is because employing workers with digital skills will save organizations additional cost of training and retraining of such employees. As stated by Al-Nuaimi, Shaalan, Alauaimi and Alnuaimi (2011), without adequate

ICT skills and abilities, workers cannot take full advantages of e-government services of the present digital era.

6. Conclusion

Today, computer appreciation skills are regarded as enabler for efficient work participation in the 21st century and thus determine the employability level of graduates. Acquisition of high-tech skills is necessary to enable school leavers utilize new ICT facilities and resources for economic empowerment. The introduction of computer studies/ICT at all levels of education particularly at college level will play a vital role in manpower development required for the attainment of sustainable development goals. College students are always eager to learn especially when such learning involves digital devices like, computers, laptops, ipads, etc. and therefore, should be encouraged by their teachers and parents since skills learning demand adequate preparation, supervision and monitoring. Hence, students training on the use of ICTs like data processing, spreadsheet processing, database management skills, Internet skills, graphic skills, etc. are of top priority for manpower development. Based on the study findings, it was recommended among others that more time be allotted to Computer Studies/ICT subject in the school timetable to enable students have enough time for drills and practice so as to ensure that students acquire sufficient computer appreciation skills required for sustainable economic empowerment upon graduation.

7. Limitations

One limitation of this study is that a few secondary schools were involved in the study out of the many colleges in the study area, and this might affect the generalizability of the results. Another drawback considered important is that the study did not take in account other aspects of computer appreciation skills like graphics skills, word processing skills, Internet skills, among others. Therefore, we recommend that future studies should consider widening the scope and sample of the study so as to collect robust data on computer appreciation skills acquisition programme of Nigerian secondary schools. Hence, future studies can involve other variables such as students' ICT self-efficacy, teachers' confidence in the use of ICT, and college students' home computer usage to verify the findings of this study.

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