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Information Communication Technology (ICT) Application-Oriented Skills Acquired by Final Year Computer Education Students of Colleges of Education for Employment

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Abstract

The study focused on information communication technology (ICT) application-oriented skills acquired by final year Computer Education (CE) students of Colleges of Education (COE) for employment in South-east zone, Nigeria. Specifically, the study determined extent to which final year CE students acquired: word processing, data base management, computer graphics, power-point presentation, and communication technology skills. It adopted survey research design. Population was made up of 275 third year CE students of eight COE in study area. Questionnaire was utilized for data collection. Data were analyzed using mean and t-test at 0.05 level of significance. The findings reveal nine word processing skills which include ability to create/edit document ($\overline{X}_g$= 1.94), among others. Other findings are seven database management skills including querying a database ($\overline{X}_g$= 1.41), among others. Further findings are 10 computer graphics skills including ability to create posters and books using Adobe Indesign ($\overline{X}_g$= 1.44) and others. Eight power-point presentation skills were also identified. Also, 10 communication technology skills were identified including, among others, ability to create and send email ($\overline{X}_G$ = 1.96).There were no significant difference in mean responses of male and female final yearCE students for each of the five hypotheses tested. Three recommendations were made based on the findings.

Keywords: Information, Communication, Technology, Application –oriented, Skills, Word, Processing, Database, Management, Computer, Graphics, Power-point.

Introduction

College of education (COE) is a level of education after secondary education. The mandate of COE is to provide training and carry out pure and applied research. It aims at producing teachers with high personal and professional discipline and integrity, teachers who are dedicated, with appropriate knowledge, skills and attitudes that would facilitate easy achievement of the national goals (National Commission for Colleges of Education {NCCE} 2012). Colleges of education were to produce highly qualified non-graduate professional teachers for the primary and junior

secondary level of education in Nigeria. The Computer Education is one of the programmes in COE. It is geared towards the fulfillment of the need for professionally qualified teachers who can impart technical knowledge and vocational skills to their students and thereby contribute to the economic development of Nigeria (NCCE, 2012). The graduates may not all become teachers, equipped with ICT skills, they could be employed in commerce and industries or become self-employed. Li (2024) reported that skill acquisition is becoming increasingly important as the world continue to shift from an industrial, manufacturing-based economy to an economy driven by information, knowledge and technological innovation.

Information and communication technology is the use of computing and telecommunication technologies, systems, and tools to facilitate the way information is created, collected, processed, transmitted, and stored (Rouse, 2024). Thakur, et al, (2023) explained that ICT includes computing technologies like servers, laptop computers, and software applications as well as the wired and wireless communication that support telephones, the Internet, the Internet of Things (IoT), and the metaverse. Computer is a major subset of ICT and it is pertinent to know that for one to work in these present day business offices, the employee must possess relevant ICT skills as ICT has permeated into every sector of the economy.

However, it may come as a surprise that many Computer Education students graduating from COE today do not have the ICT application oriented skills and aptitude for lifelong learning necessary to function successfully in the workplace. Employers, policymakers and educators need to work together to ensure that the COE systems are providing a solid foundation in ICT and lifelong learning skills.

Skill as perceived by Adeniyi (2022) is an organized series of actions that have been masterfully performed and are typically displayed in a flexible but systematic temporal pattern. Skill refers to the learned capacity to achieve a predetermined result on a job with a minimum outlay of resources. Oluka and Onyebuenyi (2017) indicated that the place of skill acquisition cannot be over-emphasized in the rapid development of education, technology, and other sectors of the economy. Skills may be seen as an excellent product of training combined with relevant ideas in carrying out specific tastes. Higher education must diversify to provide the right mix of more ICT skills that serve the labour market and higher-end research and science graduates that can fuel innovation for economic growth (Okeke, 2021). Information communication technology application-oriented skills best appreciated when acquired through formal education as they match theoretical knowledge with practical skills. ICT application-oriented skills encompass practical abilities to use technology effectively, including proficiency in software, digital tools, and online platforms for tasks like data analysis, communication, and problem-solving (Praino, 2023; Okolie & Okudare, 2024). Praino (2023) andKitthu (2024) identified some ICT application-oriented skills such as word processing, data base management, computer graphics, power-point presentation, communication

technology skills. Acquisitions of these skills continue to remain in high demand, making it a more secure and lucrative career path for both male and female graduates for employment.

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 ICT skills (Obidile & Onyeneke, 2022). Gender is important factor that could influence the acquisition of ICT skills among students in tertiary institutions in general and COE in particular. Gender according to Adanlawo & Nkomo (2023) gender is the socially and culturally imposed roles and values that shape how women and men relate to one another in a particular society. Understanding gender relations and the power dynamics behind them is essential for grasping individuals' access to resources, decision-making abilities, and how women, men, boys, and girls are affected by social development, skill development, and economic and political processes.

Specifically, gender-related studies on ICT skills acquisition have shown that male students acquire more ICT skills than female students (Ogunsola & Adesakin, 2020) whereas, Goswami and Dutta (2016) stated that female students acquired computing skills and utilize computers more frequently than male students. In another study Obidile & Onyeneke, (2022) showed no significant difference in computing skills acquired by students. No sch study has, however been carried out on COE CE students, hence this present study.

Purpose of the Study

The study focused on ICT application-oriented skills acquired by final year CE students of COE for employment in South east zone, Nigeria. Specifically, the study determined extent to which final year CE students acquired skills in:

1. word processing
2. data base management
3. computer graphics
4. power-point presentation
5. communication technology

Hypotheses (H_{O5})

The following null hypotheses were formulated and tested at 0.05 level of significance:

There is no significant difference on the mean responses of male and female final year CE students in COE on the extent they had acquired ICT application-oriented skills in:

HO_1: word processing
HO_2: data base management
HO_3: computer graphics
HO_4: power-point presentation
HO_5: communication technology.

Methodology

***Design of Study*:** The study adopted a descriptive survey research design**.**

***Area of Study*:** It was conducted in the five states in south east zone of Nigeria which is made up of five states, namely, Abia, Anambra, Ebonyi, Enugu and Imo States. The study focused on all the four federal and four state (government owned) colleges of education in south east. The zone was selected for the study because of high level of unemployment among the youths in the zone which led to numerous forms of crimes (Eze, *et al* 2024).

***Population for Study*:** The population for the study was 275 third year Computer Education students (93 males and 183 females) of 2023/2024 academic session of all the eight COEs in the zone. Information on the population of the final year students were drawn from the eight COEs in the area that offer Computer Education. The entire population was studied. There was no sample, due to the manageable size of the population. The third year students of COE were studied because they were the final year students, and they were expected to have acquired allthe ICT application-oriented skills stipulated in their 3 –year NCE curriculum prior to graduation. The data for this study were collected after the students had completed their third year courses and were about to graduate.

***Instrument for Data Collection*:** A 4-point scale questionnaire with response options; Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE) and corresponding value 4, 3, 2 and 1. It was developed based on literature reviewed and five specific purposes of the study. It was face validated by three university experts in Computer Education. It was also subjected to reliability test, using Cronbach alpha method to determine the internal consistency which yielded a coefficient of 0.78.

***Method of Data Collection*:** A total of 275 copies were administered to the respondents in hand with the help of four trained research assistants. The entire 275 copies (93 males and 182 females) were retrieved on completion.

***Data Analysis Techniques*:** Data collected for the study were analyzed using the mean and t-test at 0.05 level of significance. Items with means ranging from 3.5 - 4.00 are classified as very high extent; the items with mean ranging from 2.5 - 3.49 are classified as high extent, those with mean ranges between 1.5 - 2.49 as low extent and items with mean ranging from 0.5 - 1.49 are classified as very low extent.

Result

Table 1: Mean Responses, Standard Deviation and t-values of Male and Female Final Year Computer Education Students on Word Processing Skills

S/N	Word Processing Skills	$\bar{X}_m$	SD_m	$\bar{X}_f$	SD_f	$\bar{X}_g$	t	R
	Ability to:							
1	Create/edit documents	2.00	0.60	1.87	0.70	1.94	0.74	LE / NS
2	import/export text, graphics, tables from various sources	1.74	0.62	1.82	0.64	1.78	-0.49	LE / NS
3	create/insert of tables, symbols and pictures on documents	2.00	0.60	1.69	0.73	1.85	1.70	LE / NS
4	merge mail	1.77	0.42	1.74	0.44	1.76	0.75	LE / NS
5	back up documents on CDs and DVDs	1.96	0.21	2.31	0.69	2.14	-2.36	LE / NS
6	format documents using font types, size and colours	2.39	0.72	1.62	0.49	2.00	1.02	LE / NS
7	proofreading with Microsoft tools	1.73	0.45	1.63	0.48	1.68	1.95	LE /NS
8	password protected sensitive client information	1.83	0.36	1.89	0.32	1.86	-1.12	LE / NS

Table 1 continues

9	convert electronic / hard copy reports to PDF format using Adobe Acrobat	1.76	0.43	1.83	0.38	1.80	-1.56	LE / NS

Number of males =93; Number of Females = 182; $\bar{X}_m$= Mean of Males; SD_m = Standard deviation of males; $\bar{X}_f$ = Mean of Females; SD_f= Standard deviation of Females; t = t-value results; R= Remark, $\bar{X}_g$= Grand mean, LE= Low Extent, NS= Not Significant, NS=Not Significant

Table 1 shows that grand mean of nine items under word processing skills ranged from 1.78 to 2.14. This indicates that the participants' acquisition of the skills falls under "very low extent". The Table also shows that there were no significant differences in the mean response of male and female final year computer education students on the extent they have acquired ICT application- oriented skills in word processing skills.

Table 2: Mean Responses, Standard Deviation and t-values of Male and Female Final Year Computer Education Students on Data Base Management Skills

S/N	Database Management Skills	$\bar{X}_m$	SD_m	$\bar{X}_f$	SD_f	$\bar{X}_g$	t	R
	Ability to:							
1	entry data using existing templates and other technique	1.52	0.59	1.85	0.63	1.69	-2.00	LE / NS
2	create of database, tables, queries, reports and form.	1.48	0.51	1.39	0.54	1.44	0.67	VLE / NS
3	design database files	1.44	0.59	1.49	0.51	1.47	-0.37	VLE / NS
4	preview/ print of database files	1.34	0.48	1.35	.48	1.35	-0.30	VLE / NS
5	upload database forms/tables to the web	1.39	0.50	1.33	0.53	1.36	0.43	VLE / NS
6	query a database	1.26	0.45	1.56	0.72	1.41	-1.82	VLE / NS
7	programming in structured query language (SQL)	1.17	0.39	1.28	0.46	1.23	-0.95	VLE/ NS

Number of males =93; Number of Females = 182; $\bar{X}_m$= Mean of Males; SD_m = Standard deviation of males; $\bar{X}_f$ = Mean of Females; SD_f= Standard deviation of Females;, t = t-value results; R= Remark, $\bar{X}_g$= Grand mean, LE= Low Extent, VLE= Very Low Extent, NS=Not Significant

Table 2 shows grand mean scores of items under database management skills ranges from 1.23 to 1.47. This implies very low extent of acquisition of the skills. However, the item one has a grand mean of 1.69 which indicates low extent of acquisition of the skills by students. The result shows that computer education students have not adequately acquired the database management skills. The Table also shows there wereno significant differencesin the mean response of male and female final year computer education students on the extent they have acquired ICT application- oriented skills in database management.

Table 3: Mean Responses, Standard Deviation and t-values of Male and Female Final Year Computer Education Students on Computer Graphics Skills

S/N	Computer Graphics Skills	$\bar{X}_m$	SD_m	$\bar{X}_f$	SD_f	$\bar{X}_g$	t	R
	Ability to:							
1	create/manipulate visual elements using shape tools like rectangles, circles, etc.	1.13	0.34	1.44	0.50	1.29	-2.58	VLE/NS
2	use paintbrush, paint box /fill with colour, spray can/air brush, eraser and rotating of objects	1.52	0.59	1.39	0.49	1.46	0.98	VLE / NS
3	create posters and books using Adobe Indesign	1.39	0.50	1.49	0.51	1.44	-0.72	VLE / NS
4	create animations using movie makers and other graphics tools	1.48	0.51	1.64	0.54	1.56	-1.17	LE / NS
5	work with vector graphics editors like Adobe Illustrator to create a variety of digital and printed images such as logos, charts, cartoons	1.48	0.51	1.39	0.71	1.44	0.55	VLE / NS
6	use paint programs like Microsoft Paint and Adobe Fresco are used for creating digital artwork	1.91	0.67	1.85	0.81	1.88	0.33	LE / NS
7	design / construct 2D and 3D forms.	1.39	0.58	1.39	0.49	1.39	0.05	VLE / NS
8	create special effects for movies, games, and other visual media.	1.41	0.49	1.47	0.50	1.44	-1.20	VLE / NS
9	create animated visuals for advertising, video content, and web design	1.46	0.50	1.44	0.50	1.45	0.51	VLE / NS
10	use photo editing software like Adobe Photoshop, Lightroom for manipulating and enhancing photos.	1.44	0.50	1.40	0.49	1.42	0.64	VLE / NS

Number of males =93; Number of Females = 182; $\bar{X}_m$= Mean of Males; SD_m = Standard deviation of males; $\bar{X}_f$ = Mean of Females; SD_f= Standard deviation of Females; t = t-value results; R= Remark..$\bar{X}_g$= Grand Mean, LE= Low Extent, VLE= Very Low Extent;NS=No]]]t Significant

Table 3 shows that items 4 and 6 have grand mean scores of 1.56 and 1.88 respectively, indicating low extent. Other skills have means ranging from 1.29 to 1.46 indicating very low extent. Table 3 shows there wereno significant differencesin the mean response of male and female final year computer education students on the extent they have acquired ICT application-oriented skills in computer graphics.

Table 4: Mean Responses, Standard Deviation and t-values of Male and Female Final Year Computer Education Students on Power-Point Presentation Skills

S/N	Power- Point Presentation Skills	$\bar{X}_m$	SD_m	$\bar{X}_f$	SD_f	$\bar{X}_g$	t	R
	Ability to:							
1	select appropriate fonts and font sizes	2.00	1.00	1.77	1.01	1.89	0.87	LE / NS
2	select the right visual aids like charts, graphs, images, or videos to help illustrate your messages	1.74	0.62	1.54	0.55	1.64	1.32	LE / NS
3	use an AI presentation maker like sendsteps.ai(/en/ai/) to create an effective presentation	1.35	0.49	1.33	0.48	1.34	0.12	VLE /NS
4	choose animation schemes and transitions	1.44	0.51	1.49	0.56	1.47	-0.37	VLE /NS
5	choose eligible typeface and suitable colours	1.87	1.05	1.54	0.56	1.71	0.96	LE / NS
6	gather, select and structuring your presentation materials.	1.44	0.51	1.33	0.48	1.39	0.79	VLE /NS
7	utilize the slide master to maintain consistent design elements across all slides	1.74	0.69	1.85	0.71	1.80	-0.58	LE / NS
8	use white space to create a clean and uncluttered design that helps the audience focus on the key information	1.77	0.42	1.74	0.44	1.76	0.75	LE / NS

Number of males =93; Number of Females = 182; $\bar{X}_m$= Mean of Males; SD_m = Standard deviation of males; $\bar{X}_f$ = Mean of Females; SD_f= Standard deviation of Females; t = t-value results; R= Remark..$\bar{X}_g$= Grand Mean, LE= Low Extent, VLE= Very Low Extent; NS=Not Significant

Table 4 shows items 1, 2, 5, 7 and 8 have grand mean scores ranging from 1.64 to 1.89 indicating low extent of acquisition, while items 3, 4 and 6 have grand mean scores indicating very low extent. Table 4 also showsthat all the eight skills had their t-calculated values less than t-table value of 1.97. Therefore, there was no significant difference on the mean response of male and female final year computer education students on the extent they have acquired ICT application- oriented skills in power-point presentation.

Table 5: Mean Responses, Standard Deviation and t-values of Male and Female Final Year Computer Education Students on Communication Technology Skills

S/N	Communication Technology Skills	$\bar{X}_m$	SD_m	$\bar{X}_f$	SD_f	$\bar{X}_g$	t	R
	Ability to:							
1	create and send email.	1.70	0.47	2.21	0.62	1.96	-3.42	LE / NS
2	access, copy and posting information from internet to a different application skills	1.83	0.98	1.49	0.76	1.66	1.52	LE / NS
3	use social networks like facebook, twitter,CompanyLoop, LinkedIn etc	2.44	0.79	1.82	0.91	2.13	1.69	LE / NS
4	share of documents like PDFs, Google docs, and Microsoft office files with coworkers with your smartphone anytime	2.22	0.60	1.92	0.84	2.07	1.47	LE / NS

Table 5 continues

5	advertize in facebook and other social networking sites	1.74	0.92	1.85	0.84	1.80	-0.47	LE / NS
6	receive telephone calls professionally	1.96	0.77	1.95	0.61	1.96	0.04	LE / NS
7	upload information on the web	1.74	0.69	1.85	0.71	1.80	-0.58	LE / NS
8	download productive tools like budget calculators, to-do lists, currency converters	2.04	0.77	174	0.68	1.89	1.60	LE / NS
9	use of cloud applications	1.78	0.60	1.85	0.67	1.82	-0.38	LE / NS
10	participate in video conferencing like Go To Meeting, Webex, Zoho Meeting etc	1.57	0.60	1.67	0.66	1.62	-0.60	LE / NS

Number of males =93; Number of Females = 182; $\bar{X}_m$= Mean of Males; SD_m = Standard deviation of males; $\bar{X}_f$ = Mean of Females; SD_f= Standard deviation of Females; t = t-value results; R= Remark., $\bar{X}_G$ = Grand Mean, LE= Low Extent, NS=Not Significant

Table 5 revealsten skillsobtained mean scores ranging from 1.62 to 2.13 which fall under low extent. Furthermore, Table 5 also shows that the all the 10 skills had their t-calculated values less than t-table value of 1.97. Therefore, there was no significant difference on the mean response of male and female final year computer education students on the extent they have acquired ICT application-oriented skills in communication technology.

Discussion

Findings of the study reveal that computer education students have not acquired adequate word processing skills for employment. Again, the result of hypothesis one showed no significant difference in the extent of acquisition by gender. The findings align with recent studies such as Eze and Nwafor (2021), Johnson and Akpobome (2023) and Akubos (2025) who reported that students lack proficiency in essential word processing tasks such as creating and formatting professional documents, organizing content using formatting tools, and inserting tables and images. The authors further stated that students struggle with more advance features like mail merge, document design tools, proofreading utilities, and file conversion.

Findings on database management skills revealed that computer education students have not acquired adequate database management skills for employment. Again, the result of hypothesis two showed no significant difference by gender. The findings collaborate the report of Ekwere (2020) and Obichukwu, et al, (2021). The authors found out that graduating students are poorly skilled in using database packages as demonstrated in their inabilities to efficiently use structured query language (SQL), write programs with different database packages, create multiple table systems with screens and creating forms and tables among others which are considered essential work skills required for economic empowerment.

With regard to level of computer graphics skillsacquired for employment, the findings of the study also show that computer educations students have not acquired adequate computer graphic skills. Again, the result of hypothesis three showed no significant difference in the extent of acquisition by gender. As noted by Ibezim and Ireh (2017) that possessing artistic sensibility skills is required for

effective entrepreneurial development and also essential as a basic foundation for them to successfully compete in the labour market. The authors buttressed that in accordance with rapid development in technological driven society, technical skills are also required for effective development as it complements their knowledge in psychomotor domain which will fetch them job in industries.

Findings in Table 4 revealed that power point presentation skills were not adequately acquired by both male and female students. The findings are in consonance with Eze and Okwute (2022) who reported that graduating students of tertiary institutions acquired little presentation skills for job creation. This means that graduating students are poor when it comes to presentation skills with the use of technology such as incorporating visual and auditory aspects to a presentation and use of appropriate animation to improve presentation. However, Oluwalola, (2020) andKitthu (2024) stated that presentation software is often a requirement when presenting ideas in an organization, both internally and externally. Every professional require knowledge of presentation software to outshine in their workplace.

Furthermore, result in Table 5 revealed that both male and female computer education students have not adequately acquired communication technology skills. The findings are in consonance with Dolye (2020) and Nwegede (2024) who contended that global business environment has been taken over by theinternet. Through the combination of e-mail, video conferencing, telephone and webconferencing, cloud computing, social media, digital marketing, there is maximum potentials to communicate with worldwide audience. Graduating students must learn to use the internet for various jobs as employers prefer computer-savvy candidates.

Conclusion

It is obvious from the findings that computer education students in colleges of education do not acquire adequate relevant ICT skills. It is therefore necessary to expose both male and female students to diverse ICT application oriented skills for sustainable employment in business organizations The skills include word processing, data base management skills, computer graphics, power-point presentation skills and communication technology skills. Possessing these skills will equip the students with the necessary knowledge, competence, attitude required to secure worthwhile employment

Recommendations

Based on the findings of the study the following recommendations are made: -

1. Governments, philanthropists and parents should fund Computer Education programme to equip students with ICT application – oriented skills for the labour market.
2. Computer Education teachers need continuous training to stay updated with ICT skills demanded by the evolving business world, enabling them to effectively teach their students.
3. More time should be dedicated to skill-based computing courses to allow students sufficient practice for acquiring skills necessary for lasting employment.

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