

Problem Solving and Collaborative Competencies Required by Office Technology and Management (OTM) Graduates to Excel in Information and Communication Technologically (ICT) Driven Office

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Article History	Abstract
Original Research Article	
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Copyright © 2026 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.	
Citation: DR. IKELEGBE SAMUEL EMUHOWHO, OFULUE JUSTINA IFEANYI, & NWAODUME FRANCISCA NKECHI. (2026). Problem solving and collaborative competencies required by Office Technology and Management (OTM) graduates to excel in information and communication technologically (ICT) driven office. UKR Journal of Multidisciplinary Studies, 2(8), 114-120.	<i>The Study focused on problem solving and collaborative competencies required by OTM graduates to excel in information and communication technology (ICT) driven office. Descriptive survey design was used for the study. Three research questions and three hypotheses guided the study. The population of the study comprised of 130 respondents (Directors) working in Federal and State Ministries plus Directors working in two Institutions of higher learning in Delta State. The entire populations identified were studied. A structured questionnaire with 45 items was used to collect data from respondents. The instrument was validated by two experts. The reliability of the instrument was ascertained using Chronbach Alpha method. A coefficient of 0.82 was obtained which indicated that the instrument was reliable. Mean and Standard deviation were used to analyze the data collected in order to answer the research questions while independent samples t-test was used to test the hypothesis at 0.05 level of significance. Based on the findings of the study, it was concluded that ICT competencies, problem solving competencies and collaborative competencies are required by OTM graduates to excel in a technological driven office. It was recommended among others that agencies such as NUC and NBTE should include the knowledge of problem and collaborative competencies in OTM curriculum and that the ICT competences already included should be enhanced to meet what is required in present day offices.</i> Keywords: problem solving, collaborative, ICT, office technology management.

Introduction

The modern day office is ICT (Information and Communication Technology) driven workspace that uses modern technological tools & as far as the less understood aspect of requirements Soft Skills are needed in tandem to technical ones for effective operation. As Nakib in Akpomi, Ben-George and Wolugbon (2021) puts it: Technology is dynamic; it evolves alongside users because of user needs, changes in socio-cultural and demographic conditions, market demands; climate variability and regulations; aesthetic preferences. For an office following the technology, various tools and facilities such as computers, scanners, printers, photocopiers, telephone systems/internet facilities/paper shredders/document feeders/computer software/external storage/cloud and edge enablement/smart

cards/projectors will be in the basket. Other technologies include smart devices, collapsible office furniture, treadmill desks 3D printers, VoIP (Voice over Internet Protocol) solutions (Google Voice Viber Skype Facebook Messenger Team Talk and so forth). As a result, modern offices increasingly make use of Zoom Video and Google Meet as well as laptops, tablets, cell phones, WhatsApp audio and video calls, internet service providers (ISPs), microphones or smartboards or whiteboards for the purpose of communication and virtual interaction.

Azih and Ama (2020) stated that as a result of advancement and application of technology in workers, management and systems, changes in the flow of information process are visible, such as changes in decision levels and

organizational restructuring and these mean that an enhance level of skills are expected of workers especially Office Technology and Management graduates, this is because technologies keep pushing for new application of work skills, techniques and approaches. According to Akpomi, Ben-George and Wolugbon (2021), the OTM graduates who manages an office are expected to develop skills to enable them adapt to changing technological environments and work patterns to survive in today's office setting. Pentoski (2020) added that office technology and its successful use is only as good as the people behind it. Therefore, the present era (technology) compels OTM graduates to possess and develop competencies that can stand the test of the present day.

Bachelor of Office Technology and Management (OTM) is a programme that aims to train students in skills, knowledge, attitudes work habits and competencies necessary for successful careers in office management (Ikelegbe, 2023) The new OTM curriculum focuses heavily on computer and computer-related courses. The OTM curriculum was developed by the National Board for Technical Education (NBTE) for in training graduates with background knowledge of the composition and management of technology influenced offices with the secretarial and office management acumen to be employed into diverse sectors (Ikelegbe, 2023).

According to Meta AI Assisted (2026), an office technology and management graduate is someone who's studied how to manage and implement tech tools in offices. The OTM graduate is equipped with skills to handle tech driven office environments. They typically learn about; office automation, database management, communication systems (email, video, conferencing), document management, basic IT support and administrative procedures. The OTM graduates of today are prepared for such roles like; office administrator, executive assistant, data entry clerk and office managers. In Nigeria, OTM graduates can fit into various industries like banking, government or corporate offices due to their training, though this depends on the competencies acquired and exhibited by individual graduate.

Competency is the ability to use or use knowledge, skills, abilities, personal traits to successfully carry out critical job duties, specialised responsibilities or operate in a given role or position (Ankwandu, Okoro and Ozoemenam, 2022). Competence means the capacity, power, authority, skill, knowledge, attitude of a person to do what is required. Ohaegbulem in Azih and Ama (2020) said that there is a particular set of competencies for each level of responsibility. They noted that the competencies are focused on personal image, attitude, habits, behaviour, strategies of communication, issue solving, decision

making, honesty, humility, resourcefulness, regularity and development of human interactions which is conducive to collaboration in organisations.

Problem solving is the process of finding solutions to difficult or complex issues, it involves identifying issues, analyzing causes and implementing fixes, it is finding solutions to the challenges after identification (Meta AI Assisted, 2026). While collaboration according to Azih and Ama (2020), is the process of working as a team with a group of people in order to achieve a goal. It involves communicating clearly, clearer roles, sharing ideas, listening actively, resolving conflicts, respect and trust among staff and achieving shared goals with the team, collaboration in office environment is important because it facilitate better idea, bring about delivering assigned roles on time and less burnout.

Statement of the Problem

Offices today are electronically driven and most employers already braised up by providing the desired equipment to manage offices. However, apart from the office skills needed to manipulate the computer keyboard and skills for email and other communication skills, the office of today requires some other skills that the office manager required to achieve result. Many authors have averred that there is a challenge of mismatch between training given to students office technology and management before graduating with regards to problem solving competencies, collaborative competencies and information communication competencies required in an ICT driven office. The researcher is therefore interested in identifying problem solving competencies, collaborative competencies and ICT competencies required by the office technology and management graduates to excel in information communication technologically driven office.

Purpose of the Study

The main purpose of the study was to determine:

1. Information and communication technology competencies required by OTM graduates to excel in a technological driven office.
2. Problem solving competencies required by OTM graduates to excel in a technologically driven office.
3. Collaborative competencies required by OTM graduates to excel in a technological driven office.

Research Questions

1. What are the ICT competencies required by OTM graduates to excel in a technological driven office?

2. What are the problems solving competencies required by OTM graduates to excel in a technological driven office?
3. What are the collaborative competencies required by OTM graduates to excel in a technological driven office.

Null Hypotheses

1. There is no significant difference in the mean ratings of Directors in ministries and Directors in institutions of higher learning in Delta State on ICT competencies required by OTM graduates in an electronic driven office.
2. There is no significant difference in the mean ratings of male and female Directors working in ministries and in institutions of higher learning in Delta State on problem solving competencies required by OTM graduates in an electronic driven office.
3. There is no significant difference in the mean rating of Directors working in ministries and Directors working in higher institutions of higher learning in Delta State on collaborative competencies required by OTM graduates in an electronic driven office.

Method

Descriptive survey design was used in the study. The researcher settles on this design for the research study because the study was inquest of surveying the perception of supervisors/Directors with OTM degrees that are employed gainfully in five ministries and two higher institutions of learning in Delta State. Population consisting of 68 directors in 3 state ministries (ministry director and

assistant director), 20 directors, 42 professors from two institutions of higher learning who work with OTM graduates (in their Office) were included as participating respondents totalling about 130 directors (supervisors). The population is small enough to collect data on the entire one. In the study, a well-structured questionnaire has been developed with the title of “Problem Solving and Collaborative Competencies that are Required by Office Technology and Management Graduates Questionnaire (PSCCROTMGQ)”. It is a 45 items instrument which was used to solicit information from respondents.

Relevance, language, coverage of scope of study and general text format and suitability were investigated for the instruments. The study was carried out using a Likert 4 point scale of Very Highly Required (VHR) – 4 points, Highly Required (HR) – 3 points, Moderately Required (MR) – 2 points and Fairly Required (FR) – 1 point. The reliability test of the instrument was conducted using the Chronbach Alpha method, and it showed reliability coefficient 0.82 which indicates a good internal consistency. Research questions were answered using mean and standard deviation, while null hypothesis was tested with independent simple t-test at 0.05 level of significance. A mean value of 2.50 and above was rated as very much needed while a mean value less than 2.50 were considered not required. For hypothesis testing H_0 , if calculated t-value < fixed critical t-value then accept H_0 , if otherwise then we reject H_0 .

Results

Research Question One: What are the information communication technologically (ICT) competencies required by OTM graduates to excel in a technological driven office?

Table 1: Summary of mean and standard deviation of responses on ICT competencies required by OTM graduates.

S/N	ICT Competencies Required by OTM Graduates	Mean	SD	Remarks
1.	Ability to use word processing packages	3.36	0.68	Highly Required
2.	Ability to use spreadsheet software	3.11	0.73	Highly Required
3.	Ability to use database management software	3.18	0.65	Highly Required
4.	Ability to use PowerPoint software	2.86	0.96	Highly Required
5.	Ability to use webpage design software	2.88	0.96	Highly Required
6.	Ability to use create and organize computer files and folders	2.76	0.97	Highly Required
7.	Ability to use computer aided design such as digital camera, touch screen, trackballs for records creation	2.85	1.12	Highly Required
8.	Ability to insert pictures and symbols into document	2.48	1.18	Not required
9.	Multi-tasking for record creation	2.76	0.91	Highly Required
10.	Use of electronic document imaging for storage and retrieval of bitmapped documents	2.89	0.63	Highly Required
11.	Use of Microsoft access to generate management report	3.21	0.73	Highly Required
12.	Knowledge to create e-mail account	3.36	0.88	Highly Required

13.	Opening and composing emails online	3.32	0.98	Highly Required
14.	Sending and receiving mail with attachment	3.46	0.86	Highly Required
15.	Refreshing and saving a webpage	3.23	0.62	Highly Required
16.	Ability to download information from the net	3.62	0.48	Very Highly Required
17.	Ability to print a web page document	3.01	0.78	Highly Required
18.	Ability to place and confirm orders online	2.81	0.96	Highly Required
19.	Using the internet to store documents in multimedia and graphics	2.97	0.94	Highly Required
20.	Ability to create slides using different layout	3.11	0.82	Highly Required
21.	Ability to run slide show in PowerPoint	2.77	1.11	Highly Required
22.	Ability to create PowerPoint graphics/slides of business product to be sent online (electronic marketing)	2.88	0.98	Highly Required
23.	Ability to make presentation using slides and projectors	2.94	0.98	Highly Required
	Grand mean	3.03	0.77	Highly Required

Table 1 above revealed that respondents rated 21 items as highly required with mean rating ranging above 2.50 to 3.46. Item number 8 was rated not required with mean of 2.46 while item number 16 was rated very highly required with mean of 3.62. The grand mean which was 3.03 and the standard deviation of 0.77 shows that respondents viewed

items listed as ICT competencies required in a technologically driven office.

Research Question Two: What are the problem solving competencies required to excel in a technological driven office?

Table 2: Summary of mean and standard deviation of responses on problem solving competencies required by OTM graduates.

S/N	ICT Competencies Required by OTM Graduates	Mean	SD	Remarks
24.	Analytical thinking e.g. trouble shooting ability	3.59	0.52	Very Highly Required
25.	Tech literacy	3.00	0.87	Highly Required
26.	Possession of maintenance culture	3.56	0.51	Very Highly Required
27.	Ability to communicate	3.53	0.64	Very Highly Required
28.	Ability to detect fraud	3.59	0.52	Very Highly Required
29.	Ability to identify problems and their solution	3.59	0.52	Very Highly Required
30.	Ability to be innovative	3.41	0.77	Highly Required
31.	Ability to inspire people	3.65	0.49	Very Highly Required
32.	Ability to understand cause and effect	3.56	0.51	Very Highly Required
33.	Priority setting	3.53	0.64	Very Highly Required
34.	Attention to details	3.65	0.49	Very Highly Required
	Grand mean	3.51	0.51	Very Highly Required

Table 2, shows that respondents rated items 25 and 30 as highly required with mean ratings of 3.00 and 3.41. All other items listed were rated very highly required with mean ratings ranging from 3.53 to 3.65 respectively. With grand mean of 3.51 and standard deviation of 0.51. it is concluded that respondents rated item presented for the study as required competencies for problem solving in

information communication technological driven office by OTM graduates.

Research Question Three: What are the collaborative competencies required by OTM graduates to excel in a technological driven office?

Table 3: Summary of mean and standard deviation of responses on collaborative competencies required by OTM graduates.

S/N	Collaborative Competencies Required by OTM Graduates	Mean	SD	Remarks
35.	Ability to communicate clearly	3.68	0.47	Very Highly Required
36.	Ability to resolve conflict	3.32	0.53	Highly Required
37.	Ability to set realistic targets for the team	3.75	0.42	Very Highly Required
38.	Ability to be sensitive to friction crises	3.51	0.52	Very Highly Required
39.	Ability to listen to others ideas	3.60	0.50	Very Highly Required
40.	Ability to motivate others	3.60	0.55	Very Highly Required
41.	Possession of public relations competencies	3.66	0.47	Very Highly Required
42.	Ability to show leadership	3.64	0.50	Very Highly Required
43.	Ability to be flexible	3.51	0.52	Very Highly Required
44.	Ability to accept responsibilities	3.55	0.58	Very Highly Required
45.	Ability to achieve shared goals	3.66	0.47	Very Highly Required
	Grand mean	3.58	0.50	Very Highly Required

Table 3, shows all items listed for the study were rated very highly required except item 36 which was rated highly required with 3.32 mean value. With a grand mean of 3.58 and standard deviation of 0.50, it was concluded that items listed for collaborative competencies were rated very highly required.

Null Hypotheses

Hypothesis 1: There is no significant difference in the mean ratings of Directors in the ministries and Directors in institutions of higher learning in Delta State on ICT competencies required by OTM graduates to excel in an electronic driven office.

Table 4: t-test result of ICT competencies required by OTM graduates in a technological driven office.

Variables	N	X	SD	Df	t-cal	t-crit	L/sig	Decision
Directors in Ministry	86	3.48	0.53					
				126	0.46	1.96	0.05	Accepted
Directors in higher institutions	42	3.65	0.66					

Source: field survey report, 2026

Table 4, showed that t-calculated value is 0.46, which is less than standard t-critical value of 1.96, with 126 degree of freedom and 0.05 level of significance. There is enough evidence to accept the null hypothesis. This implies that there is no significant difference in the mean response of Directors working in ministries and their counterpart working in higher institutions in Delta State on ICT competencies required by OTM graduates in an information communication technological driven office.

Hypothesis 2: There is no significant difference in the mean ratings of male and female Directors working in the ministries and Directors in higher institutions in Delta State on problem solving competencies required by OTM graduates to excel in a technological driven office in Delta State.

Table 5: t-test Result on problem solving competencies required by OTM graduates in an information communication technological driven office.

Variables	N	X	SD	Df	t-cal	t-crit	L/sig	Decision
Male	56	3.60	0.67					
				126	0.67	1.96	0.05	Accepted
Female	76	3.48	0.44					

Source: field survey report, 2026

The data on t-test on Table 5 above revealed that at 126 degree of freedom, with t-calculated value of 0.67 while t-critical value is 1.96 and 0.05 level of significance. This implies that there is no significant difference in the mean response of male and female Directors in ministries and Directors in institutions of higher learning on problem solving competencies required by OTM graduates in an

information communication technological driven office in Delta State.

Hypothesis 3: There is no significant difference in the mean ratings of Director working in ministries and Director working in higher institutions in Delta State on collaborative competencies required by OTM graduates to excel in a technological driven office.

Table 6: t-test result on collaborative competencies required by OTM graduates in an electronic driven offices.

Variables	N	X	SD	Df	t-cal	t-crit	L/sig	Decision
Directors in Ministry	86	3.44	0.52					
				126	0.42	1.96	0.05	Accepted
Directors in higher institutions	42	3.62	0.60					

Source: field survey report, 2026

Table 6, revealed that t-calculated value is 0.42 while t-critical is 196 with 126 degree of freedom at 0.05 level of significance. Since the t-calculated value is less than the table critical value, the hypothesis is accepted. This implies that there is no significant difference in the mean response of Directors working in ministries and Directors working in higher institutions in Delta State on collaborative competencies required by OTM graduates to excel in a technological driven office.

Discussion of Findings

The result of the analysis of responses in research question one, Table 1 showed that all items listed for the study were accepted as ICT competencies required by OTM graduates in a technological driven office. They include ability to use word processing packages, spreadsheet software, database management, PowerPoint, and webpage design. Others include ability to use computer aided design, multi-tasking, electronic document imaging, use of Microsoft access to general management report and knowledge of creating and use of email. Also, the ability to send and receive mails with attachment, refresh and save a web page, download information, print webpage document, confirm and place orders online, create slides using different layout. Others include ability to run slide show in PowerPoint, create PowerPoint graphics, and ability to make presentation using slide projectors. This finding agrees with Azih and Ikelegbe (2021) where they stated that OTM graduates require a blend of soft skills and hard skills in ICT software application and modern office technology to succeed. Similarly, the findings agrees with Gana and Ejiro-Aghen (2023), in their study where they identified similar digital skills as required for OTM graduates for global relevance and decent work in civil service.

The findings in research question two, Table 2, reveals that the identified problem solving competencies listed for the

study were accepted by the respondents. They include analytical thinking, tech literacy, possession of maintenance culture, ability to communicate, ability to: detect fraud, to identify problem and proffer solution, to be innovative, to inspire people, to understand cause and effect, priority setting and ability to pay attention to details. The findings of this study is in line with the findings of Azih and Ama (2020), where they stated that OTM graduates need a broad range of skills in order to contribute to modern office activities and that problem solving skills is required by office practitioners in modern offices to enable him do a co-ordinated job instead of routine jobs.

The findings in research question three, Table 3, revealed that respondents agreed that all items listed for the study were required as competencies required by OTM graduates. They include ability to communicate clearly, to resolve conflict and to set realistic targets for the team. Others include ability to be, sensitive to friction crises, to listen to others ideas, to motivate others, and possession of public relations competencies. Also, included is ability to show leadership, to be flexible, to accept responsibilities and ability to achieve shared goals.

The three hypotheses tested for the study were accepted. This is because the respondents are all in agreement with the listed competencies, for instance hypothesis one and three were tested using Directors working in the ministries and Director working in higher institutions of learning while hypothesis two was tested using male and female respondents, the results indicates that there is no significant difference in their mean responses.

Conclusion

Based on the findings of this study, it is concluded that ICT competencies, problem solving competencies and collaborative competencies are required by OTM graduates

to excel in information and communication technological driven office.

Recommendations

The following recommendations were made based on the findings and conclusion of this study.

1. The agencies that are saddled with the responsibilities of reviewing higher institutions curriculum such as NUC, and NBTE should include knowledge of problem solving competencies and collaborative competencies skills in higher institutions curriculum, also measures should be in place to enhance the ICT competencies already in the curriculum of office technology and management (OTM) in the polytechnics and that of Office Information Management (OIM) in the universities.
2. Lecturers in the field of OTM while teaching should emphasize on the importance of these competencies i.e. in the areas of ICT, problem solving and collaborative competencies in the present day information communication technology driven office.
3. Management of institutions and stakeholders should provide enabling environment where OTM curriculum can be reviewed and upgraded at the appropriate time. This is needed to allow for curriculum harmonization in order to include new innovations and new knowledge in the OTM curriculum.

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