



Promoting Critical Thinking Research Skills and Digital Citizenship among Students of Nigeria's Tertiary Institutions

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Abstract. The study is anchored on the importance of promoting critical thinking research skills and digital citizenship among students of Nigeria's tertiary institutions with special emphasis on universities in Delta State, Nigeria. Three research questions and three hypotheses guided the study. Descriptive survey research design was adopted for the study. The population for the study was 131,150 (one hundred and thirty one thousand, one hundred and fifty) tertiary institutions' students in Delta state. A self-structured questionnaire developed by the researcher and titled "Promoting Critical Thinking Research Skills and Digital Citizenship Questionnaire" (PCTRSDCQ) was used for data collection. This instrument was validated by three experts, two from the Department of Social Science Education and one from Measurement and Evaluation all from Delta State University, Abraka. Reliability coefficient of .74 was established using Cronbach Alpha reliability estimate. Mean with standard deviation were used to answer the research questions. T-test statistics was used in analyzing the hypotheses at .05 level of significance. The findings of the study among others revealed that universities' students in Delta State are not exposed to critical thinking research skills, and the concept of digital citizenship. The researcher therefore recommended among others that management of universities, and lecturers should encourage students to explore critical thinking research skills, and digital citizenship in their research writing. This will enhance quality research output among universities' students in Delta State.

Keywords: Critical Thinking, Research Skills, Digital Citizenship, Students, Nigeria' Tertiary Institutions, and Universities

1. Introduction

Quality research output is core to education all over the world. Education has become a very big enterprise all over the globe. It has become a microscope through which individual's potentials are detected and channeled appropriately. According to Ihienyemolor (2023), the importance of education, how education can be improved through promoting critical thinking research skills, and digital citizenship to every Nigerian citizen has also become a central issue for discussion in very many global forums, therefore the need for students to be exposed to, and explore critical thinking research skills and digital citizenship has become essential in education. The quality of any nation according to Nwangwu (2016) depends on the quality of research that its students in educational institutions are able to turn out after graduation. Where the quality of research turnout is weak, the country is bound to be weak, technologically, socially, economically, politically, and vice versa. The output quality of these pieces of research however, depends majorly on critical thinking, and the sustainability of digital citizenship.

Critical thinking research skills are skills embedded in a research that enables him or her to churn out quality, adequate, standard, and appropriate research outputs. The emphasis on the promotion of critical thinking research skills is fast growing especially in universities in Nigeria (Mezieobi, 2024). Critical thinking research skills are crucial research skills that students in tertiary institutions need to develop to succeed academically and in life (Yazidi, 2023). Therefore, teaching critical thinking research skills is a serious challenge in universities, and for educationists irrespective of areas of specialization, and the need to strategically develop

these critical thinking research skills in students abound. Critical thinking research skills emphasizes the identification of six specific strategies that have been proven effective in the promotion of the research skills which include: Socratic questioning, collaborative learning, inquiry-based learning, concept mapping, problem-based learning, and argument mapping (Yazidi, 2023; Rokhaniyah, 2016). In research, at all levels of educational endeavour, critical thinking plays an essential and critical role in a student's academic success and beyond. That involves critically, and reflectively analyzing information, identifying underlying assumptions and biases, evaluating arguments and evidence, and developing well-reasoned conclusions (Watt & Roundy, 2022; The Glossary of Education Reform, 2014). Critical thinking research skills enable researchers to make informed decisions, proffer solutions to problems, and communicate effectively in various research settings. Factors, such as the emphasis on rote memorization, lack of effective supervisor-supervisee relationship, lack of research materials, and standardized testing, result in a lack of opportunities for universities' students to develop critical thinking research skills (Facione, 2020). Moreover, universities' students in Delta state oftentimes lack the necessary metacognitive skills required for critical thinking (Halpern, 2014; Yazidi, 2023). This is the reason why educationists, researchers, students, and lecturers need effective strategies to promote the development of critical thinking research skills.

In research writing, critical thinking research skills involve the questioning assumptions and thinking creatively to develop innovative ideas and solutions to problems. By developing critical thinking research skills, universities' students are best equipped to think outside the box and come up with new solutions to complex issues. Critical thinking research skills develops effective communication (oral and written) skills in different research settings. It is the ability to effectively communicate ideas and arguments to others. Critical thinking research skills, equip students with the ability to articulate their thoughts and ideas in a clear, concise, and persuasive manner, both in writing and speaking. It further prepares universities' students for the real world and how to cope with real life situations. In today's complex and rapidly changing world, critical thinking research skills are essential for success in the school, workplace and in everyday life (Abrami, et al, 2018; Ennis, 2021). Even employers are looking for individuals who can think critically, proffer solutions to problems, and make informed decisions. By developing critical thinking research skills, students are better prepared for the

challenges they will face in the real world. In the universities, critical thinking research skills fosters in students independent thinking and the state of adopting an opinion and stance during research writing. Critical thinking research skills are skills that involve the ability to question assumptions, and challenge ideas. By developing critical thinking research skills, students-researchers are encouraged to think independently and develop their own opinions based on evidences and sound reasoning (Abrami, et al, 2018; Yazidi, 2023; Ennis, 2021). Furthermore, critical thinking research skills are prominently characterized in all the skills or abilities learners are expected to acquire through the type of education being provided. One, who cannot critically think, may not be able to proffer solutions even the minutest challenge. As human beings, we currently live in a world of problems – economic problem, social problem, ethnic problem, political problem, religious problem, educational problem, Science and technologically related problems to mention a few. It only takes an individual with a sound mind, a mind characterized with reflective thinking, which can engage in deep analysis, to come up with causes of the problem at hand and generate possible solutions or options to arrive at a decision; to solve a or get out of the problem (Adeyemi, 2012). The use of technology in carrying out or conducting research in Nigerian universities is fast increasing. Students in contemporary times utilize artificial intelligence (AI), and other online instruments in conducting pieces of research. This has reduced the critical thinking research skills' abilities of the students. In most cases, universities' students copy-and-paste materials downloaded online without critical evaluation of such materials, therefore plagiarizing someone else' work. This is not good for the development of education in Nigeria. Therefore, schools are obliged to expose the students to digital citizenship through digital citizenship education.

Digital citizenship is another important variable in this paper. It has to do with the strategic technological approach adopted to give a person or group of persons sense of belonging, exposing them to the enjoyment of privileges, and opportunities in a particular area. Most importantly, the widespread use of the Internet, digital space has now flooded the universities including universities in Nigeria. With the revolutionization of the educational system as a whole by the internet, particularly in twenty first-century education, it is widely accepted that the Internet facilitates education across geographic and temporal boundaries, thereby promoting digital citizenship among students (Harsasi, 2015; Kuntoro & Al-Hawamdeh, 2023; Prasetyo, et al, 2023). Because of the prevalence of the internet, the

learning culture has moved from face-to-face teaching and learning to online teaching/blended teaching and learning.

Prasetyo et al (2023) stated that in the digital-mediated world, students enroll in an online activity anywhere, everywhere. Every other activity within and around the university including teaching, learning, administration, and partnerships between parents and the university, the university and other education stakeholder are promoted and carried out online (Pannen, 2014; Sekarasih, 2016). Irrespective of the above, digital technology is constantly a double-edged sword (Hidayat & Listiawati, 2018). It has its benefits and risks for the students. Worthy of note is the fact that digital citizenship is critical to recognize the lecturers' and administrators' roles in anticipating opportunities and challenges associated with technology use in the university. In the university, lecturers play vital roles in ensuring students possess the critical research skills and attitudes in using technology responsibly.

For the purpose of addressing social issues that are associated with the use of technology among students in universities, lecturers' and administrators' proficiency with technology must be accompanied by a prompt of digital citizenship. Digital citizenship itself is a useful framework that is widely accepted as a foundation for acting responsibly when communicating with technology (Prasetyo et al, 2023). According to Ribble and Bailey (2016), students in the universities must develop a strong sense of digital citizenship to prepare and educate them to use technology effectively. Due to widespread Internet and teen-dominated digital citizens, Nigeria and other countries in the world have faced a number of challenges related with the use of technology in the universities, which include cyber-crime, widespread pornographic distribution, plagiarism, and cyber-bullying (Adinigrum, 2015; Paterson, 2019; Sulisty & Manap, 2018). Lecturers, and universities' management are expected to adequately address digital media behaviours for students in relation to managing to social media issues. Furthermore, most Nigerian universities' lecturers and management are less prepared to promote digital citizenship (Prasetyo et al. 2021) among students. When students engage in cyber-bullying and access pornographic websites, for example, universities' lecturers and management prefer to restrict Internet access and mobile phone use in order to address digital threats without jeopardizing student rights (Ruiz, 2019). In contemporary times, there are no significant policies that are supposed to be introduced in Nigeria in order to assist lecturers and students in resolving misuse and abuse of technology

and preparedness for digital citizenship education. Digital citizenship is a requirement that all lecturers must embrace to prepare students to use technology responsibly and safely.

University education is the level of education that comes after the secondary education (upper basic education level schools- JSS 1-3, and senior secondary schools- SS 1-3). It is the tertiary education that exposes students to professionalism, and specialization in one area or the other. University education occupies a prime of place that promotes national development, nation-building, national unity, national integration, national consciousness, and national re-orientation/value re-orientation. This is the reason why Otonko (2022) noted that the prime of place education occupies in the developmental effort of nations has never been doubted the world over. University education is an essential investment in human capital (Otonko, 2022; Mezieobi, 2024).

In the university, teaching, learning, research, and community services are the epicentre. A student's life in all ramifications is molded in the university. Critical thinking research skills and digital citizenship are important in the life of contemporary universities' students in Nigeria and all over the globe. Developing, and promoting critical thinking research skills, and digital citizenship among students of universities in Delta state, Nigeria is the core of this paper.

1.1 Statement of the Problem

The policy declaration of Federal Government of Nigeria (2013) in her National Policy on Education stated that the Federal Government of Nigeria has adopted education as an instrument per excellence for effective national development. By that policy declaration, it is evident that Nigeria believes in the efficacy of education as the vehicle for individual and national development.

Unfortunately, the belief has been turned down due to scarcity of research resources, and the influx of technology in education. In the 70s and 80s, after the take-over of schools by the government, Nigeria citizens believe that the government owned schools which include universities are basically the concern of the government, therefore the government should take care of the universities. It is also unfortunate that pieces of research carried out by universities' students are copy-and-paste. This entails that universities' students no longer utilize digital citizenship or they have abused their digital citizenship.

Pieces of research from Nigerian universities in the 21st century have lost innovation, creativity, and problem-solving tendencies. They are now a repeat of old issues that are obsolete, and outdated. This means that students no long critically think during research-related activities.

Along the line, things started falling apart and the centre could no longer hold. The entire university education system has become deplorable. These deplorable conditions, therefore has caused the researcher to want to look at the various ways of promoting critical thinking research skills and digital citizenship among students of Nigeria's tertiary institutions in Delta State, Nigeria which particular emphasis on universities.

1.2 Purpose of the Study

The study was set to investigate the various ways of promoting critical thinking research skills, and digital citizenship among students of Nigeria's tertiary institutions in Delta state with particular emphasis on universities. Specifically, the study sought to:

- Ascertain the extent of promoting critical thinking research skills among students of Nigeria's universities in Delta state.
- Determine the extent of promoting digital citizenship among students of Nigeria's universities in Delta state.
- Examine the extent of universities' management staff participation in promoting critical thinking research skills and digital citizenship among students of Nigeria's universities in Delta state.

1.3 Research Questions

The following research questions were posed to guide the study:

- What is the extent of promoting critical thinking research skills among students of Nigeria's universities in Delta state?
- What is the extent of promoting digital citizenship among students of Nigeria's universities in Delta state?
- What is the extent of universities' management staff participation in promoting critical thinking research skills and digital citizenship among students of Nigeria's universities in Delta state?

1.4 Hypotheses

The following hypotheses were formulated at .05 level of significance.

HO₁ There is no significant difference in the mean ratings of male and female students of Nigeria's universities on the extent of promoting critical thinking research skills in Delta state.

HO₂ There is no significant difference in the mean ratings of male and female students of Nigeria's universities on the extent of promoting digital citizenship in Delta state.

HO₃ There is no significant difference in the mean ratings of male and female universities' management staff on the extent of promoting critical thinking research skills and digital citizenship among students of Nigeria's universities in Delta state.

2. Research Methodology

The research survey adopted for this study was descriptive survey research design which x-rayed "promoting critical thinking research skills and digital citizenship among students of Nigeria's tertiary institutions in Delta State, Nigeria". Three research questions and three hypotheses guided the study. The population for the study was 131150 students representing 12 universities in Delta State. The sample size was 297 students selected through a random sampling technique. Data was collected using 19 item structured questionnaire developed by the researcher titled "Promoting Critical Thinking Research Skills and Digital Citizenship Questionnaire (PCTRSDCQ)". The instrument was of two sections; A and B. A is for bio data of the respondents while B addressed the research questions. The instrument was face and content validated by three experts; two from the Department of Social Science Education and one from Department of Educational Foundations (measurement and evaluation option), all from Faculty of Education, Delta State University (DELSU), Abraka. Reliability coefficient of .74 was established using cronbach Alpha reliability estimate. 297 copies of questionnaire were distributed using two research assistants who were briefed on the modalities for the distribution and retrieval. Out of the whole lot distributed, only 290 copies of the questionnaire were returned, giving a return rate of approximately 98%. Mean and standard deviation were used to answer the research questions while t -test statistics was used to test the hypotheses at .05 level of significance. The study also made use of $n > 2.50$ as region of acceptance while $n < 2.50$ as region of rejection for the research questions.

3. Analysis

The analysis was made using mean with standard deviation while t-test was used to test the hypotheses.

Research Question 1: What is the extent of promoting critical thinking research skills among students of Nigeria’s universities in Delta state?

Table 1: Mean responses of respondents on the extent of promoting critical thinking research skills among students of Nigeria’s universities in Delta state.

S/N	Items	Male Mean	Male SD	Female Mean	Female SD	Average Mean	Average SD	Decision
1	Allocated competent supervisors	3.00	.93	2.58	1.24	2.79	1.09	A
2	Guiding the students through the research process	3.27	.88	2.83	.94	3.05	.91	A
3	Supplying the students with adequate materials to aid their research	2.06	.83	1.67	1.07	1.87	.89	R
4	Encourage the students to always consult their supervisors	2.27	.88	2.42	1.08	2.35	.98	R
5	Give informed feedback	2.80	.87	2.83	.72	2.82	.80	A
6	Referred to literature that will facilitate their research writing	2.53	1.24	2.75	.97	2.64	1.11	A
7	Read through their write-ups	2.40	.91	2.17	.72	2.29	.82	R
	<i>Result</i>	2.62	.93	2.50	.96	2.56	.95	A

Table 1 above shows the mean responses of respondents (students) on the extent of promoting critical thinking research skills among students of Nigeria’s universities in Delta state. Notably, both male and female students accepted items 1, 2, 5, and 6 (allocated competent supervisors, guiding the students through the research process, received informed feedback, and referred to literature that will facilitate research writing). This is because their mean scores of 2.79, 3.05, 2.82 and 2.64 exceeded the judgement base of 2.5. Meanwhile, the respondents both rejected the items 3, 4, and 7 (supplying the students with adequate materials to aid their research, encourage the students to always consult their supervisors, and read through their write-ups). This is because their mean scores of 1.87, 2.35 and 2.29, were below the judgement base of 2.50. Notwithstanding these, the students generally accepted that it is very important to promote critical thinking research skills among students of Nigeria’s tertiary institutions in Delta State, Nigeria. This is because, the general mean score of the cluster is 2.56 which exceeds the judgement base of 2.50.

Research Question 2: What is the extent of promoting digital citizenship among students of Nigeria’s universities in Delta state?

Table 2: Mean responses of respondents on the extent of promoting digital citizenship among students of Nigeria’s universities in Delta state.

S/N	Items	Male Mean	Male SD	Female Mean	Female SD	Average Mean	Average SD	Decision
8	Provide institutional WiFi	2.07	.80	2.00	.74	2.04	.77	R
9	Provide log in details	2.00	.93	2.25	.87	2.13	.90	R
10	Enjoy uninterrupted internet services	2.13	1.06	1.83	.84	1.98	.95	R
11	Have access to the ICT centre	2.50	.83	3.25	.87	2.88	.85	A
12	Organize computer-based activities	2.13	.64	2.42	.79	2.23	.72	R
	<i>Result</i>	2.17	.85	2.55	.82	2.36	.84	R

Table 2 above shows the mean responses of respondents (students) on the extent of promoting digital citizenship among students of Nigeria’s universities in Delta state. Worthy to note is that, both the male and female students accepted only item 11 (have access to the ICT centre). This is because its mean score of 2.88 exceeds the judgement base of 2.5. Meanwhile, the general cluster rejected items 8, 9, 10, and 12 (provide institutional WiFi, provide log in details, enjoy uninterrupted internet services, and organize computer-based activities). This is because their mean scores of 2.04, 2.13, 1.98 and 2.23 did not reach the judgement base of 2.50.

Research Question 3: What is the extent of universities’ management staff participation in promoting critical thinking research skills and digital citizenship among students of Nigeria’s universities in Delta state?

Table 3: Mean responses of respondents on the extent of universities’ management staff participation in promoting critical thinking research skills and digital citizenship among students of Nigeria’s universities in Delta state.

S/N	Items	Male Mean	Male SD	Female Mean	Female SD	Average Mean	Average SD	Decision
13	Provide students with all needed materials to facilitate research writing	2.27	.80	2.75	.97	2.51	.89	A
14	Pay lecturers adequately to motivate them	2.07	.80	1.58	.90	1.83	.85	R
15	Provide laptops/desktops for lecturers and students’ use	2.33	.98	1.83	.84	2.08	.87	R
16	Safeguard available research materials	2.07	.88	2.08	1.31	2.08	1.69	R
17	Keep adequate records of pieces of research that are innovative	2.07	1.10	1.67	.99	1.87	1.05	R
18	Advertise and promote pieces of research that are innovative	2.27	.88	2.58	1.24	2.43	1.06	R
19	Sponsor students on research adventures	2.20	.86	2.00	.95	2.10	.96	R
	Results	2.18	.90	2.07	1.03	2.13	.97	R

Table 3 above shows the mean responses of respondents (students) on the extent of universities’ management staff participation in promoting critical thinking research skills and digital citizenship among students of Nigeria’s universities in Delta state. Worthy to note is that, both the male and female students accepted only item 13 (provide students with all needed materials to facilitate research writing). This is because its mean score of 2.75 exceeds the judgement base of 2.5. Meanwhile, the general cluster rejected items 14, 15, 16, 17, 18 and 19. This is because their mean scores did not reach the judgement base of 2.50.

Ho₁: There is no significant difference in the mean ratings of male and female students of Nigeria’s universities on the extent of promoting critical thinking research skills in Delta state.

Table 4: t-test Analysis of male and female students of Nigeria’s universities on the extent of promoting critical thinking research skills in Delta state.

Status	N	Mean	SD	Df	t-value	t-cal	Decision
Male	155	2.62	.93	295	1.98	1.55	Do not
Female	142	2.50	.96				Reject H ₀

From the table, it can be seen that the t-cal 1.55 is less than the t-value 1.98, the researcher therefore does not reject the null hypothesis and states that, there is no significant difference between the mean ratings of male and female students of Nigeria’s universities on the extent of promoting critical thinking research skills in Delta state.

Ho₂: There is no significant difference in the mean ratings of male and female students of Nigeria’s universities on the extent of promoting digital citizenship in Delta state.

Table 5: t-test Analysis of Male and Female students of Nigeria’s universities on the extent of promoting digital citizenship in Delta state.

Status	N	Mean	SD	Df	t-value	t-cal	Decision
Male	155	2.17	.85	295	1.98	5.55	Reject H ₀
Female	142	2.55	.82				

From the table, it can be seen that the t-cal 5.55 is greater than the t-value 1.98, the researcher therefore rejects the null hypothesis and states that, there is a significant difference between the mean ratings of male and female students of Nigeria’s universities on the extent of promoting digital citizenship in Delta state.

Ho₃: There is no significant difference in the mean ratings of male and female universities’ management staff on the extent of promoting critical thinking research skills and digital citizenship among students of Nigeria’s universities in Delta state.

Table 6: t-test Analysis of Male and Female universities’ management staff on the extent of promoting critical thinking research skills and digital citizenship among students of Nigeria’s universities in Delta state.

Status	N	Mean	SD	Df	t-value	t-cal	Decision
Male	155	2.18	.90	295	1.98	1.39	Do not
Female	142	2.07	1.03				Reject H_0

From the table, it can be seen that the t-cal 1.39 is less than the t-value 1.98, the researcher therefore does not reject the null hypothesis and states that, there is no significant difference between the mean ratings of male and female universities' management staff on the extent of promoting critical thinking research skills and digital citizenship among students of Nigeria's universities in Delta state.

4. Discussion of Findings

On the extent of promoting critical thinking research skills among students of Nigeria's universities in Delta state, it was revealed that students rejected items 1, 2, 5, and 6, and rejected items 3, 4, and 7. This is in line with Obi (2019) who asserted that allocating competent project supervisors to students will help them in getting, and accessing the adequate guidance needed for research writing success. Furthermore, the items rejected were in line with Nwangwu (2022), who reiterated that students do not get adequate encouragement during research writing. Some supervisors treat the students like subordinates, and do not give them the necessary attention. Also, students in most Nigerian universities do not have access to research materials that can aid their research writing. Nwakpa (2016) stated that if students are adequately supported by their supervisors, and other management staff in project writing, they will be able to be innovative, and creative.

On the extent of promoting digital citizenship among students of Nigeria's universities in Delta state, the respondents accepted item 11 which is the fact that they have access to ICT centres, but rejected items 8, 9, 10, and 12. Nwakpa (2016) stated that digital citizenship entails giving individuals access to ICT facilities including WiFi services, uninterrupted internet access, and so on. He further stated that unfortunately, students do not have access to WiFi services, uninterrupted internet, within and around the university's environment. He also noted that in some universities where log-in details are given to students, these log-in details are never functional until the students graduate from the university. This is not a good image from most Nigerian universities. According to Ugwuanyi (2023), reports have it that issues of interrupted internet services is due to epileptic power/electricity supply within and around the universities. Some Nigerian universities are located in rural areas, and it is difficult to have steady

electricity supply in such areas where the universities are located.

On the extent of universities' management staff participation in promoting critical thinking research skills and digital citizenship among students of Nigeria's universities in Delta state, item 13 was accepted, while items 14, 15, 16, 17, 18, and 19 were rejected. Emenala and Ibekwe (2023) opined that universities, the government, and management of universities are supposed to provide enabling environment to facilitate research, and research writing among students. They further noted that some factors hinder effective research writing by students such as lack of adequate encouragement of lecturers, lack of research writing sponsorship, lack of record keeping on pieces of research, and so on. Nakpodia (2023) on the issue critical thinking and digital citizenship noted that with proper universities' management of students' research, including students' use of technology within and around the universities' environment during research, students will be encouraged to use their critical thinking research skills, and innovation from students' pieces of research can be used in the development of the nation at large.

5. Conclusion

In conclusion, though the universities do not encourage students during research, the government, and other education stakeholders should begin to contribute towards encouraging pieces of research by students in tertiary institutions in Delta state in particular, and Nigeria in general. Students can always show commitment during research writing if they are encouraged through sponsorship, provision of the enabling environment, security of their lives, research materials, and their innovations adopted through their pieces of research.

6. Recommendations

Based on the findings the following recommendations were made:

- Students should be encouraged to carry out, and write pieces of research using their critical thinking research skills.
- The universities' management staff should create the enabling environment for students to carry out research. This will include

ensuring the safety of their lives, research materials, the environment-within and around, and the innovations that will be achieved from their research.

- Tertiary education trust fund (TETFUND) should also consider sponsoring students' research. This will serve as a source of encouragement to the students.
- Digital Citizenship is essential in research. Students should be encouraged to consult, and use online sources during the conduct of their research. They should also be encouraged to reference cited materials according to avoid plagiarism.

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