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## EXPLORING THE DETERMINANTS OF CRITICAL THINKING SKILLS DEVELOPMENT AMONG LIBRARY AND INFORMATION SCIENCE STUDENTS IN NIGERIAN PUBLIC UNIVERSITIES

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### ABSTRACT

Student librarians are faced with many challenges as they advance in their academic pursuance and the survival of many depend solely on the skills and competencies acquired to confront these challenges. This study takes a look at the factors that can foster acquisitions of critical thinking skills among student librarians in public universities in Nigeria. The study applied a descriptive survey design. The sampled population for the study was 112 lecturers and librarians of this number, 20 are from the department s of Educational psychology, 20 sociology lecturers, 40 are lecturers in the department of library and information science while the others were from different departments selected from 40 public universities in Nigeria through purposive sampling technique, while a Likert four point type structured questionnaire was the only instrument used for data collection. The instrument was validated by three experts from the department of measurement and evaluation of Abia State University, Uturu, Nigeria using Cronbach's alpha. Result showed coefficient of  $\alpha=.81$ . Data collected were analyzed using frequencies and simple percentages and presented in tables. The study discovered inter-alia that the key factors that can facilitate the acquisition of critical thinking by student-librarians are the classroom/learning environment as well as instructional practice and that student-librarians, can improve their critical thinking and other skills by understanding their mental process, practicing active listening and meeting with mentors, becoming more self-aware, developing foresight and participating in team-building exercises. Based on the findings, it was recommended among other steps that teaching environment should be reflective, encouraging open-mindedness and objectivity and that instruction should be cognitive-based, in which lectures should adopt problem-solving approaches and inquiry based instruction in teaching students.

**Keywords:** critical Thinking, critical Thinking Skill, cognitive skill, Student-Librarians, Constructivism, modern Teaching methodology

## Introduction

Modern teaching methodology is against training and bringing up students who can only memorize from syllabus and recite whatever they have learnt for the sake of passing examination rather the essence of is that teaching should be focused on instructing students to improve their intellect by utilizing new and innovative ideas. This implies that modern teaching focuses on entire learning process rather than strictly on the final examination and it is dedicated to helping students built skills as part of constructivist approach to learning in the contemporary era. Constructivism according to Derry (1996) is the theory that says learners construct knowledge rather than just passively take in information. As people experience the world and reflect upon those experiences, they build their own representations and incorporate new information into their pre-existing knowledge (schemas).

Specifically, modern education methodology focuses on expanding students' fundamental knowledge about the world and building critical thinking skills that will allow them handle all kind of challenges as they advance in their academic career and the world at large. Just as explained by the Office of Curriculum, Assessment and Teaching Transformation University at Buffalo (2024) that the consequences of constructivist theory are that: Students learn best when engaged in learning experiences rather passively receiving information, learning is inherently a social process because it is embedded within a social context as students and teachers work together to build knowledge and that because knowledge cannot be directly imparted to students, the goal of teaching is to provide experiences that facilitate the construction of knowledge. This is against a traditional approach to teaching that focuses on delivering information to students, yet constructivism argues that you cannot directly impart this information. Only an experience can facilitate students to construct their own knowledge. Therefore, the goal of teaching is to design these experiences. Apart from that, in this contemporary world ruled by information, science and technology students find themselves, demands skills and competencies that will enable them navigate the global village and confront its challenges.

In a bid to confront these challenges efforts are being made globally to educate the students in line with relevant skills. This has resulted in the introduction of modern technology that is cognitive based instructions to facilitate the acquisition of these skills. Against this backdrop, reveals Dede (2010) many frameworks such as the Partnership for the 21<sup>st</sup> Century Skills, the enGauge Framework from the North Central Regional Educational and the Metiri Group, the organization of Economic o-operation and development competencies

and National Leadership Council for Liberal Education as well as Americas Promise Essential Learning Outcome, the International Society for Technology Education and National Education Technology Standards for Students among others have advocated skills considered as paramount for the 21<sup>st</sup> Century. These skills as proposed by Partnership for the 21<sup>st</sup> Century Skills (2006) include inter-alia critical thinking and problem solving skills, communication skills, creativity and innovative skills, collaborative skills and contextual learning skills. As observed, critical thinking and problem solving were all part of the framework as the reason behind such cannot be farfetched when one takes into cognizance that thinking is at the centre of human effort as he or she faces challenges within the environment. As declared by Anyafulude (2006), every human born is endowed with thinking faculty with which encountered problems can be solved and this may be the reason behind many thinking there is no need stressing the need for arousal of thinking process Halpern (1999) ones asserted. However, research has proven and suggested that there is much to be done to help students become better critical thinkers in that their thinking ability can be developed through he relevant and appropriate experiences presented to them in a formal and informal situation (Dodd, 2004 & Anyafulude, 2006). Besides, revealed Nwachukwu and Ottah (2007), lecturers and other stakeholders in the life of students can mediate their thinking and problem solving skills by helping them get to be aware of thinking tools, the possibility of using them and explicit instruction and monitoring of their learning and their environment manipulated to equip them with relevant skills. This noted Uzoka and Nwachukwu (2007) supports the idea that ability to conceptualize meaningfully does not come without simulation but require consistent and coherent psychological intervention in which students are exposed to experiences relevant to their thinking intervention programs built upon theories such as the theory of Structural Cognitive Modifiability in which appropriate environment and intentional mediation are provided have been shown to enhance even neural plasticity (Feuerstein & Falik 2013, Magiotta, 2013).

On the other hand, learning environment of most public universities in Nigeria and lecturers declared Ejide (2006) and Udosen (2011) have been found wanting in fostering critical thinking and problem solving skills even when it has been established that no 21<sup>st</sup> century student an successfully navigate the academic world or survive thereafter without these skills. As posited by Dede (2010), though it was fourteen years ago it still hold in Nigeria that today's classroom/lecture room lack 21<sup>st</sup> century learning and teaching equipment and materials and does not assess the competencies for the century as well as the ability to successfully utilize various forms of

mediated interaction are not accessed. Ejide (2006) did reveal that most lecturers especially novices come to the university seeing themselves as compendium and mobile encyclopedia and by such assumptions, impose whatever they think they know on passive learners whose minds are seen as empty heads or tabula rasa with emphasis mainly content rather than creating opportunities for discovering learning that promotes creativity. This implies that knowledge is being transferred only through the conventional method of teaching in which knowledge transmitting is based on task masters model. Ejide (2006) further lamented a situation in which most Nigerian university lecture rooms hardly reflect the interactive nature of teaching and learning rendering students passive recipients of copious and often poorly understood information with the concomitant effect of maximizing boredom and drudgery.

Against this backdrop, there is no gain stating the obvious, that there is a missing link. Do we attribute the state to government, university management or to lecturers? In all, this study is aimed at determining generally those factors that can foster critical thinking among student librarians in public universities in Nigeria and by extension, Nigerian University students and also to close the gap in knowledge in this all important soft skills as well as to create the awareness on the need to acquire this skills by not only student-librarians but by all students.

### Research Objectives

The objectives of this study are to:

1. Determine factors that can foster acquisition of critical thinking skills among student-librarians in public universities in Nigeria,
2. Ascertain steps to developing critical thinking skills and mindset among students-librarians in public universities in Nigeria and
3. Identify factors that may enhance critical thinking among student-librarians in public universities in Nigeria.

### Research Questions

The study was further guided by the following questions:

1. What are the factors that can facilitate the acquisition of critical thinking skills among student-librarians?
2. What are the steps of skills towards acquiring critical thinking skills among student-librarians?
3. What are the factors that may enhance critical thinking among student-librarians in public universities in Nigeria?

## Literature Review

### Conceptualization of Critical Thinking

As revealed by Foundation for Critical Thinking (2019), Critical thinking is a rich concept that has been developing throughout the past 2,500 years and that the term "critical thinking" has its roots in the mid-late 20th century. All the same asserted Abrami, et al (2015) critical thinking is a widely accepted educational goal though the definition is contested, but the competing definitions can be understood as differing conceptions of the same basic concept: careful thinking directed to a goal. Conceptions differ with respect to the scope of such thinking, the type of goal, the criteria and norms for thinking carefully, and the thinking components on which they focus. Its adoption as an educational goal has been recommended on the basis of respect for students' autonomy and preparing students for success in life and for democratic citizenship. "Critical thinkers" have the dispositions and abilities that lead them to think critically when appropriate. The abilities can be identified directly; the dispositions indirectly, by considering what factors contribute to or impede exercise of the abilities. Standardized tests have been developed to assess the degree to which a person possesses such dispositions and abilities. Educational intervention has been shown experimentally to improve them, particularly when it includes dialogue, anchored instruction, and mentoring. Controversies have arisen over the generalization of critical thinking across domains, over alleged bias in critical thinking theories and instruction, and over the relationship of critical thinking to other types of thinking. In this regard, Birt (2024) defines it as the process of analyzing information to get the best answer to a question or problem through drawing upon ones experience, reasoning, observation and communication with others and making informed decisions that yield positive solutions.

While Scriven and Paul (1987) sees it as the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. The asserted that it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness and entails the examination of those structures or elements of thought implicit in all reasoning: purpose, problem, or question-at-issue; assumptions; concepts; empirical grounding; reasoning leading to conclusions; implications and consequences; objections from alternative viewpoints; and frame of reference. Critical thinking in being responsive to variable subject matter, issues, and

purposes — is incorporated in a family of interwoven modes of thinking, among them: scientific thinking, mathematical thinking, historical thinking, anthropological thinking, economic thinking, moral thinking, and philosophical thinking

Whereas, Stanford Encyclopedia of Philosophy (2022) explains that Critical thinking can be seen as having two components: a set of information and belief generating and processing skills, and 2 the habit, based on intellectual commitment, of using those skills to guide behavior. It is thus to be contrasted with: the mere acquisition and retention of information alone, because it involves a particular way in which information is sought and treated; the mere possession of a set of skills, because it involves the continual use of them; and the mere use of those skills without acceptance of their results. The emphasis is that Critical thinking varies according to the motivation underlying it. When grounded in selfish motives, it is often manifested in the skillful manipulation of ideas in service of one's own, or one's groups', vested interest. As such it is typically intellectually flawed, however pragmatically successful it might be. When grounded in fair mindedness and intellectual integrity, it is typically of a higher order intellectually, though subject to the charge of "idealism" by those habituated to its selfish use. However it was noted that no kind of critical thinking is universal in any individual; everyone is subject to episodes of undisciplined or irrational thought. Its quality is therefore typically a matter of degree and dependent on, among other things, the quality and depth of experience in a given domain of thinking or with respect to a particular class of questions. No one is a critical thinker through-and-through, but only to such-and-such a degree, with such-and-such insights and blind spots, subject to such-and-such tendencies towards self-delusion. For this reason, the development of critical thinking skills and dispositions is a life-long endeavor.

Elder (2007) posits that Critical thinking is self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way and makes one to think critically consistently attempting to live rationally, reasonably and empathically. Such a person she added is keenly aware of the inherently flawed nature of human thinking when left unchecked thus strive to diminish the power of their egocentric and socio-centric tendencies by using the intellectual tools that critical thinking offers – concepts and principles that enable them to analyze, assess, and improve thinking. \such a person also work diligently to develop the intellectual virtues of intellectual integrity, intellectual humility, intellectual civility, intellectual empathy, intellectual sense of justice and confidence in reason as well as always working to improving the reasoning abilities and they will at times fall prey to mistakes in reasoning, human

irrationality, prejudices, biases, distortions, uncritically accepted social rules and taboos, self-interest, and vested interest. They strive to improve the world in whatever ways they can and contribute to a more rational, civilized society. At the same time, they recognize the complexities often inherent in doing so. They avoid thinking simplistically about complicated issues and strive to appropriately consider the rights and needs of relevant others. They recognize the complexities in developing as thinkers, and commit themselves to life-long practice toward self-improvement. They embody the Socratic principle: The unexamined life is not worth living, because they realize that many unexamined lives together result in an uncritical, unjust, dangerous world.

To Monash University (2024) critical thinking connotes a kind of thinking in which one questions, analyses, interprets, evaluates and make a judgment about what he or she read, hear, say, or write. And that the term *critical* comes from the Greek word *kritikos* meaning "able to judge or discern". Invariably, good critical thinking is about making reliable judgments based on reliable information. It is noted that applying critical thinking does not mean being negative or focusing on faults rather it means being able to clarify your thinking so that you can break down a problem or a piece of information, interpret it and use that interpretation to arrive at an informed decision or judgment as people who apply critical thinking consistently are said to have a critical thinking mindset, but no one is born this way. These are attributes which are learnt and improved through practice and application. In the academic context, Monash University (2024) added that critical thinking is most commonly associated with arguments in that one might be asked to think critically about other people's arguments or create his or her own. To this end, to be a better critical thinker, therefore one needs to learn how to clarify thinking purpose and context, question sources of information, identify arguments, analyse sources and arguments, evaluate the arguments of others and create or synthesize own arguments.

### Theoretical Framework

Inasmuch as the quest for equipping students has been on the increase as a result of the nature of contemporary society that is filled with barrage of challenges that require critical thinking to surmount, it imperative to state that critical thinking has remained part of an fro the day he encountered his first problem. Suffice it to say, that it started from the Garden of Eden when man realized that he was naked and thrown out of the garden by God to fend for himself. In the opinion of Yildirim and Ozahraan (2011), critical thinking finds it root in the ancient great Greek Philosophers in the likes of Socrates, Aristotle and Plato who sought to approach truth by engaging in critical

reflective discussion in which ideas and arguments were pitted against each other probably to arrive at a more objective discourse. In a review on critical thinking, Lai (2011) did identify three strands of discipline which are philosophy, psychology and education from which the root of critical thinking could be traced and emphasized that each discipline has its own approach to critical thinking.

As emphasized by Lai (2011), the philosophical approach stresses the characteristics of ideal critical thinkers and standards of good thought as the psychological approach focuses on how people think ritually and the type of actions and behaviors they exhibit as critical thinkers whereas, educational approach focuses on the taxonomy of information processing skills just like the work of Benjamin Bloom et al. This fact was further buttressed by Elder (2007) who inferred that critical thinkers strive to improve the world in whatever ways they can and contribute to a more rational, civilized society. At the same time, they recognize the complexities often inherent in doing so. They avoid thinking simplistically about complicated issues and strive to appropriately consider the rights and needs of relevant others. They recognize the complexities in developing as thinkers, and commit themselves to life-long practice toward self-improvement. They embody the Socratic principle that an unexamined life is not worth living, because they realize that many unexamined lives together result in an uncritical, unjust, dangerous world she added. It is in this regard noted Lynch and Wolcott (2001) terms such as critical thinking, scientific methods, professional or lineal judgment, problem based enquiry, decision making, information literacy and strategic planning as well as life-long learning represent thinking process.

Facione (2011) affirms that critical thinking is a purposeful thinking that includes both cognitive skills and disposition. While cognitive skills refer to more critical thinking skills such as, interpretation, analysis, evaluation, inference, explanation and self regulation, disposition refers to habits of the mind such as analytical, open-mindedness, confidence, in reasoning, trust-seeking, judiciousness, inquisitiveness, and systematic. The assertion is that critical thinkers should have at their disposal guided intellectual standards, supportive of intellectual integrity, perseverance, reason and self-discipline, ability to identify logical connections between elements of thought and problem, self regulatory ability, ability to accept multiple legitimate point of view and to seek weaknesses and limitations within their own position (Tilbury, Osmond & Scott, 2010).

On theoretical bases of mediating learning experience (MLE) Feuerstein and Falik (2013) created detailed psycho-educational theory based on fundamental belief on an individual's capacity to change even if labeled developmental delayed or learning disabled is rest on fact

that anyone can be taught-mediated-how to learn and how to think. In other words added Green (2014), every human being is cognitively modifiable at any age. As revealed by Lomosky (2014) MLE consist of a theory and a set of principles and criteria for mediated learning whereby, thorough interaction with one capable or experienced mediator, the cognitive functions and thinking process can be develop. Green (2014) however submits that lack of ability results from lack of mediating learning experience in which the role of a mediator is at centre. He was of the opinion that in MLE the mediator directs the learner's attention and makes relevant suggestions that will assist the learner to organize and acquire thinking patterns and learning habits.

According to Otero (2003) Vygotsky's social cultural mediation places greater emphasis on the external world and focuses on how socialization and culture impact the structure and function of an individual thinking. Turuk (2008) disclosed that Vygotsky's theory advocates learning inter-alia as a semiotic process where participation in socially mediated activities is essential in that the mediation becomes the means of mediating the individuals own mental functioning. This lecturer or adult intervention is geared towards bridging the gap between what the student can do on his own and what he is ready to do but will not successfully undertake it without the lecturer or more competent persons assistance. This is what Vygotsky tagged zone of proximal development which is one of the concepts in his theory. He recognized the important role of peers, adults and teachers who scaffold or mediate learning using language and supportive strategies (grosser, 2014). As stated by Green (2014), the zone of proximal development is the hypothetical space between what students can accomplish on their own and what they can do in collaboration with a more knowledgeable others.

As noted by Tomic and Kingma (1996), learning in the zone of proximal development contributes to the advancement of cognitive development in the sense that lecturers should not wait until the student should be able to handle the new unwept rather should use education to bring the student to maturity. The implication is that lecturers or teachers effort in the classroom instruction should be devoted to making sure that the student advance in his or her learning and that lectures should be proactive in guiding the student to do those things he or she can do with the help of one competent persons. This potential capacity will eventually turn out to become an actual intellectual capacity in which the student through proper guidance will independently carry out the task which he or she could only do with the help of an adult or one competent peer. The ZPD therefore reveal Blake and Pope (2008) stresses the fact that teachers should be explaining, modeling and using guided practice in the classroom as by modeling what they want their students to do, students will be able to work through their assigned

tasks. The advice is that lectures should think aloud an instructional strategy that allows students to talk through new steps.

Concerning instructional practices and classroom environment that can facilitate critical thinking Halpern (1999) was emphatic that such classroom should be one that will encourage active student participation in the learning process, it must be cognitive based in which students not only process information but also consciously reflect on what they are learning. Moolla (2014) posit that such classroom should allow for collaborative learning, differentiated learning, independent learning as well as a deep learning approach. In thinking classroom, stated Moonsamy (2014), the teachers role as a mediator of learning involves the mediation of the content knowledge and also the thinking skills and strategies that make it easier for mastery of thinking. Moonsamy further stated that a thinking classroom can only occur when it is shaped by intentional and explicit mediation from the teacher which supports the acquisition of cognitive skills and meta-cognitive awareness and use. This explains that thinking classroom does not just occur neither is it automatic but through the effort of teachers and school management. The assertion is that learning environment that encourage critical thinking promotes active learning through frequent questions and provides enough support to allow students to challenge their current conception of knowledge and interact with other students (Brown & Freeman, 2000, University of Maryland, 2010).

Xiongyong (2012) hinted that mediated learning is located within the theoretical framework of socio-constructivism in that mediating learning gathers its strength from the interactions between the learner and more competent significant persons like the teachers. This implies that the role of a teacher changes from that of conventional transmitter to a facilitator, trainer/scaffolding just like a mid-wife who assists a woman in labour to be delivered of her baby. The teacher as a facilitator therefore must ascertain the readiness of the learner before scaffolding. Just as noted by Lynch and Wolcott (2001), students fail to exhibit more complex thinking skills because their educational experiences have been provided with inadequate support for critical thinking skill development for optimal performance in that the potential of value of learning experiences are adjudged by the degree to which they build on previous experiences, provide developmental appropriate opportunities for individual to produce optimal performance and lay a foundation for further development.

Contributing Barell (2010) infer that critical thinking process is all about problem solving therefore students should be challenged sine occasions that do not present problems do no arouse thinking. In doing this, the lecturer or the teacher as the case may be, should guide/scaffold the by taking into consideration their previous experience, readiness and arousal of their thinking processes through inquiry which the traditional method of teaching will not be able to meet.

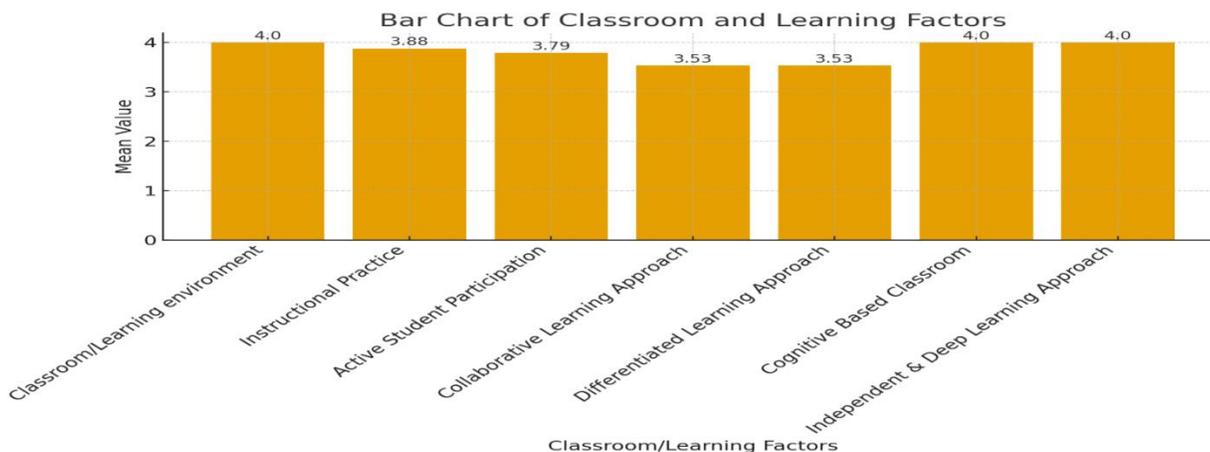
On critical thinking skills needed to be acquired by any student, Monash University (2024) highlighted four critical thinking skills as well as the mindsets and practices one must acquire to be a critical thinker as; questioning skills, analytical skills, evaluation skills and synthesis skills but noted that the list is by no means an exhaustive list of all critical thinking skills because the skills one uses will depend on one's specific context. In the same vein Birt (2024) stated that one can improve critical thinking and skills by becoming more self-aware and by considering his thought process, values, morals, ethics and other beliefs, Identifying and evaluating how he receive and process information, considering how others might feel about a situation or decision one makes, listening carefully and attentively while others are talking and to always ask questions when not sure. Other are to use previous experience and facts to help one make ones current decision through critical thinking, meeting with a mentor, participating in team-building exercises and asking for leadership opportunities.

### Methodology

The study applied a descriptive survey design and was guided by four research questions formulated in line with the research objectives. The sampled population for the study was 112 lecturers and librarians of this number, 20 are from the department of Educational psychology, 20 from sociology, 40 from the department of library and information science while the others were from different departments selected from the 40 public universities in Nigeria through purposive sampling technique. While a Likert four point type structured questionnaire was the only instrument used for data collection. The instrument was validated by three experts from the department of measurement and evaluation of Abia State University, Uturu, Nigeria using Cronbach's alpha. Result showed coefficient of  $\alpha=.81$ . The questionnaires were sent through respondents emails and also returned through the same channel 100%. Data collected were analyzed using frequencies and simple percentile and presented in tables.

**Presentation of Data**

What are the factors that can facilitate the acquisition of critical thinking skills among student-librarians?



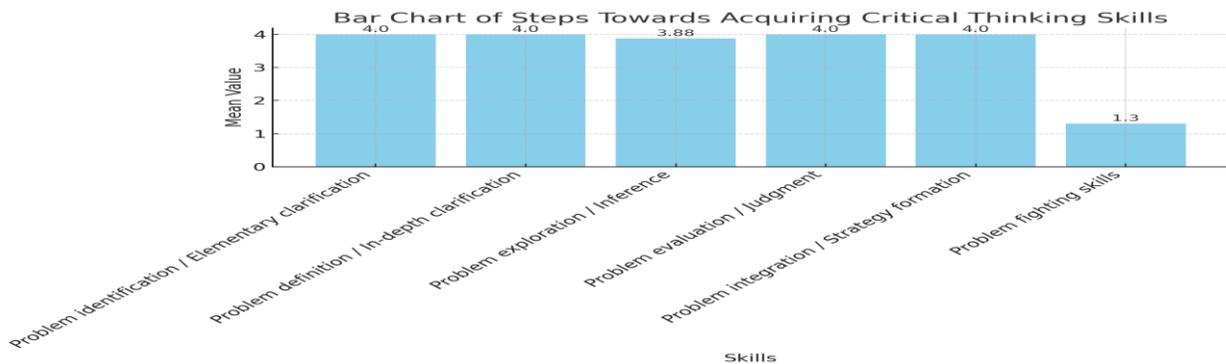
**Table1: Factors that can facilitate acquisitions of critical thinking skills among student-librarians**

Item	SA		A		DA		SDA		Mean
	F	%	F	%	F	%	F	%	
Classroom/Learning environment	112	100	***	***	***	***	***	***	4.00
Instructional Practice	98	87.5	14	12.5	***	***	***	***	3.88
Classroom that encourages active students' participation in the learning process	88	78.57	24	21.43	***	***	***	***	3.79
Classroom characterized by collaborative learning approach	78	69.64	21	18.75	7	6.25	6	5.36	3.53
Classroom characterized by differentiated learning approach	67	59.82	40	35.71	2	1.78	3	2.68	3.53
Cognitive based classroom	112	100	***	***	***	***	***	***	4.00
Classroom characterized by independent and deep learning approach.	112	100	***	***	***	***	***	***	4.00

Data in table 1 above did reveal that 112 respondents representing 100% generally strongly agree that classroom/learning environment, cognitive based classroom and classroom characterized by independent and deep learning approach are major factors that can facilitate acquisition of critical thinking skills among student-librarians. The 112 respondents which is also 100% either strongly agree or agree that instructional practice and classroom that encourages active students' participation in the learning process are other factors that can facilitate the acquisition of critical thinking skills

among student-librarians. While over 80% of the respondents also strongly agree or agree that classroom characterized by collaborative learning approach and by differentiated learning approach are the other factors that can enhance the acquisition of critical thinking skills among the student-librarians.

What are the steps of skills towards acquiring critical thinking skills among student-librarians?



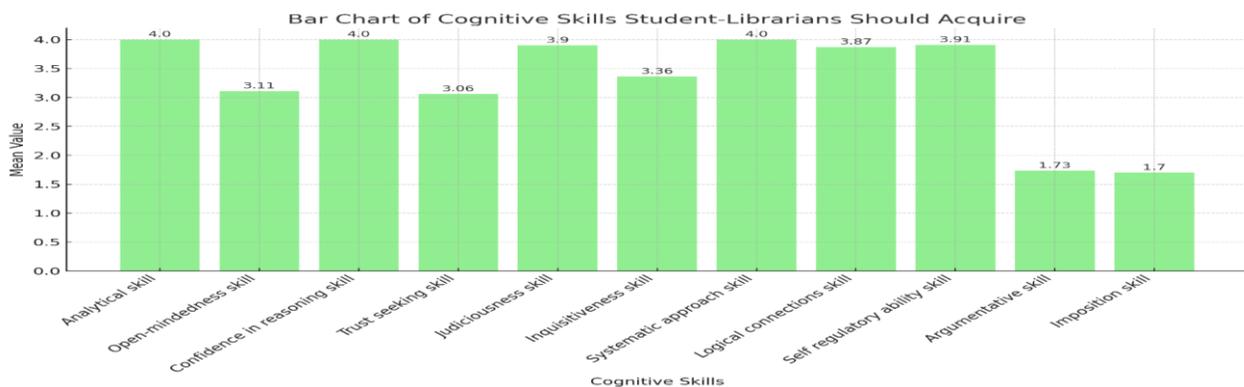
**Table 2: Steps of skills towards acquiring critical thinking skills among student-librarians**

Item	SA		A		DA		SDA		Mean
	F	%	F	%	F	%	F	%	
Problem identification skill or Elementary clarification	112	100	***	***	***	***	***	***	4.00
Problem definition skill or In-depth clarification	112	100	***	***	***	***	***	***	4.00
Problem exploration skill or inference	98	87.5	14	12.5	***	***	***	***	3.88
Problem evaluation/applicability skill or judgment	112	100	***	***	***	***	***	***	4.00
Problem integration skill or strategy formation	112	100	***	***	***	***	***	***	4.00
Problem fighting skills	***	***	***	***	34	30.36	78	69.64	1.30

As shown in table 2, the analyzed data indicate that there are various skills that ought to be acquired to pave way for the acquisitions of critical thinking skills among student-librarians. From the data, such skills as strongly agree by the 112 respondents or 100% include problem identification skill or elementary clarification, problem definition skill or In-depth clarification, Problem evaluation/applicability skill or judgment and problem integration skill or strategy formation as well as problem

exploration skill or inference which the 112 respondents strongly agree or agree on. On the other hand, 100% of the respondents strongly disagree or disagree to the acquisition of problem fighting skills with a mean of 1.30 which is below the benchmark of 2.50 as one of the skills that are prelude to acquisitions of critical thinking skills.

What Cognitive skills are student-librarians in public universities in Nigeria supposed to acquire?



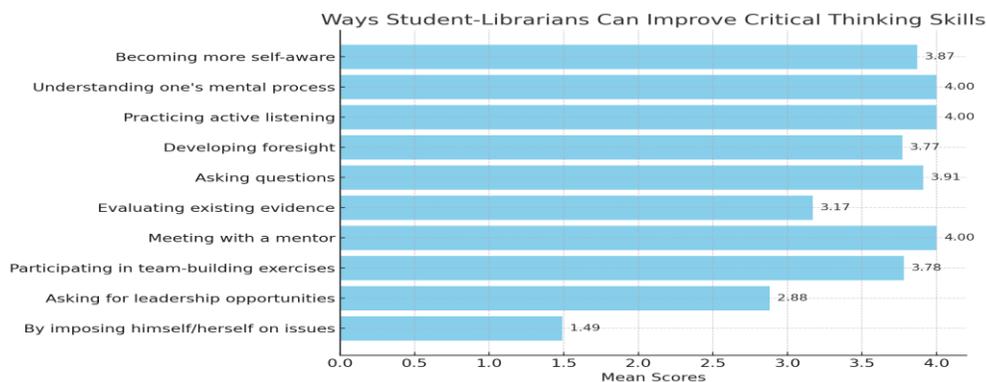
**Table 3: Cognitive skills student-librarians in public universities in Nigeria suppose to acquire**

Item	SA		A		DA		SDA		Mean
	F	%	F	%	F	%	F	%	
Analytical skill	112	100	***	***	***	***	***	***	4.00
Open-mindedness skill	43	38.4	50	44.64	7	6.25	12	10.71	3.11
Confidence in reasoning skill	112	100	***	***	***	***	***	***	4.00
Trust seeking skill	64	57.14	33	29.46	6	5.36	9	8.03	3.06
Judiciousness skill	100	89.3	12	10.7					3.9
Inquisitiveness skill	72	64.29	20	17.86	8	7.14	12	10.71	3.36
Systematic approach skill	112	100	***	***	***	***	***	***	4.00
Ability to identify logical connections between elements of thought and the problem skill	97	86.61	15	13.39	***	***	***	***	3.87
Self regulatory ability skill	102	91.1	10	8.9					3.91
Argumentative skill	6	5.36	3	2.68	56	50	49	43.75	1.73
Imposition skill	***	***	***	***	78	69.64	34	3.36	1.70

On cognitive skills student-librarians should acquire which is the bedrock of critical thinking, the data collected as displayed in table 3 above showed that 100% or 112 of the respondents strongly agree that student-librarians need to acquire Analytical skill, Confidence in reasoning and Systematic approach skills, while the same 100% strongly agree or agree that student-librarians need to acquire Judiciousness skill, the ability to identify logical connections between elements of thought and the problem as well as Self regulatory ability. Other cognitive

skills over 80% respondents strongly agree or agree that student-librarians should acquire prelude to acquiring critical thinking skills include, Open-mindedness skill, Trust seeking skill and Inquisitiveness skill. In the Contrary, the entire 112 respondents which is 100% strongly disagree that the acquisition of imposition skill as well argumentative skill are part of critical thinking skills

In what ways can student-librarians in public universities in, Nigeria improve their critical thinking and other skills?



**Table 4: Ways student-librarians can improve their critical thinking and skills**

Item	SA		A		DA		SDA		Mean
	F	%	F	%	F	%	F	%	
Becoming more self-aware	97	86.61	15	13.39	***	***	***	***	3.87
Understanding ones mental process	112	100	***	***	***	***	***	***	4.00
Practicing active listening	112	100	***	***	***	***	***	***	4.00
Developing foresight	86	76.79	26	23.21	***	***	***	***	3.77
Asking questions	102	91.1	10	8.9	***	***	***	***	3.91
Evaluating existing evidence	67	59.82	21	18.75	10	8.9	4	3.57	3.17
Meeting with a mentor	112	100	***	***	***	***	***	***	4.00
Participating in team-building exercises	87	77.68	25	22.32	***	***	***	***	3.78
Asking for leadership opportunities	32	28.57	47	41.96	20	17.86	13	11.61	2.88
By imposing himself or herself on issues					55	49.11	57	50.89	1.49

Table 4 reveal that 112 of the respondents which represents 100% strongly agree that understanding one's mental process, practicing active listening and meeting with a mentor are ways student-librarians can improve their critical thinking and other skills. The same 100%, either strongly agree or agree that becoming more self-aware, developing foresight and participating in team-building exercises are also ways student-librarians can improve their critical thinking skills whereas, 79 of the 112 respondents or 70.53% strongly agree or agree that asking for leadership opportunities is one of the ways available for student-librarians to improve their critical thinking skills as well as other skills but the entire 112 respondents strongly disagree or disagree to the idea of a student-librarian imposing himself or herself on issues as a way of improving ones critical thinking skill and other skills.

### Discussion of Results

The outcome of this study did show that the key factors that can facilitate the acquisition of critical thinking by student-librarians are the classroom/learning environment as well as instructional practice (see table 1). The classroom and the learning environment should be one that encourages active students' participation in the learning process, characterized by collaborative learning approach, independent and deep learning approach and differentiated learning approach and must also be Cognitive based. This findings is in conformity with Moolla (2014), who posits that classroom should allow for collaborative learning, differentiated learning, independent learning as well as a deep learning approach as well as Moonsamy (2014) who stated that a thinking classroom can only occur when it is shaped by intentional and explicit mediation from the teacher which supports the acquisition of cognitive skills and meta-cognitive awareness and use. This explains that thinking classroom does not just occur neither is it automatic but through the effort of teachers and school management. The assertion is that learning environment that encourages critical thinking promotes active learning through frequent questions and provides enough support to allow students to challenge their current conception of knowledge and interact with other students (Brown & Freeman, 2000, University of Maryland, 2010).

Furtherance, the study discovered that for student-librarians to become critical thinkers, they need for instance, acquire problem identification skills, problem definition skill, problem evaluation/applicability skill or judgment and problem integration skill or strategy formation as well as Problem exploration skill or inference. This result corroborates the assertion that critical thinkers should have at their disposal guided intellectual standards, supportive of intellectual integrity, perseverance, reason and self-discipline, ability to

identify logical connections between elements of thought and problem, self regulatory ability, ability to accept multiple legitimate point of view and to seek weaknesses and limitations within their own position (Tilbury, Osmond & Scott, 2010).

The study also found that there are necessary cognitive skills that must be acquired by student-librarians as prelude to acquiring critical thinking skills. According to the data collected and analyzed, these skills include, analytical skill, confidence in reasoning and systematic approach skills, Judiciousness skill, the ability to identify logical connections between elements of thought and the problem as well as self-regulatory ability. Others are open-mindedness skill, Trust seeking skill and Inquisitiveness skill. This finding affirms the views of Monash University (2024) that highlighted four critical thinking skills, mindsets and practices one must acquire to be a critical thinker as, questioning skills, analytical skills, evaluation skills and synthesis skills but noted that the list is by no means an exhaustive of all critical thinking skills because the skills one uses will depend on one's specific context.

On the other hand, this finding did not totally agree with Monash University (2024) assertion that critical thinking is most commonly associated with arguments in that one might be asked to think critically about other people's arguments or create his or her own. To this end, to be a better critical thinker, therefore one needs to learn how to clarify thinking purpose and context, question sources of information, identify arguments, analyse sources and arguments, evaluate the arguments of others and create or synthesize own arguments. This because over 90% of the respondents do not agree that acquisition of argumentative skill is necessary in improving ones cognitive skill which is the hub of critical thinking may be on the assumption that situations ay determine one stand.

Finally, it was also discovered that student-librarians can improve their critical thinking and other skills by understanding their mental process, practicing active listening and meeting with mentors, by becoming more self-aware, developing foresight and participating in team-building exercises as well as by asking for leadership opportunities. This discovering is in tandem with Birt (2024) inference that one can improve critical thinking and skills by becoming more self-aware by considering his thought process, values, morals, ethics and other beliefs, identifying and evaluating how he receive and process information, considering how others might feel about a situation or decision you make, listen carefully and attentively while others are talking and to always ask questions when not sure, using previous experience and facts to help one make ones current decision through critical thinking, meeting with a mentor,

participating in team-building exercises and asking for leadership opportunities.

### Conclusion and Recommendations

From the findings of this study, one can deduce that critical thinking skills is not just a necessity but a sine-qua-non not only for student-librarians but for all who want to successfully face and tackle multiple challenges of the contemporary world. Ultimately, there are various ways these skills can be acquired and improved on regular basis. In the area of student-librarians, it is a collective responsibility of both library schools management and lecturers, while the students on their own part, should focus their minds towards acquiring this highly needed soft skills of our time. The implication therefore, is that for student-librarians in public universities in Nigeria and other nations of the world, to be relevant in this 21<sup>st</sup> century and be able to handle all kind of challenges in a dynamic world, they must be taught critical thinking from the inception. This can be taught explicitly and implicitly by lecturers. As has been revealed by experts, when students are taught these skills, they should be made to be pretty aware of them and encouraged to apply them when faced with challenges. In line with the above, it is recommended that:

1. Teaching environment should be reflective, encouraging open-mindedness and objectivity,
2. Instruction should be cognitive-based, in which lectures should adopt problem-solving approaches and inquiry based instruction in teaching students,
3. There should be explicit instruction of thinking skills as well as their infusion in contents in lecture rooms and laboratories
4. Lecturers should make lecture rooms cooperative/collaboration to foster cross pollination of knowledge in which more competent peers will be able to scaffold the less competent ones.
5. Finally, Lecturers should adopt facilitators' role and move in the direct of mediating knowledge, taking students from where they are to where they ought to be.

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