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Chapter

Multilateral Relationship between Information Literacy, Self-Concept and Metacognitive Ability

Oluwole O. Durodolu and Joseph M. Ngoaketsi

Abstract

This study examined information literacy, metacognitive abilities and self-concept capabilities. The evaluation of this research indicated that self-concept is the totality of psychological, emotional, psychosomatic and mental development that provide confidence to individual in the ability to search, use, appraise and assess information resources, which are critical qualities needed to enable information literacy; an individual needs to be conscious and develop aptitude to identify useful information. Metacognitive ability is important because of the age of information overload which an individual is overwhelmed with which signified that information available is exceeding processing capacity of an average individual. Accordingly, once information overload ensues, it is possible that a decrease or decline in quality of decision-making will happen. In view of this, metacognitive ability becomes necessary in order to equip people with the critical ability to contemplate rigorously before action is taken. The objective of this research is to embark on content analysis of the subject matter of information literacy, metacognitive abilities and self-concept in which existing research was thoroughly evaluated in order to identify gap in research and bring out new knowledge. This research uses qualitative content analysis as a method of data collection in which existing journals and other information resources were evaluated. Research has been silenced on the triangular relationship of metacognitive ability, self-concept and information literacy, that is, the gap this research attempt to bridge.

Keywords: information literacy, self-concept, metacognitive ability, information overload, information access

1. Introduction and background to the study

The history of mankind access to information has never been easier than it is in this contemporary world, but easy access to information does not necessarily guarantee access to quality, genuine, reliable and truthful information. The Internet is an open platform where many people can ventilate and publicize their opinion, idea, impression and views, without necessarily going through peer review mechanism by expert in different fields of knowledge or the opinion be subjected to rational scrutiny, before accepting it ex cathedra. Regrettably, the inability to separate fake, counterfeit and forged information can be a major source of embarrassment. Wrong sources of information can lead to erroneous and costly decision to organizations

and professional body. Therefore, to reduce and limit this predicament, it becomes imperative to acquire skill that will empower individual on how to identify trustworthy sources of information on the Internet especially by teachers whose roles and responsibility is to expand the frontiers of knowledge. In view of this, many scholars are of the opinion that metacognitive dexterity equips people with high level of thinking capable of boosting higher-order thinking [1]. In order not to fall into the error of using unreliable sources of information, it is worthwhile to source for information from accredited academic databases that has been endorsed and certified collectively by professional body; this ensures to establish quality control particularly within the academic community.

Metacognitive skill is the knowledgeable ability that empowers information seekers to pursue their information need with critical mind, evaluate information resources meticulously, make inferences and deduce evidence in the perspective of one's own information needs and, finally, make evaluative judgment about sourced information. A characteristic of this set of thinking is the awareness that information seekers have of their own thinking procedure, which is referred to as metacognitive knowledge, which is a vital piece of ability to resolve information literacy puzzle [1–3].

2. Objective

This article embarks on content and in-depth analysis of the subject matter of information literacy, metacognitive abilities and self-concept.

3. Purpose of the study

The purpose of this study is to evaluate the characteristic necessary to overcome the challenges of the contemporary period associated with information overload. Information literacy is a twenty-first tool to help in managing and circumnavigating the ocean of information. It can also be compared to an instrument or compass to help navigate the world of abundant information resources. The challenges of information overload are acknowledged as a source of anxiety for today's information seekers as they are frequently being overwhelmed by information from countless sources. Without the knowledge of metacognitive ability which is an aptitude to strengthen the ability to ratiocinate and make a reliable choice based on valued judgment anchored on the process of logical reasoning, metacognitive strategies are centred on organization, monitoring and appraisal which are qualities that can be applied in seeking, utilizing and communicating information. Information age requires self-confident and self-regulating learners fortified with lifelong learning skills. Independent learning ability and information literacy are fundamental expertise necessary not only for lifelong learning but also for attainment in the information-centred societies.

This chapter addresses scholars' views from different backgrounds on their perspectives on the information literacy skills and special abilities like self-concept and metacognitive ability. The chapter therefore reviews literature in the subject area of the evolution of information literacy, perceptions of information literacy and information search strategy; the chapter also identifies a significant correlation linking of self-concept and information literacy skills, investigates the level of self-concept and personal abilities and identifies a significant correlation between this abilities and information literacy skill acquisition for teaching purposes.

4. Methodology

This research is guided by interpretive research paradigm in which concepts are discussed to bring in-depth understanding. This research uses qualitative content analysis as a method of data collection in which previous recorded document were studied systematically; journal, conference papers, reliable online resources and policy document were carefully evaluated in relation to the subject matters of information literacy, self-concept and metacognitive abilities that were reviewed. This is done in order to identify gap in research and bring out new knowledge. The identified keyword above was used in search of information resources from manly web of science and EBSCOhost. The researcher left out other databases for this research because of easy accessibility to the selected database, namely, web of science and EBSCOhost, which the researcher has access to in the place of work. The synthesis in the review of literature was achieved by combining important keyword that forms the bedrock of this research, that is, metacognitive ability, self-concept and information literacy; these keywords were evaluated to bridge the knowledge gap and established a new knowledge.

There is paucity of research contribution in the area of metacognitive learning; therefore, it poses a great deal of challenge in getting sufficient research material to embarking on this research in relation to information literacy and self-concept. The purpose of this research is to also close the research gap, for instance, embarking on informetric evaluation of the available information resources using web of science

Timeline of publication used		%
Years	Number	
1979	1	1.82
1995	1	1.82
1998	2	3.63
2002	1	1.82
2003	2	3.63
2004	2	3.63
2005	3	5.45
2006	4	7.27
2007	2	3.63
2008	1	1.82
2009	6	10.91
2010	5	9.09
2011	5	9.09
2012	5	9.09
2013	8	14.55
2014	4	7.27
2015	2	3.63
2018	1	1.82

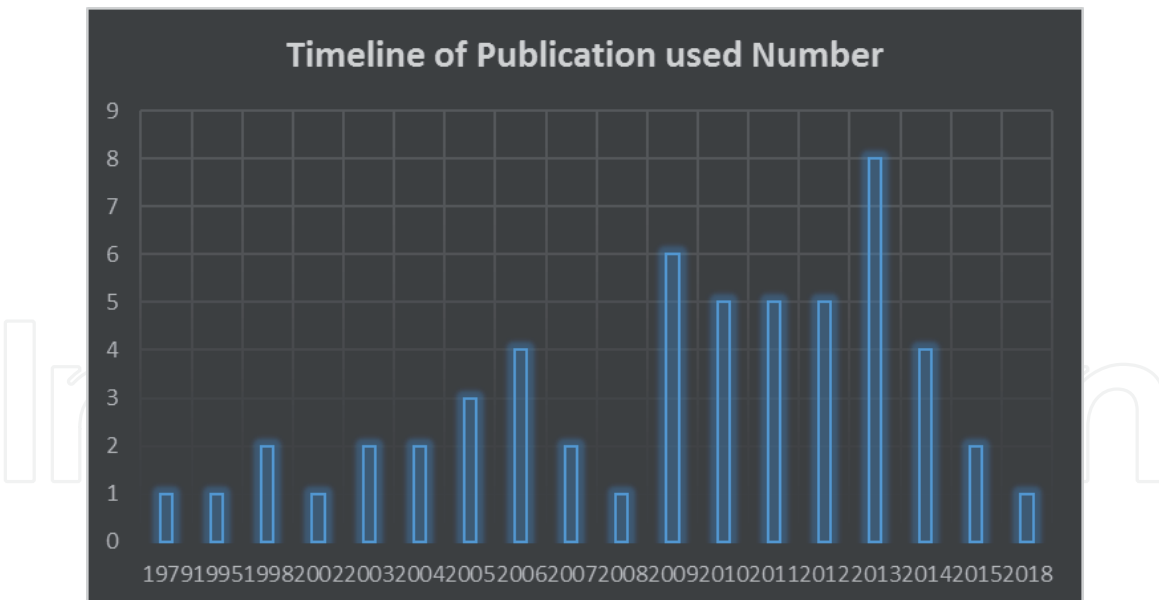**Table 1.**
Timeline of publications.

Figure 1.
Graphic representation of timeline of publication.

which is a database that has up-to-date and retrospective coverage from 1900 to the present, which includes 34,200 journals along with numerous books, proceedings, patents and data sets. The informetric result generated shows that within the span of 27 years (1992–2019), research output in metacognitive leaning is 395 (see **Table 1**) out of which research articles are 263 followed by conference proceeding with 138. Countries leading in these research areas are the United States (57), People's Republic of China (46) and England (24). Therefore, for the sake of this study, 55 research articles were selected starting from 1979 to 2018, and most of the selected articles were relatively recent (see the timeline in **Table 1** and **Figure 1**).

5. Perception of the need for information literacy skills

Technology, especially the Internet, has amplified the quantity of information accessible, but this also comes with challenges associated with seeking and using information resources [4, 5]. The author observed controversies among librarians and information professionals in some countries yearning for new literacy to enable access and use of information resources in many formats from an increasing information environment [5]. Access to overwhelming information resources has undermined the need for libraries across the globe to serve as gatekeepers between those who seek for information and information resources. This new revolution in information atmosphere and the skills that promote independent information seeking have stimulated the academic debate on teaching and learning information literacy [6]. It was affirmed that information seekers are dazed by the enormousness of information available to them from different sources. Taking decisive action to know when information accessible is adequate is a foremost reason for apprehension and doubt often experienced by information seekers [5].

Information can be seen as that which reduces doubt, uncertainty and ambiguity in decision-making [7]. The quality of information is critical for efficient operation and decision-making and important to modern society in carrying out daily productive activities. Thus, information need is described as a personal or collective aspiration to find and acquire information to fulfill a conscious or unconscious need. Information need occurs when an individual is faced with a dilemma in which

knowledge acquired over a period of time is not adequate to help his/her objective. As a result, the need for information will trigger the curiosity to seek for it and thus satisfy the need [8].

Various other studies have discussed information need, for example [9–11]. In the opinion of the researcher, information needs or question formations can be viewed from four basic progressions, namely, visceral need (need as dictated by intuition or instinct), conscious need (the result of deliberate effort), formalized need (the product of human invention) and compromised need (need as expressed verbally) [9]. Various researches have also been carried out on the need for information, for instance, to embark on an evaluation of the changing need for information among professionals [12]. The study suggested that there is a need for curricular change in coping with current information need. A study analyses the information needs and pattern of information-seeking behaviour of professionals and observe that information is needed in order to obtain more knowledge. The authors also observe that professionals need to be familiar with and improve the availability of and accessibility to the Internet in the workplace for better job performance, supporting innovation and sustaining economic development [10]. There are stable and unstable information needs to explain the perpetual change in needs over a period of time and differentiate between a changing world, types of information need and interpretation of data [11].

An information literate person is proficient in determining the nature and scope of information needed to meet personal and professional requirements [13]. The present information background is rich and categorized by an abundance of information sources and providers, a multiplicity of methods for accessing information and a redundancy of content from numerous sources [14]. In this information-saturated environment, many information users tend to experience a sense of inadequacy and anxiety [15]. The prevailing difficulty is how to navigate this intricate landscape of information to enable satisfaction of information need.

The awareness of information overload symptoms and causes would help scholars in meeting and satisfying information needs, as the flood of potentially relevant information has become pervasive [16]. In an attempt to meet daily information needs, individuals are compelled to consider more information and opportunities than they can effectively process. This information overload is made worse by "data smog", which is a concept describing the proliferation of low-value information, which can also lead to anxiety, stress, alienation and potentially dangerous errors of judgment, which can adversely affect productivity [17].

One of the major consequences of meeting information need has been the exponential growth of the Internet and information and communication technologies, which is the prime reason for information overload, and the speed and complexity of developments in society. A study contends that people find it more complicated to handle the amount of new information they receive, regular changes in the organizations and technologies they use and the increasingly complex and unpredictable side effects of their actions [18].

The need for information is as important as blood in the human system, because without information, transformation will not be possible. Information is essential in all human endeavors for problem-solving. Information need triggers information search, the practice by which a person seeks knowledge about a difficult circumstance constituting a major impediment, which leads to seeking for information on the Internet by millions of users [19]. The web is now a primary source of information for many people, motivating a critical need to understand how users search or employ search engines [20]. Information need and information seeking are different but related concepts because both of them are components of information behaviour [21]. The adventure to seek for information begins with the need

for information, and to meet that need, an individual must be aware of the various information sources available.

A body committed to promotion of educational development worldwide has also been keenly upholding the perception of knowledge societies in which information literacy plays a prime role in structuring comprehensive, pluralistic, just and participatory societies by enabling people to understand and make valued judgments as active users of information and become producers and distributors of information and knowledge in their own right [22]. It was also affirmed that information literacy enables citizens to make informed choices to meet the information needs which will help them achieve their full potential and it enables them to maintain their political, economic and social development [23].

There is a dire need for information literacy training of teachers; researchers [24, 25] affirmed that the need is particularly required in rural areas for students in training and working adults and could be addressed by considering the approach of ICT for development and the need for international standards and curricula for information literacy. This approach should be followed by action based on the prevailing circumstances of teachers, a wide and systematic review of supporting literature and encouraging critical inquiry.

It is evident from studies conducted by many researchers that there are teachers who have the right view of online education as they are aware of its usefulness to the education system. Although personal issues like time constraints, perceived usefulness, perceived ease of use and low enthusiasm are a relatively common phenomenon, awareness, capacity building and enabling environments should be provided to encourage the use of online information resources among teachers [26].

Examinations of teachers' competence in developing countries have revealed that they gain information literacy knowledge and ICT skills through personal efforts aided by families or friends to gain training outside the schools. The implication of this, in the view of scholars, is that much of the training provided by the schools for student teachers does not meet the need for them to integrate information literacy skills into their teaching. This underscores the need for more emphasis to be placed on exposing student teachers to advanced courses in information literacy skill and ICT knowledge [27]. Schools and indeed universities in the developing nations must improve on their information literacy skills and ICT technique in line with the UNESCO recommendation. Therefore, metacognitive ability and strategies can lead to positive information research experiences and, consequently, should be imparted during library instruction and orientation programme, to trigger metacognitive strategies [22].

6. Effects of metacognitive ability on information literacy

Metacognition can be defined as the ability to think about one's thinking process, which combines two components of knowledge and regulation about oneself in relation to factors that might affect performance, strategic knowledge and knowledge to be applied based on present challenges [28]. Metacognitive ability has been seen as having knowledge, understanding and control over mental activities and appropriate use of the acquired knowledge [29]. Metacognitive regulation is the monitoring of one's cognition and includes planning activities, awareness of comprehension and task performance and evaluation of the efficacy of monitoring processes and strategies [28]. Metacognition refers to sophisticated thinking which comes with dynamic mechanism over the intellectual methods engaged in learning.

According to a researcher, information literacy is a foremost metacognitive skill; i.e. information literacy skills are exactly the expertise people require to be able to

take control of their own thinking and learning in order to find the best information for their needs. To be information literate demands self-awareness. This refers to an attentiveness towards and understanding of learning processes [30]. Learners who possess highly developed metacognitive skills are more likely to acquire information literacy skills as a precondition for modern learning [31]. It was also explained that metacognitive ability reinforces information literacy as a reiterative, holistic process where individuals continually assess their own ability to increase their information literacy [32].

John H. Flavell, the progenitor of metacognition, describes it as purposeful, planful, deliberate, goal-directed, future-oriented intellectual behaviour that can be directed at achieving cognitive tasks [33]. Metacognitive ability also refers to knowledge concerning cognitive ability and affective states and control over knowledge in order to achieve a specific goal. Such knowledge can be classified into declarative, procedural and conditional knowledge which are the overall qualities expected to advance knowledge acquisition [34]. Metacognitive experiences involve awareness of one's own cognitive ability and affective processes. These experiences are retrieved by actively monitoring one's own mental processes [34]. A metacognitive ability integrates, among other things, ability in time management, limits information searching to the most pertinent rather than the most available and considers conflicting viewpoints and emotional intelligence, which means that learning can involve complex moods of uncertainty, frustration and doubt [35].

Metacognitive strategies include a variety of simple processes such as underlining, outlining, notetaking, summarizing, self-questioning and more complicated methods such as hierarchical summaries, conceptual maps, thematic organizers and metaphorical thinking [36]. In investigating how to efficiently teach information literacy and reliability assessment skills in the use of online information atmosphere, in the context of students' dependence on the use of Internet resources. The lack of information in literacy skills can limit critical appraisal. It was therefore suggested that innovative instructive techniques are necessary for effective online information literacy skill and to integrate scaffolding and metacognitive support [37].

Metamemory refers to the ability of people to demonstrate the capacity to search the content of memories, either prospectively or retrospectively, out of which judgements or clarification are drawn. Metamemory is not memory per se, but depends on it [38]. Understanding memory reveals that memory can fall short of the expected need in two diverse ways: the first involves forgetting or being incapable of retaining information despite one's best efforts. The other involves "misremembering" or remembering something incorrectly [39].

According to a research, metacomprehension means the capability to examine the degree to which one understands information being communicated, to recognize the reason for failure to comprehend and to employ repair strategies when failures are identified [40]. It was observed that metacomprehension derives from two keywords: meta and comprehension. For example, metadata would mean that data is being analyzed about data. Comprehension means an ability to understand or show lack of understanding. Metacomprehension thus means an ability to be aware of or understand one's understands of a topic [41].

Self-regulation, colloquially known as willpower, refers to self-directed competence for altering behaviour. It helps to increase the flexibility and adaptability of human behaviour, helping people to adjust their actions to a remarkably broad range of social and situational demands [42]. Thinking about the importance of self-regulation can help individuals to become objective and to understand in responding to behaviour.

Understanding the impact of temperament and considering goodness of fit can assist teachers in selecting strategies that support the development of self-regulation [43].

6.1 Personal knowledge

Personal knowledge refers to knowledge applied in the profession which has been accumulated and proved over time to possess permanent value, worldwide application and universal truth. It is acquired mainly through formal and informal training [44]. The process of gaining knowledge is a method essential to survival which begins early and continues all through life. Metacognitive knowledge involves consciousness and manifestation of the content of an individual's thought, ranging from simple awareness of the content of one's immediate and prior thought [45].

The importance of knowledge cannot be over-emphasized in any profession, especially in the area of classroom management techniques. Knowledge is a set of skills and information obtained through experience and/or education, giving someone the ability to perform well in a specific field or ability [46]. Personal knowledge can be translated into a progressive classroom environment capable of boosting the intellectual ability of students and fostering intelligent behaviour for problem-solving purposes, decision-making and creative thinking. Figuratively, the intelligence friendly classroom serves as a caring companion and mindful guide to the intellect of each and every learner in it [47].

6.2 Task and procedural knowledge

In the opinion of researchers, people constantly become skilled because of the knowledge acquired from years of experience, but since personal experience is always insufficient, people tap from the experiences of relatives, friends and colleagues in an attempt to enlarge their knowledge or solve problems [48].

Procedural knowledge is the knowledge that is demonstrated through the procedure of doing it. It shows how people understand things and how the mind works to gain, recall and use the knowledge. This is often unconscious knowledge: though someone may demonstrate it, it can be something otherwise not considered by the person. For example, a teacher may know when to apply a particular technique in the classroom but may not be able to precisely explain this to his colleagues. In other words, it can be considered a trade secret that makes one individual distinct from others [49].

6.3 Strategic and declarative knowledge

Declarative knowledge is known as the ability to recall stored or acquired information. This procedure entails three stages of learning declarative knowledge: first, establishing a link between new information and an existing body of knowledge, which means learning how to remember new information; second, categorizing information by putting new information into groups, placing it into different parts of the memory; and third, elaborating information by making connections among the information being received as well as connecting new information to existing knowledge [50].

Learning strategies are devices used by learners to aid acquisition of knowledge and skills. Instruction should guide the learner in the choice of appropriate learning strategies for particular learning tasks. Facilitating the learning of declarative knowledge, concepts, procedures, principles, problem-solving, cognitive attitudes and psychomotor skills begins with decisions on what content should be presented, how it should be presented and in what sequence the instruction should follow [51].

6.4 Conditional knowledge

It has been claimed that the ability to decide when and why a particular approach is necessary for the purpose of problem-solving is conditional knowledge. A teacher can do a wonderful job in passing knowledge across to students but may find it difficult to teach them how to weigh up options available to them and make informed decisions about when to employ this skill [51].

7. Effects of self-concept in information literacy skills

Many researchers have pointed to the fact that personal abilities can no longer be overlooked when investigating information literacy skill. For instance [52–54], postulate that personal abilities are vital in scrutinizing the connection between information literacy and the self-concept which is the bedrock of personal ability and academic attainment. Such scrutiny is necessary in order to salvage those who may be victims of self-destructive beliefs which may also be damaging to students [55].

The most important attribute of modern societies is that everything is in a perpetual state of flux. At the same time, the quantity of information is now overwhelming, and technology has become relevant to every aspect of human life. There is hardly any professional calling today which has not felt the positive influence of this change. It is therefore almost mandatory for all who wish to be relevant in any career to embrace this new technique. Societies of the information age must be confident in the application of modern technology to be able to access information to foster independent, self-regulated learners equipped for lifelong learning. The manpower needed by today's societies can be described as effective consumers of information who can find, evaluate, use, produce and share information and make use of technology in all these activities [56].

Satisfactory self-perception of scholarly capability is fundamental for the recognition of intellectual ability, thereby promoting learning of complex skills like information-seeking skills. It was also suggested that academic self-concept should moderate the connection between intelligence and information literacy: a constructive relationship between intelligence and information literacy is expected for an academic self-concept. Thus, it is accepted that this moderator effect is mediated by personal effort. Whenever people are able to distinguish between personal deficits or strengths, they will come to understand how to develop the level of confidence they aspire to have [57].

Self-concept is characterized as the sum total of a person's mental and physical features and evaluation of self. As such it has three aspects: the cognitive (thinking), affective (feeling) and the psychomotor (action). It is important to consider the self-concept as developing in these three areas. It can also be seen as individual awareness of self and awareness of identity [58]. It was also noted that it has become an acceptable fact that one's self-concept is a way in which one sees oneself. This is not restricted to physical appearance, which is reflected in one's academic, professional and social existence, but includes private and personal awareness [59].

Personal confidence in the use of modern technology is important for effective use of expertise. Scholars affirm that skill acquisition is insufficient unless individuals develop self-confidence in the application of what is learnt. In other words, success based on the possession of required skills for performance also requires the confidence to use these skills effectively [60]. Therefore, apart from possessing information literacy skills, individuals in modern society must also be convinced about their proficiency in the use of these skills. Information literacy self-efficacy is capable of motivating academic performance; information literacy can help in

predicting academic achievement, while self-concept is considered a major factor in developing information literacy [61].

Psychological factors affect human ability to learn new skills. Therefore, in addition to attaining information literacy skills, it is also important to develop perceived self-efficacy concerning these skills [56]. This will help in better appreciation of self-efficacy as a way to boost problem-solving capacity as a needed feature for lifelong learning. Self-concept is a vital component of teaching, not just to help with academic performance; it supports social skills and makes it easier for teachers to influence positive behaviour. Students are also better equipped to cope with mistakes, disappointment and failure if the mental attitude of teachers is positive; they are more likely to stick with challenging tasks and complete learning activities [61].

The self-concept of teachers has lifelong impact in the overall performance of learners, because it has positive effects on their self-esteem. This is because reinforcing the self-esteem of students is a direct consequence of increased motivation and learning. Teachers' positive attitudes can create a satisfying teaching environment and help to give students the impression that they belong and are welcome in the school setting. Teachers with positive mental attitudes must constantly communicate to students that mistakes are part of the learning process and that no student should ever feel embarrassed to ask questions if he or she does not understand something [62].

Self-concept comprises an individual's perception, emotion and attitude towards him or herself and is usually shaped in the course of familiarity with and understanding of one's environment. It was affirmed that self-concept is a combination of environmental and psychological conditions [63]. These two factors can affect human behaviour, as people become vulnerable to social factors in their search for independence [60]. Self-concept is a multidimensional entity which consists of very different cognitive and affective components [64, 65].

Perception of self can be a consequence of cumulative effects during biological, social and psychosocial transitions. Constructive transitions result in healthy self-concept developments, which make possible the achievement of many advantageous outcomes. Positive educational environments, family, school and community youth groups can shape personal qualities, which support cognitive, psychological, psychosocial and socio-emotional achievement. Positive outcomes will motivate the desire to attain high educational goals that are integral in self-concept formation [66].

Eight elements form the foundation of a person's self-concept; they are morality and ethics, personal and physical attributes, family, identity, social satisfaction and behaviour [67]. Self-concept also refers to an act of self-evaluation or self-perception, and it signifies the total sum of a person's belief about his or her own qualities. Self-concept reflects how people evaluate themselves in domains in which they consider success important [68].

8. Conclusion

The thematic analysis of this qualitative research emphasizes the importance and complimentary relationship between the selected variables for this research. For instance, metacognition is inherently part of ability needed to be mindful in planning, regulating and evaluating of one's intellectual processes such as the one needed in navigating the overabundance of information resources available from different sources; the study emphasizes the role of personal knowledge, task and procedural knowledge, strategic and declarative knowledge and, finally, conditional knowledge and the role they play in helping to shape activities channel towards information acquisition. Metacognitive control supports the ability to help in managing learning and fostering problem-solving skills.

At the heart of modern problem is information overload; therefore, it is imperative to acquire the skill that will lessen the burden of having access to genuine sources of information and be able to separate chaff from wheat in the world of information; otherwise, complex decision-making process influenced will be negatively affected. Incorrect, erroneous or misinformation, particularly on social media which are deliberately spread with intension to deceive, can be costly and lead to consequences that may be difficult to reverse; therefore, it should be a modern requirement for the knowledge of information literacy to be acquired. Since most of the modern information resource is driven by technology, it is important for any establishment to be restructured to accommodate these changes, which is often replaced with newer model, and consequently it is vital for the information literacy to become a lifelong skill. Doing this also requires self-concept which is the ability to demonstrate confidence and self-assurance in the handling of this modern tools and techniques, which comes with persistence and irrepressibility in the face of daunting and overwhelming challenge. Metacognitive skill is the ability to ponder seriously on any line of action before ultimately reaching decision; in view of the abundance of inaccurate information abundantly available, this quality becomes a sine qua non for survival in the information age and empowers individual to effectively search and navigate the world of information.

Conflict of interest

The authors declare no conflict of interest.

Author details

Oluwole O. Durodolu[1,2]* and Joseph M. Ngoaketsi[1]

1 Department of Information Science, University of South Africa, Pretoria, South Africa

2 University of Lagos Library, Lagos, Nigeria

*Address all correspondence to: woledurodolu@gmail.com

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