# Metacognitive Skills of Nursing Students in Nigerian Universities

**Chiejina EN[1], Ebenebe RC[2]**

[1]Department of Nursing Science, Faculty of Health Sciences & Technology Nnamdi
Azikiwe University Nnewi Campus, Nigeria.

[2]Department of Educational Foundations, Faculty of Education, Nnamdi
Azikiwe University Awka, Nigeria.

**Abstract:** *This study investigated the metacognitive skills of nursing students in Nigerian universities. The sample size was 240, and the respondents were selected by simple random sampling from government owned and private universities. Two research questions and two null hypotheses guided the study. The instrument used for data collection was Questionnaire on Metacognitive Strategies in Nursing (QMCSN). Mean score, standard deviation (SD) and Spearman Rank Correlation Coefficient (rho) were used to answer the research questions while Wilcoxon Rank Sum and Mann-Whitney-U tests were adopted in testing the null hypotheses at 0.01 level of significance. The findings revealed significant correlation between the students' learning strategies, their self-evaluation strategies and their metacognitive goals. Significant relationships were also observed among the students in government and private universities with regard to their classroom self-evaluation strategies as well as their metacognitive goals. Based on the findings, nurse educators were advised not to neglect the affective and motivational aspects of metacognition.*

**Keywords:** Metacognition, Learning strategies, self-evaluation, goals, Nursing students.

## 1. Introduction

Flavell (1979)[1] defined metacognition as the ability to think about thinking. Mezirow (1981)[2] describes metacognition as reflective thinking or a level of consciousness that exists through executive cognitive control and self communication about experiences. Martinez (2006)[3] views metacognition as monitoring and control of one's thought. Furthermore, Elliott et al (2000)[4] explained that a person's thoughts about a decision he has made or about how he is doing in a project all entail metacognitive processes. It involves careful consideration and examination of issues of concern related to an experience. It is also a review of personal and professional life experiences, identification of the skills, qualities and knowledge that result, and recording this learning experience in some form. Flavell (1985)[5] has it that metacognitive knowledge leads individuals to select, evaluate, revise or abandon cognitive tasks, goals and strategies in the light of their relationships with one another and with their own abilities and interests with respect to an enterprise. In the classroom, metacognitive knowledge of task operates when the nature of a task forces one to think about how one will manage. If it is a difficult task, perhaps one will decide to allocate more time or perhaps to prepare an outline (Elliott et al, 2000)[4].

According to Anderson (2002)[6], learners who are metacognitively aware know what to do when they do not know what to do, that it, they have strategies for finding out or figuring out what they need to do. The use of metacognitive strategies ignites one's thinking and can lead to profound learning and improved performance especially among learners who are struggling. Graham (1997)[7] opined that metacognitive strategies that allow students to plan, control and evaluate their learning have the most central role to play in this respect. As Kuhn and Dean (2004)[8] explained, metacognition is what enables a student who has been taught a particular strategy in a particular

problem context to retrieve and display that strategy in a similar but new context. Further, Schraw (1998)[9] describes metacognition as a multidimensional set of general, rather than domain-specific skills; these skills are empirically distinct from general intelligence, and may even help to compensate for deficits in general intelligence and/or prior knowledge on a subject during problem solving.

The essential aspects of metacognition are planning, self-regulation, self-evaluation and self-reinforcement of goal-oriented behaviours (Kuiper and Pesut, 2004[10]; Whitebread et al, 2009[11]). Planning involves identification and selection of appropriate strategies and allocation of resources. Planning include goal-setting, activation of background knowledge and budgeting time. Self-regulation or self-monitoring refers to deliberate attention to the behaviour used to attain goal progress, and it motivates improvement in learning (Schunk, 1990)[12].

Self-regulation of judgments leads to self-efficacy (Schunk and Zimmerman 1997)[13]. Reflective self-regulated learning in nursing include the sub processes of self-observation, self reaction and self-judgment (Kuiper, 1999)[14]. When self – judgments are linked directly to goals, self-regulatory processes are reinforced. Self-evaluation refers to the reflective thinking about experiences and situations to determine if knowledge is adequate, what goals are to be set, and if there is the self-efficacy required to reach them. Self-evaluation also implies appraisal of the products and the regulatory processes of one's goals (Shraw et al, 2006)[15]. Self – evaluation is the key component of reflection, which in turn influences critical thinking and the development of clinical reasoning skills (Kuiper, 1999)[14].

Self-reinforcement of goal-oriented behaviours refers to students giving themselves a reward following successful completion of the activity being monitored (Elliot et al 2000)[4]. Self-reinforcement can be a very potent strategy

for increasing the occurrence of a student's performance. Students can be taught to praise themselves or arrange some pleasant activity as self-reward which then acts to sustain performance (Elliot et al, 2000)[4].

Self-regulated learning (SRL) model has been used as a conceptual framework to support the development of metacognitive knowledge and build reflection capacity among students in transition from school to work environments (Kuiper, 2000a)[16]. In study of a sample of new graduate nurses, Kuiper (2000a)[16] observed that critical thinking strategies increased overtime with use of self-regulation learning prompts.

Kuiper and Pesut (2004)[10] noted that effective clinical reasoning in nursing practice depends on development of both cognitive and metacognitive skills. Roberts and Erdos (1993)[17] explained that cognitive strategies are used to help an individual achieve a particular goal (eg understanding a text) while metacognitive strategies are used to ensure that the goal has been reached (eg quizzing oneself to evaluate one's understanding of that text). Metacognitive experiences usually proceed or follow a cognitive activity. They often occur when cognitions fail, such as recognizing that one did not understand what one just read. Activities of metacognitive processes occur as the learner attempts to rectify the situation.

Fonteyn and Cahill (2001)[18] observed that use of reflective clinical logs assist nursing students to become active learners, to manage their own thinking and to improve their metacognition.

Other metacognitive insights include awareness of the need for knowledge such as using references and resources, judgments of self-improvement, judgments of resources, self-reactions and self-correction strategies (Kuiper,2000)[19].

Educators, researchers and practitioners have used metacognitive concepts in a variety of ways to understand and explain the dynamics of problem-solving and clinical reasoning in nursing practice, for example, it is desired characteristics of professional practice among nursing regulatory bodies, a desirable outcome associated with curriculum development, effective planning and evaluation of programmes (Patterson et al, 2002)[20].

Nursing service settings expect nurses to be proficient in the reflective thinking required to support clinical decisions and judgments about client care. In addition, reflective thinking is one of the key ingredients in a commitment to lifelong learning that characterizes professional growth and development (Brasford, 2002)[21].

Studies have revealed that student-teacher relationship is a confounding variable that influences acquisition and development of reflective thinking. Davies (1995)[22] and Landeen et al (1995)[23] observed that students' fear of judgment and evaluation by teachers significantly influence their acquision of reflective thinking. However, sharing experiences with peers and faculty in a non-judgmental supportive milieu seem to become an essential aspect of reflective process (Davies, 1995)[22]. Reflection differs

between hospital nurses who used lower levels of reflection (consciousness) compared with community nurses and nurse practitioners who use higher levels of reflection (critical consciousness). Also the nature of clinical experience may affect ability to reflect rather than the years of working experience (Kuiper and Pesut, 2004)[10].

Studies have revealed some barriers to development of reflective thinking. Palmer et al (1994)[24] observed that reflection is undermined if nurses fail to value experience that does not support standards of professional and personal values.

Recent changes in nursing education have led to the desire to provide meaningful learning rather than rote learning, and metacognitive learning strategies have been identified to promote meaningful learning (Irvine, 2008)[25]. However, some metacognitive strategies appear to be under-exploited in Nursing education and practice (Irvine, 2008)[25]. A nursing student who had been practicing under supervision, may, on graduation, find herself working alone in a remote community setting where she will require the metacognitive skills she acquired as a student so as to ensure competency and attainment of standards in the discharge of her professional duties. The problem this study addresses therefore is the metacognitive skills of the students undergoing nursing education program in universities.

## 2. Research Questions

- What is the relationship between the learning strategies of nursing students in the classroom and their self-evaluation strategies?
- How does the metacognitive goals set out by nursing students relate to the learning strategies they adopt in their clinical practice?

## 3. Hypotheses

There is no significant difference between the nursing students in government-owned universities and their counterparts in private universities with regard to their metacognitive self-evaluation strategies in the classroom. The metacognitive goals set out by the nursing students in government-owned universities do not significantly differ from that of their counterparts in private universities.

## 4. Materials and Methods

The study was a survey. A sample of 240 undergraduate nursing students was selected by simple random sampling technique from two universities (government owned and private universities) in Nigeria. Inclusion factors of the study population were the students in their third year, forth year and fifth year of the program. The first year and second year students were excluded from the study. Ethical approval and the participants' consent were obtained prior to the study. The instrument used for data collection was questionnaire titled Metacognition strategies in Nursing (QMCSN) which had two parts. Part A of the instrument elicited information on demographic data (eg age, level of the student, units where the student had been posted for clinical practice, etc), while part B elicited information on the metacognitive

strategies adopted by the students in both classroom setting and in their clinical practice. The questionnaire items in part B adopted ordinal scales. A four-point scale ranging from 1 – 4 was used to measure the variables which included planning and selection of learning goals, learning strategies used in the classroom, learning strategies used in clinical practice, self-regulation strategies by the student, strategies adopted for awareness of the need for knowledge, self-evaluation strategies, self-reinforcement of goal-oriented behaviours and the barriers to metacognitive skill acquisition. The four-point scale had strongly disagree/rare rated 1 point, disagree/fair rated 2 points, agree/ most of the time rated 3 points while strongly agree/ always was rated 4 points. Anonimosity was ensured by excluding the names of the respondents in the data collection.

The instrument was personally administered to the respondents by the researchers so as to facilitate work. Descriptive statistics was used to determine the mean and standard deviation (SD) of the variables. Spearman Rank Order Correlation Co-efficient (rho) was used to answer the research questions while Mann-Whitney-U test and Wilcoxon Rank Sum test were adopted in testing the null hypotheses at 0.01 level of significance. The statistical analysis was performed using SPSS package.

## 5. Result

**Table 1:** Descriptive Statistics of the measured variables

| Variable | N | Minimum | Maximum | Mean (X) | SD |
|---|---|---|---|---|---|
| Age | 240 | 18 | 51 | 24.1042 | 4.98382 |
| Metacognitive goal | 240 | 1 | 4 | 2.9556 | 0.67282 |
| Learning strategies in the classroom | 240 | 1 | 4 | 2.6736 | 0.50469 |
| Learning strategies in clinical practice | 240 | 1.13 | 4 | 2.9224 | 0.57915 |
| Metacognitive self-regulated behaviour | 240 | 1.68 | 4 | 3.1706 | 0.44737 |
| Self-evaluation in the clinical setting | 240 | 1 | 4 | 3.1031 | 0.62926 |
| Self-evaluation in the classroom | 240 | 1 | 4 | 3.0431 | 0.68149 |
| Self-reinforcement behaviour | 240 | 1 | 4 | 2.8938 | 0.57097 |
| Barriers to self-reflection | 240 | 1 | 4 | 2.1417 | 0.62858 |
| Valid N (Listwise) | 240 | | | | |

**Table 2:** Relationship between the learning strategies of nursing students in the classroom and their self-evaluation strategies

| Variable | N | X | SD | rho value | Level of significance |
|---|---|---|---|---|---|
| Learning strategies in the classroom | 240 | 2.6736 | 0.50469 | | |
| Self-evaluation strategies in the classroom | 240 | 3.0431 | 0.68149 | 0.339** | 0.01 |

** Correlation is significant at 0.01 level (1-tailed).

**Table 3:** Relationship between metacognitive goals of nursing students and the learning strategies they adopt in their clinical practice

| Variable | N | X | SD | rho Value | Level of significance |
|---|---|---|---|---|---|
| Metacognitive goals | 240 | 2.9556 | 0.67282 | | |
| Learning strategies in clinical practice | 240 | 2.6736 | 0.50469 | 0.214** | 0.01 |

** Correlation is significant at 0.01 level (1-tailed)

Table 1 shows the descriptive statistics of the measured variables. Out of the 240 respondents, the mean age was 24.1042 with a standard deviation (SD) of 4.98382, mean for metacognitive goal was 2.9556 with SD of 0.67282, mean value for learning strategies adopted by the respondents in the classroom was 2.6736 with SD of 0.50469; for learning strategies in clinical practice, the mean value was 2.9224 with SD of 0.57915, metacognitive self-regulated bahaviour had mean value of 3.1706 with SD of 0.44737, mean value for self-evaluation in the clinical setting 3.1031 with SD of 0.62926, self-evaluation in the classroom had mean value of 3.0431 with SD of 0.68149; for self-reinforcement bahaviour, the mean was 2.8938 with SD of 0.57097, while barriers to self-reflection had mean value of 2.1417 with SD of 0.62858. The table also indicates minimum and maximum values for each of the variables.

Table 2 shows that at 0.01 level of significance, the rho correlational value for the relationship between the learning strategies of nursing students in the classroom and the self-evaluation strategies they adopt was 0.339.

Table 3 shows that the rho correlational value for the relationship between the metacognitive goals of nursing students and the learning strategies they adopt in clinical practice was 0.214, and it was significant at 0.01 level.

**Table 4:** Wilcoxon Rank Sum test comparison of classroom self-evaluation by nursing students in government and private universities

| Variable | Ranking Order | N | Mean Rank | Sum of Ranks | Z-Cal | Z-Crit | Probability |
|---|---|---|---|---|---|---|---|
| University Type- classroom self-evaluation | Government | 168 | 118.7 | 19944.5 | | | |
| | Private | 72 | 124.7 | 8975.5 | 0.62 | 0.538 | P<0.01 |
| | Total | 240 | | | | | |

**Table 5:** Mann-Whitney-U test comparison of the metacognitive goals of nursing students in government-owned and private universities

| Variable | Ranking Order | N | Mean Rank | Sum of Ranks | Z-cal | Z-crit | Probability |
|---|---|---|---|---|---|---|---|
| University type- | Government | 168 | 113.2 | 19022.5 | 2.51 | 0.12 | P<0.01 |
| | Private | 72 | 137.5 | 9897.5 | | | |
| | Total | 240 | | | | | |

NB: Z-Cal= standard score

Table 4 shows that at 0.01 level of significance, the calculated Z score of 0.616 was more than the critical value of 0.538. There is significant relationship between the nursing students in government owned university and their counterparts in private university with regard to their metacognitive self-evaluation in the classroom. Therefore the null hypothesis is rejected.

At 0.01 level of significance the calculated Z-score of 2.507 was more than the Z-crit of 0.12 (table 5). The null hypothesis is therefore rejected. There is significant relationship between the nursing students of government owned university and their counterparts in private university with regard to their metacognitive goals.

## 6. Discussion

Findings from the study indicate significant correlation (rho = 0.339) between the learning strategies of nursing students in the classroom and the self-evaluation strategies they adopt (table 2). Graham (1997) [7] explained that the ability to choose and evaluate one's strategies is of central importance. Paris and Winograd (1990)[26] pointed out that as students monitor and appraise their own cognition, they became more aware of their strengths and weaknesses.

Findings from the study also indicate significant correlation (rho=0.214) between metacognitive goals and learning strategies of nursing strategies in clinical practice (table 3). Anderson (2002)[6] explained that preparation and planning are important metacognitive skills that can improve student learning. By engaging in preparation and planning in relation to a learning goal, students are thinking about what they need or want to accomplish and how they intend to go about accomplishing it.

The significant relationship observed in the classroom self-evaluation of the nursing students of both government and private universities (table 4) supports the observation of Kuiper (2000)[19] on peri-operative nursing interns who displayed use of critical thinking skills that included self-evaluation

Findings from the study indicate significant relationship in the metacognitive goals adopted by the nursing students in both government and private universities (table 5). Anything contrary from this finding should be questioned because the students are undergoing the same training program with same curriculum (NUC Benchmark, 2007)[27]. Anderson (2002)[6] suggests that teachers can promote this reflection by being explicit about the particular learning goals they have set for the class and guide the students in setting their own learning goals. The more clearly articulated the goal, the easier it will be for the learners to measure their progress.

## 7. Conclusions and Recommendations

The findings of the study indicate significant correlation between the learning strategies of nursing students, their metacognitive self-evaluation strategies and goals. The classroom self-evaluation strategies as well as the metacognitive goals of the nursing students in government and private universities were significantly related.

Irrespective of institutional ownership, nurse educators should not neglect the affective and motivational aspects of metacognition including self-efficacy, learning attributions and goal orientations because students may possess the requisite knowledge and skills but fail to use them.

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## Author Profile

**Edith N. Chiejina** received B.Sc in Nursing Science in 1991, M.Ed and Ph.D in Educational Psychology in 2000 and 2005 respectively. She was employed as a lecturer in the Department of Nursing Sciences, Faculty of Health Sciences & Technology, Nnamdi Azikiwe University in 2006, and is still functioning in that capacity.

**Roseline Ebenebe** received her B.Sc, M.Sc and Ph.D from University of Nigeria. She is a professor of Educational Psychology in the Department of Educational Foundations, Faculty of Education, Nnamdi Azikiwe University Awka Nigeria.