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Development of "metacognition scale" for college students

T. SIVASAKTHI RAJAMMAL *

Department of Educational Psychology, Tamil Nadu Teachers Education University, Chennai- 600 097.

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Abstract

Traditional Curriculum focused only on the development of cultures and customs. Modern Curriculum helps to develop the talent or skill of the children through education. The process of reflecting on one's own performance, learning, and thought processes is known as metacognition. It incorporates planning, keeping track of, and assessing one's comprehension and performance of a task. Metacognition is the process by which learners plan their learning, track their progress toward a learning objective, and then assess the results using their knowledge about the work at hand, learning strategies, and themselves. Metacognition is frequently seen to have four components: Metacognitive Knowledge, Metacognitive Skills, Metacognitive Regulation, and Metacognitive Experiences. The Metacognition Scale (MS) has been constructed and standardized by the investigator in the present study for College Students. The Metacognition Scale consists of 45 statements. The simple random sampling technique was used for the current investigation. The sample consists of 100 College students randomly selected for the pilot study from Chengalpattu and Chennai District. The Cronbach's Alpha technique was used to regulate the tool and finally, out of 45 statements in MS - 38 statements were retained in the final study.

Keywords: Tradition; Modern; Metacognition; College students; Skills; Knowledge; Regulation; Experiences.

1. Introduction

Metacognitive abilities can enhance academic and professional achievement and are crucial for critical thinking. Better knowledge integration and organization are also linked to them. A variety of learning and study techniques, such as planning, mental scripting, positive self-talk, self-questioning, self-monitoring, and others, are examples of metacognitive skills. It is thought that metacognitive abilities are involved in a variety of cognitive processes, such as spoken communication, reading comprehension, attention, and memory.

1.1. Need of the Study

One-on-one interactions between learners and instructors in meetings, advising, or review sessions, as well as in class, can use the increasing amount of data supporting teaching and learning strategies that specifically address various cognitive skill levels. One's perception of oneself and other individuals as cognitive processors is known as Metacognitive Knowledge. Metacognitive Skills are the capacity to reflect on, comprehend, and apply one's own thought processes to enhance learning. The practice of controlling one's own learning through preparation, observation, and assessment is known as Metacognitive Regulation. It is an essential part of self-regulated learning, which encompasses motivation and cognition. An Individual's emotions and awareness that arise while solving problems and finishing tasks are known as Metacognitive Experiences. From the above statements, the investigator felt that Metacognition plays a major role among college students in their learning process in this modern world, because college students are the future pillar of our nation and so the need is felt to do this study "Assess the level of Metacognition among College Students".

* Corresponding author: T. SIVASAKTHI RAJAMMAL

2. Operational Definitions

The Operational Definitions of Metacognition and College Students are:

2.1. Metacognition

As far as this research is concerned the investigator defines Metacognition refers to the capacity to reflect on, evaluate, and control cognitive processes such as decision-making, memory, and perception. Metacognition has its four dimensions namely Metacognitive Knowledge, Metacognitive Skills, Metacognitive Regulation, and Metacognitive Experiences.

2.2. College Students

College Students refer to an individual who completed their high school education and can enrol in a college or university to pursue their higher education in a particular institution. College students from government, government-aided and self-financed educational institution are included in this study and the age group of college students is from 18 years and above.

3. Review of Related Literature - Studies related to Metacognition:

3.1. Indian Studies

Deepika Mondal (2023) investigated on Metacognitive Awareness and its relation to Academic Performance among Learners: a Review Paper. Becoming aware of one's own thought processes is known as metacognitive awareness. The awareness of one's thinking and the techniques one applies is known as metacognition. It helps students be more aware of what they are doing, why they are doing it, and how their learning abilities may be applied differently in other contexts. The study was conducted to analyze Metacognitive Awareness and its relation with Academic performance at different levels (primary, secondary, high secondary, undergraduate, postgraduate, B.Ed.). It is qualitative research. This study reviewed the research on Metacognition Awareness in the last ten years. The Researcher did not use primary data only used secondary data. The Researchers have collected all the secondary data from the previous research paper. Then, the Researcher analyze and interpreted all the collected data. The study found that overall students' Metacognitive Awareness was average and high, and also found a positive and strongly significant correlation between Metacognitive Awareness and Academic Achievement.

Aadil Ahmad Mir & Najmah Peerzada (2022) examined on a Study of Metacognition and Academic Achievement among College Students of Kashmir. The purpose of this study was to examine the relationship between metacognition and academic achievement among Kashmir valley college students. The research was purely descriptive in nature. The sample of the investigation was 400 college students (200 male and 200 female) who were selected through stratified random sampling. The tools used for data collection were the Metacognition inventory developed by Punita Govil (2003) and the aggregate percentage of marks obtained by respondents on their previous exam was used to determine academic achievement. The findings of the study revealed there is no difference between mean scores of males and females on metacognition. Moreover, a positive correlation was found between metacognition and academic achievement among college school students of Kashmir.

3.2. Foreign Studies

Tchounwou M, Okoye E C & Iseguede F (2023) conducted on Comparison of the Efficacy of Metacognition on Students' Academic Performance Between Usa, France, Australia, and China. Prior research has emphasized the importance of metacognition as a contributing factor to increasing student retention at colleges and universities. Enhancing students' awareness of their cognitive skills is just as crucial. This research reviewed and compared metacognition studies conducted on students in Australia, China, France, and the USA. These studies used self-regulated learning, self-efficacy, and meta-learning factors to evaluate metacognition performance among undergraduate students, including 362 participants in the USA, 128 in Australia, 118 in France, and 517 in China. Results revealed a positive impact of metacognition skills on all students, increasing their academic performance. However, compared to the participants in China, the results revealed that the overall effect size of self-regulated learning on academic achievement in the USA, France, and Australia was small because the Chinese students learned those metacognition habits at a very young age. The results also indicated that their beliefs contributed significantly to learning outcomes.

Kim P H (2021) examined on Facilitation of Metacognitive Accuracy among Learners in Higher Education. College students' both over and under-confidence regarding their examination performances well demonstrate a low level of metacognition they have. This paper attempted to measure college students' metacognitive accuracy using three different tools. The study's main rationale is to foster advanced metacognition among college students. To this end, 48 college freshmen participated in the study, and their predicted and actual midterm and final scores were calculated. The instructor delivered a series of lectures on metacognitive skills and its importance. The participants' metacognition levels as well as awareness of learning processes were measured. The results demonstrated moderate to fairly significant improvement of metacognition among the student participants over a semester. Relevant implications are discussed.

4. Pilot Study

The Metacognition Scale (MS) of 45 statements intended for the pilot study was administered to a sample of 100 College students studying in the Arts and Science Colleges of Chengalpattu and Chennai district. Then their responses were scored cautiously and the marks secured by all the College students were organized in descending order from the highest score to the lowest score. Then they were subjected to the item analysis.

5. Construction of Scale

5.1. Construction of Metacognition Scale

The investigator constructed the Metacognition Scale for College Students with the suggestions of the experts. Forty five statements on the scale were utilized in the pilot study. All the 45 items were with five-point scales, such as Strongly Agree, Agree, Uncertain, Disagree, and Strongly Disagree. The statement of the scale consists of factors related to Metacognitive Knowledge, Metacognitive Skills, Metacognitive Regulation, and Metacognitive Experiences. The tool was validated with the help of 100 College Students. Each statement has been scored as 5 for strongly agree, 4 for agree, 3 for uncertain, 2 for disagree and 1 for strongly disagree for all the positive statements only. There are 9 negative statements in the Metacognition scale which are 4,19,20,21,23,28,36,41, and 42 and these were scored reversely. The total scores acquired from the sample were determined by utilizing Cronbach's Alpha technique to identify the reliability of the tool. The statement has a value greater than 0.3 was selected for the final study.

Thus, out of 45 statements, 38 statements were selected for the final study. The final study of the Metacognition Scale of College Students of the pilot study show the selected statements by using Cronbach's Alpha values are given in Table 1.

Table 1 Item Analysis for Metacognition Scale and Selection of Items for Final Study

Item Number	Item Total Cronbach's Alpha Correlation	Selected / Not Selected
1	0.500	Selected
2	0.640	Selected
3	0.360	Selected
4	0.462	Selected
5	0.308	Selected
6	0.415	Selected
7	0.512	Selected
8	0.267	Not Selected
9	0.487	Selected
10	0.375	Selected
11	0.492	Selected
12	0.134	Not Selected
13	0.504	Selected

14	0.285	Not Selected
15	0.535	Selected
16	0.429	Selected
17	0.659	Selected
18	0.390	Selected
19	-0.114	Not Selected
20	0.534	Selected
21	0.479	Selected
22	0.453	Selected
23	0.402	Selected
24	0.364	Selected
25	0.600	Selected
26	0.545	Selected
27	0.534	Selected
28	0.542	Selected
29	0.478	Selected
30	0.255	Not Selected
31	0.279	Not Selected
32	0.350	Selected
33	0.629	Selected
34	0.377	Selected
35	0.489	Selected
36	0.537	Selected
37	0.489	Selected
38	0.625	Selected
39	0.532	Selected
40	0.357	Selected
41	-0.086	Not Selected
42	0.470	Selected
43	0.452	Selected
44	0.573	Selected
45	0.574	Selected

5.2. Description of the Metacognition Scale

The Metacognition Scale was constructed and validated by the investigator. The investigator constructed this tool based on the literature review about the Metacognition of College Students and its dimensions are Metacognitive Knowledge, Metacognitive Skills, Metacognitive Regulation, and Metacognitive Experiences. Totally 38 statements were finalized based on the dimensions of Metacognition.

5.3. Dimensions of Metacognition Scale

The Metacognition Scale for College Students consists of five dimensions namely, Metacognitive Knowledge, Metacognitive Skills, Metacognitive Regulation and Metacognitive Experiences. Initially, 45 statements were arranged according to the dimensions such as Metacognitive Knowledge has 10 statements, Metacognitive Skills has 11 statements, Metacognitive Regulation has 11 statements, and Metacognitive Experiences has 13 statements. After the pilot study, 38 statements were finalized based on the dimensions of Metacognition as shown in Table 2.

Table 2 Dimensions of Metacognition Scale and the Item numbers

S. No	Dimensions	Items	No. of Items
1	Metacognitive Knowledge	1 to 9	9
2	Metacognitive Skills	10 to 17	8
3	Metacognitive Regulation	18 to 26	9
4	Metacognitive Experiences	27 to 38	12
Total			38

5.4. Scoring Procedure

The tool consists of 38 statements that reflect the Metacognition level of the College students. The respondents were asked to put a tick ☑ mark against each statement under one of the five responses such as Strongly Agree, Agree, Uncertain, Disagree, and Strongly Disagree. Each statement has been scored as 5 for strongly agree, 4 for agree, 3 for uncertain, 2 for disagree and 1 for strongly disagree for all the positive statements only. There are 7 negative statements in the Metacognition scale [4,16,17,19,24,30,35] and these were scored reversely. The Metacognition of College Students score of the subject gives the total statement scores of all 4 dimensions. As a result, the range of scores is from 1 to 190, showing the score in the Metacognition level of College Students.

6. Reliability

A reliability coefficient measures the accuracy of a test or measuring instrument obtained by measuring the same individuals twice and computing the correlation of the two sets of measures by Cronbach's alpha method. Therefore, the reliability value is 0.917.

7. Validity

Validity was established by circulating the roughly drafted Metacognition Scale and carrying out all the suggestions specified by the professors in the Department of Education. The square root of reliability has been used to calculate the validity index. The validity of the Metacognition scale is 0.958 and hence the scale is considered to have high validity.

8. Conclusion

The investigator is hopeful that the Metacognition scale would help measure the level of Cognitive Knowledge of College students. Hence, the constructed Metacognition tool will be very useful for the investigator to measure the extent level of Metacognition among College students in their present education system.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Aadil Ahmad Mir & Najmah Peerzada. (2022). A Study of Metacognition and Academic Achievement among College Students of Kashmir. International Journal of Advanced Research in Science, Communication and Technology. Volume 2, Issue 1, Pg: 266 – 270. ISSN (Online) 2581-9429. https://ijarsct.co.in/Paper2655.pdf.

[2] Deepika Mondal. (2023). Metacognitive Awareness and Its Relation to Academic Performance Among Learners: A Review Paper. International Journal of Research and Review. Vol. 10; Issue: 7; Pg: 742 - 748. E-ISSN: 2349-9788; P-ISSN: 2454-2237. https://www.ijrrjournal.com/ IJRR_Vol.10_Issue.7_July2023/IJRR86.pdf.

[3] Tchounwou, M., Okoye, E. C., & Iseguede, F. (2023). Comparison of the Efficacy of Metacognition on Students' Academic Performance Between Usa, France, Australia, and China. Advances in Social Sciences Research Journal, 10(7), 252–271. https://doi.org/ 10.14738/assrj.107.14833.

[4] Kim P. H. (2021). Facilitation of Metacognitive Accuracy among Learners in Higher Education. Review of International Geographical Education Online. doi: 10.48047/ rigeo.11.08.58.

[5] Kashapov, M. M., and et.al. (2017). Components of metacognition and metacognitive properties of forecasting as determinants of supra-situational pedagogical thinking. Psychology in Russia: State of the Art. Vol: 10; Issue: 1; Pg: 80-94. ISSN 2074-6857 (Print) / ISSN 2307-2202 (Online). Doi: 10.11621/pir.2017.0106.

[6] Neena Sawhney & Sneh Bansal. (2015). Metacognitive Awareness of Undergraduate Students in Relation to their Academic Achievement. The International Journal of Indian Psychology. Volume: 3, Issue: 1, No: 8, ISSN 2348-5396. https://ijip.in/wp-content/uploads/2019/02/C03135V3I12015.pdf.