Readiness towards the Use of Meta-cognition tnd its Relationship with Academic Achievement of Higher Secondary Students

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Abstract

This paper is related to the study of readiness towards the use of meta-cognition in the learning process of higher secondary students. Results of the study revealed that there is a significant difference in the readiness towards the use of meta-cognition of higher secondary students on the ground of gender differences. However, no significant difference was found in the readiness towards the use of meta-cognition of higher secondary students on the basis of their academic streams . Positive correlation was found between the readiness towards the use of meta-cognition and academic achievement.

Key- words of the study: Meta-cognition, Academic Achievement

Many new concepts, learning methods, and teaching strategies were introduced in the learning process to make it effective. Meta-cognition is one of them. It has recently become a popular topic for theorizing and for empirical research.It is of interest because it implies those modes of teaching which may lead to more effective learning as compared to that currently attained in schools. This psychological concept is related with the learner's cognitive ability by which he can know about his own knowledge, learning skills and habits, and regulates his on pace of learning.

Meta-cognition refers to awareness of one's own thought and thinking process. According to Ahmed (2008), meta-cognition is the internal awareness of cognitive abilities, including self-awareness of both learning and retrieval strategies. Taylor (cited by Peirce,2003), defines metacognition as "an appreciation of what one already knows, together with a correct apprehension of the learning task and what knowledge and skills it requires, combined with the ability to make correct inferences about how to apply one's strategic knowledge to a particular situation, and to do so efficiently and reliably".

Meta-cognitive knowledge and meta-cognitive regulation are two components of meta-cognition. Meta-cognitive knowledge refers to what one knows, what one does not know and what one wants to know. This component also refers to an individual's awareness about his capabilities and learning habits as well as the nature of a learning-task and useful learning strategies to perform different types of learning works. Meta-cognitive regulation is the regulation of cognition and learning experiences through a set of activities that help learner to monitor, control and restructure their on-going learning process.

The use of meta-cognition helps an individual to be a good learner. Meta-cognitive strategies assist us become more efficient and powerful in our learning because they help us to find information, evaluate when we need additional resources, and understand when to apply different approaches to solve the problems. When children begin to master these strategies – and learn when, how, and why to use them – they are able to learn more effectively and intentionally (Brown, 1997). The use of metacognition makes learner goal-oriented. According to Coutinho (2007), metacognitive awareness is positively correlated with mastery-goal-orientation.

Need of the study

Though some research works related to this area have been done in foreign countries but in Indian context particularly in Gujarat, there is a knowledge gap in this field. There are some questions which are yet to be answered such as : (i) If there is any difference in the readiness towards the use of meta-cognition in the learning process of higher secondary students on the ground of gender and educational stream?, (ii) Is there any relationship between readiness towards the use of meta-cognition in the learning process and academic achievement of higher secondary students?

Objectives of the study

1. To find out the difference in the readiness towards the use of meta-cognition in the learning process of higher secondary students with respect to their gender.

2. To find out difference in the readiness towards the use of meta-cognition in the learning process of higher secondary students with respect to their academic streams (Arts and Science).

3. To find out the relationship between the readiness towards the use of meta-cognition in the learning process and academic achievement of higher secondary students.

Hypotheses of the study

The following three null hypotheses were framed in this study to achieve the objectives :

1. There is no significant difference in the readiness towards the use of meta-cognition in the learning process of female and male higher secondary students.

2. There is no significant difference in the readiness towards the use of meta-cognition in the learning process of Arts and Science stream higher secondary students.

3. There is no significant relationship between the readiness towards the use of meta-cognition in the learning process and academic achievement of higher secondary students.

Methodology

The present study falls in the domain of descriptive study as it intends to investigate the readiness of the use of meta-cognition in the learning process of higher secondary students. Survey method was used in this study.

Population and sample

Higher secondary students of the Ahmedabad district were identified as the population of the study.

Cluster sampling method was used to select the sample. Two hundred fourteen final year higher secondary students of the academic year of 2010-2011 were selected as the sample from four higher secondary schools of Ahmedabad district. There were 113 female and 101 male higher secondary students in the sample.

Tool

The scale, named Meta-cognition Use Readiness Scale (MURS), was used to collect the data. This scale was developed and validated by Dixit (2010) as a part of GCERT (Gujarat Council of Educational Research and Training) sponsored project-work. There are 32 items in the scale in Gujarati language. These items are related with the two components of meta-cognition named meta-cognitive knowledge and meta-cognitive regulation. Out of the 32 items, 15 items are related with meta-cognitive knowledge and 17 items are related with meta-cognitive regulation. Item number 2, 4, 5, 8, 9, 10, 12, 13, 15, 16, 18, 19, 20, 25, and 31 are associated with meta-cognitive knowledge and item number 1, 3, 6, 7, 11, 14, 17, 21, 22, 23, 24, 26, 27, 28, 29, 30, and 32 are associated with meta-cognitive regulation.

The Split-half reliability value of the scale is .89. The Cronback Alpha was calculated for the reliability measurement of the tool. Its value was .89. Both the reliability value shows that tool is reliable. The Meta-cognition Use Readiness Scale was given to the experts in order to ascertain its face validity. The experts agreed that the items in the scale are relevant to measure the readiness of the use of meta-cognition and worthwhile for collecting the data from the sample. The Cliffs item consistency index of the scale is .38.

Academic achievement was obtained from the previous examination result of higher secondary students. The obtained aggregate percentage of previous examination (class 11th exam) held in 2009-2010 of higher secondary students, was treated as the Academic achievement in this study. The obtained aggregate percentages were collected from the school-office of each selected higher secondary student in the sample.

Collection of the data

The researcher visited the randomly selected higher secondary schools to administer the scale on higher secondary students. The purpose of the study was explained to the school principals and the permission was obtained. After explaining the purpose of study, the final year higher secondary students were requested to respond the scale. Responded scale sheets were collected and arranged according to their class role number by the researcher. According to their class role number, obtained aggregate percentages of previous year examination (class 11th exam) were collected from the school office and written in the appropriate box of the each responded sheet.

Analysis and interpretation of the data

Descriptive and inferential statistical techniques were used to analyze the data. Mean and S.D. were calculated in descriptive statistics. t-ratio, F-test and Pearson-r correlation were used to examine the hypotheses of the study. All calculations were conducted with the help of Ms-Excel and SPSS computer programs. There were three hypotheses tested in the study. According to hypothesis the details of data analysis and interpretation are given below.

(1) Mean, SD and t-ratio were calculated to test the null hypothesis-1, which stated that, ' there is no significant difference in the readiness towards the use of meta-cognition in the learning process of female and male higher secondary students'. Result has been presented in the following table-1.

Table 1: Mean, SD, and t-ratio with reference to Gender

Gender	Number of H.S. Students	Mean	SD	t-ratio
Female	113	72.16	8.47	2.73*
Male	101	68.55	10.82	

*= Significant at 0.01 level

The observation of the Table-1 shows that there were 113 higher secondary female students and 101 higher secondary male students in the sample. The mean and SD of the scores of the female respondents were 72.16 and 8.47 respectively and that of male respondents were 68.55 and 10.82 respectively. The t-ratio of the mean difference was 2.73, which is significant at 0.01 level. So the null hypothesis-1 was not accepted.

Means, it was found that, there is a significant difference between the readiness towards the use of meta-cognition in the learning process of female and male higher secondary students. Female higher

secondary students are significantly more ready towards the use of meta-cognition in their learning process rather than male higher secondary students. Though, Joshi (1997) found in his study that there was no significant difference in the meta-cognitive reading awareness on the ground of gender differences.

(2) Mean, SD and t-ratio were calculated to test the null hypothesis-2 which stated that, ' there is no significant difference in the readiness towards the use of meta-cognition in their learning process of Arts and Science stream higher secondary (H.S) students'. Result has been presented in the following table-2.

Table- 2: Mean, SD, and t-ratio with reference to Academic Streams

Academic Stream	Number of H.S. Students	Mean	SD	t-ratio
Arts	110	71.15	10.3	1.06*
Science	104	69.73	9.22	

*= Not significant at 0.01 level of significance.

The observation of the Table-2 shows that there were 110 higher secondary students of Arts stream and 104 higher secondary students of science stream in the sample. The mean and SD of the scores of the Arts Stream respondents were 71.15 and 10.30 respectively and that of science streams respondents were 69.73 and 9.22, respectively. The t-ratio for the mean difference was 1.06, which was not significant, at the 0.01 level of significance. So the null hypothesis-2 was accepted.

Means, the higher secondary students of the both streams (Arts and Science) show statistically similar readiness towards the use of meta-cognition in their learning process.

(3) Pearson 'r' was calculated to test the null hypothesis-3 which stated that,'there is no significant relationship between the readiness towards the use of meta-cognition in the learning process and academic achievement of higher secondary students'. Result has been presented in the following table-3.

Table -3 : Correlation 'r' between readiness towards the use of metacognition and academic achievement

Variables	Number of H.S. Students	r
Readiness towards the use of metacognition	214	.43
Academic achievement	214	

The observation of the Table-3 shows that the total number of the higher secondary students is 214 in the study. According to Table-3 it is revealed that the calculated Pearson 'r' between the readiness towards the use of meta-cognition in their learning process and academic achievement of higher secondary students is 0.43, which is statistically significant. It shows that significant and positive correlation exists between the readiness towards the use of meta-cognition and academic achievement of higher secondary students. Coutinho (2007) and Young (2008) also found in their study that awareness of meta-cognition and the use of meta-cognitive strategies are positively correlated with educational achievement

Findings of the study and Implications

The results of first objective of the study, revealed that there is a significant differences found in the readiness towards the use of meta-cognition in their learning process on the ground of gender differences. According to the result of the study female higher secondary students are more ready towards the use of meta-cognition in their learning process rather than male higher secondary students.

The results of second objective of the study, revealed that there is no difference in the readiness towards the use of meta-cognition in their learning process of Arts and science stream's higher secondary students. Both streams' higher secondary students show similar readiness towards the use of meta-cognition in their learning process. It means the readiness towards the use of meta-cognition is not related with academic streams (Arts and Science).

The results of third objective of the study, revealed that there is a significant positive correlation between the readiness towards the use of meta-cognition and academic achievement.

Therefore, as evident from the above findings, it is very important to organize training programs for all the students to make them more ready towards the use of meta-cognition in the learning process to achieve better learning outcomes. Special attention should be taken for male higher secondary students in such type of orientation and training programs to make them more ready towards the use of meta-cognition in their learning process.

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