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Academic Achievement In Relation To Metacognition And Self-Efficacy Among Secondary School Students

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Abstract:

The present study has been undertaken to study the academic achievement in relation to meta-cognition and self-efficacy among secondary school students. The sample consists of 200 secondary school students (100 boys and 100 girls) selected from PSEB & CBSE Schools of Amritsar District studying in Arts Stream. The data was collected by using standardized scale of Meta-cognitive inventory (MCI - Govil, 2011) and Self-efficacy Scale (SES - Singh & Narain; 2014). The data obtained was analysed statistically with the help of Mean, SD, t-ratio and 'r' and used to arrive at the following conclusions: There exists significant difference in meta-cognition and self-efficacy among girls and boys of secondary schools belonging to Arts stream, There also exists significant difference in meta-cognition and self-efficacy among students of CBSE & PSEB Schools belonging to Arts stream. A significant positive relationship between meta-cognition and academic achievement and self-efficacy and academic achievement of secondary schools students belonging to Arts stream was found.

Keywords: Academic Achievement, Meta-cognition, Self-efficacy, Secondary Students

Introduction

Academic achievement is a vital outcome in education that reflects students' knowledge, skills, and competencies. Meta-cognition refers to the awareness and regulation of one's thinking processes, while self-efficacy relates to an individual's belief in their own abilities to succeed in academic tasks. Meta-cognition plays a crucial role in academic achievement as it involves students' ability to monitor, plan, and regulate their cognitive processes. Students with strong meta-cognitive skills are more likely to engage in effective learning strategies, such as setting goals, organizing information, and evaluating their progress. They are better equipped to identify their strengths and weaknesses, make appropriate adjustments to their learning strategies, and seek help when needed. Self-efficacy, as proposed by Albert Bandura, refers to an individual's belief in their capability to perform specific tasks successfully. In the academic context, students with high self-efficacy perceive themselves as competent learners, have confidence in their abilities, and believe that they can overcome challenges. This belief influences their motivation, effort, and persistence in academic tasks. Students who believe in their ability to do well academically tend to be more motivated in school (Schunk, 1991). When self-efficacious students attain their goals, they continue to set even more challenging goals (Schunk, 1990). This can all lead to better performance in school in terms of higher grades and taking more challenging classes (Multon, Brown, & Lent, 1991). A positive relationship exists between self-efficacy and learning performance in computer training, specifically declarative knowledge (Gist et al., 1989; Martocchio & Hertenstein, 2003).

Review: Several studies have demonstrated the positive association between meta-cognition and academic achievement among secondary school students. Efklides (2008) found that students with higher levels of meta-cognitive awareness performed better academically compared to those with lower levels. Students who possess strong meta-cognitive skills are more likely to engage in effective learning strategies, such as setting goals, monitoring their progress, and adapting their approaches accordingly.

Meta-cognitive strategies, such as planning, organizing information, and self-regulation, has been found to contribute to improved academic performance (Barnard et al., 2009). These strategies enable students to effectively manage their time, resources, and cognitive processes, leading to better learning outcomes. Explicit instruction in meta-cognitive strategies can enhance students' meta-cognitive awareness and subsequently improve their academic achievement (Schraw et al., 2006).

Self-efficacy, a key construct in social cognitive theory, refers to an individual's belief in their ability to succeed in specific tasks. Numerous studies have established a strong link between self-efficacy and academic achievement among secondary school students. Students with high self-efficacy tend to be more motivated, persistent, and confident in their academic endeavours, leading to better academic outcomes (Pajares, 2005). Self-efficacy beliefs influence students' academic performance through various mechanisms. Students with high self-efficacy are more likely to set challenging goals, exert greater effort, und persist in the face of obstacles (Zimmerman, 2000). They also tend to adopt more effective learning strategies and seek assistance when needed (Multon et al., 1991). On the contrary, students with low self-efficacy may experience reduced motivation, anxiety and a tendency to avoid challenging tasks, which can hinder their academic achievement (Bandura, 1997).

Meta-cognition and self-efficacy are closely intertwined constructs that interact and influence each other. Students with strong meta-cognitive skills are more likely to develop a sense of self-efficacy, as they possess a deeper understanding of their cognitive abilities and can

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effectively regulate their learning processes (Schneider et al., 2008). Moreover, meta-cognitive strategies, such as self-reflection and self-monitoring, contribute to the development of accurate self-efficacy beliefs, as students gain insights into their strengths and weaknesses (Pajares, 2005). Conversely, self-efficacy beliefs can impact meta-cognition by influencing students' motivation, goal-setting, and effort allocation. Students with high self-efficacy are more motivated to engage in meta-cognitive processes, as they perceive themselves as capable of successfully completing tasks and achieving desired outcomes (Zimmerman, 2000). In contrast, low self-efficacy can undermine students' meta-cognitive engagement and hinder their ability to effectively regulate their learning (Efklides, 2008).

Hypotheses Of The Study

1. There exists no significant difference in metacognition among girls and boys of secondary schools belonging to Arts stream.
2. There exists no significant difference in metacognition among students of CBSE & PSEB Schools belonging to Arts stream.
3. There exists no significant difference in Self-efficacy among girls & boys of secondary schools belonging to Arts stream.
4. There exists no significant difference in Self-efficacy among students of CBSE and PSEB Schools belonging to Arts stream.
5. There exists no relationship between metacognition and academic performance of secondary school students belonging to Arts stream.
6. There exists no relationship between Self-efficacy and academic performance of secondary school students belonging to Arts stream.

Methodology

Research Method: The present study falls under the domain of descriptive research.

Sample: In the present study, sample consists of 200 secondary school students (100 boys and 100 girls) were selected from PSEB & CBSE Schools of Amritsar District with purposive and random sampling technique.

Tools used

1. Meta-cognitive inventory (MCI - Govil, 2011).
2. Self-efficacy Scale (SES - Singh &Narain; 2014).

Discussion and Interpretation

In order to test this hypothesis, Mean and S.D of Metacognition among girls and boys of secondary schools belonging to Arts stream was calculated. The scores of girls and boys have been described in terms of mean, S.D and t-value in the table 1.

Table 1: Mean, S.D and t-value of Metacognition among girls and boys of CBSE AND PSEB secondary schools belonging to Arts stream

		N	Mean	S.D.	SE_D	t-value
Gender	Girls	100	90.17	13.87		2.91
	Boys	100	94.10	11.39	1.79	
Type of School	CBSE	100	88.12	8.72	1.32	2.82
	PSEB	100	91.84	9.96		

(Critical value 1.96 at 0.05 level and 2.58 at 0.01 level, df = 198)

Hypothesis 1: The table 1 reveal that the mean score and S.D of boys is 90.17 and 13.87 respectively and mean score and S.D of girls is 94.10 and 11.39 respectively. The t-value comes out to be 2.91 which is significant at 0.01 level of significance. Hence, the hypothesis no. 1, There exists no significant difference in metacognition among girls and boys of secondary schools belonging to Arts stream, is rejected. In this highly competitive world where the knowledge is infinite, males are having more opportunities to access to media, internet, smartphones etc. The observed difference in scores could be influenced by a range of individual factors, including cognitive abilities, learning styles, personal motivation, and prior educational experiences which lead towards the development of Metacognitive Ability. Differences in the availability of resources, support systems, and mentorship could contribute to variations in metacognitive development among boys and girls. Unequal access to support or educational opportunities may affect their metacognitive growth.Thus, it is evident from the above results that globalization and advancements in technology are driving changes in the male's basic skills as well as in reading critically, write persuasively, think and reason logically, and solve complex problems. Hence, it may be concluded that male students are more competent in using their Metacognitive Ability as compare to females. The above result is supported by Jagadeeswari and Chandrasekaran (2013) who found that there is significant difference in the metacognitive awareness based on their girls and boys, type of school management

Hypothesis 2: In order to test this hypothesis 2, mean and S.D of metacognition among students of CBSE and PSEB schools belonging to Arts stream was calculated. The scores of CBSE and PSEB have been described in terms of mean, S.D and t-value in the table 1.1 and further reveals that the mean score and S.D of CBSE is 88.12 and 8.72 respectively and mean score and S.D of PSEB is 91.84 and 9.96 respectively. The t-value comes out to be 2.82 which is significant at 0.01 level of significance. Hence, the hypothesis no. 2, "There exists no significant

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difference in metacognition among students of CBSE & PSEB Schools belonging to Arts stream" is rejected. The observed difference in scores could be influenced by a range of school related factors, including cognitive abilities, learning styles, personal motivation, and prior educational experiences. This led to the development in their Metacognitive Ability. Differences in the availability of resources, support systems, and mentorship in CBSE schools as compare to PSEB board schools could contribute to variations in metacognitive development among students. Unequal access to support or educational opportunities may affect their metacognitive growth.Thus, it is evident from the above results that globalization and advancements in technology are driving changes in the CBSE Board students basic skills like reading critically, write persuasively, think and reason logically and solve complex problems. Hence, it may be concluded that CBSE Board students are more competent in using their Metacognitive Ability as compare to PSEB students. The above result is supported by Jagadeeswari and Chandrasekaran (2013) who found that there is significant difference in the metacognitive awareness based on type of school management.

Hypothesis 3: The mean, S.D., t-ratio of Self-efficacy of adolescent boys and girls were calculated to test the hypothesis 3. The result of this analysis is being shown in Table 2

Table 2: Mean, S.D and t-value of Self-efficacy among girls and boys of CBSE AND PSEB secondary schools belonging to Arts stream

		N	Mean	S.D.	SE_D	t-value
Gender	Boys	100	74.70	7.00	2.00	1.08
	Girls	100	76.00	9.74		
Type of school	PSEB	100	63.93	5.04	0.76	5.03
	CBSE	100	67.75	5.69		

(Critical value 1.96 at 0.05 level and 2.58 at 0.01 level, df = 198)

Table 2 shows that mean scores for self-efficacy of Girls are 76.00 which is higher than self-efficacy mean score of boys which are 74.70. The t-value testing the significance of means differences of self-efficacy of adolescent boys and girls are 1.08 which in comparison to the table value is insignificant at both the levels of confidence. From the above interpretation of results, it is clear that there exists no significant difference in self-efficacy of adolescent boys and girls. Thus hypothesis 3, "There exists no significant difference in Self-efficacy among girls and boys of secondary schools belonging to Arts stream" is not rejected.

Hypothesis 4: In order to test this hypothesis 4, mean and S.D of Self-efficacy among students of CBSE and PSEB schools belonging to Arts stream was calculated. The scores of CBSE and PSEB have been described in terms of mean, S.D and t-value in the table 2 and it reveals that the mean score and S.D of boys is 63.93 and 5.04 respectively and mean score and S.D of girls is 67.75 and 5.69 respectively. The t-value comes out to be 5.03 which is significant at 0.01 level of confidence. Hence, the hypothesis no.4, "There exists no significant difference in Self-efficacy among students of CBSE and PSEB Schools belonging to Arts stream" is rejected.

Hypothesis 5: In order to test this hypothesis 5, coefficient of correlation of metacognition and academic performance of secondary school students belonging to Arts stream was calculated. The scores of coefficients of correlation of metacognition and academic performance of secondary school students have been shown in the table 3.

Table 3: Coefficient of correlation of metacognition and Self-efficacy with academic performance of secondary school students belonging to Arts stream

Variable	Academic performance	Metacognition	Self-efficacy
Metacognition	0.89	------	------
Academic performance	------	0.89	0.16
Self-efficacy	0.16	------	------

The table 3 reveals (r= 0.89) that the metacognition and academic performance of secondary school students have high positive correlation. Hence, the hypothesis 5 "There exists no relationship between metacognition and academic performance of secondary school students belonging to Arts stream" is rejected. Thus, the result reveals that there is significant relationship in metacognition and academic performance of secondary school students belonging to Arts stream. This result is quite in conformity with results of the studies conducted by Cetinkaya and Erktin (2002), Coutinho (2007), Young & Fry (2008), Zulkiply (2009), Ozsoy (2011), Abdellah (2015), Singh (2018), Farnam & Anjomshoaa (2020) and Samuel and Okonkwo (2021), who also found significant positive relationship between metacognition and academic performance.

Hypothesis 6: In order to test the hypothesis 6, coefficient of correlation of Self-efficacy and academic performance of secondary school students belonging to Arts stream was calculated. The scores of coefficients of correlation of Self-efficacy and academic performance of secondary

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school students has been shown in the table 3 and it reveals (r= 0.16) that the Self-efficacy and academic performance of secondary school students are positively correlated with each other. Hence, the hypothesis 6, "There exists no relationship between Self-efficacy and academic performance of secondary school students belonging to Arts stream" is rejected. Thus, the result reveals that there is significant relationship in Self-efficacy and academic performance of secondary school students belonging to Arts stream.

This result is quite in conformity with results of the studies conducted by Lent, Lopez & Bieschke (1993), Pietsch, Walker & Chapman (2003), Lane, Lane, and Kyprianou (2004), Mahyuddin, Elias, Cheong, Muhamad, Noordin and Abdullah (2006), De Fátima (2014), Kolo, Jaafar & Ahmad (2017), Baanu, Oyelekan & Olorundare (2018), Musa (2020), who also found positive relationship between Self-efficacy and academic performance whereas Kennedy (1996) in his study reported that science self-efficacy did not significantly influence academic achievement.

Findings:
1. There exists significant difference in metacognition among girls and boys of secondary schools belonging to Arts stream.
2. There exists significant difference in metacognition among students of CBSE & PSEB Schools belonging to Arts stream.
3. There exists no significant difference in Self-efficacy among girls and boys of secondary schools belonging to Arts stream.
4. There exists significant difference in Self-efficacy among students of CBSE and PSEB Schools belonging to Arts stream.
5. There exists high positive relationship between metacognition and academic performance of secondary school students belonging to Arts stream.
6. There exists positive but low relationship between Self-efficacy and academic performance of secondary school students belonging to Arts stream.

Educational Implications
In the light of findings of the present study it is suggested that:
1. Metacognitively well trained and equipped with all the skills, arts students will become an indispensable asset for the developing nations like India. So, the teachers should identify the students with low metacognition and provide training to them to enhance their Metacognitive skills.
2. Teacher should develop metacognitive skills among the students irrespective to their SES Status, gender and provide adequate number of opportunities in classroom by creating suitable environment to practice their skills and strategies along with feedback to students.
3. The PSEB school teachers should be provided a powerful insight that can be applied to increase the metacognitive skills of students as well as empower students to take ownership for their own learning. The teachers of these schools should be given seminars, workshops and short courses; so that they may teach students to think about their learning, self-reflect and monitor their individual progress.

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