Significance of intra-personal intelligence and academic self-concept as predictors of metacognition

[1]Swalaiha and [2]Sameer Babu M
[1,2]Department of Educational Studies, Jamia Millia Islamia (JMI), New Delhi, India
[2]Primary author: msameer@jmi.ac.in

Abstract—This paper emphasizes the importance of comprehending students' metacognition to their intra-personal intelligence and academic self-concept and their intra-personal intelligence. Metacognition is a comprehensive word that includes the structures associated with people's cognitive processes and information. Metacognition refers to an individual's awareness and understanding of their cognitive processes and ability to manage and shape them effectively. Metacognition, academic self-concept, and intrapersonal intelligence are interconnected in educational settings. Metacognition, which refers to the understanding and control of one's thinking processes, significantly influences an individual's perception of their academic abilities and overall self-concept in an academic context. Intrapersonal intelligence, also known as self-awareness and self-management, plays a crucial role in developing and applying metacognitive strategies. This, in turn, significantly impacts academic success and how individuals perceive themselves in educational settings. The authors discuss the importance of studies that examined the correlation between specific variables from Scopus and Google Scholar. A total of twenty-five studies were carefully chosen and thoroughly analyzed. There is a need to explore students' metacognition, specifically focusing on their intra-personal intelligence and academic self-concept as determinants.

Keywords: Intrapersonal intelligence, Academic self-concept, Metacognition, Predictors

I. INTRODUCTION

LEARNERS must develop resilience and a strong belief in their capacity to continue to achieve in the modern world (Mori et al., 2001). Beyond the previously established bounds of cognitive capacity, they must envision possible outcomes. Understanding, nurturing, and bringing to life a scholarly phenomenon is also essential. The following questions need to be carefully considered: "Why was this knowledge acquired?", "How can I improve my comprehension?" and "Where can I apply this knowledge effectively?" When a learned skill, knowledge, or idea is questioned or contested during or after the learning process, it is scrutinized (Sellars, 2006). Through this inquiry process, people can evaluate themselves, become more self-aware, and thoroughly grasp who they are. This idea of self-knowledge, which has remained relevant now, is based on Socrates' antiquated wisdom. The act of guiding cognitive processes through self-control was first referred to as "monitoring comprehension" by Flavell (1976). Metacognition was similarly characterised by Hacker and Dunlosky (2003) as the conscious knowledge that people have of their cognitive capacities during the processes of perception, memory, and reasoning, as well as their capacity to control and direct these capacities.

Globally, education is seen as a crucial component that enhances an individual's chances of success in life, elevates the standard of living, and promotes the overall welfare of a community. Academic achievement is directly related to one's prospects of success, earning a living, and being happy (Battle & Lewis, 2002). The development of abilities, characteristics, and values is aided by education. This paper discusses metacognition, intrapersonal intelligence, and academic self-concept in detail.

Metacognition

Metacognition-knowledge about learning supports learning (Slavin, 2009). Almasi (2003) defines metacognition as "thinking about thinking". According to Kuhn and Dean (2004), metacognition helps learners manage their thinking. Learners' awareness of their cognitive actions is also metacognition (Schoenfeld, 2016). Similarly, Martinez (2006) saw metacognition as monitoring and controlling thoughts. Metacognition emphasizes preparing, monitoring, managing, and evaluating information (Efklides, 2011; Papaleontiou-Louca, 2014). O'Neil and Brown (1998) defined metacognition as thinking about thinking, as it forms a metacognitive method to solve learners' challenges. It is a fact that students learn better with metacognition (Veenman et al., 2006). Seyf (2007) defines metacognition as learning to learn. Indeed, metacognition is awareness of one's thoughts and knowledge. Knowing what and how well one knows is metacognitive monitoring (Flavell, 1979). As a later-developing cognitive skill, metacognition develops from early childhood to adolescence (Kuhn, 2000). Retrieving and using a learning approach for a problem in a new setting is possible with metacognition (Kuhn & Dean, 2004). Beyond thinking about thinking, metacognition occurs, which requires students to "externalize mental events" (Bransford, Brown, & Cocking, 2000, p. 67).

Metacognition is the ability to actively identify, regulate, and control cognitive processes (Khan, 2013). In the 1970s, Flavell pioneered memory research that would later be approached from education and other domains (Wellman, Ritter & Flavell, 1975). Osses and Jaramillo (2008) define metacognitive techniques as knowing our operations and mental processes, how to use them, readjust them, and adapt them to

achieve the goal. Metacognitive methods help students control, direct, regulate, monitor, and assess their learning, according to Nosratinia and Adibifar (2014). Many researchers have indicated that metacognitive methods improve learning performance and are essential for academic achievement.

Studies show that metacognitive awareness the student's ability to identify strengths and weaknesses, deepen their knowledge of strategies, and understand how, when, and why to use them—is crucial to learning and studying, which closely reflects students' ability to reflect on their learning, which is linked to university students' academic abilities (Tuononen et al., 2017). Metacognition may also improve students' learning processes and academic performance (Beccaria et al., 2014; Sawhney & Bansal, 2015; Vosniadou, 2021; Young & Fry, 2008).

Despite earlier research showing that university students can monitor and reflect on their strategy use, Roth et al. (2016), and Anthonysamy et al. (2020) found that metacognitive knowledge is still missing. According to Harvard Business Review, students' lack of metacognition is the most significant learning obstacle (Boser, 2018). Not asking if they understand a skill or concept. University students are supposed to be proactive and engaged online, yet literature suggests they use metacognitive methods at low levels (Anthonysamy et al., 2020). However, university students lack self-awareness and comprehension of their cognitive process, which self-reflection, planning, monitoring, and controlling procedures can achieve. Research suggests that metacognitive strategies can improve learning performances (Puška et al., 2020), but their use among university students is still limited (Hashemyolia et al., 2015). Low metacognitive strategy utilization has led to poor student learning (Hu & Li, 2017; Moreno et al., 2019; Terras & Ramsay, 2015). Metacognition goes along with intelligence and personality, which is normal.

Intra-Personal Intelligence

According to Gardner (2003), individuals do not have a single "g" intellect but a collection of autonomous intelligence. Whether it is a unitary or multiple intelligence, the capacity to perceive, understand, and apply one's experience to succeed in many contexts is what it means. Individuals can be classified into eight distinct forms of intelligence, according to Gardner (1999): interpersonal, intrapersonal, bodily-kinesthetic, logical-mathematical, musical, linguistic, spatial, and naturalistic. According to Gardner's (1999) hypothesis of multiple intelligences, intelligent people can excel in any of these areas. He argues that one's tastes and circumstances dictate which intelligence to use (Mantzaris, 1999). Among the many aspects of intelligence, interpersonal and intrapersonal intelligence play a pivotal role in shaping processes like learning and cognition and, naturally, academic achievement.

According to Armstrong (2000), "self-smart" is another name for intrapersonal intelligence. This suggests that people with this trait are in tune with their sentiments and can identify and meet their needs. According to Dummett (2006), they have the capacity for introspection and can follow their gut feelings. One way to become an expert thinker quickly is to use your interpersonal and intrapersonal intelligence skills, say Kornhaber, Fierros, and Veenema (2004) cited in Nurulwahida and Azman (2016). A person's ability to know who they are and what they want out of life depends on their level of intrapersonal intelligence.

Conversely, focusing on one's wants, desires, and goals might develop intrapersonal intelligence and come to terms with who they are. According to Gardner and Moran (2006), there are two main categories of Intelligence Quotient (IQ): intrapersonal and interpersonal. Understanding one's capabilities and limitations and how to make the most of these facts is essential to intrapersonal intelligence (Mayer et al., 2012). Academic achievement is linked to self-awareness and personal growth (Mowat, 2011). It is believed that metacognition, like intrapersonal intelligence, is associated with one's academic self-concept.

Academic Self-Concept

Fostering academic self-concept is widely recognised as a crucial educational goal (Byrne, 1986; Marsh & Craven, 2006; Shavelson et al., 1976) due to its assumed impact on student performance and adaptation. Consequently, research has extensively examined self-concept (Byrne, 1986; Guay et al., 2003; Hansford & Hattie, 1982; Marsh & Craven, 2006; Marsh et al., 2005). According to Shavelson et al. (1982), the model proposes that an individual's overall self-concept encompasses academic and non-academic aspects.

The idea of academic self-concept refers to the self-evaluation made by students regarding their educational capabilities and capacities (Trautwein et al., 2006). It can also be described as an individual's self-perception as a learner and perception of their function in academic environments (Guay et al., 2003). Skaalvik and Skaalvik (2002) conceptualised academic self-concept as students' cognitive awareness and subjective perception of their academic abilities. In their study, Jacob et al. (2002) identified specific factors that significantly impact students' academic self-concept. These factors include students' academic routines, practices, and innovations in teaching methods and are considered crucial in modifying students' self-concept. There is typically variation in academic self-concept across different grade levels. An incremental elevation in academic self-concept is noticed in conjunction with the augmentation of academic accomplishments. According to Liu and Wang (2005), the academic self-concept encompasses various dimensions that are associated with the academic performance of students. The student's success is closely associated with their understanding of their potential and talents. The study of academic accomplishment has garnered significant interest among researchers, who have proposed varying definitions for this concept. Zimmerman, Copeland, Shope, and Dielman (1997) define academic achievement as a student's notable accomplishments within a specific academic domain. This paper aims to ascertain how metacognition in students can be predicted by intrapersonal intelligence and academic self-concept.

II. TRENDS AND RELATED LITERATURE

Review studies on Metacognition

To assess the relationship between metacognition and academic achievement among undergraduate college students in Birbhum, West Bengal, Hossain, and Chowdhury (2023) conducted a study. The study's findings revealed a positive correlation between metacognition and academic achievement, as assessed by a standardized awareness questionnaire. This underscores the significance of mindfulness and adaptation in the process of learning. Merely 5.26% of students possess elevated metacognition. However, there exists a positive correlation between academic achievement and metacognition.

In 2022, Ahmed and Najma conducted a study on the relationship between metacognition and academic achievement among college students from Kashmir. The research was descriptive, and the poll selected a sample of 400 college students, consisting of 200 males and 200 females. Their choice was made via stratified random sampling. The data collection process involved the utilization of Punita Govil's 2003 Metacognition Inventory. The academic achievement was assessed by calculating the total proportion of respondents' prior exam marks. Our analysis revealed no statistically significant disparity in the mean metacognition scores between males and females. The study found a significant association between metacognition and academic achievement in college students from Kashmir.

The study aims to assess the metacognitive strategies employed by middle school pupils in eighth-grade problem-solving, as Güner and Erbay (2021) outlined. The 37 students' non-routine word problems were assessed using semi-structured interviews. The findings indicated that metacognitive skills had a significant impact on problem-solving. Proficient metacognition facilitated accurate problem-solving using various methodologies, mathematical notations, and logical reasoning. The lack of metacognition posed difficulties in comprehending problems, selecting strategies, and obtaining accurate solutions.

Siqueira et al. (2020) conducted a cross-sectional study that employed qualitative and quantitative methods to investigate the motivational factors and potential benefits of self-regulated learning in medical education among medical students from the University of Sao Paulo (USP) in Brazil. A qualitative analysis was conducted using an open-ended question: "What is the primary motivator for me in medical school?" A study involving 155 students found that possessing knowledge in the cognition area of MAI significantly enhanced their drive to learn. The level of mastery approach goal orientation was found to be greater than that of mastery avoidance.

In their study titled "The Relationships Between Academic Self-efficacy, Learning-related Emotions, and Metacognitive Learning Strategies with Academic Performance in Medical Students: A Structural Equation Model," Hayat et al. (2020) elucidated that a significant obstacle faced by medical schools pertains to the identification of the variables that exert an influence on student performance. The sample for this study consisted of 279 medical students from Shiraz University of Medical Sciences. The participants in the study were administered surveys measuring AEQ, metacognitive learning approaches, and academic self-efficacy. The analysis of the data was conducted using SPSS and Smart PLS3. The academic performance of medical students was affected by their self-efficacy, emotions related to learning, and metacognitive learning techniques, as demonstrated through structural equation modeling.

Metacognition and Mathematical Problem Solving: A Study by Izzati and Mahmudi (2018) critically examined ten scholarly papers about metacognition and mathematical problem-solving. This paper examines how metacognition impacts low, average, and high-level arithmetic students. Math puzzles need the use of metacognition. Metacognition, or thinking about thinking, is the ability to observe and govern our ideas, problem-solving, and questioning. To solve a mathematical problem, one must study it, devise a solution, implement it, and verify it. Practical math problem-solving requires the use of metacognition.

Metacognition and Mathematics Learning: A Secondary School Teachers' and students' Perspective by Alzahrani (2017) examined how metacognition affects arithmetic learning from teachers' and students' perspectives. Case studies were a systematic strategy to gather data and identify research issues. Data was collected through semi-structured interviews and classroom observations. A thematic analysis revealed major discoveries about the study's purpose. First, the usual technique may hamper metacognitive mathematics instruction, and metacognitive mathematics training should be planned. Still, its principal purpose should be to improve students' abilities to monitor and regulate their thinking when solving mathematical problems.

Aditi Kadian (2016) studied academic accomplishment, executive function, intelligence, and metacognition, and examined how executive function, intellect, and meta-cognition affect middle school academic performance. The sample included 50 private and 50 government pupils in grades 6-8. Raven Progressive Matrix and Metacognition Awareness Inventory were employed. The study examined intelligence, meta-cognition awareness, executive functioning, and academic performance. Intelligence affected academic achievement more than executive functioning and meta-cognition. The study also indicated that IQ predicts academic success better than executive functioning and meta-cognition.

Sawney and Bansal (2015) found that metacognition involves understanding and controlling cognitive processes by organizing, monitoring, and modifying them. Academic success depends on practical thinking, independent thinking, and mastering essential skills like scheduling, planning, and course change. Cognitive and metacognitive methods assist students to reflect on and understand their learning. This study examines how metacognitive awareness and undergraduate academic success link. The survey sampled 100 Chandigarh college undergraduates. Schraw & Dennison's 1994 Metacognitive Awareness Inventory (MAI) measured metacognition, and the results demonstrated a significant difference in undergraduate academic achievement between high and poor metacognitive awareness scores.

Shetty (2014) examined student teachers' metacognition levels by learning style to determine which styles were associated with higher metacognition. They picked descriptive surveying on a sample of 172 student teachers and administered the MBTI-1977 and Metacognitive Awareness Inventory (Schraw & Dennison, 1994). After data collection, the "t-test" compared student teachers' mean Metacognition scores by learning style. Student teachers with ESFJ were the most notable (Extraversion et al.). However, introversion and thinking student teachers had significantly higher Metacognition than extraversion and feeling students.

Reviews on Intra-Personal Intelligence

Arnidha and Maulani (2022) did a study titled "The Effect of Intrapersonal and Interpersonal Intelligence on Mathematics Learning Motivation" to investigate the influence of intrapersonal and interpersonal intelligence on students' motivation to learn mathematics in Pringsewu Regency. This descriptive quantitative study employs ex post facto research tools on 97 pupils in the fourth grade from SD Negeri Cluster 1, located in the Sukoharjo District. The research demonstrates a notable impact of intrapersonal and interpersonal intelligence on students' motivation levels in Pringsewu Regency mathematics education.

Barman and Roy (2021) conducted a study called "Intrapersonal Intelligence and Decision-making Ability of Higher Secondary School Students" to examine the extent and association between intrapersonal intelligence and the decision-making proficiency of students in higher secondary educational institutions. The research utilized a quantitative approach relying on surveys. The study's sample comprised 500 students who were pursuing their higher secondary education in the state of West Bengal, India. The researchers employed two self-developed questionnaires, one for evaluating intrapersonal intelligence and another for quantifying decision-making capacity. The results suggest a substantial relationship between gender and stream with the intrapersonal intelligence of higher secondary pupils. Moreover, a statistically significant and positive correlation exists between intrapersonal intelligence and decision-making capacity.

Okwuduba et al. (2021) conducted a study titled "Impact of Intrapersonal and Interpersonal Emotional Intelligence and Self-directed Learning on Academic Performance among pre-university Science Students." They investigated the correlation between Emotional Intelligence (EI), Self-directed Learning (SDL), and academic achievement among 443 Nigerian students in pre-university science programs. The findings indicated a favorable relationship between perceived Interpersonal and Intrapersonal Emotional Intelligence (EI) and student academic performance. However, the influence of self-directed learning on academic achievement was shown to be inconsistent. The independent factors accounted for a significant variance in students' academic achievement within pre-university programs, offering valuable insights for developing intervention programs.

Perez and Ruz (2019) conducted a study titled "Intrapersonal Intelligence and Motivation in Foreign Language Learning" using focus group exercises, weekly evaluation sheets, and interviews as the research methods. The study aimed to present a program grounded in intrapersonal intelligence to enhance student motivation. The curriculum was segmented into five parts, from Monday to Friday, each lasting four hours. The program is segmented into three distinct sections. During the initial phase, students learn new grammatical requirements to effectively analyse intrapersonal information within the first few days. Subsequently, tasks specifically designed for the grammar type are implemented in the second phase. Lastly, in the third phase, an assessment evaluates the students' motivation and intrapersonal intelligence. A two-hour session succeeded a two-hour grammar instruction focused on developing conversational skills. Students cultivate learning skills by leveraging their expertise and

enhancing motivation, while teachers may effectively administer language programs. The findings underscored the program's emphasis on fostering intrapersonal intelligence and motivation, yielding advantages for students and educators.

Mohamed Abdel-Haq, MAmin, Helwa and Abdel-Hady Abdel-Gawad (2019) focused on utilising interpersonal and intrapersonal intelligence to enhance English as a Foreign Language (EFL) grammatical competence among 30 first-year preparatory school pupils in Benha, Qaliupia. The pre- and post-test scores of the students were compared based on their interpersonal and intrapersonal intelligence. The findings demonstrated that the experimental group exhibited a notable enhancement in their English as a Foreign Language (EFL) grammatical competence skills compared to the control group. This suggests that these intelligences had a crucial role in developing these skills.

Mulbar et al. (2019) conducted a study to examine the impact of intrapersonal intelligence and interpersonal intelligence on students' mathematics learning outcomes. The researchers conducted an ex post facto study to investigate the potential impact of students' interpersonal and intrapersonal intelligence on their mathematics learning ability. This study focused on students pursuing a major in natural science at SMAN 1 Kalukku, a senior high school in Indonesia. The data was collected using a learning achievement exam, an interpersonal, and an intrapersonal questionnaire. It was determined that the students exhibit superior learning performance in mathematics, as evidenced by their high intrapersonal and interpersonal intelligence scores.

Sholikhati et al. (2017) experimented to examine students' cognitive capacities to their intrapersonal intelligence. The study's objective was to assess students' cognitive abilities by employing Bloom's taxonomy as a framework and considering their intrapersonal intelligence. Intrapersonal intelligence pertains to the cognitive abilities linked to recognising and understanding oneself. A descriptive technique was utilized in this study, employing a qualitative methodology. The participants for this study were chosen from each intrapersonal intelligence category, namely high, moderate, and low. They were then administered a problem-solving test. The test results were cross-validated by conducting interviews. The results of this study indicate that those with elevated levels of intrapersonal intelligence demonstrated the capacity to engage in analytical thinking. Students who possessed a moderate amount of intrapersonal intelligence demonstrated the ability to engage in applying-level thinking. In contrast, students with low intrapersonal intelligence could achieve the understanding level.

Parker's (2016) research examines the relationship between intrapersonal intelligence and resilience in the context of academic performance for learners in the 21st century. This research examines the correlation between academic achievement in higher education during the twenty-first century and intrapersonal intelligence, resilience, and resilience. 91 undergraduate students participated in the study, employing transformational and constructivist learning theories. The results of the study revealed a high correlation between intrapersonal intelligence and GPA, which serves as an indicator of academic accomplishment. To enhance academic outcomes and provide students with the necessary skills to navigate the challenges of the twenty-first century, academic leaders must prioritise the design of curricula that foster the cultivation of intrapersonal intelligence.

According to Behjat (2012), in a study, the efficacy of interpersonal and intrapersonal intelligence in the context of foreign-language acquisition. Gardner's idea of multiple intelligences has influenced the teaching profession. This study aims to determine the significance of both interpersonal and intrapersonal bits of intelligence in the context of language acquisition. A selection was made of EFL students from several universities. The participants were divided into groups during the interview according to their interpersonal and intrapersonal intelligence levels. To evaluate their linguistic aptitude, they successfully finished the TOEFL reading and grammar parts. An analysis of average scores revealed a correlation between these cognitive abilities and language acquisition. Furthermore, the study demonstrated that men and women performed superiorly in a language exam due to their intrapersonal and interpersonal intelligence, verifying Gardner's theory that personal intelligence is autonomous.

Sellars and Sanber (2006) conducted a study on the role of intrapersonal intelligence in aiding students in the English classroom. This study investigated the progression of intrapersonal intellectual abilities in children aged seven to nine years. The program's objective was to cultivate self-awareness and self-regulation abilities within the context of English language acquisition. The intervention encompassed the implementation of goal setting, personal learning tools, and enhanced work habits. The findings indicated a notable enhancement in students' self-awareness, self-perception as learners, and heightened accountability for their educational pursuits.

Reviews on Academic Self-Concept

Yang et al. (2023) investigated the functions of academic self-concept and effort perseverance in the context of self-assessment procedures. This research aimed to examine the function of academic self-concept as a mediator between effort persistence and self-evaluation using the self-system processes model of motivation. They found no statistically significant relationship between effort persistence and self-assessment. According to the results, academic self-concept, whether at the domain or component level, significantly mediates the effect of persistence of effort on self-assessment. There was a strong conceptual relationship between self-perceptions and self-assessment practices in the context of learning, and these empirical findings corroborated that view. These results enriched the current body of knowledge in three fields: academic self-concept, self-assessment, and grit.

According to Basith's (2021) research, the author determined how academic self-concept and self-esteem were at different levels, how they related to academic achievement, and how self-esteem mediated the relationship between academic self-concept and academic achievement. Using simple random sampling, 482 students were chosen from a total of 907 students at STKIP Singkawang to participate in the research. Adapted from earlier studies, the self-concept and self-esteem questionnaires were among the research instruments, along with documentation of GPA. According to the findings, most students have a healthy sense of self-concept but only a moderate amount of self-esteem. Academic success was not significantly related to self-concept or self-esteem, but the two were significantly related. The correlation between self-concept and performance in the classroom was not moderated by self-esteem. Furthermore, self-concept does not directly impact academic performance, but it predicts self-esteem.

Academic identity and the ability to think critically: The work of Chatzinikolaou and Tsirides in developing a model to forecast the degree commitment of college students (2020). Researchers set out to examine college student's dedication to their chosen major in connection to their Academic Self-Concept and Critical Thinking Dispositions. Using questionnaires, a survey was administered to 120 Greek college students attending a privately run school. Academic self-concept was the most significant predictor of degree commitment, and the two had a weak positive link.

In an investigation of the framework of academic identity, Arens et al. (2020) conducted a methodological review and provided empirical examples of key models. Academic Self-Concept (ASC) is believed to be structured hierarchically and has multiple facets. The methodological review focuses on the main models that showed how ASC was structured: a first-order factor model, a bifactor representation from exploratory structural equation modeling, a higher-order factor model, the Marsh/Shavelson model, and the nested Marsh/Shavelson model. The researchers describe the models' psychometric properties and how they correspond to the theoretical assumptions of the ASC's makeup. To evaluate these models, they consulted a dataset of 1,232 German 10th graders, comprising both generic and a diverse set of domain-specific ASCs. The connections between ASCs and academic achievement and

the correlations between ASCs varied between structural models.

A study conducted by Tan (2019) investigated the relationship between university students' arithmetic achievement and their self-concept and learning tactics: Academic Self-concept, Learning Tactics, and Problem-solving Achievement of University Students. It indicated that self-concept was moderate and that there was a favorable correlation between self-concept and success in addressing problems. Using a descriptive correlational methodology and a statistically valid sample of 240 students, the researchers found that students' problem-solving performance improved as their self-concept and strategy utilization increased. The application of learning techniques somewhat mediated achievement in problem-solving. The pupils' disinterest in reading and mathematics prevented them from reaching a high level of problem-solving.

The Hierarchy, Multidimensionality, and Change in the Academic Self-Concept in Higher Education, a study of Gorges and Hollmann (2019), related self-concepts of ability, both in terms of their structure and how they changed over the years. This study's foundation was a longitudinal investigation of the effects of students' academic self-concepts on their growth and development as learners. Three hundred forty-one participants, aged twenty-one and a half to fifty-seven percent, evaluated their sense of self to their course of study and four auxiliary variables. Structural equation models were utilised to examine structural stability and directional effects, compare structural models, and conduct confirmatory factor analyses. The findings corroborated the hypothesis of multi- and hierarchical structure, with a generic self-concept unique to the area of research serving as the highest level of abstraction. During the initial university months, the structural model and self-concepts remained steady.

The study analysed 68 college students and examined how four aspects of students' academic self-concept affected their recovery from a stressful presentation in a university seminar. The study titled "Influences of Different Dimensions of Academic Self-concept on Students' Cardiac Recovery after Giving a Stressful Presentation through the lens of Wimmer et al. (2019)". According to the research, higher levels of students' social self-concept, dependent on social comparison, were associated with worse recovery. Recovery was more effective for those with higher levels of absolute self-concept, unrelated to external criteria. Results indicated that coping with academic stress is hindered when focusing on social comparisons.

In contrast, adaptive responses to difficult conditions are facilitated when one focuses on one's abilities (internal performance standard). These results touch learning, teaching, and students' health and well-being. The significance of concentrating on one's strengths in managing academic pressure was emphasised in the study.

After conducting an exploratory study using participant observation methodologies, Blegur et al. (2018) identified six tactics that can be used to teach students academic self-concepts during the learning process: 1) through the establishment of logical consequences that allow students to evaluate their own beliefs and efforts critically; 2) through the assignment of challenging responsibilities; 3) through the provision of dynamic expression media that empower students to think critically; 4) through the provision of solution-based feedback that motivates students to work hard; 5) through the practice of transparent evaluation of learning outcomes that allow students to feel good about their academic performance; and 6) through the integration of positive motivational thoughts that guarantee equal opportunity for all.

Ajmal and Rafique (2018) found that students in the Rawalpindi region who were enrolled in Master of Education programs for one year or Bachelor of Education programs for 1.5 years had higher levels of academic self-concept as judged by the Liu and Wang (2005) academic self-concept scale. A better academic self-concept helps students accomplish better academics since there is a substantial positive association between academic self-concept and academic achievement of distance learners. In addition, they compared to B.Ed. (1.5-year) distance learners, those enrolled in the M.Ed. (1-year) program

exhibited a stronger academic self-concept. It stressed the importance of counseling sessions, seminars, and workshops for distant learners to improve their self-concepts.

Secondary school students from CBSE board schools in Varanasi were the subjects of a quantitative study by Jaiswal and Choudhuri (2017), which compared the self-concepts of male and female students and looked at the correlation between academic self-concept and academic accomplishment. The students' academic performance was evaluated using their self-reported CGPA from the previous year. Kample and Naik (2013) developed the Academic Self-Concept Scale (ASCS) to assess academic self-concept. The scale consisted of 57 items divided into 8 subscales: Academic Ability, Academic Interests, Study, Examination, Academic Interaction, Academic Efforts, Curriculum, and Academic Future. Results demonstrated a favorable and statistically significant correlation between students' academic self-concept and their performance in the classroom. There was a marked gender gap in students' academic self-concepts, but overall, it bolstered students' optimistic views of their abilities and competence in the classroom.

The Reciprocal Effects Model (REM) was investigated in a study by Marsh and Martin (2011) titled Academic Self-concept and Academic Achievement: Relations and Causal Ordering. The REM postulates that academic self-concept (ASC) and achievement are symbiotic, resulting in mutual benefits. Their work prioritized a construct validity approach and multiple viewpoints when assessing the REM. The results demonstrated that prior ASC influences future performance directly and indirectly, whereas self-esteem and non-academic factors had little to no impact. Young children, health, cross-cultural studies, and non-elite sports were among the domains in which the REM was useful.

Isiksal (2010) reviewed the academic motivation and self-concept scores of undergraduates from Turkey and the United States throughout their time at university. The study compared these two variables. Using the Academic Motivation Scale and the Academic Self-Concept Scale, 566 undergraduates (284 from Turkey and 282 from the United States) were analyzed. The number of years spent in university and one's country had a substantial impact on these parameters. In terms of intrinsic and extrinsic ratings, as well as academic self-concept, American pupils performed better than their Turkish counterparts. Both cultural groups' senior students scored higher on academic self-concept and intrinsic drive measures. While Turkish undergraduates saw an uptick in their extrinsic motivation scores during their third and fourth years of college, American students saw a fall as they moved up the grade levels. Distinct cultural and social norms between the two countries were also considered in the research.

III.   DISCUSSION OF THE RESULTS

According to Anthonysamy et al. (2020), university students frequently lack metacognitive awareness and exhibit subpar performance in this domain. The lack of metacognitive skills can significantly impair individuals' academic achievements and general welfare. A strong correlation exists between intra-personal intelligence, academic self-concept, metacognition, and academic achievement. The study highlights the relevance of investigating the interrelationships among metacognition, intra-personal intelligence, and academic self-concept to improve students' cognitive capacities, decision-making aptitude, and self-observation. This study holds significant relevance within the framework of contemporary education, as it has the potential to facilitate the enhancement of students' topic knowledge and flexibility, thereby contributing to their overall academic and personal development.

Understanding the cognitive and emotional components that impact students' learning process necessitates examining metacognition, intrapersonal intelligence, and academic self-concept. Although previous studies have provided insights into different facets of these concepts, there remains a requirement for a thorough examination that particularly explores the interaction between these variables within the

specific context of students across the globe.

The concept of metacognition holds significant importance in pupils' learning processes (Almasi, 2003; Kuhn & Dean, 2004). Engaging in self-reflection, strategizing, overseeing, controlling, and assessing knowledge is crucial for effective learning (Efklides, 2011). Prior research has demonstrated a beneficial association between metacognitive awareness and academic achievement (Dumford & Miller, 2018; Broadbent & Poon, 2015). Nevertheless, recent research indicates a lack of metacognitive understanding among college students (Anthonysamy et al., 2020), highlighting the necessity for additional investigation in this domain.

According to Gardner (1999), intrapersonal intelligence encompasses comprehending one's feelings, emotions and wants. The association between this type of intelligence and proficiency in critical thinking and self-reflection has been established (Dummett, 2006). Nevertheless, a more thorough analysis is needed to determine its precise influence on metacognition among students of various geographical and social backgrounds.

According to Skaalvik and Skaalvik (2002), academic self-concept refers to the self-evaluation made by students on their educational capabilities. This construct has been recognised as a significant determinant of academic success. Ajmal and Rafique (2018) found that a positive academic self-concept positively impacted students' motivation, contentment, and overall performance. Educational institutions and scholars have underscored the significance of maximizing academic self-concept as a primary objective of schooling (Brookover & Lezotte, 1979). Although separate studies have been conducted on these constructs, there is a shortage of comprehensive research examining the relationship between intrapersonal intelligence, academic self-concept, and metacognition among students from various cultural milieu. Comprehending the interconnections between these variables is crucial in formulating focused interventions and instructional approaches that augment students' metacognitive abilities. This review study thus highlights the existing knowledge gap by offering a comprehensive understanding of the intricate interplay between metacognition, intrapersonal intelligence, and academic self-concept within the context of Indian students.

Increasing students' metacognition depends on our understanding of the roles played by students' academic self-concept and intrapersonal intelligence (Marsh & Craven, 2006; Gardner, 1983). How people view their academic talents significantly impacts their ability to establish goals, stay motivated, and actively participate in learning activities (Harter, 2012). Higher motivation levels and more in-depth learning techniques are associated with a positive academic self-concept, whereas disengagement is a possible outcome of a negative self-concept (Marsh & Martin, 2011). According to Gardner's hypothesis, a person's ability to comprehend their feelings, goals, and preferred learning methods is known as intrapersonal intelligence (Gardner, 1983). Adapting learning tactics, reflecting on one's performance, and self-regulation are all strengths of students who score high on the intrapersonal intelligence scale (Armstrong, 2009). Educators may help students with low self-esteem and lack self-confidence in their learning capacities build these skills and improve their metacognitive abilities by looking at these elements (Zimmerman, 2002). Flavell (1979) argues that pupils can become more independent learners by bolstering their academic self-concept and intrapersonal intelligence. Students' metacognitive skills and academic performance can be improved by incorporating these concepts into teaching methods.

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