CHAPTER II

REVIEW OF RELATED LITERATURE

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2.1.0 Introduction

Any research project must include a survey of related literature since it provides a thorough grasp of the body of information already available on the subject. By reviewing earlier studies, pointing out gaps in the literature, and laying out the theoretical and empirical underpinnings of the research, this part puts the study in context. In order to ensure that the study builds upon and adds to the ongoing academic discourse, this review analyses pertinent papers in order to highlight important topics, methodologies, and findings that guide the current investigation. In the end, this chapter places the research in the larger context of the field and validates its value.

The review of related literature done for the study are divided into the following sub-headings:

- Studies related to Multiple Intelligence Theory
- Studies related to Learning Competency
- Studies related to Cognitive Domain
- Studies related to Affective Domain
- Studies related to Psychomotor Domain
- Studies done combining all the three domains.

2.1.1 Studies Related to Multiple Intelligence

Nayyereh Ghaznavi et al. (2021) investigated the impact of a multiple intelligences teaching approach on classroom engagement and the activation of multiple intelligences in physically disabled learners. The mixed-methods study involved three classes of 10 Iranian physically disabled learners, with 10 participants in the control group and 20 in two experimental groups. Over six months, the study found that the multiple intelligences teaching approach significantly improved learners' multiple intelligences and classroom engagement. The results also indicated that second language (English) instruction was more effective than first language (Persian) instruction in fostering these improvements. The authors conclude that multiple intelligences-based instruction can help physically disabled children achieve greater personal and social success by activating their strengths

and abilities. They recommend further research with larger sample sizes and diverse contexts to better understand the effects of multiple intelligences instruction on learners with special needs. The study highlights the importance of personalized learning strategies in enhancing student engagement and development.

Yaghoob Raissi Ahvan & Hossein Zainali Pour, (2016) conducted a descriptive correlation study titled, "The Correlation of Multiple Intelligences for the Achievements of Secondary Students." The study mainly focuses in investigating the relationship between the multiple intelligences and the academic achievement level of the secondary school students. A total number of 270 students of Bandar Abbas were selected by cluster random sampling as the sample of the study. Mean, SD, Pearson coefficient correlation and regression were used to analyse the data collected through questionnaire. The results showed that visual-spatial, verbal-linguistic and interpersonal intelligence of multiple intelligence was found significant and able to predict academic achievement whereas musical intelligence was found to be a negative predictor for the academic achievement of the student.

The descriptive correlation study "The Correlation of Multiple Intelligences for the Achievements of Secondary Students" by **Ahvan and Pour (2015)** emphasised on the relationship between secondary school students' multiple intelligences and degree of academic performance. 270 students total from Bandar Abbas were chosen for the research sample using cluster random sampling. Pearson coefficient correlation, regression, mean, and standard deviation will help one examine the questionnaire's gathered data. While musical intelligence was found to be a negative predictor of the student's academic performance, visual-spatial, verbal-linguistic, and interpersonal intelligence of multiple intelligences were revealed to be significant predictors.

Sreeraj (2015) conducted a study titled "Relationship between Multiple Intelligence and Achievement in Mathematics of Students at Secondary Level." The primary objective was to explore the relationship between multiple intelligences and mathematics achievement among secondary school students. For this purpose, a sample of 1,500 students was selected from three districts in Kerala using stratified random sampling. A survey method was employed, utilizing tests to assess linguistic, logical-mathematical, spatial, interpersonal, and intrapersonal intelligences, along with a mathematics achievement test for 9th-grade students. The study found a low correlation between mathematical achievement and linguistic intelligence, a very high correlation with logical-mathematical,

spatial, and intrapersonal intelligences, and a moderate correlation with interpersonal intelligence. Overall, the findings indicated that the components of multiple intelligence are positively correlated with achievement in mathematics.

Piaw and Don (2014) explored the multiple intelligences and their correlation with personal factors in Malaysian school administrators. They found significant correlations among the multiple intelligences, with the strongest abilities being interpersonal and intrapersonal, and the weakest being naturalistic, bodily-kinesthetic, and musical-rhythmic. The study also revealed that increased work experience is linked to higher interpersonal and intrapersonal abilities. Interpersonal and intrapersonal intelligences were found to be the strongest predictors of overall multiple intelligences among school leaders. These findings have valuable theoretical and practical implications for school leadership.

Rekha (2013) conducted a descriptive and correlational study to investigate multiple intelligences, creativity, and achievement motivation among secondary school students in Mysore. The research included a sample of 1,005 students selected using random sampling. Data were collected using the Multiple Intelligence Scale, the Verbal Test of Creative Thinking developed by Baqer Mehdi, and the Achievement Motivation Test by Prathibha Deo and Asha Mohan. The results indicated that most students scored at an average level in multiple intelligence, creativity, and achievement motivation. Gender differences were observed in multiple intelligence, but no significant differences were found with respect to type of school, locale, or medium of instruction. For creativity, gender differences were not significant; however, significant differences existed based on type of school, location, and medium of instruction. Achievement motivation showed significant differences across all three variables. Furthermore, the study found a highly significant relationship between multiple intelligences, creativity, and achievement motivation.

Li et al. (2012) expound on the notion of educational games and multiple intelligences, while also investigating the relationship between the two concepts. Subsequently, researchers investigate the influence of educational games on the enhancement of students' different intelligences, including logical-mathematical intellect. Moreover, academics examine strategies for augmenting students' cognitive abilities using instructional games. In summary, researchers can utilize computer games to enhance the many intelligences of students.

Hajhashemi et al. (2011) explore the correlation between Multiple Intelligences (MI) profiles and language learning strategies among school students. The results revealed a low, positive correlation between MI profiles and language learning strategies. Meta-cognitive strategies showed the strongest correlation with MI, followed by cognitive and compensation strategies.

Beceren (2010) conducted a study to ascertain the multiple intelligences of pre-school children (ages 4-6) during the learning process. Procedia - Social and Behavioral Sciences. The research was conducted to ascertain whether the intelligence types of children differed based on their parents' educational level and socioeconomic status, with a particular emphasis on the use of intelligence types in learning for 4- to 6-year-olds in accordance with the Multiple Intelligences Theory. The investigation involved a cohort of 232 children and their parents. The gender distribution results suggested that visual-spatial intelligence was the preferable option for both girls and boys. A statistically significant correlation was found between the educational attainment and socioeconomic status of the parents and the types of intelligence displayed by their children.

In **Divina's (2010)** study, the Theory of Multiple Intelligences was incorporated into the teaching process to help Grade V students at David Elementary School identify and develop their varied intelligences. This approach encouraged the learners to recognize and nurture their hidden abilities. The study was conducted at David Elementary School as a response to the condition of the Special Education Program in Pangasinan. The module content was validated by a select group of SPED instructors and administrators in Baguio City. Data collected from fifteen parents, four instructors, and fifteen pupils were analyzed using frequency counts, percentages, weighted mean, and t-tests. Results revealed that the students involved in the MI class exhibited all eight intelligences in differing degrees, with bodily-kinesthetic intelligence being the most prominent among them. Additionally, in the key subjects of Science, English, and Math, the students showed strong naturalistic intelligence. Both parents and teachers had almost identical perceptions of the pupils' intelligences, except for intrapersonal intelligence, where a marked difference in opinions was observed between the two adult groups.

The null hypothesis—that there were no significant differences between parents' and teachers' perceptions of students' various intelligences—was accepted, except in the area of intrapersonal intelligence. After engaging in activities based on Multiple Intelligences

theory, the pupils' post-test scores significantly increased compared to their pre-test scores, leading to the rejection of the null hypothesis of no difference between pre- and post-test results. Overall, Divina's findings demonstrate that integrating the Multiple Intelligences theory into classroom instruction can enhance children's educational experiences, making learning more interactive, meaningful, and enjoyable.

During the 2004-2005 academic year, **Pasha (2008)** conducted a study involving 120 high school students from grades 10 and 11, representing both genders and a range of academic and technical disciplines. The research utilized the Persian version of the Multiple Intelligences (MI) questionnaire by Harms and Douglas, covering eight categories of intelligence, along with the Bell Adjustment Questionnaire and a researcher-designed demographic survey. Academic performance in Persian language, foreign language, mathematics, and sciences was also assessed to examine connections with the different types of intelligence. The findings revealed a low to moderate but meaningful correlation between the various intelligences and students' academic scores. Additionally, female students demonstrated higher interpersonal intelligence, while male students showed greater visual-spatial intelligence. No significant differences were found between the two groups in other types of intelligence.

Seyyed Ayatollah Razmjoo (2008) conducted a study titled "The Relationship between Multiple Intelligences and Language Proficiency," which aimed to investigate the association between English language proficiency and nine types of intelligences. The study had three main objectives: to determine whether there is a relationship between multiple intelligences and language proficiency among Iranian Ph.D. candidates taking the Ph.D. entrance exam in Shiraz; to examine if individual types or combinations of intelligences can predict language proficiency; and to explore the effect of sex on language proficiency and intelligence types. The results indicated that there was no significant relationship between language proficiency and either the combined or individual types of intelligences. Additionally, no significant differences were found between males and females in terms of language proficiency or intelligence types. Furthermore, none of the intelligences were identified as predictors of language proficiency. Overall, the study found no significant relationship between multiple intelligences and English language proficiency within the Iranian context.

2.1.2. Studies related to Competency

Desmita et al. (2021) analyzed the direct and indirect effects of pedagogical and professional competencies among 80 randomly selected social studies teachers from a population of 107. Using questionnaires and documentation, data were analyzed through descriptive and path analysis. Results showed a positive relationship between teachers' competencies and students' motivation and achievement, highlighting the need for teachers to enhance their pedagogical and professional skills to better support student success.

Ramanathan et al., (2021) conducted a study to explore the learner's perspectives on competency- based medical education which was based on cross-sectional descriptive survey. The results were found that nearly three-fourths of the student opined that foundation course, attitude ethics, communication module and early clinical exposure were necessary. Also, the students were of the opinion that horizontal rather than vertical integration is more appreciable. And maintenance of log book was perceived as time-consuming and cumbersome.

Jose-María Alvarez-Martínez-Iglesias et al. (2020) conducted a study titled "Assessment by Competences in Social Sciences: Secondary Students' Perception Based on the EPECOCISO Scale," which aimed to examine students' perceptions of the extent to which competences in Social Sciences, Geography, and History have been developed. The study considered various factors, including what students had learned in these subjects, the difficulty involved in acquiring the competences, the assessment methods applied, and the ability to transfer these competences to real-life situations. To facilitate this, the researchers developed a novel and original instrument called the Evaluation of the Perception of Competences in Social Sciences (EPECOCISO). Through a descriptive and quantitative validation study using purposive sampling, they gathered the opinions of over 1,400 fourth-year secondary students in Spain. The instrument demonstrated strong psychometric qualities, highlighting a well-balanced sample composition (51% male and 49% female), as well as maintaining confidentiality and validity. Moreover, a Kaiser-Meyer-Olkin (KMO) value exceeding 0.9 confirmed the high reliability and internal consistency of the scale.

M, P. et al. (2019) conducted a study involving undergraduate social science students in Spain to explore their preferences for autonomous versus directed learning in acquiring information competencies (ICs), while considering factors such as gender, academic

program, belief in the importance of ICs, and self-efficacy. The study utilized the IL-HUMASS (Information Literacy Humanities Social Sciences) online survey, administered across five public Spanish universities during the 2013-2014 academic year. Participants were enrolled in various undergraduate programs including audiovisual communication, education, information science, pedagogy, journalism, psychology, social work, and tourism. Statistical analyses such as the Mann-Whitney U test, Kruskal-Wallis test, chi-square test, and discriminant analysis were conducted. The results indicated an overall stronger preference for directed learning in four areas of information competencies: searching, evaluation, processing, and communication. However, students from audiovisual communication, education, and journalism programs showed a tendency towards autonomous learning, whereas those studying information science and psychology preferred directed learning. Additionally, believing in the importance of information competencies was associated with a preference for autonomous learning, while higher self-efficacy was linked to a preference for directed learning. Mian Usman Sattar et al. (2019) conducted a study to assess the effectiveness of Virtual Reality in teaching and training within the medical field. The study aimed to examine the impact of text-based, video-based, and immersive learning technologies on the learning motivation and competency of participants from public and private medical colleges and universities in Pakistan. The sample consisted of 87 fourth-year medical students from three public and five private institutions. Experimental materials were provided through virtual reality, video, and text formats, after which participants completed a questionnaire evaluating their learning motivation and competency across these different mediums. Data analysis using t-tests revealed that Virtual Reality was the most effective method for enhancing both learning motivation and competency among medical students.

Banumathi (2018) did a study to examine faculty competency for a successful teaching and learning process in higher education. The primary objective was to examine the competences, including knowledge, skills, attitudes, and behaviours, essential for an efficient teaching and learning process. The researcher collected data from 863 respondents across three districts: Coimbatore, Erode, and Tirupur, utilising the Stratified Random Sampling technique. The data were gathered using the survey approach. The statistical methods employed in the study included t-test, ANOVA, mean, median, standard deviation, and Chi-square. The findings indicated no substantial disparity in skills between the faculty members of the Arts and Science College and those of the Engineering College.

There exists a substantial disparity among the three categories (high, moderate, and low competence) of faculty competence and the independent variables. Furthermore, it was determined that factors such as qualifications, designations, and experience significantly correlate with enhancements in students' analytical thinking and creativity, improvements in employability skills, and overall development through high-quality instruction.

Pamela Wolfe Kohlbry (2016) conducted a study titled "The Impact of International Service-Learning on Nursing Students' Cultural Competency," which evaluated the effects of an international immersion service-learning project on the cultural competence levels and components of baccalaureate (BSN) nursing students. To measure changes in cultural competence before and after the experience, a triangulated methodology was employed. Participants completed a demographic survey and responded to open-ended qualitative questions during the post-trip meeting. Data analysis included calculations of means, frequencies, and correlations between demographic and survey data, along with comparisons of pre- and post-test means. Additionally, qualitative responses from six open-ended post-test questions were coded, leading to the identification of key themes. The findings demonstrated that the international immersion service-learning project had a positive impact on enhancing nursing students' cultural competence.

Verma and Kulshrestha (2015) conducted survey research to assess the Laboratory Competence Status of Chemistry students in senior secondary schools. For this purpose, 240 students from four institutions (60 students from each) of Agra city were taken as samples by using lottery method in order to collect the data. Comparison was done between UP Board and CBSE board students' Competence. Chemistry Laboratory Competence Test (CLCT) standardized by Meena Buddhisagar Rathor and Renu Moyade Kotwale and published from Indore in 2011 was used to collect the data. The results showed that students of UP board had been found low competent in Chemistry laboratory while students of CBSE board were average competent. It was clear from the findings that skills of students in Chemistry laboratory need to be improved.

Jimmi Copriady (2014) conducted a survey-based study to examine teachers' competencies in the teaching and learning of Chemistry practicals, focusing on four interconnected aspects: designing, planning, implementing, and evaluating experiments or training aimed at enhancing the quality and standards of instruction in the subject. A random sample of 234 chemistry teachers from Riau, Indonesia, participated in the study.

A questionnaire was employed to assess the competencies across the four areas. Multiple regression analysis was used to determine the contribution of each competency to the overall quality of teaching and learning in Chemistry practicals. The findings revealed a moderate level of competency in all four aspects: designing, planning, implementing, and evaluating practical training.

2.1.3 Study related to cognitive domain

Devi (2024) conducted a quasi-experimental study which objective was to create an instructional strategy that capitalizes on experiential learning and Multiple Intelligence Theory to improve the comprehension of science and 21st-century skills among secondary students. The study used a pre-test post-test non-equivalent group design to compare standard instruction to an experiential approach based on Multiple Intelligences. At Jawahar Navodaya Vidyalaya Khumbong, 74 ninth-grade students (38 experimental, 36 control) were evaluated on scientific innovation, critical thinking, and science proficiency. Over the course of four months, the experimental group was instructed using a six-step intervention based on Kolb's experiential learning paradigm. The results, examined using ANCOVA and t-tests, revealed significant improvements in the experimental group's learning outcomes, validating the efficacy of the MI-based experiential technique. The findings have consequences for educators, curriculum developers, and legislators.

Putri and Ahda (2020) carried out a study to examine the effectiveness of workbooks based on Multiple Intelligence theory in enhancing the learning competencies of tenth-grade students, assessing their performance across cognitive, emotional, and psychomotor domains. The research employed the Plomp model, which comprises four stages: initial investigation, development, prototyping, and evaluation. Data were gathered through objective questionnaires and observation forms. The analysis encompassed the Kolmogorov-Smirnov test for normality, Levene's test for homogeneity of variance, and a t-test for hypothesis evaluation. The findings indicated that students utilizing Multiple Intelligence-based workbooks had superior learning outcomes in all three domains compared to those employing traditional handbooks and worksheets.

Winarti et al. (2019) carried out an experimental study to assess the effectiveness of a teaching approach grounded in Multiple Intelligences for improving junior high school students' scientific process skills and their multiple intelligences. The study highlighted that educators often overlook students' academic abilities in relation to their inherent potential. Using a pretest-posttest control group design, the research involved 124 students

and collected data through a Multiple Intelligence test, a Science Process Skills test, and observation journals. Statistical analyses, including simple linear regression, ANOVA, and t-tests, were applied to test the hypotheses. The findings revealed that the Multiple Intelligence-based instructional strategy significantly enhanced both the students' science process skills and their multiple intelligences.

Using Multiple Intelligence Approach, **Khan (2018)** conducted research to create instructional plans for primary level mathematics education. The study mostly aims to find the several multiple intelligences among the students and create instructional plans depending on the discovered multiple intelligences. Furthermore, to investigate the degree of mathematical interest of the student in applying the new approaches and to evaluate the performance of elementary school students following the new strategy. The study's sample consisted on Jamia Middle School's eights standard students. The tools and techniques used by the researcher in the study were Multiple Intelligences Development Assessment Scales (MIDAS), Intelligence based Observation Schedule for each strategy based on checklist by Thomas Armstrong Strategies developed by the researcher in eight intelligence of multiple intelligence theory, semi-structured interview schedule and opinionnaires. From the findings it was found that in almost all the items for the tests conducted in Phase I and Phase II, majority of students have scored full marks per item, and mentioned at least one intelligence that they are high on as per the MIDAS scores. It was noticeable from the study that students with high intelligence scores are likely to perform in that intelligence at high, moderate or low levels. But in case of low scored students. It is less likely to perform at a high level for that intelligence involved in the strategy. Also, it was found that the combination of intelligences is likely to cater to a larger number of students in a class in some form or the other to arouse their interest for the mathematics topic and keep them engaged during the lesson.

Singh (2017) developed a teacher education model grounded in Multiple Intelligence Theory. The study aimed not only to develop this model but also to examine the current use of Multiple Intelligence-based classroom practices in English language teaching by teacher educators and pre-service teachers at a teacher education college. The sample consisted of 33 teacher educators from colleges affiliated with SPPU and 84 pre-service teachers enrolled in B.Ed. courses at an SPPU-affiliated teacher education college. A mixed-methods design was employed, with the Product Development Method guiding the

model's creation. Data were gathered through surveys and analyzed using percentages, frequencies, chi-square tests, and grounded theory. Findings revealed that both teacher educators and pre-service teachers were aware of multiple intelligences and predominantly engaged in activities related to verbal and logical-mathematical intelligences, but had limited awareness of reflective practices. The developed model proved effective in enhancing teaching by promoting the use and implementation of various reflective activities in the classroom.

Tarannum (2016) examined the effectiveness of a teaching module based on Multiple Intelligence Theory with 64 upper primary students. The study involved a control group and an experimental group, where the experimental group was taught using the newly developed MI-based module, while the control group received conventional instruction. The experiment comprised four phases: pre-test, treatment, post-treatment, and delayed post-test. A criteria-based mathematics test was employed to assess achievement. Data analysis was conducted using ANCOVA, ANOVA, and t-tests. The results revealed significant differences in academic performance and concept retention between the experimental and control groups, highlighting the effectiveness of the Multiple Intelligence-based teaching module.

Widiana, Wayan, Jampel, and Nyoman (2016) conducted an action research study aimed at enhancing students' creative thinking and academic achievement through the implementation of the Multiple Intelligence Approach combined with Mind Mapping in science learning. The study was carried out in two cycles, each comprising planning, action implementation, observation, and reflection. The primary objectives focused on multiple intelligence, science achievement, and students' attitudes. The sample included 5th-grade students from SD 8 Tinyar Barat, Kubu, and Karagasam. Data on creative thinking were gathered through performance tests, while achievement in science was measured using questionnaires. The findings indicated that the use of the Multiple Intelligence Approach with Mind Mapping positively influenced both students' achievement and creative thinking in science.

Emandu et al. (2013) conducted a quasi-experimental study and examined the effectiveness of Multiple Intelligence Teaching Strategies (MITS) in improving chemistry achievement. Two urban secondary schools in Onitsha were selected, with one group taught using MITS (experimental) and the other through traditional methods (control). A

total of 88 SSII students participated. Pre-tests and post-tests, including a delayed post-test after four weeks, were conducted using teacher-made achievement tests. Data were analyzed using mean, standard deviation, and ANCOVA at a 0.05 significance level. The results revealed that the experimental group outperformed the control group significantly. Additionally, the Multiple Intelligence Teaching Strategy proved more effective in helping students retain learned knowledge. The improved performance of the experimental group was attributed to their active and continuous engagement in comprehensive classroom activities throughout the lessons.

Guzel and Coskun (2013) aimed to profile technical vocational high school students based on Multiple Intelligences Theory and to assess how these profiles affected their final year-end grades. The study included 102 second-year students from the Electric, Chemistry, Computer, and Automation Departments of Konya Selcuklu Adil Karaagac Anatolian Technical High School during the 2008-2009 academic year. Intelligence was viewed as more fixed than academic achievement. The study also noted that stronger beliefs in the immutability of intelligence or academic achievement predicted greater feelings of helplessness toward schoolwork six months later, even after controlling for initial helplessness levels. Findings showed that, regardless of department, the least developed intelligence areas were Verbal-Linguistic, Musical-Rhythmic, and Naturalist intelligences, while Social, Intrapersonal, and Physical-Kinaesthetic intelligences were the most developed. Differences in intelligence profiles were observed among departments. Students in the Computer department achieved the highest average year-end grades. However, the levels of development in different intelligence domains did not have an impact on overall year-end academic success.

Sibel and Ali (2013) conducted a study to evaluate the efficacy of the Multiple Intelligences (MI) theory in contrast to conventional educational approaches in instructing the topic of enzymes. The study mainly focus to analyze the efficacy of scientific educators and measure the retention of students' knowledge. The findings indicated no substantial difference between the experimental and control groups in the pre-test. Post-intervention, the experimental group employing the MI approach demonstrated markedly superior performance on both the final assessment and the retention test relative to the control group utilizing conventional teaching approaches.

Yalmanci, G.S. & Gozum, A.I.C (2013) conducted an experimental study titled "The Effects Of Mulltiple Intelligence Theory Based Teaching On Students' Achievement And Retention Of Knowledge (Example Of The Enzymes Subject)," in order to compare the effectiveness of Multiple Intelligence and traditional method on science teachers' success and permanence of their information regarding enzyme subject. The experimental study was based on the two group pretest – posttest experimental design. Statistical techniques such as t-test, ANOVA, Benforroni test were used. And the result of the study revealed the use of Multiple Intelligence Method to be more beneficial than the traditional method.

Francis (2012) investigated the efficacy of the Multiple Intelligence (MI) approach in achieving secondary-level science learning objectives. The study examined its role in fostering a constructivist learning environment, promoting inclusive education, and the influence of learning style, gender, school type, and IQ on its effectiveness. Using a quasi-experimental Counter Balanced Design, the study sampled 736 sixth-grade students across various school boards. Data were collected through multiple tools, and statistical analysis included ANOVA and descriptive measures. Results showed the MI approach effectively met learning objectives across all student groups, with no gender disparities, and fostered a participatory learning environment.

Vartak (2012) compared the effectiveness of teaching environmental education units for Std XI with and without multiple intelligences. A quasi-experimental study method was used, with class 9 students selected via an incidental sampling method. After the pre-test, the experimental group was provide instruction based on multiple intelligences, whereas the controlled group received standard instruction. The study found that learners primarily used bodily kinaesthetic intelligence and that numerous intelligences-based training led to higher academic achievement compared to non-many intelligences-based instruction.

Wang, Qian Ng, Florrie Fei-Yin (2012) revealed that implicit notions of intelligence and academic success were consistently distinguished among Chinese students, who regarded intellect as more fixed than academic accomplishment. Traditional educational methods are insufficient for the modern digital age. This Multiple Intelligences framework evaluates students' verbal, mathematical, and restricted visual abilities. The Multiple Intelligences Theory, a modern educational framework, recognizes the varied interests and capabilities of students. To effectively guide the educational process, educators must first create intelligence profiles for their students.

Delgoshaei and Delavari (2011) conducted a study to investigate the effect of the Multiple Intelligence (MI) approach on the cognitive development of preschool children. The study used a quasi-experimental design and employed both descriptive data analysis and inferential statistics, including independent and paired t-tests. The application of the MI method in educational settings was found to be highly significant, with a 99% level of significance.

Poornima and Reddy (2011) investigated the educational implications of Multiple Intelligences Theory. Effective educators acknowledge that not all pupils acquire knowledge in the same manner. Some individuals learn more effectively when the material is presented visually, while others require the information to be recited or heard. Some individuals thrive when instruction involves hands-on manipulation, while others prefer more vigorous activities. Some students thrive in small groups where they collaborate to educate one another, while others prefer to work independently. Some individuals flourish on high-energy activities and stimulation, while others require time for quiet reflection. The research delves into the theory of MI, including its nature, criteria for recognition, key points, and eight intelligences. It also delineates the general teaching strategies that are employed, the obstacles that may arise when implementing the MI in the classroom, and the methods and approaches that can be employed to surmount these obstacles.

Ebru and Firdevs (2010) conducted a study to explore the relationship between multiple intelligences and the academic performance of secondary school students. This research utilizes the relational survey methodology. The participants comprise 250 secondary school students from Izmir, Turkey. Data is being gathered with the Multiple Intelligences Scale for Students and a survey. The aggregate grades from students' initial semester function as a standard for academic achievement. Data is analysed using descriptive statistics. Identifying the diverse intelligences of secondary school students and the differences correlated with their academic performance will enhance self-awareness and skill acknowledgment among students, while also offering suggestions for programs designed to elevate their academic success and serving as a foundation for subsequent research. This study's results indicate that gender significantly influences multiple intelligences. Specifically, girls outperform boys in verbal-linguistic and musical abilities. Academic achievement ratings significantly influence pupils' multiple intelligences. Students with inferior academic accomplishment exhibit diminished verbal-linguistic, logical-mathematical, and both interpersonal and intrapersonal abilities compared to their

peers. Overall academic performance was the most significant predictor of success in general music, and music also positively impacts academic performance in other subjects.

Gokhan (2010) conducted a study to examine the effect of the Multiple Intelligences approach on the environmental awareness and attitudes of primary school children, compared to traditional teaching methods. The findings revealed that the experimental group, which received instruction using the Multiple Intelligences strategy, showed significantly higher levels of environmental awareness, positive attitudes, interest, understanding, and enjoyment than the control group.

Douglas et al. (2008) conducted research on "The Impact of the Multiple Intelligences Teaching Strategy on the Academic Performance of Eighth Grade Math Students. This applied quantitative study compares two distinct instructional methods: Direct Instruction (DI) and Multiple Intelligences (MI). The present investigation investigates the impact of these methodologies on Mathematics achievement ratings. The results indicate that students who received MI (Multiple Intelligences) showed a significant improvement on a post-mathematics assessment compared to those taught through Direct Instruction.

Ramzi et al. (2008) conducted a study examining gender differences in self-assessments of Multiple Intelligences among adolescents from India and Lebanon. The sample comprised 648 Lebanese and 252 Indian students who evaluated their intelligences following Gardner's framework. The results showed that males rated their bodily-kinesthetic intelligence higher than females, while females gave higher ratings to their verbal and intrapersonal intelligences compared to males. Significant differences between the Indian and Lebanese groups were found in cognitive domains such as linguistic, spatial, and logical intelligences. When controlling for the father's educational level, notable variations emerged in verbal, spatial, and logical skills between the two nationalities. Additionally, an interaction between gender and nationality was observed for the logical intelligence: Lebanese males rated this ability more highly than Lebanese females, whereas Indian females rated it higher than Indian males, although their ratings were still lower than those of both Lebanese males and females.

Eisa M. Al-Balhan (2006) conducted a study with middle-school students in Kuwait to evaluate the effectiveness of multiple intelligences in predicting improvements in reading skills based on academic performance. The research involved middle school students who had received their first quarter grades and were participating in an after-school tutoring

program. Half of the students attended a traditional tutoring program, while the other half participated in a tutoring program grounded in Gardner's Multiple Intelligences theory. The results indicated that the experimental group (mean = 48.99), which employed multiple intelligences in their learning process, outperformed the control group (mean = 45.30) throughout the academic year. Additionally, analyses of the experimental group based on gender, type of school, and residential location revealed that female students enrolled in private schools located in suburban areas showed significant improvements in reading, as reflected in their quarterly grades.

Rashmi (2006) explored the application of Gardner's Multiple Intelligences Theory in resource evaluation by K-2 students, focusing on verbal/linguistic, logical-mathematical, musical, kinesthetic, spatial, interpersonal, intrapersonal, and naturalist intelligences. Students assessed resources for intelligence-based activities, selecting those with at least 4-5 such activities to share with parents. Feedback was collected on resource utilization and learning outcomes, guiding future selections. The structured process engaged both students and parents, fostering enthusiasm for library periods. The study highlighted the theory's role in developing analytical skills and enhancing student success.

Ethan Elliott Hodge (2005) reviewed literature on the relationship between MI instructional approaches and student achievement in secondary schools. The study found limited research on this connection and could not establish a causal link between MI methods and student performance. However, the evidence suggests MI theory positively impacts student learning and development. Further research is needed to quantify this correlation.

Stanford (2003) conducted a comprehensive analysis of the Multiple Intelligences (MI) hypothesis and its implementation in educational contexts. The research emphasizes the integration of MI theory into general education classes. It highlights three fundamental components: effective teaching strategies, necessary curricular adjustments, and student assessment methods. These factors are essential for ensuring that all students, regardless of their abilities, are provided the opportunity to succeed and learn in a diverse classroom environment.

2.1.4 Study related to Affective domain

Näykki et al. (2019) present a compelling examination of how emerging digital technologies—such as social networking systems, game-based learning platforms, and digital fabrication tools—can be strategically leveraged to support not only cognitive but

also affective dimensions of learning. Through four distinct case studies ranging from higher education to early childhood and secondary schooling, the authors demonstrate the potential of digital innovations to foster emotionally engaging and socially interactive learning experiences. For instance, the use of a social networking platform in a university setting promoted reflective online dialogue, while a Minecraft-based project in primary education illustrated how game environments could stimulate motivation and emotional involvement in learning. Additionally, the integration of "maker" culture and digital fabrication in early and secondary education highlighted how hands-on digital creativity enhances emotional investment and collaboration. The study underscores the importance of designing digital learning environments that intentionally support affective processes such as motivation, emotional expression, and engagement alongside cognitive development. The authors advocate for pedagogical scaffolding that addresses both domains, emphasizing that meaningful and sustained learning in the digital age must be both intellectually and emotionally resonant.

Susmita Mishra (2018) conducted a study to examine the relationship between memory, interest, and intelligence with achievement in English language at the intermediate level. A total of 400 students (200 boys and 200 girls) were selected using a stratified random sampling method. Data were collected using the English Language Proficiency Test (2014) developed by Prof. K. S. Mishra and Dr. Ruchi Dubey. Pearson's correlation coefficient was employed for statistical analysis. The findings revealed that students' memory was significantly related to English language achievement across both genders and in both science and arts streams. However, occupational interest showed no significant relationship with English achievement among any of the groups. Similarly, no significant relationships were found between religious interest, social interest, intellectual interest, or recreational interest and achievement in English language for males, females, science, or arts students. Additionally, intelligence was found to have a significant positive relationship with English language achievement across all genders and academic streams.

Singaravelu, S., (2017) conducted a study to investigate the Student Teachers' interest towards ICT. The researcher had selected 200 student teachers randomly from 3 B.Ed. College in Kumbakonam taluk of Thanjavur District, Tamil Nadu. The data collection process was carried out with the help of ICT interest inventory constructed and validated by the researcher and for analysis and interpretation of data t-test was used . The result reveals High interest level among student teachers regarding ICT. So suggestion had been

provided for curriculum frame works incorporated standards for teaching students with ICT.

Chandra Prabha Pandey, (2016) conducted a study to see the effectiveness of Cooperative Learning on Civic sense, Civic responsibility Interest in study and academic achievement of students of junior high school. For this purpose the researcher adopted Non-equivalent pre-test-post-test Quasi Experimental design to conduct the study. The data were collected from 167 students (82 girls and 85 boys) of class 8 from two CBSC schools of Banaras Hindu University. The statistical techniques such as Mean, Median, Mode, SD, Skewness, Kurtosis, etc. Levene's test of equality of error variance. F test and ANCOVA had been used to analyse the data. From the findings of the results it was found that both cooperative learning method and traditional teaching method are equally effective in developing the level of civic sense. In case of civic responsibility cooperative learning was found to more significant than traditional method. Also cooperative method of learning found to be more significant in developing Academic Interest than the traditional one. Regarding academic achievement also cooperative method of learning found to be more significant than the traditional one.

Janet Susan Blankenburg et al. (2016) conducted a study to examine the structure of science interest among German 6th-grade students, focusing on biology, chemistry, and physics as specific contexts along with various activities. The study involved a sample of 474 students aged 11 to 12 years. Using confirmatory factor analysis, the researcher validated a hypothetical model of interest that integrated the full range of early school science with Holland's RIASEC framework, ultimately determining that students' interest in science is best represented by a cross-classified model incorporating latent context and activity factors. The findings showed that students were most engaged by investigative and hands-on activities across all science contexts. Additionally, notable gender differences emerged: girls showed greater interest in artistic and realistic activities, particularly within biological contexts, while boys demonstrated higher interest in social and physics-related activities compared to girls.

Ahmad et al. (2015) investigated the effectiveness of Multiple Intelligence Theory (MIT) into History teaching to enhance motivation among low –-achieving secondary students in Malaysia. A quasi-experimental design was employed upon 68 students forming two groups as treatment group and control group with 34 students in each. The MIT based instructional strategies was applied to the treatment group and conventional teaching to the controlled group. Statistical analysis revealed significant increases in motivation levels

in the treatment group compared to the control group, indicating that MIT integration facilitates more dynamic, student-centered learning experiences that tap into diverse intelligences—verbal-linguistic, kinesthetic, interpersonal, musical, and logical-mathematical—thereby improving engagement and academic inclination in History.

Essien, Essien Ekpenyong, et al. (2015), conducted a study to assess the relationship between the students' interest towards social studies and their academic achievement in tertiary institutions in Cross River State, Nigeria. The researcher adopted ex- post facto research design for the study. 753 students were selected randomly to collect the data with the help of Students' Interest in social Studies Questionnaire (SISSQ) and Social Studies Achievement Test (SOSAT) for the study A sample of seven hundred and fifty-three (753) students was randomly selected for the study. To study the relationship between the students' interest and their academic achievement Pearson product moment correlation analysis was adopted. The findings revealed that students' interest in social studies significantly relate to their academic achievement in the subject.

Chandrasekaran (2014) conducted an experimental study to assess the development of four science-related constructs—scientific interest, scientific attitude, critical thinking, and creative intelligence—within the context of biology learning. Students in the biology class of IX grade at higher secondary institutions were randomly assigned to either the experimental or control group. Pre-test scores were used to ensure equivalence between the groups. The control group was taught four biology chapters using traditional methods, while the experimental group received instruction based on Synectics' teaching model over a period of twelve weeks. Analysis of pre-test and post-test scores revealed that the experimental group demonstrated significantly greater improvements in scientific attitude, creative intelligence, and critical thinking compared to the control group. Thus, the study concluded that the Synectics teaching model effectively fosters the development of creative intelligence and critical thinking abilities among biology students. Moreover, education has served as a foundation for numerous individuals both within the political sphere and beyond.

Patrice Potvin and Abdelkrim Hasni (2014) conducted a study to examine factors contributing to the decline in interest in school science and technology. The research involved 2,628 students from grades 5 to 11 in Quebec, Canada. A questionnaire was used to investigate various factors, including both in-school and out-of-school preferences, perceived difficulty, importance, and frequency of engagement, tracking these closely

related variables over a seven-year period. The results revealed an overall decline in interest related to in-school science and technology factors, while interest and engagement in out-of-school science and technology activities, as well as in science and technology studies and careers, showed improvement. Additionally, the study analyzed and interpreted some shorter-term fluctuations by comparing them with changes in certain teaching practices.

A descriptive survey research was conducted by **Yadav and Singh (2011)** to compare the attitudes and social skills of undergraduate students toward computers. Data was collected from arbitrarily selected A random sample of 320 undergraduate students from the urban and rural sections of Kanpur, Uttar Pradesh, was chosen. The selected cohort in the study was administered the Social Competence Scale and the Computer Attitude Scale. According to the results, the social competence of undergraduate male students was superior to that of their female counterparts, and the social competence of undergraduate urban students was superior to that of rural students. No difference was observed between male and female students; however, a significant disparity in attitudes toward computers was observed between undergraduate urban and rural students.

Mariya Yukhymenko (2011) conducted a meta-analysis to examine the effects of the GlobalEd Project, a web-based educational intervention focused on international negotiations within the social studies curriculum, on middle and high school students' interest in social studies and their negotiation self-efficacy. The study found that participation in the project significantly enhanced students' interest in social studies for both middle and high school groups, and improved negotiation self-efficacy specifically among high school students. The intervention had different impacts on the two groups, with a greater increase observed for high school students. Additionally, significant moderating effects related to the demographic composition of the samples were identified for both social studies interest and negotiation self-efficacy. Finally, after accounting for school-related factors, a higher proportion of students intending to attend college and those who watch national news were associated with increased interest in social studies.

G. Singaravelu (2010) aimed to evaluate the development of the affective domain—covering attitudes, values, and emotional growth—among higher secondary students and teachers at a government school in Coimbatore, emphasizing the frequently neglected importance of this domain in comparison to the cognitive and psychomotor domains. Utilizing a survey methodology, the research involved 100 Standard XII students and 10

teachers, who completed self-developed questionnaires and opinionnaires to capture their views and behaviors regarding the three learning domains. The findings revealed that students placed significant emphasis on the cognitive domain, showed average concern for the psychomotor domain, and gave very little attention to the affective domain; teachers' responses echoed this neglect. The chi-square analysis demonstrated a significant association between male and female teachers' opinions regarding the affective domain, underscoring a broad consensus on its neglect. The study concludes that the underdevelopment of the affective domain has societal consequences and recommends curricular reforms and teacher training to promote affective learning outcomes.

Steinmayr, Ziegler, and Trauble (2010) conducted a study to investigate the relationship between sustained attention, intelligence, and academic achievement within a non-clinical population. The research involved 231 students from the eleventh and twelfth grades. Predictors included a performance score of 82, along with assessments of sustained attention, linguistic ability, arithmetic skills, and general intelligence. Academic achievement was measured using grades in mathematics and German, as well as overall Grade Point Average (GPA). The results showed that both measures of sustained attention were significantly associated with academic performance, but only the quality of performance score added predictive value for academic success beyond intelligence quotient (IQ). Differences in sustained attention notably affected the link between verbal IQ and German grades, while quality of performance influenced the relationship between general intelligence and GPA, as well as between numerical intelligence and mathematics grades. This study provides insight into how sustained attention and intelligence jointly relate to academic outcomes in a non-clinical student sample.

2.1.5 Study related to Psychomotor domain

Amorim et al. (2024) conducted a study to explore the relationship between psychomotor skills and academic performance in 350 children, both with and without disabilities, attending mainstream schools in Portugal. The researchers used standardized assessment instruments, including the Neuropsychomotor Functions Assessment Battery for Children (NPmot.pt), Preschool Diagnostic Tasks (PRE), and the School Learning Skills Battery (SLSB), to collect data. The results indicated that psychomotor development was a strong predictor of pre-academic skills but had a diminished impact on academic performance after the age of seven. These findings emphasize the importance of early assessment and

targeted interventions to improve psychomotor skills, supporting the learning and development of all children.

Imam et al. (2024) investigated the effects of Kolb's experiential learning model and Gardner's multiple intelligence model on students' critical thinking and psychomotor skills in Electrical Installation and Maintenance Work in Kaduna State, Nigeria. Employing a quasi-experimental design, 127 National Technical Certificate II students (109 males and 18 females) were randomly selected and assigned to two treatment groups based on intact classes. Data were collected using researcher-developed instruments: the Electrical Installation and Maintenance Work Critical Thinking Test (EICTT) and the Electrical Installation Psychomotor Achievement Test (EIPAT). Mean scores were calculated to answer the research questions, and hypotheses were tested using ANCOVA at a 0.05 significance level. The results indicated that the multiple intelligence model was more effective than Kolb's model in improving students' critical thinking and psychomotor performance. Additionally, gender differences were noted, with male students outperforming females in critical thinking, and a significant interaction was found between teaching method and gender.

Pathak (2023) conducted a study to evaluate the effectiveness of a Drama-Integrated Teaching Programme (DITE) that incorporated various forms of educational drama to enhance Multiple Intelligences among English language learners. The research sample comprised 61 female students, randomly divided into two intact groups: a control group of 29 students who received traditional instruction, and an experimental group of 32 students taught using the DITE approach over 60 days. The Multiple Intelligence Scale by Surbhi Agarwal and Suraksha Pal (2017) was used to measure the students' Multiple Intelligences. Data were analyzed using mean gain scores, standard deviation, and independent samples t-tests. Results showed that the experimental group experienced significant improvements in overall Multiple Intelligences compared to the control group, with substantial gains in Verbal, Musical, Naturalistic, Interpersonal, and Intrapersonal intelligences. However, improvements in Logical, Spatial, Bodily-Kinesthetic, and Existential intelligences were not statistically significant. The study concluded that integrating drama into teaching can effectively enhance specific domains of Multiple Intelligences, particularly Verbal, Musical, Naturalistic, Interpersonal, and Intrapersonal, thereby positively impacting learners' overall intelligence profiles.

Garza et al. (2022) conducted a study involving 321 first-year engineering students (107 females and 214 males) at a private university in northeast Mexico during 2020 to assess their multiple intelligences based on Gardner's theory. Analysis using Kruskal–Wallis tests ($\alpha = 0.05$) revealed gender differences: females scored higher in linguistic and interpersonal intelligences, whereas males scored higher in mathematical and visual intelligences. Additionally, variations among engineering programs were observed—civil engineering students performed best in mathematical, visual, and musical intelligences; sustainability engineering students excelled in naturalistic intelligence; while computer science students had the lowest scores in kinesthetic intelligence. These findings provide valuable insights for developing more inclusive and effective educational strategies.

Xie et al. (2020) developed a teaching model grounded in Multiple Intelligence Theory, incorporating fuzzy mathematics and fuzzy set algorithms. They also explored innovative approaches to college physical education, focusing specifically on basketball instruction as the research subject. Using the framework of Multiple Intelligence Theory, the study analyzed students' sports skills, practical teaching abilities, and cognitive skills. The experimental results revealed that the teaching method, tailored to the students' individual intelligence profiles in the experimental group and involving active communication between teachers and students throughout the instructional period, significantly enhanced the students' thinking abilities.

Muzaffer (2019) compared the learning styles of students involved in individual and team sports through the lens of Multiple Intelligence Theory, focusing on visual, affective, and bodily-kinesthetic intelligences. Using a quantitative design, data were collected from 160 students (80 male, 80 female, aged 13–16) and analyzed using SPSS 22. Results showed significant differences in intelligence domains based on the type of sport. The findings suggest that strength in one intelligence area can positively influence the development of others, supporting the value of integrating Multiple Intelligence Theory into learning and curriculum design.

In their review paper, **Talaghir Laurentiu Gabriel et al. (2019)** explore the multiple psychomotor perspectives in physical education as reflected in specialized Romanian literature. The study accessed six databases representative of Sport Science and Physical Education, identifying various bibliographical sources. The authors found that psychomotricity is a subject approached by specialists from diverse domains such as

medicine, pedagogy, psychology, physiology, and psychiatry. The study highlights the influence of motor activities on psychic and cognitive skills and identifies theoretical aspects like definitions, classifications, concepts, and stages of motor development. The authors conclude that psychomotor content, initially found in recovery or cognitive disorder issues, has been assimilated by physical education and sports specialists. They emphasize the need for further research on the educational potential of movement activities and the importance of adapting teaching methods to the diverse needs of learners. The study underscores the significance of psychomotor aspects in enhancing overall educational outcomes.

Ceylan (2018) in his study included 15 children who participated in a 5-week nature-based program (3 days per week) during the 2016-2017 summer semester. All participants lacked prior experience with outdoor activities, and parental agreement was acquired. The "Self-Assessment Scale in Multiple Intelligence Fields" (Seber, 2001) was used both before and after the program to assess changes in multiple intelligences. The study found significant improvements in all eight intelligence areas: linguistic, visual, mathematical, kinesthetic, social, intrapersonal, naturalistic, and musical ($p < 0.05$). A positive correlation was discovered between linguistic and naturalistic intelligence ($r = 0.59$), but negative correlation was established between kinesthetic and social ($r = -0.59$) and social and intrapersonal intelligence ($r = -0.52$). The study reveals that nature activities have a good impact on children's multiple intelligences.

Johnson (2016) examine how MI can be used to Taekwondo's philosophy of self-cultivation. Three sample plans were offered to demonstrate how teachers can teach Taekwondo physical skills and philosophy concurrently. According to the findings of this study, MI can help teach Taekwondo philosophy more effectively.

Paul, Khanna et al. (2011) studied psychomotor performance as an indicator of training distress in 100 athletes (65 males, 35 females). Using tools like MAPSS, ABQ, CSAI-2, and an eye-hand coordination test on the Vienna Test System, athletes were categorized into high, moderate, and low-risk groups based on MAPSS scores. One-way ANOVA showed significant differences among groups ($p < 0.001$). Findings revealed that higher training distress and load increased burnout and anxiety, while reducing self-confidence—negatively impacting psychomotor performance.

2.1.6 Study done combining all the three domains of learning Cognitive, Affective and Psychomotor domain

Erol et al. (2025) explored how mind and intelligence games (like chess, mancala, and reversi) support cognitive, affective, and psychomotor development in 5th–7th grade students, based on input from 30 students, 10 teachers, and 10 parents. Using interviews and thematic analysis, the study found these games enhanced the cognitive domain in terms of thinking skills, academic performance, decision-making, affective domain in terms of values, social skills, motivation, and attitude and psychomotor domain in terms of coordination, and fine motor abilities.

Owan et al. (2022) investigated the influence of four student-related factors—innate ability, health, motivation, and social capital—on cognitive, affective, and psychomotor skills (CAPs). The study surveyed 870 senior secondary students using validated questionnaires and analyzed the data through hierarchical linear regression. The findings revealed that all four factors significantly predicted learning outcomes in all three domains. Interestingly, social capital was found to diminish the effect of innate ability, regardless of students' health and motivation levels. This study underscores the importance of adopting a holistic approach to evaluating student performance that goes beyond cognitive measures alone.

The study by **Dalkıran, Eryiğit, and Sivri (2020)** investigated the comparative impact of constructivist learning on the cognitive, affective, and psychomotor domains in physical education classes among middle and high school students. Utilizing an experimental research design, the authors assigned 97 students to control and experimental groups, with the latter receiving instruction guided by constructivist principles over an 11-week period. The findings indicated a significant positive impact of constructivist learning on students' cognitive and psychomotor outcomes, as evidenced by higher performance in both domains compared to the control group. Although no significant difference was found in the affective domain for the experimental group, a decline in attitudes was observed among control group high school students, suggesting traditional methods may diminish motivation.

Dorji et al. (2020) explored the effects of Early Child Care and Development (ECCD) education on elementary students' cognitive, affective, and psychomotor skills in five schools in Chhukha district over one year (2019–2020). Using both qualitative and quantitative methods, data were collected from 73 teachers and observations of 6 students. Findings showed ECCD had a positive impact on student performance, with the strongest effect on psychomotor skills, followed by affective and cognitive domains. The study recommends designing a balanced ECCD curriculum to support all three learning domains equally.

The study by **El Iq Bali and Musrifah (2020),** titled *"The Problems of Application of Online Learning in the Affective and Psychomotor Domains During the Covid-19 Pandemic"*, presents a qualitative analysis of the challenges faced in Islamic religious education within affective and psychomotor learning domains amid the shift to online instruction. Conducted at Miftahul Ulum Islamic Senior High School in Probolinggo, the research highlights that while cognitive learning could still be somewhat managed through assignments, affective aspects such as student interest, honesty, responsibility, and discipline were significantly hampered. Similarly, psychomotor development, particularly in skill-based practices like funeral prayer rituals, was constrained due to the lack of physical interaction and hands-on engagement. The study attributes these difficulties to factors including limited access to technology, inadequate teacher preparedness, and insufficient supervision at home. Despite the use of familiar platforms like WhatsApp for accessibility, the paper concludes that online learning lacks the capacity to fully support affective and psychomotor outcomes, advocating for a return to face-to-face learning to ensure holistic student development.

Noor et al. (2020) examined student performance across cognitive, affective, and psychomotor domains in two embedded diploma courses—Basic Soil Mechanics and Basic Hydraulics—with 406 and 336 students respectively. Assessments emphasized cognitive skills (60%), psychomotor (30%), and affective (10%). Results showed students performed better in psychomotor and affective domains. Spearman's correlation revealed a positive link between performances in both subjects ($r = 0.039$ and $r = 0.268$, $\alpha = 0.05$). The findings highlight the importance of holistic assessment to develop industry-ready graduates.

Supertini et al. (2020) intended to develop and evaluate products in the form of song and movement-based learning approaches to improve children's cognitive and psychomotor abilities. This research and development used Thiagarajan, Semmel, and Semmel's 4D theory. This research consists of four phases: definition, product design, product development, and dissemination. This study's data analysis employed both qualitative and quantitative methods, with instruments such as questionnaires, product validation sheets, and learning observation sheets. The findings revealed that this learning method had a higher level of validity, practicality, and efficacy in improving children's cognitive and psychomotor abilities than the norm.

Deepa V (2017) conducted an experimental study the effectiveness of Multiple Intelligence Approach in fostering psychological and educational attributes such as academic achievement, self - esteem, study habit and attitude of class IX students towards biology. For this, the researcher selected a total number of 60 students for both experimental and controlled group. From the study it was found the group which was taught with the help of the M.I. approach scored higher than the group which was taught with the conventional method in all the attributes such as academic achievemednt, self esteem, study habit and attitude towards biology. However, in case of gender no difference was found between the scores of boys and girls student.

Sonmez (2017) examined whether Sonmez's model, which links cognitive, affective, psychomotor, and intuitive learning domains, is supported by empirical evidence. Using both qualitative and quantitative methods, findings showed a strong positive correlation among all four domains, suggesting that learning in one area is connected to others. The results support the idea that these domains function together in the brain. The study recommends further research to explore this integrated learning model.

2.2.0 Insight from the Review of Related Literature

From the reviews done so far by the researcher regarding the present study the researcher found Multiple Intelligence Approach to be mostly effective in the teaching learning process. However, the approach has been used mostly in the area of natural science or physical science subjects, language subject, professional courses and only a few social science subject areas.

Also, regarding competency in learning, most research has been done in competence regarding teaching, professional courses, business, competence in a profession and competency in subject like science, language, technical subjects, etc. Only few research studies were done on regarding the competency in the area of social science subject. As new policies such as NEP 2020 NCF 2005, etc. has recommended regarding Competency-Based Learning so it is high time to recognise it. Hence the researcher found a research gap regarding the use of Multiple Intelligence Based Instructional Approach in achieving learning competency towards Social Science subject.

2.2.1 Conceptual Framework of the Study

The present study is grounded in Howard Gardner's Theory of Multiple Intelligences (1983), which posits that intelligence is not a singular construct, but a multidimensional phenomenon that encompasses a variety of cognitive capacities. Gardner originally identified seven intelligences—linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, and intrapersonal—and later added naturalistic and existential intelligences (Gardner, 1999). This theoretical paradigm shifts away from traditional IQ-based assessments and supports differentiated instruction tailored to diverse learner profiles. In the context of curriculum transaction in Social Science, this approach can significantly influence the teaching-learning process by aligning pedagogy with students' unique intelligence profiles, thereby enhancing their engagement, comprehension, and retention.

The **curriculum transaction** refers to the dynamic, bidirectional process of delivering curriculum content through instructional strategies, learner participation, and contextual adaptations (NCERT, 2005). In Social Science education at the secondary level, curriculum transaction is crucial for fostering critical thinking, civic awareness, historical consciousness, and socio-political understanding. However, conventional methods such as rote learning, textbook dependency, and one-size-fits-all teaching models often fail to accommodate learners with varied cognitive styles and intelligences (Aggarwal, 2008). This misalignment may hinder the development of *learning competency*, which includes cognitive (knowledge-based), affective (value-based), and psychomotor (skill-based) dimensions of learning.

Learning competency is defined as the learner's ability to demonstrate desired learning outcomes in a subject through understanding, application, analysis, and value

internalization (Delors et al., 1996; Anderson & Krathwohl, 2001). In Social Science, this encompasses knowledge of historical facts, geographical concepts, civic ideals, and socio-economic structures along with the capacity for empathy, decision-making, and participatory citizenship. Multiple Intelligence (MI)-based instruction enables the creation of multifaceted learning environments that integrate storytelling (linguistic intelligence), debates (interpersonal), model-making (spatial), fieldwork (naturalistic), and music or dramatization (musical, bodily-kinesthetic), thereby facilitating holistic competency development.

From a **constructivist pedagogical perspective**, MI-based instruction aligns with the view that learners construct knowledge actively through meaningful experiences (Bruner, 1966; Vygotsky, 1978). The Social Science classroom, being an interdisciplinary and humanistic domain, benefits from such experiential learning, which encourages students to relate historical events, civic issues, and geographical phenomena to their real-life contexts. The MI-based approach promotes *curriculum contextualization*, which helps bridge the gap between abstract concepts and practical understanding. For instance, a student strong in musical intelligence may compose a rap on the French Revolution, while another with logical intelligence may create a timeline chart explaining historical cause-effect relationships.

Furthermore, Gardner (1999) emphasized the instructional utility of MI theory in "pluralizing" teaching, whereby a concept is presented in multiple formats to appeal to different intelligences. This strategy also supports the principles of Universal Design for Learning (UDL), fostering inclusivity and equity in the classroom. In secondary Social Science education, where abstract concepts like democracy, colonialism, or globalization are taught, using MI-based strategies helps translate complex ideas into accessible knowledge forms for diverse learners.

Research supports the efficacy of MI-based instruction in enhancing student performance, engagement, and motivation. Studies by Tirri & Nokelainen (2011), Singh (2017), and Sharma & Kaur (2021) reveal that students taught through MI-aligned activities exhibit higher academic achievement, better social interaction, and more positive attitudes towards learning. In the context of Assam, where secondary school classrooms are often multilingual and socio-economically diverse, the MI approach can bridge learning gaps and promote equity by personalizing instruction.

In light of these theoretical and empirical perspectives, this study conceptualizes the relationship between MI-based instructional strategies and the achievement of learning competencies in Social Science. The framework assumes that when curriculum transaction is aligned with students' multiple intelligences, it leads to enhanced comprehension, retention, and application of knowledge, values, and skills essential in Social Science learning. Thus, the independent variable is the **MI-based instructional approach**, the intervening variable is **curriculum transaction**, and the dependent variable is **learning competency** (encompassing cognitive, affective, and psychomotor domains).

This relationship is also moderated by **teacher effectiveness**, **student learning style**, **available resources**, and **institutional support**, which may influence the degree of impact. The MI-based approach is not intended to label students or create rigid categories, but rather to serve as a flexible pedagogical tool that allows educators to diversify and adapt instruction, thereby maximizing student potential across varied intelligences.

Ultimately, the conceptual framework highlights the integrative role of MI theory in redefining curriculum transaction processes and advancing learning outcomes in Social Science education. The assumption is that if teachers utilize strategies aligned with students' diverse intelligences, the result will be more inclusive, meaningful, and competency-driven learning experiences. The proposed framework is represented in the conceptual diagram below

Figure: 2.1 Visual representation of Conceptual framework of the Study