

**Chapter 2 -
Review of
Related
Literature**

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2.1 Introduction

Through research, global body of knowledge gets continuously built and enriched. Each individual researcher contributes to this body of knowledge in some aspects of the subject he/she studies. Thus, it is essential for all researchers to take stock of all existing relevant literature; to assess the depth and breadth of knowledge already developed and to identify the gaps that help them to sharpen the scope and focus of their studies. Literature review helps to develop understanding and clarity of various researches, debates and issues that have already been conducted on the topic. It helps to build knowledge, concepts, research methodology, experimental techniques and the ways how concepts are applied to real life problems. It provides an insight as to how the research findings are presented. Literature review is, thus, a comprehensive summary of previous researches done on a specific area/topic and the critical evaluation of the literature in relation to the problem being researched.

In this Study, the Researcher carried out review of relevant literature under the following themes -

1. Constructivism and Constructivist Teaching
2. Teaching-learning Principles/Methods
3. Learning Styles and Study Habits
4. Emotional and Social Intelligence
5. Multiple Intelligence
6. Technology in Constructivist teaching
7. Constructivist Teaching of Various Subjects
8. Studies specific to 5E approach.

Literature review provided the platform and the basis to conduct the present study.

2.2 Studies on Constructivism and Constructivist Teaching

Social Science is the interdisciplinary study of the development of human society and its associated knowledge and understanding through the study of different subjects such as history, geography, political science, economics etc. Teaching of Social Science has predominantly been simple transmission of information primarily via

teacher centric approaches. In contrast, the Constructivism philosophy postulates that people learn best when knowledge is constructed by them based on their previous knowledge and experience. John Dewey (1859–1952) was one of the leading advocates of Constructivism Theory. Bruner (1915–2016) and Piaget (1896–1980) were the main proponents of Cognitive Constructivism while Vygotsky (1896–1934) was the major theorist for Social Constructivism. Dewey (1938) in his work *Experience and Education* emphasized the importance of previous experience and knowledge that play key role in the development of understanding. Bruner (1961) built on learning through dialogue, encouraging the learners to enlighten themselves through reflection. In this way, learning becomes a process of discovery where learners build their own knowledge on their existing knowledge with active dialogues with the teachers. Vygotsky (1934) developed theory of Social Constructivism. According to him, every function in the child’s cultural development appears twice: first, on the social level (inter-psychological) and then inside the child (intra-psychological). He emphasized the role of language and culture in cognitive development. The main concept of constructivism is that students bring prior knowledge into a learning situation in which they analyze and re-evaluate their understanding. This process of interpretation, articulation and re-evaluation is repeated till they comprehend the subject. Doolittle et al (2003) said that teachers need to become facilitators of knowledge. Another role of the teacher is knowledge exploration as they redirect the focus and rationale of the lesson. According to Cannella, et al (1994) and Richardson (1997), learning activities in a constructivist setting involves students’ active engagement, inquiry, problem solving, and collaboration with others. According to Zevin (2015), correct answers and single interpretations are de-emphasized in constructivist learning.

Learning is collaborative and is an outcome of dynamic interaction amongst the learners, teachers and tasks. McCray (2007) in his Study ‘Constructivist Approach: Improving Social Studies Skills and Academic Achievement’ concluded that in constructivism philosophy, we construct our own understanding by reflecting on our experiences. Each person develops his/her own mental models. Learning is the process of adjusting our mental models to accommodate new knowledge. Hoagland (2000) advocated application of constructivist concepts to the teaching of Social Studies in order to positively impact the learning process. As per McKay (1993), teacher collaborates and participates with the children in constructing reality by engaging

open-ended inquiry that addresses and clarifies students' doubts. Brooks et al (1993) in their book "In search of Understanding- The Case for Constructivist Classroom" provided five principles of constructivist pedagogy - posing problems of emerging relevance to students, structuring learning around primary concepts, seeking and valuing students' points of view, adapting curriculum to address students' suppositions, and assessing students' learning in the context of teaching. Teague (2000) in his Study, "Social Constructivism & Social Studies", said that the fundamental purpose of social studies is to educate students on how to become effective citizens. While history, geography, political science and economics are commonly associated with social studies, it covers other disciplines like sociology, anthropology, psychology, philosophy, and many others (Martorella, 1997). The teacher should realize that multiple perspectives exist in the world on nearly every issue (Rice et al, 1999). According to Ediger (2000), teachers of social studies need to use a variety of methods to help each learner to perform since each one has different learning styles and level of intelligence. It is thus, the responsibility of the teacher to determine the best way to teach so that his/her students learn. Problem solving activities provide the student authentic learning experiences (Cole et al, 1991). Primary role of a teacher in a social constructivist classroom is that of a guide and a facilitator. The other role is to redirect the focus and rationale of the lesson. Brown (1999) contends that it promotes thinking in classrooms and in the evaluation process. Learning and development through cooperative learning leads to social collaborative activities (Rice et al, 1999). This type of activity requires students to work primarily in groups (Brooks et al, 1993). Cooperative learning requires the students to collaborate and critically analyze the issue at hand, which help them develop higher-level thinking skills. Friesen et al (2013) in his document, "Inspiring Education" (2010) for the Alberta Ministry of Education, Canada to guide education in Alberta till 2030 advocated students to develop competencies through a process of inquiry and discovery. Heard (2007) in his Study, "My Experience Incorporating Constructivist Teaching Strategies within an Art Education Classroom" experienced a positive impact on student learning and a student-centered learning environment due to constructivist teaching. Singh (2015) in his Study, "Constructivist Paradigm in Teaching-Learning Process" observed that while behaviorism believes that teaching consists of transferring knowledge from outside to the learners, in constructivism, learners construct their own knowledge.

The study proposed the following shift in teaching- learning process (Refer Table 2.1 below):

Table 2.1
Shift in Teaching-Learning Process

Sr. No.	Teaching-Learning Process during Normal Class	Teaching-Learning Process during Constructivist Class
1.	Lesson is introduced by asking questions or by lecturing or problem solving on board	Lesson is introduced by demonstrating study materials, narrating story and giving content on paper to read and answer the question
2.	Focus is on description, explanation and completion of topic	Focus is on to engage learners in learning task either in classroom or in field
3.	Learners are passive listeners	Learners are actively involved in exploration of contents
4.	Learners are asked to complete homework	Learners are expected to complete tasks and present
5.	Teacher as informer and explanatory	Teacher as facilitator, guide and manager
6.	Evaluation is necessary and rigid	Evaluation is flexible and simple

Tay (2013), in his Study “Alternative Assessment Methods in Social Studies” proposed assessment methods like performance/project-based evaluation, attitude scales, Self, peer and group evaluation, interview, concept maps, rating scales, etc.

2.3 Studies on Teaching-Learning Principles/Methods

Caine, et al (2008) in their book “12 Brain/Mind Learning Principles in Action – Developing Executive Functions of the Human Brain” (2nd edition), discussed on how human beings learn and place that understanding at the very centre of teaching. They developed a set of 12 Brain/Mind Learning Principles that summarize what we presently know about learning. Some of the major learning principles are advocating engagement in social interaction, ensuring emotional connect, developing ability to perceive both details and the larger view, encouraging individual style and uniqueness. Karaduman, et al (2007) in their book “The Effect of Constructivist Learning Principles based Learning Materials to Students’ Attitudes, Success, and Retention in Social Studies” observed that Social Science functions as an umbrella that interconnects many other disciplines. It prepares students for citizenship in democracy (Barr et al, 1978). Social Science guides

students to develop a broad understanding of the political and economic developments as well as general world knowledge about the environment in which they live in. It has been a teacher-centric education in Social Science where learning is mainly through memorization (Yanpar, 2001). On the other hand, constructivist approach enables students to learn through practicing, problem solving and decision-making activities (Fontana, 1997). Constructivist learning derives benefits like Collaborative Learning, Ownership in Learning; Case based Learning and Situated Learning. Li (2012) in his study, "Approaches to Learning: Literature Review", reviewed learning related theories and their implementation at the school and classroom levels. Students learn to solve real problems by asking questions, investigating, gathering and analyzing data, making interpretations, creating explanations and drawing conclusions (Marx et al, 2004). Inquiry processes address critical thinking, creative thinking, self-regulated learning skills, metacognitive ability and communication skills (Hmelo-Silver et al, 2007). The role of the Teacher was that of a facilitator in problem-based learning. The required knowledge and skills were achieved in the process of solving authentic problems (Barrows, 1996). Researchers have also studied the Situated and Embodied Cognition Model - As people interact with the environment and acquire knowledge, it needs to be grounded in socially and culturally acceptable mediums (Barab et al, 2007). For example, mathematics concepts can be embedded in authentic contexts, so students are able to visualize and understand the problem (Bransford et al, 2000). Self-regulated learning model involves metacognition, motivation and thinking strategies (Schunk et al, 2000).

Collins et al (1991) provided guidelines for applying the Cognitive Apprenticeship Model in the classroom that involves identifying the processes of a task and how the task can be accomplished, ensuring the tasks are situated in authentic contexts, diversifying the contexts. Several Studies have focused on the effectiveness of Collaborative Learning in which students solve problems together (Teasley et al 1993). As per social constructivism concepts, learners construct knowledge through interacting with others (Atwater 1996). Franzoni et al (2009) in their Study "Student Learning Styles Adaptation Method Based on Teaching Strategies and Electronic Media" presented a general framework for combining learning styles, teaching strategies and electronic media. Learning style is defined as the characteristics and preferences in the way people receive and process information. It refers to the fact that

every person has his own method of learning. Various teaching strategies are used by the teachers to facilitate and instill a deeper understanding of the information in the students. It includes games, role plays, case studies, presentations, Q&A, group work etc.

2.4 Studies on Learning Styles & Study Habits

Each person has a preferred style of learning. It is important for the teacher to know it to ensure effective teaching-learning process. Stewart et al (1992) defined learning styles as those educational conditions under which a learner is most likely to learn. Most of the models of learning styles include auditory, kinesthetic and visual. Kolb (1984) prescribed his model of learning styles as divergers, convergers, accommodators and assimilators. Divergers are the “why” learners. They think deeply and learn from logical instruction or hands on experience that leads to discovery. Convergers are “how” learners. They think about things and then try them out. Accommodators are the “what if” learners. They are completely hands on learners. Assimilators prefer to think than to act. They learn better through lectures and reading. Csapo et al (2006) in their Study, “The Role of Learning Styles in the Teaching/ Learning Process”, carried out an analysis of types of learning styles for a variety of students at different grade levels through completed questionnaire of over 2000 students. This study found that the predominant learning style type was auditory.

2.5 Studies on Emotional Intelligence (EI) and Social Intelligence (SI)

The importance of Emotional Intelligence (EI) and Social Intelligence (SI) in effective teaching is paramount. Use of emotional intelligence is a pre-requisite for developing good relationship with the students, to create more engagement, greater motivation, more positive approach, more collaboration and creativity. While EI deals with intrapersonal relationship, SI deals with interpersonal relationships. Teacher must possess good knowledge of EI and SI to become effective in the teaching-learning process and be accepted by the students. If it happens, the outcome will be positive. Cohen (2014) in his Study, “What is Social Intelligence?”, described Social Intelligence as a combination of understanding of people and the skills needed for interacting successfully with them. In other words, it is the ability to get along with others and to encourage them to cooperate. Social intelligence has five dimensions – presence, clarity, awareness, authenticity and empathy.

Goleman, through his books, “Emotional Intelligence” (1996) and “Social Intelligence” (2005), elevated the status of emotional and social intelligence in the

field of education. Emotional Intelligence is about self-mastery while Social Intelligence is the ability to lead and inspire other people through influence, empathizing and caring. Emotional Intelligence is the ability to manage emotions and inner potentials for positive relationships. Thorndike (1920) in an article titled “Intelligence and its Use” in Harper Magazine defined Social Intelligence as the ability to understand and manage men and women, boys and girls – to act wisely in human relations. Moss et al (1927) explained Social Intelligence as the ability to get along with others. Albrecht (2006) explained Social Intelligence as the ability to get along well with others that reduce conflict, create collaboration and drives people to achieve common goals. Stricker et al (1990) noted that there are few studies that have correlated Social Intelligence with performance outcomes. Brackett et al (2006) in their Study, “Emotional Intelligence in the Classroom: Skill-Based Training for Teachers and Students”, observed that successful schools ensure that all students acquire basic skills e.g. reading, math and have strong backgrounds in other subject areas like science, history etc. Recently, however, educators and parents have begun to support a broader educational agenda – one that enhances teachers’ and students’ social and emotional skills (Greenberg et al, 2003). Ramana (2013) in his Study, “Emotional Intelligence and Teacher Effectiveness – An Analysis”, found that the emotional competence of teachers is necessary for effectiveness and quality in carrying out teaching–learning processes in the classroom. Jadhav (2015) in her Study “Enhancement of Social Intelligence of Student Teachers” found that people with high Social Intelligence have awareness of other people’s feelings and use this understanding to manage social situations appropriately. Nagar (2015) in his Study, “Social Intelligence – Meaning, Relation and Importance”, recommended that National Policy of Education should include teacher training programs in order to enhance teachers’ social intelligence. Such programs will assist teachers in developing better strategies for classroom management. Bhadouria (2013) in her Study, “Role of Emotional Intelligence for Academic Achievement for Students”, found that teaching of emotional and social skills at school not only positively influence academic achievement during the year but also leave the impact for a long period of time.

2.6 Studies on Multiple Intelligence (MI)

Gardner (1983), a psychologist and a professor at Harvard University formulated the theory of Multiple Intelligence (MI) that identifies nine unique intelligences through which individuals learn and teach new information. Gardner defined first seven

intelligences in “Frames of Mind: The Theory of Multiple Intelligences” (1983) and the last two in “Intelligence Reframed: Multiple Intelligences in the 21st Century” (1999). In “Frames of Mind”, Gardner said that it is not how smart a person is but ‘how’ is he smart, which is important. Nine intelligences of Gardner are verbal-linguistic intelligence, logical-mathematical intelligence, musical intelligence, visual-spatial intelligence, bodily-kinesthetic intelligence, interpersonal intelligence, intrapersonal, naturalist intelligence, existential intelligence. Gardner (1993, 2006) in his book, “Multiple Intelligence: New Horizons”, presented a different view of school as, a pluralistic view of mind, recognizing many different and discreet facets of cognition, acknowledging that different cognition strengths and contrasting styles. He advocated the concept of individual-centered school that takes this multi-faceted view of intelligence seriously. Xie et al (2009) in their Study, “Research on Multiple Intelligences Teaching and Assessment”, said that Multiple Intelligence could provide teachers with more choices in teaching and assessment methods, but also allow students to demonstrate what they have learned in different ways. Some components of Multiple Intelligence teaching are (a) critical thinking, (b) passion and enthusiasm for the surrounding, (c) courage to try new things, (d) creativity and skills, (e) generosity and tolerance, (f) keen observations (Rockwood, 2003). Fierros (2004) of Villanova University, in his Study “How Multiple Intelligences Theory Can Guide Teachers’ Practices: Ensuring Success for Students with Disabilities”, dealt with the relationship between Multiple Intelligence (MI) and increased student outcomes. This Study reviewed the use of MI through project in schools using MI theory. It was found that teachers and administrators realized the power of MI for all students, irrespective of those with learning differences. Multiple Intelligences needs to be used effectively since each student is different and has their own preferred way of learning.

2.7 Studies on Technology in Constructivist Teaching

Doolittle et al (2003) in their Study, “Constructivism as a Theoretical Foundation for the Use of Technology in Social Studies,” brought out the impact of technology on constructivist teaching as proposed by various researchers.

National Council for Social Studies (NCSS, 1992) has advocated integration of technology, especially internet into Social Studies classroom. Likewise, many social studies educators (Berson et al, 2001; Braun et al, 1999; Hope, 1996; Martorella, 1997; Yeager et al, (1995); White (1999); Hooper et al (2000) and Lorsbach et al (1999) have also advised the same. Amongst others, Braun et al (1999); Cogan et al (2000)

proposed to explore the world through use of interactive technologies. Berson et al, 2001; Braun et al, 1999; Scott et al, 2000 favored the use of a range of internet technologies in teaching of Social Studies. Diem (1999) said that the challenge for the social studies teacher is to find how to use the new tools and techniques to increase students' understanding of the content and improve the skills to use technology effectively. Fontana (1997) argued that challenge must be undertaken by social studies educators to maintain its vitality, direction, and integrity.

Technology provides a platform for students to collaborate with one another. Martin-Stanley et al (2007) in their Study, "Constructivism and Technology: Strategies for Increasing Student Learning Outcomes", discussed the findings of various researchers. Technology has been found to be used in many classrooms to foster meaningful learning experiences (Jonassen et al, 1999). Several studies have investigated the role of technology in enhancing the teaching-learning process in constructivist classrooms (Black et al, 1995; Brush et al, 2000; Collins, 1991; Duffy et al, 1996; Richards, 1998). Applying a constructivist approach in a classroom using technology creates more learning opportunities. For example, online activities provide students with unlimited access to information and tools for creativity and development, self-motivation, and critical thinking. Berson (2000) in his Study "Rethinking Research and Pedagogy in the Social Studies: The Creation of Caring Connections through Technology and Advocacy", argued that reform of schooling related to Social Studies lies in establishing interdisciplinary and inter-professional collaboration and the infusion of technology into practice. Bell (2001) in his Study, "Preparing tomorrow's Teachers to Use Technology: Perspectives of the Leaders of Twelve National Education Associations", recommended the need of teachers' training on technology. Social Studies educators recommend some specific technology tools like digital resource centers, digital video cameras, handheld computing devices, video conferencing, electronic whiteboards, statistical software packages, internet, presentation software, etc. Diem (2000) in his Study "Can it make a difference, Technology and the Social Studies" said that use of new technologies has created reorganization in the way teachers teach in the class and students learn. However, traditional teacher-centric instructional paradigms have not changed much as many teachers have not used computer technology or have just started to use it. There is a need for a holistic research on the effects of technology on student participation, curriculum implementation, technology integration and classroom

dynamics. Rice, et al (1999) in their Study, “How Technology Aids Constructivism in the Social Studies Classroom”, stated that technology can be used to support social constructivism by using collaboration in problem-solving. Technology tools like simulation, video discs, multimedia/hypermedia, and telecommunications can be used in constructivist learning in the social studies classroom. Saye, et al (1999) in their Study, “Student engagement with social issues in a multimedia-supported learning environment”, said that technology can help Social Studies classrooms in solving problems. The future state of constructivism will flourish in the form of the ‘learning sciences’ where technology is a very important tool to promote learning in powerful ways. Jha (2017) in her Study, “ICT Pedagogy in Higher Education: A Constructivist Approach” discussed as how Information and Communication Technology (ICT) plays a role in constructing knowledge. Firstly, ICT is useful in constructing new knowledge that helps learners and teachers to interact in a creative and meaningful way and secondly, the learners use ICT to make meaning of the contents and context of their own surrounding.

2.8 Studies on impact of Constructivist Teaching in Higher Education and at the school level in various subjects.

In almost last two decades, various studies have been conducted on the Constructivist teaching approach of different subjects to understand its effectiveness. Mostly, experimental method has been adopted where two groups – Experimental Group and Control Group were formed. Constructivist teaching was administered to the experimental group while traditional method was used for the control group. Pre-Tests and Post-Tests were conducted, and the Mean Achievement Scores were obtained and statistically analysed.

Studies on Constructivist teaching in Teacher Education

Khalid et al (2012) in their Study, “Constructivist Vs Traditional: Effective Instructional Approach in Teacher Education” compared the instructional module based on constructivist approach with the traditional approach in teacher education and concluded that the significant improvement of experimental group may be due to teaching with constructivist approach. Similar finding by Tandel (2012) was reported in his Study titled “Development of Metacognitive Skills in Science Student- Teachers through Constructivist Approach”. The Study found that Engage, Explore, Explain, Elaborate and Evaluate phases of the constructivist approach provided more meta

cognitive writing and meta cognitive regulation behavior and there was significant development of evaluating skill, metacognitive regulation in science student-teachers through this approach. Rajendran (2012) in his Study on “Constructivist Approach to Environmental Education among Pre-Service Student Teachers” observed the extent to which the student-teachers engage their learners on understanding environmental concepts/issues through constructivist classroom experience. The researcher concluded that constructivist classrooms facilitated better understanding on environmental concepts - a significant difference was found between the post-test results of treatment and control groups in favour of the treatment groups.

However, there have also been research studies where it was found that overall; the achievement of the treatment group was not significantly higher than that of the comparison group like Pettitt (2008) found in his study, “A Comparative Study of Traditional/Constructivist Teaching Methods Used in Algebra Classes for Preservice Elementary Teachers”.

Studies conducted on Constructivist teaching at the School level - Pure Science

Several research studies have been conducted both in India and abroad at the school level to research the impact of constructivist methodology on academic achievement. Adak (2017) studied “The effectiveness of Constructivist Approach on Academic Achievement in Science at Secondary Level” and concluded that the experimental group students achieved significantly better score compared to control group, exposed to traditional method of teaching. Qarareh (2016) studied “The Effect of Using the Constructivist Learning Model in Teaching Science on the Achievement and Scientific Thinking of 8th Grade Students” and found statistically significant difference between the students’ post-test scores of scientific thinking which was attributed to the teaching method. Roy Chowdhury (2016) too, found in his research study, “Effect of Constructivist Approach on the Achievement in Mathematics of IX Standard Students” that the post-test mean, SD, t-Value of scores for two groups indicated that performances of experimental group was significantly better than that of control group. Parasurama (2016) in his Study “An Impact of Technology Based Constructivist Teaching (TBCT) on academic achievement of IX Standard Students of Bengaluru City” also concluded that students of TBCT group constructed knowledge better with the help of technology. Barman et al (2015) and Owusu (2015) reported through their Studies that the constructivist teaching method was found to be significantly more effective. Similarly, Fathima (2015), Satyaprakasha et al (2014), Secken et al (2011)

found constructivist teaching had significant positive impact. Kim (2005) in his Study “The Effects of a Constructivist Teaching Approach on Students’ Academic Achievement, Self-concept and Learning Strategies” researched the effectiveness of constructivist teaching of Mathematics in elementary school in Korea in terms of academic achievement, self-concept, learning strategies and students’ preference. Constructivist teaching was found to be more effective in terms of academic achievement of students. However, it was not effective in terms of students’ self-concept enhancement but had some effect on motivation to learn. Students had some preference for a Constructivist teaching classroom environment

Studies conducted on Constructivist Teaching of Social Science

There have been few studies conducted in the area of Social Science. Chackko (2012) studied the “Effectiveness of Constructivist Approach in Teaching of Social Studies at Upper Primary Level”. The constructivist approach was found to be effective for low, average and highly intelligent students in improving achievement in Social Studies that included critical thinking and the experimental group performed better compared to control group, in all the dimensions. Mishra (2014) in his Study titled “Social Constructivism and teaching of Social Science”, studied alternate models of teaching Social Science. The study concluded that learners’ engagement and ownership in classroom pedagogic process, culture of enquiry had significantly improved as a result of the alternate models adopted by the students and they were able to defend their ideas. Power and authority had shifted from teacher to students, the whole class benefited from collective learning. Constructivist approach had a significant effect on both the achievement and interest of students in the Social Sciences (Akanwa et al, 2014; Srinivasalu, 2013).

2.9 Studies conducted specifically with the 5E Teaching-Learning Model

Bybee (2009) in his Study, “The BSCS 5E Instructional Model and 21st Century Skills”, addressed the connection between development of 21st Century skills and the Biological Sciences Curriculum Study (BSCS) 5E Instructional Model. This model comprised, as the name suggests, 5Es – Engagement, Exploration, Explanation, Elaboration and Evaluation. The Study found that the 5E model meets the 21st century skills like system thinking, self-management/self-development, non-routine problem solving. Yadigaroglu et al (2012), in their quasi-experimental Study, “The Effects of Activities Based on 5E Model on Grade 10 Students’ Understanding of the Gas

Concept”, investigated the effect of activities developed based on 5E model in a high school in Turkey. A statistically significant difference in favor of experimental group was found. Cardak et al (2008) in their Study, “Effect of 5E Instructional Model in Student Success in Primary School”, studied the effect of the 5E instructional model on sixth grade students’ success during the circulatory system unit. Statistical analysis showed a significant difference in favor of experimental group. Singh et al (2015) compared the impact of conventional and innovative 5E (Engage, Explore, Explain, Elaborate and Evaluate) constructivist teaching of Biological Science on the students and concluded that the constructivist learning approach had a positive effect on students’ academic achievement. Similar positive results were found by Secken et al (2011) in his Study, “The Effect of Constructivist Approach on Students’ Understanding of the Concepts Related to Hydrolysis”.

2.10 Findings of the Literature Review

Construction and Constructivist Teaching

John Dewey, Bruner, Piaget, Vygotsky are the major philosophers and proponents of this concept which has been extensively researched over the last few decades. The study of Brown (1999) concluded that the fundamental purpose of Social Studies was to educate on how to become effective citizen. Hoagland (2000) advocated that applying constructivist concepts to the teaching of Social Studies can revolutionize the learning environment. Basic tenets of constructivism are that people learn best when knowledge is constructed by them based on their prior knowledge and experience. According to Edigar (2000), Social Studies need to use a variety of methods to assist each pupil to achieve as optimally as possible. Doolittle et al (2003) stated that teachers must become facilitators of knowledge, not conduits. Another role of teacher is knowledge exploration as they redirect the focus and rationale of the lesson. Collaborative activities (Rice et al, 1999), group activities (Brooks et al, 1993) help students to critically analyze the issues and help to develop higher level thinking skills. Tay (2013) proposed alternate assessment methods like self, peer and group evaluation, performance-based evaluation, rating scale, etc. instead of traditional assessment approach.

Teaching-learning Principles/Methods

Caine et al developed 12 Brain/Mind learning principles like advocating engagement in social interaction, ensuring emotional connect, etc. Karaduman, et al (2007), Barr et al (1978) said that Social Science functions as an umbrella that interconnects other disciplines and helps to develop understanding on political and economic development of the world. Yanpar (2001) observed that Social Science learning is through memorization while Fontana (1996) found that constructivist approach enables students to learn through problem solving and decision making. Li (2012) proposed various models of learning - inquiry-based, problem-based, collaborative etc.

Learning Styles & Study Habits

Stewart et al (1992) said that most of the models of learning styles include Auditory, Kinesthetic and Visual – while David Kolb (1984) specified his model of learning styles as divergers, convergers, accommodation and assimilation. Csapo et al (2006) found that predominant learning style is auditory. Felder-Silverman (1988) provided Learning Styles dimensions that impacted learning of concepts.

Emotional Intelligence and Social Intelligence

Goleman (2005), Cohen (2014), Thorndike (1920), Stricker et al (1990), Toor (2013) have conducted various studies on Emotional and Social Intelligence. According to Goleman, Emotional Intelligence is the ability to manage emotions and inner potentials for positive relationships. According to Albrecht (2006), Social Intelligence is the ability to get along well with others and get their cooperation. Ramana (2013) found that emotional competence is necessary for effectiveness and quality teaching-learning processes.

Multiple Intelligence

Gardner (1983, 1999) identified nine (9) unique intelligences through which individuals learn and teach new information. They are verbal-linguistic, logical-mathematical, music, visual-spatial, bodily-kinaesthetic, interpersonal, naturalistic and existential intelligences. Xie et al (2009) said that Multiple Intelligence could provide with more options in learning and assessment methods. Multiple Intelligence needs to be used judiciously since each student is different and they have their own preferred way of learning.

Technology in Constructivist Teaching

Many Social Studies educators like Berson et al (2001), Braun et al (1999), Hope (1996), Martorella (1997) and others have advocated use of technology in

Constructivist teaching. Berson et al (2001), Braun et al (1999), Scott et al (2000) proposed use of internet technologies in Constructivist teaching of Social Studies. Other researchers like Jonassen et al (1999), Black et al (1995), Brush et al (2000), Collins (1991), Duffy et al (1996), Richards (1998) have suggested positive impact of use of technologies in constructivist teaching. Bell (2001) proposed the need of teachers training on technology. Saye et al (1999) said that Social Studies classroom are supposed to be problem-centered multimedia-supported learning environment. Jha studied how Information and Communication Technology (ICT) plays a role in constructing knowledge and improve learning in the higher education.

Constructivist Teaching of Various Subjects

During 2005-2017, quite a few Studies have been conducted on constructivist teaching of various subjects. Mostly, experimental method was adopted where two groups – experimental and control groups were formed. Constructivist approach was administered to the experimental group while traditional method was used for the control group. Pre-test and post-test were conducted, and the scores were analysed. Kim (2005) found that students of Mathematics liked the constructivist classroom environment. However, the method was not found to be effective in self-concept enhancement but had some positive effort on motivation. Robert (2006), Mishra (2014), Srinivasalu (2013), Chackko (2012), Parasurama (2016) carried out constructivist teaching for Social Science and experienced positive impact of the constructivist method. Adak (2017), Akanwa et al (2014), Tandel (2012), Secken et al (2011), Singh et al (2015), Barman et el (2015), Qarareh (2016) carried out Constructivist teaching for Sciences. All found constructivist teaching method significantly more effective. Fathima (2015) and Satyaprakasha et al (2014) found positive impact of constructivist teaching. Khalid (2012) and Rajendran (2012) found positive impact of constructivist approach on teacher education. Pettitt (2008), Owusu (2015), Roy Chowdhury (2016) got good impact of constructivist teaching of Mathematics subject. Singh et al (2015) also experienced the positive effects of the 5E model (Engage, Explore, Explain, Elaborate and Evaluate), proposed by Rog Bybee (2009) in developing and implementing constructivist teaching of Science. Study of Masek et al (2010) suggests that creativity is potentially to be fostered through constructivist perspective and problem-based learning is a powerful tool for the same.

5E Learning Model

Bybee (2009) formally developed the model. Subsequently, many educators/researchers like Yadigar et al (2012), Cardak et al (2008) and others experienced positive impact of the model in teaching-learning process. Thus, it is found that while constructivist teaching has a possibility of positively impacting the teaching-learning process; many more researches are still required, especially on teaching of Social Science in secondary school considering the critical importance of the subject and the ground reality. Outcome of the researches conducted in the area of teaching-learning of Social Science is encouraging. However, some literature pointed out the negative side of constructivist approach – breadth of coverage of content has been found to be less at times due to time constraint. Answers to this will have to be found out.

2.11 Rationale of the Study

A detailed review of the topic and the various research studies done in this area bring to light the following major points:

The goal of education is to help students grow as human beings and become responsible and conscious citizens of the society. As per Indian Constitution, Right to Education is a fundamental right of every citizen and it calls for a very versatile, dynamic and flexible learning process that addresses the needs of all types of learners.

Social Science helps to understand the socio-political-economic-cultural environment and enables the learners to participate and contribute meaningfully to society and create healthy relationships with one another. Unfortunately, Social Science education has remained largely teacher-centric with undue emphasis on rote-memorization. This makes Social Science an uninteresting subject and does not give the students joy of learning the subject. It is considered a non-utility subject and is given less importance than the natural sciences. Despite being important for the society, the subject is languishing. Multi-prong approaches are needed to instill respectability of Social Science in the curriculum, education system and society. It is necessary to emphasize that it provides the social, cultural, and analytical skills required for an increasingly interdependent world, and to deal with political and economic realities (NCF 2005). The importance of Social Science needs to be enhanced manifold as it prepares the future citizens of the society. Constructivism is an emerging learning philosophy that postulates that learners are better able to learn by constructing meaning by themselves based on their previous knowledge and experiences. Thus, the learning process shifts from being teacher-centric to student-centric and where teacher becomes a facilitator,

moderator, collaborator and guide. Students bring prior knowledge and experience into a learning situation. Such learning and acquisition of new knowledge through constructivism is more valuable compared to what comes unilaterally from the teacher. Further, knowledge retention tends to be more. The constructivist approach that encourages students to learn through active engagement, taking lead in the learning process, problem-solving and decision-making activities can be an appropriate methodology to teach Social Science. Construction of meaning, self-reflection and learning in group are expected to improve learning and performance of the students including enhancement of their critical thinking ability.

The 5E Model was adopted as the 5 steps Engage-Explore-Explain-Elaborate-Evaluate attend to the various learning theories and learning styles which have been researched extensively and found to be important in the learning process. Each stage has its own contribution to the learning process and gives students ample opportunity for construction of knowledge by active participation in each stage in accordance with his individual learning style and intelligences. Thus, the method was found to be most suitable for individual and collaborative learning.

As a teacher of Social Science for 30 years, the Researcher found it to be a great opportunity to take up this challenging task of implementing constructivist teaching approach in Social Science in school level and assess its effectiveness. The Researcher undertook design, development and implementation of Lessons based on constructivist approach (5E Model) for the ninth standard Social Science English medium students of CBSE curriculum to assess effectiveness of the constructivist approach through students' academic achievement after undergoing this experience. This study also sought to obtain students' reactions towards this new methodology of teaching-learning process. The Researcher chose standard IX for her experiment as it is the commencement of the Secondary Section when new subjects are introduced and thus, the teaching methodology assumes greater importance to help students in its understanding and retention of knowledge. The Researcher selected the first three chapters of the Social Science subject as these lessons were scheduled to be taught in the school during the time the Researcher performed the experimental study.

The Researcher did not want to disturb school schedule by selecting other topics. Thus, the present study seeks to throw light on the existing practices in Social Science teaching and via the findings that emerge, provide direction to make the subject more meaningful.