CHAPTER

REVIEW OF RELATED LITERATURE

Coming together is a beginning
Keeping together is progress
Working together is success

- Henry Ford -
CHAPTER II
REVIEW OF RELATED LITERATURE

2.1. Introduction:

The present chapter is an essential part of any research report. A summary of the writings of recognized authorities and of previous research provides evidence that the researcher is familiar with what is already known and what is still unknown and untested. Because effective research is based on past knowledge this step helps to eliminate the duplication of what has been done and provides useful hypotheses and helpful suggestions for significant investigation (Best, & Kahn, 2005). Figure 2.1 shows how the reviews have been categorised and presented.

FIGURE 2.1 Categorization of the Review of Related Literature
2.2. Conceptual Review:

2.2.1. Review Regarding Constructivism:

- **History of Constructivism:**

  Constructivism views learning as a process in which the learner actively constructs or builds new ideas or concepts based upon current and past knowledge or experience (Sharma, 2010). There is a history of two thousand years attached to constructivist thought in the Eastern tradition and a history of at least three hundred years in Western thought. Walsh (1999) cites the writings of Gautama Buddha (560-477 BC): “We are what we think. All that we are arises within our thoughts. With our thoughts we make the world.”

  This is indeed the view that individuals construct the world in which they live. That is, we come to understand our surroundings through processes of thinking based upon what is observed or otherwise experienced. The founder of Taoism, Lao Tzu, a contemporary of Gautama Buddha, more or less, also made statements to the effect that reality is a changing and variable entity which can be perceived differently by different individuals.

  In the Western context, Giambattista Vico (1668-1774) wrote about human “knowing” involving an “imaginary construction of order in experience” (Mahoney, 2005: 747). Immanuel Kant (1724-1804), who is sometimes considered to be the first to have put forward constructivist ideas, described the mind as “an active organ which transforms the chaos of experience into orderly thought” (ibid). Piaget’s thoughts on constructivism learning seem to have been based on some of the ideas first promulgated by Kant. Vaihinger (1852-1933) elaborated on some of Kant’s ideas too. In his philosophy “As If”, published in 1911, Vaihinger implies that mental effort is directed
towards making sense of what is experienced on the journey of life and constructing an understanding of the many varied experiences encountered on the way.

George Kelly’s (1963) writing of his radical rethinking of the ways we construct our understanding of our experiences, was influenced by Vaihinger’s work. Kelly suggests that we live in two fundamental worlds. The first world exists outside of any human understanding; the second is the world based upon the ways in which we interpret the primary world, which is an individual enterprise, in the form of representations or constructs.

- **The Constructivist learning theory:**

  We have seen that the notion of constructivism theory might actually date back to the philosophies of Gautama Buddha and Lao Tzu. However the real development of constructivist learning theory can be placed in the twentieth century.

  Early twentieth century attempts at regularising an approach to understanding how learning takes place were centred on what have become known as behaviourist or, sometimes, stimulus-response theories. The notable scientists who developed this school of learning theory are: Pavlov (1849-1936) for the development of classical conditioning at the beginning of the twentieth century; Watson (1878-1958) for setting out the initial principles of behaviourism; and Skinner (1904-1990) for his pioneering work on the importance of reinforcement.

  This approach to understanding learning was set aside and the constructivist movement began to gain importance. Each of us will build an idiosyncratic version of reality based partly on identical experiences but shaped by individual experience and, importantly, upon an individual’s prior knowledge, understanding and experience. That means that two learners exposed to exactly the same learning experience (e.g. a planned
lesson) are likely to have different learning outcomes as a result of, amongst other things, what they already knew about the subject and how they interpret the items of knowledge presented to them and how they undertake the activities during the lesson.

The beginning of the constructivist approach to learning is considered to be the work of Jean Piaget (1896-1980). Piaget who worked in the mid and late twentieth century was not a social constructivist. However, his work led to the expansion of understanding of child development and learning as a process of construction that has underpinned much of the theory relating to social constructivism.

There are different forms of constructivism: Figure 2.2 depicts the different forms of constructivism.

![Forms of Constructivism](image)

**FIGURE 2.2 Forms of Constructivism**

- **Social Constructivist approach:**

  Within the field of social constructivism there is great emphasis laid upon the importance of social context. There are two aspects of social context which affect the
progress and extent of learning (Gredler, 1997; Wertsch, 1991): first, the systems garnered by the learner from his or her particular culture, such as language, the use of mathematical systems and logic, which develop throughout life; second, social interaction with more knowledgeable members of the community. Thinking skills develop in children as they interact with those around them, especially adults.

Social constructivism theory emphasises the importance of culture and context in understanding what is experienced in the wider community and in constructing knowledge built on this understanding (Derry, 1999; McMahon, 1997).

Figure 2.3 shows the three aspects of social constructivist thinking.

FIGURE 2.3 The Three Aspects of Social Constructivist Thinking

i. Reality: Social constructivists tell us that reality is constructed through shared human social activity. Members of a community create the properties of the world which they share and which they understand in an agreed way (Kukla, 2000). Reality is not something which can already exist in the form arrived at by one individual because each individual will construct their own reality which will not necessarily coincide with the reality of others.
Knowledge: Social constructivists also tell us that knowledge is a human creation and that it is constructed by social and cultural means (Ernest, 1999; Gredler, 1997; Prawat and Floden, 1994). Meaning and understanding are created by individuals by means of their social interaction and their interaction with their environment. The knowledge held by some can be different from that held by others.

iii. Learning: Social constructivists tell us that learning is a social process. It is neither simply an individual process, nor a passive process (McMahon, 1997; Pritchard 2009). Effective and lasting learning takes place for the individual when engaged in social activity with a range of others, when in social context and when new or repeated sensory input (e.g. words, pictures, music, stories and much more) is related to pre-existing knowledge and understanding.

The importance of culture and context is highlighted in the theories of Vygotsky, Bandura and others. (Thousand, Villa, & Nevin, 1994).

- **Social Development Theory or Vygotsky’s Social Development Theory**

Vygotsky’s Social Development Theory is the work of Russian psychologist Lev Vygotsky (1896-1934), who lived during Russian Revolution. Vygotsky’s work was largely unknown to the West until it was published in 1962.

Vygotsky’s theory is one of the foundations of constructivism. It asserts three major themes:

1. Social interaction plays a fundamental role in the process of cognitive development. In contrast to Jean Piaget’s understanding of child development (in
which development necessarily precedes learning), Vygotsky felt social learning precedes development. He states: “Every function in the child’s cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (inter psychological) and then inside the child (intra psychological).” (Vygotsky, 1978).

2. The More Knowledgeable Other (MKO). The MKO refers to anyone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process, or concept. The MKO is normally thought of as being a teacher, coach, or older adult, but the MKO could also be peers, a younger person, or even computers.

3. The Zone of Proximal Development (ZPD). Figure 2.4 portrays the ZPD which is the distance between a student’s ability to perform a task under adult guidance and/or with peer collaboration and the student’s ability of solving the problem independently. According to Vygotsky, learning occurred in this zone.

![FIGURE 2.4 The Zone of Proximal Development](image)
Vygotsky focused on the connections between people and the sociocultural context in which they act and interact in shared experiences (Crawford, 1996). According to Vygotsky, humans use tools that develop from a culture, such as speech and writing, to mediate their social environments. Initially children develop these tools to serve solely as social functions, ways to communicate needs. Vygotsky believed that the internalization of these tools led to higher thinking skills. (Learning Theories, 2008)

- **Bandura’s Social Cognitive Theory:**
  
  Bandura’s major theoretical beliefs are fully consistent with social constructivist thought. He points out that human lives are not lived in isolation (Royer, 2004). He writes about what he terms “collective agency”, which is an extension of more individualised “human agency”. The notion of collective agency is concerned with people working together on shared beliefs and common aspirations to improve their lives. Bandura argues that people learn from observing role models in day-to-day life. He explains that,
  
  “Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on their effects of their own actions to inform them what to do.” (1977:22). (Douma, 2006).

- **Social Interdependence Theory:**
  
  Social Interdependence, the basis of cooperative learning, is a theory that describes how individuals are affected by one another’s actions. For example, social interdependence is present when the goal achievement of a particular individual influences the goal achievement of another (Johnson & Johnson, 2005). This type of dynamic determines the success or failure of goal achievement.
There have been several theorists who have made contributions to the theory of social interdependence. Gestalt psychologist Kurt Kaffka first noted the dynamics of group interdependence in early 1990’s, which was refined by Kurt Lewin (Morgan, Rosenberg & Wells, 2010). Morton Deutsch later expanded Kurt Lewin’s philosophy of interdependence among group members and he was the first to articulate social interdependence theory during the 1940s and make distinctions between interdependence types (Johnson, Johnson & Smith, 1991).

Social interdependence is a characteristic existing in cooperative learning experiences and is an essential component in any cooperative learning activity. It is present when the actions of individuals and others affect outcomes; either positive or negative social interdependence exists within cooperative groups. Through positive interdependence, individual actions yield the achievement of group goals; negative interdependence prevents the achievement of the group goals. Those with positive goal interdependence gain higher achievement than those who work alone and have the opportunity to interact with others. (Johnson & Johnson, as cited in Rivera, 2013)

2.2.2. Review Regarding Cooperative Learning:

The theory behind cooperative learning is based mainly on Lev Vygotsky’s Social Development Theory. Vygotsky’s Social Development Theory has also been termed Social Constructivism. The primary assumption of the social developmental perspective is that interaction among students increases their mastery of the concepts in the tasks. Theorists such as Vygotsky (1978) hold the view that learning first takes place in interaction among students before it becomes mental processes for the individual. (García, Mircea & Duque, 2010).
Cooperative learning theory is an offshoot of Constructivism. While Constructivism focuses on personal experience as the foundation for learning new material, cooperative learning utilizes not only the student’s own experience to solidify knowledge, but also uses the experiences of others. Both theories emphasize the importance of interactivity with respect to the design and implementation of lesson plans. (Douma, 2006).

- **Development of Cooperative Learning: A Historical Perspective**

  The highlights of the historical developments which took place in the researches related to cooperative learning have been described in Chapter I (p 5 -8). They are represented in Table no. 2.1 given below

**TABLE 2.1**

**Historical perspective of Researchers culminating to cooperative Learning**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Researchers</th>
<th>Researches culminating to cooperative learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1898</td>
<td>Norman Triplett</td>
<td>Triplett explained that creatures of the same species in each other’s presence can perform certain species-specific activities more effectively.</td>
</tr>
<tr>
<td>1920</td>
<td>Allport</td>
<td>He concluded that group situations facilitated better performance on tasks requiring overt responses (e.g., number of associated words offered by an individual – the quantity of performance). However, in contrast, social facilitation hampered tasks requiring intellectual responses (e.g., arguments to support the association made between words – the quality of performance).</td>
</tr>
<tr>
<td>1924</td>
<td>Gates</td>
<td>Individuals with poor ability initially improved more without an audience; and those who were of high ability performed better with an audience</td>
</tr>
<tr>
<td>Time Period</td>
<td>Researchers</td>
<td>Researches culminating to cooperative learning</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1925/1930</td>
<td>Travis/Dashiell</td>
<td>Both researchers concluded that individuals performing alone had the poorest performance. The audience condition was sufficient for individuals to perform better.</td>
</tr>
<tr>
<td>1930s</td>
<td>-</td>
<td>1930s in response against laissez-faire individualism in Depression America, cooperation became a less favoured alternative than competitive individualism.</td>
</tr>
<tr>
<td>1940s</td>
<td>Morton Deutsch</td>
<td>Recognized that competitive and cooperative conditions did not exist in any pure sense, but in many situations cooperation and competition are combined.</td>
</tr>
<tr>
<td>1950s</td>
<td>Record high experiments</td>
<td>These indicated that in competitive conditions there was less friendly behavior and cohesiveness amongst the group. In contrast, subjects were friendlier and there was more cohesiveness in cooperative groups that could aim for shared rewards.</td>
</tr>
<tr>
<td>1960s,</td>
<td>-</td>
<td>- American concerns were centred around civil rights and equal education opportunities. Cooperative instructional techniques were identified as one for improving interpersonal relationships, emotional well-being and self-concept of students and reducing prejudice.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Later the tightening of the USA economy led to the reduction in research grants, but influenced research designs aimed at maximizing gains and minimizing loss.</td>
</tr>
<tr>
<td>1970s</td>
<td>-</td>
<td>- There appeared to be a confluence among different academic disciplines: education, anthropology, social psychology and developmental psychology; uniting in an attempt to understand the child.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Several pilot programmes adopting cooperative learning structures in classrooms were developed in response to the perceived needs of ethnic integration in newly disintegrated schools.</td>
</tr>
<tr>
<td>Time Period</td>
<td>Researchers</td>
<td>Researches culminating to cooperative learning</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1980’s to present day</td>
<td>-Roger T. Johnson and David W. Johnson are the main exponents of cooperative learning.</td>
<td>Research has resulted in a body of educational materials advising teachers about cooperative teaching methods and how to train children to cooperate in classroom settings.</td>
</tr>
</tbody>
</table>

(Hoon, 2004)

- **Concept of Cooperative Learning:**

  Organizing students to work together in small groups has been an ancient practice in education throughout the world (Salvin, 1995). Cooperative learning does not happen successfully unless it is well orchestrated and certain considerations prevail. These considerations increase the chances that the groups will work well together and achieve targeted standards (Gregory & Chapman, 2002).

  According to R. T. Johnson and D.W. Johnson (1996) who are considered as proponents of cooperative learning, the acronym GROUP implies what happens when we work together and how to be successful in any group activity.

  - **G** - Give encouragement
  - **R** - Respect others
  - **O** - (Stay) on task
  - **U** - Use quiet voices
  - **P** – Participate actively
  - **S** – Stay in our GROUP.

  Griswold and Rogers (1995) defined cooperative learning as
“The instructional use of small groups, so that students work together to maximize their own and each other’s learning; a method of instruction by which students works together in small groups to reach a common goal; and an activity that facilitates collaborative efforts among students.”

Foyle and Lyman (1988) defined cooperative learning as a teaching strategy involving children’s participation in small group learning activities that promote positive interaction. Flowers and Ritz (1994) viewed cooperative learning as a teaching strategy where teams of two or more work together on learning tasks. Each member of the team brings special talents to the group i.e. concrete or analytical abilities of others. Also other team members cooperate on the achievement of the tasks and learn from each other. It also means taking the talents of individuals and putting these together to get the job done. As a result, students learn both academic and social skills for cooperative learning environments.

Cooperative learning is an arrangement in which students work in mixed ability groups and are rewarded on the basis of the success of the group (Woolfolk, 2001). In cooperative learning, teams, each with students of different levels of ability, use a variety of learning activities to improve the understanding of the subject. Each member of the team is responsible not only for learning what is taught but also for helping team mates learn, thus, creating an atmosphere of achievement. Cooperative effort results in participants striving for mutual benefits so that all group members:

- Gain from each other’s efforts
- Recognize that all group members share a common fate;
- Know that one’s performance is mutually caused by oneself and one’s team members; and
Feel proud and jointly celebrate when a group member is recognized for achievement (Johnson & Johnson, 2001)

There are three commonly recognized types of cooperative learning groups. Each type of group has its own purpose and application.

i. Informal Cooperative Learning Groups: These ad-hoc groups may be organized "on-the-fly" as an aid in direct teaching. Informal groups are particularly useful in breaking up a lecture into shorter segments interspersed with group activity. While this method leads to less time for lecture, it will increase the amount of material retained by students as well as their comfort working with each other. (Johnson, et al., 2006, p.3:10)

ii. Formal Cooperative Learning Groups: This type of group forms the basis for most routine uses of cooperative learning. Groups are assembled for at least one class period and may stay together for several weeks working on extended projects. These groups are where students learn and become comfortable applying the different techniques of working together cooperatively. (Johnson, et al., 2006, p.2:2)

iii. Cooperative Base Groups: Cooperative base groups are long-term, stable groups that last for at least a year made up of individuals with different aptitudes and perspectives. They provide a context in which students can support each other in academics as well as in other aspects of their lives. The group members make sure everyone is completing their work and hold each other accountable for their contributions. Implementing cooperative base groups in such a way that students meet regularly for the duration of a course completing cooperative learning tasks can provide the permanent support and caring that students need "to make academic progress and develop cognitively and socially in healthy ways." (Johnson et al., 1998, p.10:7)
Elements of Cooperative Learning:
Cooperative learning is a successful teaching strategy in which small teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject. Each member of a team is responsible not only for learning what is taught but also for helping teammates learn, thus creating an atmosphere of achievement. Students work through the assignment until all group members successfully understand and complete it. (Kagan, 1994).

It is only under certain conditions that cooperative efforts may be expected to be more productive than competitive and individualistic efforts. Those conditions are:

1. Clearly perceived positive interdependence
2. Considerable promotive (face-to-face) interaction
3. Clearly perceived individual accountability and personal responsibility to achieve the group’s goals
4. Frequent use of the relevant interpersonal and small-group skills
5. Frequent and regular group processing of current functioning to improve the group’s future effectiveness

The five main elements of cooperative learning are illustrated in Figure 2.5:

**FIGURE 2.5 Five Elements of Cooperative Learning**
1. **Positive Interdependence**: The students should believe that they "sink or swim together." Within cooperative learning situations, students have two responsibilities: a) learn the assigned material, and b) ensure that all members of the group learn the assigned material. Following are the ways to ensure positive interdependence among students:

   a. **Positive Goal Interdependence** - Students perceive that they can achieve their learning goals if and only if all the members of their group also attain their goals.

   b. **Positive Reward - Celebrate Interdependence** - Each group member receives the same reward when the group achieves its goals.

   c. **Positive Resource Interdependence** - Each group member has only a portion of the resources, information, or materials necessary for the task to be completed; the members’ resources have to be combined for the group to achieve its goals.

   d. **Positive Role Interdependence** - Each member is assigned complementary and interconnected roles that specify responsibilities that the group needs in order to complete the joint task. Teachers create role interdependence among students when they assign them complementary roles such as reader, recorder, checker of understanding, encourager of participation, and elaborator of knowledge. Such roles are vital to high-quality learning.

2. **Face to Face Promotive Interaction**: Positive interdependence results in promotive interaction. Promotive interaction may be defined as individuals encouraging and facilitating each other's efforts to achieve, complete tasks, and produce in order to reach the group's goals.
3. **Individual Accountability/Personal Responsibility and Group Accountability:**

To ensure that each student is individually accountable to do his or her fair share of the group’s work, teachers need to assess how much effort each member is contributing to the group’s work, provide feedback to groups and individual students, help groups avoid redundant efforts by members, and ensure that every member is responsible for the final outcome. Common ways to structure individual accountability include:

i. Keeping the size of the group small. The smaller the size of the group, the greater the individual accountability may be.

ii. Giving an individual test to each student.

iii. Randomly examining students orally by calling on one student to present his or her group's work to the teacher (in the presence of the group) or to the entire class.

iv. Observing each group and recording the frequency with which each member-contributes to the group's work.

v. Assigning one student in each group the role of checker. The checker asks other group members to explain the reasoning and rationale underlying group answers.

vi. Having students teach what they learned to someone else. When all students do this, it is called simultaneous explaining.

4. **Interpersonal and Small-Group Skills:** In order to coordinate efforts to achieve mutual goals, students must: 1) get to know and trust each other, 2) communicate accurately and unambiguously, 3) accept and support each other, and 4) resolve conflict constructively (Johnson, 1990, 1991; Johnson & F. Johnson, 1991).
Groups improve as members learn to contribute positively, acquire trust and manage conflict. These skills are not innate; they must be learned by the teacher and taught to the students. In cooperative learning groups, students learn academic subject matter (task work) and also interpersonal and small group skills (teamwork). Thus, a group must know how to provide effective leadership, decision-making, trust-building, communication, and conflict management. Given the complexity of these skills, teachers can encourage much higher performance by teaching cooperative skill components within cooperative lessons.

5. **Group Processing:** Group processing may be defined as reflecting on a group session to: 1) describe what member actions were helpful and unhelpful, and 2) make decisions about what actions to continue or change. The purpose of group processing is to clarify and improve the effectiveness of the members in contributing to the collaborative efforts to achieve the group’s goals.

There are two levels of processing -- small group and whole class. In order to ensure that small-group processing takes place, teachers allocate some time at the end of each class session for each cooperative group to process how effectively members worked together.

In addition to small-group processing, the teacher should periodically engage in whole-class processing. When cooperative learning groups are used, the teacher observes the groups, analyzes the problems they have working together, and gives feedback to each group on how well they are working together. The teacher systematically moves from group to group and observes them at work. A formal observation sheet may be used to gather specific data on each group. At the end of the
class period the teacher can then conduct a whole-class processing session by sharing with the class the results of his or her observations. If each group has a peer observer, the results of their observations may be added together to get overall class data.

An important aspect of both small-group and whole-class processing is group and class celebrations. It is feeling successful, appreciated, and respected that builds commitment to learning, enthusiasm about working in cooperative groups, and a sense of self-efficacy in terms of subject-matter mastery and working cooperatively with classmates. (Johnson & Johnson, 2002)

There is a difference between simply having students work in a group and structuring groups of students to work cooperatively. A group of students sitting at the same table doing their own work, but free to talk with each other as they work, is not structured to be a cooperative group, as there is no positive interdependence. Perhaps it could be called individualistic learning with talking. For this to be a cooperative learning situation, there needs to be an accepted common goal on which the group is rewarded for its efforts. If a group of students has been assigned to do a report, but only one student does all the work and the others go along for a free ride, it is not a cooperative group. A cooperative group has a sense of individual accountability that means that all students need to know the material or spell well for the whole group to be successful. Putting students into groups does not necessarily gain a cooperative relationship; it has to be structured and managed by the teacher or professor. (Thousand, Villa & Nevin, 1994)
2.2.3. Review Regarding Cooperative Learning Techniques:

Cooperative Learning Designs can be categorised into four types (Williams, 2002). Figure 2.6 shows the types of Cooperative Learning Designs.

![Types of Cooperative Learning Designs]

**FIGURE 2.6 Types of Cooperative Learning Designs**

2.2.3.1. Think-Pair-Share:

Think-Pair-Share is a cooperative learning strategy that can promote and support higher level thinking. The teacher asks students to think about a specific topic, pair with another student to discuss their own thinking and then share their ideas with the group. (Online Teaching Resource, 2005)

2.2.3.2. Numbered Heads:

Ask students to number off in their teams from one to four or six. Announce a question and a time limit. Students put their heads together to come up with an answer. Call a number and ask all students with that number to stand and answer the question. Recognize correct responses and elaborate through rich discussions (Colorin Colorado, 2015).


2.2.3.3. Three Minute Review:

Teacher stops any time during a lecture or discussion and give teams three minutes to review what has been said, ask clarifying questions or answer questions (Quinn, 2013)

2.2.3.4. Round Table Technique:

It is an information sharing strategy that uses to generate multiple answers to a question posed by the teacher. Students respond in writing to a question that requires factual answers rather than conceptual or controversial responses. In sequential round table, one piece of paper is circulated and students add information that answers the question as it comes to them. In a simultaneous round table, each student responds on a separate piece of paper. At the end of the writing activities, the student presents the answer to the class. (Quinn, 2013)

2.2.3.5. Think-Ink-Pair-Share:

The Think-Ink-Pair-Share activity is an excellent prior knowledge activity that helps students to focus their thoughts on specific topic. Students are given a question or topic and are asked to first think about what they know, and then record their ideas down, pair up with someone to share what they wrote. The final stage is a large group discussion. (Texas Education Agency, 2013).

2.2.3.6. Formulate, Listen, Share and Create:

Johnson, Johnson and Barlett, (1990) offered this strategy. Here the teammates first privately formulate responses, then share and listen in turn, and together create a new answer or perspective through discussion and elaboration. This activity has widespread application and encourages students to stretch their thinking. (Meredith & Steele, 2011)
2.2.3.7. Three Step Interview:

Each member of a team chooses another member to be a partner. During the first step individuals interview their partners by asking clarifying questions. During the second step partners reverse the roles. For the final step, members share their partners responses with the team or the class. (Quinn, 2013)

2.2.3.8. Peer Tutoring:

The textbook definition of peer tutoring is "a system of instruction in which learners help each other and learn (themselves) by teaching". The key to this definition is the word ‘peer’, meaning someone with the same or a nearly equal status as the person being tutored, who, as such, is not a professional instructor.

Peer tutoring is the system of instruction in which learners help each other and learn by teaching. (Sonawane, & Vartak, 2010)

2.2.3.9. Circle the Sage:

The teacher polls the class to see which students have a special knowledge to share or those who have been given prior knowledge. They are selected as the sages or the tutors. In this structure, there are three times of discussions about the topic. The first discussion is when the students surround the sage and get inputs from the sage. The second discussion is when the students compare notes with their teammates. The last discussion is when the teacher reviews the materials with the whole class. (Wigati, 2011)

2.2.3.10. Pairs Compare:

Pairs generate multiple responses to a question, then compare their answers with another pair or the class and create additional solutions. (Quinn, 2013)
2.2.4. Review Regarding Multi Method and Mixed Methods Research:

**Multi method** approaches in research refer to the use of multiple methods (typically quantitative and qualitative) in conducting research (Creswell, 2003). Brewer and Hunter (1989) say “… actual multi method projects are…either single studies or more complex programmes of continuing research, which systematically employ various combinations of field, survey, experimental and non-reactive methods to address their research questions.” (p. 28). Multi methods approach in research helps to obtain full answers and increase the robustness of our understanding (Mingers, 2001). Using multiple methods has the potential of gaining knowledge about different aspects of a phenomenon under study, and therefore, an overall better and more complete explanation. Mingers (2001) argues that “different research methods (especially from different paradigms) focus on different aspects of reality and therefore a richer understanding of a research topic will be gained by combining several methods together in a single piece of research or research programme.” (p. 241) (Garcia & Pardo, 2006).

**Mixed methods** involve combining or integration of quantitative and qualitative research and data in a research study. Qualitative data tends to be open ended without predetermined responses while quantitative data usually includes closed ended responses such as found on questionnaires or psychological instruments. The field of mixed method research is relatively new with the major work in developing it stemming from the middle to late 1980’s. Its origin however goes back further. In 1959 Campbell and Fisk used multiple methods to study psychological traits – although their methods were only quantitative measures. Their work prompted others to begin collecting multiple forms of data, such as observations and interviews (qualitative data) with
traditional surveys (Sieber, 1973). Early thoughts about the value of multiple methods – called mixed methods – resided in the idea that all methods had bias and weaknesses, and the collection of both qualitative and quantitative data neutralised the weakness of each form of data. Triangulating data sources – a means of seeking convergence across qualitative and quantitative methods – was born (Jick, 1979). By the early 1990’s mixed methods turned toward the systematic convergence of qualitative and quantitative databases, and the idea of integration in different types of research designs emerged. Although many designs exist in the mixed methods field, three primary models are found in social sciences today:

- **Convergent Parallel Mixed Methods** is a form of mixed methods design in which the researcher converges or merges qualitative and quantitative data in order to provide a comprehensive analysis of the research problem. In this design as depicted in Figure 2.7 given below, the investigator typically collects both forms of data at roughly the same time and then integrates the information in the interpretation of the overall results. Contradictions or incongruent findings are explained or further probed in this design. (Creswell, 2014).

    ![FIGURE 2.7 Convergent Parallel Mixed Methods Design](image)

Explanatory sequential mixed methods is one in which the researcher first conducts quantitative research, analyses the results and then builds on the results to explain them in more detail with qualitative research. It is considered explanatory because the initial quantitative data results are explained further with qualitative data. It is considered sequential because the initial quantitative phase is followed by the qualitative phase. The following figure 2.8 shows the explanatory sequential mixed methods design.

![Explanatory Sequential Mixed Methods Design](image)

**FIGURE 2.8 Explanatory Sequential Mixed Methods Design**

Exploratory sequential mixed methods is the reverse sequence from explanatory sequential design. As given in figure 2.9 in the exploratory sequential approach the researcher first begins with a qualitative research phase and explores the views of participants. The data are then analysed, and the information used to build into a second, quantitative phase. The qualitative phase may be used to build an instrument that best fits the sample under study, to identify appropriate instruments to use in the follow up quantitative phase, or to specify variables that need to go into a follow up quantitative study.

![Exploratory Sequential Mixed Methods Design](image)

**FIGURE 2.9 Exploratory Sequential Mixed Methods Design**
These basic models can then be used in more advanced mixed methods strategies. They are as follows:

- **Transformative Mixed Methods** is a design that uses a theoretical lens drawn for social justice or power as in overarching perspective within a design that contains both quantitative and qualitative data. The data in this study could be converged or it could be ordered sequentially with one building on the other.

![Transformative Framework (e.g. feminist, racial, disability)](image)

**FIGURE 2.10 Transformative Mixed Methods Design**

- **Embedded Mixed Methods** design involves as well either the convergent or sequential use of data, but the core idea is that either quantitative or qualitative data is embedded with a larger design (e.g. an experiment) and the data sources play a supporting role in the overall design.

![Embedded mixed methods diagram](image)

**FIGURE 2.11 Embedded Mixed Methods Design**
- Multiphase Mixed Methods design is common in the fields of evaluation and programme interventions. In this advanced design, concurrent or sequential strategies are used in tandem over time to best understand a long term program goal. E.g. longitudinal, multi-project, large scale. (Creswell, 2014).

**FIGURE 2.12 Multiphase Mixed Methods Design**

Ghauri, Gronhaug and Kristianslund (1995) define triangulation as the combination of methodologies in the study of the same phenomenon. Triangulation is the system of using more than one method where all methods are interrelated to provide dependable research results.

According to Esterby – Smith, (2002), Denzin (1970), (as sited in Thomas, 2004) four types of triangulations are identified:

i. Data Triangulation: Here data is collected from different sources of the study of the phenomenon.

ii. Theoretical Triangulation: One theory is taken from one discipline and is used to explain a situation in another discipline.

iii. Triangulation by investigator: Different researchers collect data individually and independently for the same phenomenon. They compare the findings on the basis of data collected.
iv. Methodological Triangulation: It is the way of using both qualitative and quantitative methodologies in research in order to get reliable findings. This comprises within the method triangulation and between the method triangulation. (Karim, 2007).

2.2.5. Review Regarding Statistical Analysis:

2.2.5.1. t-test:

A mere quantitative superiority of the experimental group mean score over the control group mean score is not conclusive proof of its superiority. Because we know that the means of two groups randomly drawn from the same population are not necessarily identical, any difference that appeared at the end of the experimental cycle could possibly be attributed to sampling error or chance. To be statistically significant, the difference must be greater than that reasonably attributed to sampling error. The test of significance of the differences between two means is known as a t-test. It involves the computation of the ratio between experimental variance (observed difference between two sample means) and error variance (the sampling error factor). (Best & Kahn, 2005)

2.2.5.2. MANOVA:

The purpose of a t-test is to assess the likelihood that the means for two groups are sampled from the same sampling distribution of means. The purpose of an ANOVA is to test whether the means for two or more groups are taken from the same sampling distributions. The purpose of MANOVA is to test whether the vectors of means for two or more groups are sampled from the same sampling distribution. MANOVA is used when there are several correlated dependent variables, and the
researcher desires a single, overall statistical test on this set of variables instead of performing multiple individual tests. (Carey, 1998).

Wilk’s Lambda is a test statistic used in multivariate analysis of variance (MANOVA) to test whether there are differences between the means of identified groups of subjects on a combination of dependent variables (Crichton, 2000).

2.2.5.3. Effect Size:

Effect size is a simple measure of quantifying the difference between two groups or the same group over time, on a common scale. In educational setting, effect size is one way to measure the effectiveness of a particular intervention. Effect size enables us to measure both the improvement (gain) in learner achievement for a group of learners and the variation of student performances expressed on a standardised scale. By taking into account both improvement and variation it provides information about which interventions are worth having. Effect size quantifies the size of the difference between two groups, and may therefore be said to be a true measure of the significance of the difference (Coe, 2002).

Partial eta squared ($\eta^2$) is used to estimate effect size in MANOVA. It is the sum of squares effect over sum of squares effect plus the sum of squares error (Levine & Hullet, 2002)

2.3. Research Review

2.3.1. International Research on Cooperative Learning:

A study was conducted by Clevenger, Dusing, Houck and Zuber (2008) titled ‘Improvement of Off-Task behaviour of Elementary and High School students through
the use of Cooperative Learning Strategies.’ The purpose of the research was to decrease the off task behaviour in the classroom. Off task behaviour where students are not engaging in classroom activities interfere with their learning. After the teacher researchers used cooperative learning as the intervention, the incidents of off task behaviour were lessened according to the behaviour checklist. Thus the researchers recommended that cooperative learning be used as intervention to keep students on task.

Brahmer and Harmatys (2009) conducted a study on ‘Increasing student effort in complex problem solving through cooperative learning and self recording strategies’. The purpose of the study was to determine if incorporating cooperative learning and self recording strategies had an impact on student effort on complex problems. A total of thirty eight 9th through 11th grade math and science students at two different sites were a part of the study. All students were placed under cooperative learning groups and each kept a strategy journal. The teacher researcher concluded that cooperative learning and self recorded strategies did make a positive impact on student effort on complex problems in math and science classrooms.

Qiu (2010) conducted a mixed methods study on the relationship between class size and the use of grouping strategies on note taking, note writing and collaborative discussions in online graduate level courses. In this study titled ‘A Mixed Methods Study of Class Size and Group Configuration in Online Graduate Course Discussions’ the quantitative data obtained from the WebKF Databases covering the above mentioned variables was analysed using Pearson Correlation, one way ANOVA, t-test, ANCOVA and multiple regression analysis. The qualitative data obtained from the interviews was analysed using the Grounded theory. The quantitative and qualitative data analyses were designed to complement each other. Findings suggested that 13 to 15
as an optimal class size and four to five is an ideal sub group size. The data also suggested that the overload effects of large classes can be minimized by dividing students into small groups for discussion purposes.

A research study titled ‘Cooperative Learning in Community College Setting: Developmental Coursework in Mathematics’ conducted by Rivera (2013) investigated the effects of implementing cooperative learning strategies in the development of a Mathematics coursework. The research followed the mixed method approach. Two quantitative instruments used for data collection was the Mathematical content assessment and Self Efficacy survey. Qualitative data was collected through four data collection methods, namely Maths Reflection, Student interviews, Focus groups and observation. The quantitative Data was analysed using paired samples t- test and the qualitative data was coded and analysed using the grounded theory. The results indicated that implementing cooperative learning practices increased student attendance as well as decreased student withdrawal rates. Students were also motivated to work with each other on mathematical homework outside of class sessions. Thus use of cooperative learning served as a vehicle to motivate students to work on their mathematics coursework with their peers.

A study by Hatipoglu (2012) titled ‘A comparative study on student achievement in Science through Cooperative Learning and Individualistic learning at Nantawan International School’ was conducted on a sample of 64 multinational students from varying levels of primary year 3 to 6. They were given a pre test and post test through both cooperative and individualistic learning style in order to compare student achievement in science in the second semester in the academic year 2011-2012. A major finding of the study was that there was a significant difference in the student’s
achievement in science between comparative and individualistic learning. Cooperative learning activities were more effective than individualistic learning activities in science. As a result of the finding of this research cooperative learning is recommended in the teaching/learning process to improve student achievement in science.

2.3.2. National/ Indian Research on Cooperative Learning:

A study was conducted by Kaul (2008) titled ‘The effect of learning together techniques of cooperative learning method on student’s achievement in Mathematics’. It was an experimental research in which pre test post test design with control group was applied. The study was conducted with 70 pupils studying in 7th class in N.S. Public School, Gamma II Greater Noida, and Uttar Pradesh. In this study, experimental and control groups were used. Learning Together Technique of Cooperative Learning Method was applied to the experimental group and Traditional Teaching method was applied to the control group. Conclusions showed that there is a significant difference between the results of experimental and control groups. Learning together technique of Cooperative Learning method is more effective than traditional teaching method.

A study titled ‘Developing and Using Group Learning Worksheets for Multi Level Learning Situations: An Experiment’ was conducted by Kishore (2009). It was an experiment done to systematise group learning in a multi age, multi level situation of a small single teacher school for girls of a rural area, based on developing and using group learning worksheets for English at grade II level for each lesson of the prescribed textbook with the lessons broken into three learning segments. The reactions of the students were significantly positive.
Behera and Pattanaik (2010) conducted a study titled, ‘Effect of Cooperative Learning on Achievement in History’. In this study and attempt was made to use cooperative learning in history classrooms and find out its effect on achievement of students. The sample of the study consisted of 100 students of class VII from three schools of Nayagarh town. Achievement test in history was administered to 233 students of above schools. The students were matched by paring their scores of achievement test in history and Raven’s Progressive Matrices. This study revealed the greater effects of cooperative learning approach on the achievement of history of seventh grade students than the conventional method of teaching with respect to knowledge, understanding, application and total scores. Cooperative learning also increased the achievement in history of both boys and girls almost equally. Similarly retention in achievement in history was significantly increased in the group of cooperative learning than conventional method of teaching. The result of the study indicates great effectiveness of cooperative learning on development of achievement in history of the students. The study recommended that teacher educators also can educate the pre and in service trainees regarding the use of cooperative learning to enhance the quality of learning in classrooms.

In another study Mandole (2010) conducted a research on ‘The effects of cooperative learning model on the academic achievement and self esteem of students of standard VIII in History’. The present research was aimed at ascertaining the effects of cooperative learning model on the student outcomes such as academic achievement in history and the Self Esteem of students of standard VIII. The methodology selected was experimental and followed a quasi experimental design of the Pre test Post test Non Equivalent group. The sample consisted of 98 students both boys and girls from standard VIII of English medium schools situated in Navi Mumbai. The study found
that 1). There is a significant effect of the cooperative learning model on academic achievement and self-esteem of the students. 2) The effect of the cooperative learning model on academic achievement and self esteem of students was found to be significant even after the initial differences in the pre test scores of the two groups have been removed and 3) The effect of the treatment on academic achievement as well as self esteem of students is maximum.

A study titled ‘Effect of Cooperative Learning on Achievement Motivation and Anxiety’ was performed by Puspanjali and Satyaprakash (2010). The study attempted to find out the effectiveness of cooperative learning strategy on achievement motivation and anxiety of Class VI students of Bangalore City. The pre test – post test group design was used. The sample consisted of 90 students with an average age of 11 years from three high schools in Bangalore. The findings of the study were a) Cooperative Learning strategy was more superior to conventional method in significantly promoting achievement motivation and b) Cooperative Learning strategy was effective in significantly reducing the anxiety.

The quality of the learning is decided by the quality of teachers and by the way the teachers engage the learners in their classroom. A study was undertaken by Deepa and Sadananthan (2012) titled ‘Attitude of Secondary School Teachers Towards Cooperative Learning.’ This study was carried out to identify the attitude of secondary school teachers towards cooperative learning implementation in their classroom and to study the influence of age, sex, locality, teaching experience, academic qualification and subject of teaching on attitude towards cooperative learning. The survey was conducted on a stratified random sample of 180 secondary school teachers from 20 schools in Kanyakumari District of Tamil Nadu. The study revealed that 45.6% of teachers had favourable attitude towards Cooperative Learning. They preferred cooperative teaching
learning approach in their classrooms. However teachers need training in Cooperative teaching learning approach. So in service programmes should be organised for them. The curriculum should be reconstructed so that the whole education system creates Cooperative Learning Climate in the classroom.

2.3.3. International Research in Cooperative Learning on Pre Service Teachers

A study titled ‘Are we giving cooperative learning enough attention in pre service teacher education’ was conducted by Bouas (1996). Four data sources was used in this study: a researcher designed pre-post Likert scale survey of attitudes/ opinions toward cooperative learning; a researcher designed pre-post true/false test of knowledge about academic and social benefits associated with cooperative learning; post class interviews; and interviews conducted with two subjects during their respective student teaching experiences. The sample of the study was 53 elementary education majors. The findings of the study showed that the subjects had trouble trusting group mates while working collaboratively. The post class interviews revealed that academic benefits were identified by the subjects. They also identified nurturant effects/ social benefits of working in groups which included more person to person interaction, creation of more enjoyable learning atmosphere, growth in self confidence and emergence of more team work. The subjects expressed their intentions to use cooperative learning in their future classrooms.

Akcan (2000) presented a paper titled ‘Cooperative Learning Course Syllabus for Pre Service Teachers’ at the Annual Meeting of Teachers of English to Speakers of Other Languages organised in Vancouver, Canada. This paper contains a syllabus designed for 15 weeks advanced level undergraduate course in foreign language
teaching method. The syllabus aims to give information about what cooperative learning is and how it can be used effectively in classroom. The students will understand the strengths and weaknesses of this method and improve their critical thinking on it implementation. It also contains 23 annotated bibliography on cooperative learning.

Afeefa (2001) did a study on ‘Pre Service Teachers’ Attitude Toward and Knowledge about Cooperative Learning in Kuwait’ in which he conducted a training workshop for Pre Service Teachers from College of Basic Education (CBE) in Kuwait, on Cooperative Learning Strategy. After the workshop the responses from the Pre Service Teachers in the experimental group showed that they gained a high knowledge of cooperative learning as a teaching learning strategy and had a positive attitude towards implementing cooperative learning strategy in their classrooms.

Allinder (2001) conducted a research titled ‘Effects of Modelling on Attitudes and Perceptions of Preservice Special Education Teachers.’ This study examined the effect of modelling instructional strategies in an introductory class for preservice special education teachers (N=42). Examination of participants’ attitudes toward various instructional strategies found attitudes and perceptions were positively affected by the instructor's modelling of certain strategies, especially experiential learning activities, guest speakers, and videos about people with disabilities.

A study titled ‘Change in Pre-Service Teacher Attitudes toward Contemporary Issues in Education’ was done by Johnson and Howell, (2005). According to them Pre-service teacher education is concerned with producing graduates who move into the field able, in terms of both skills and attitudes, to implement research-based conclusions that may not always coincide with the attitudes of previously trained teachers. The researchers sought to assess attitudes and attitude change regarding
contemporary issues in education (i.e., grade retention, inclusive education, learning strategies instruction, cooperative learning, and classroom management), among students \( N = 124 \) enrolled in a second-year educational psychology course. Comparison of pre- and post-course Likert ratings indicated that these pre-service teachers modified their attitudes regarding grade retention, inclusive education, and classroom management but not with regard to learning strategies instruction and cooperative learning. It would appear that pre-service teacher attitudes, in some cases, are amenable to change in a relatively brief time.

Dikici and Yavuzer (2006) of the University of Nigde, Turkey studied ‘The Effects of Cooperative Learning on the Abilities of Pre-Service Art Teacher Candidates to Lesson Planning in Turkey’. For this purpose, 32 art teacher candidates were selected for the experimental group, and 32 art teacher candidates were selected by random sampling method. Cooperative learning method was applied to the experimental group, and traditional learning method was applied to the control group. The results showed that there was considerable improvement in the lesson plans prepared by the experimental group as compared to the control group. The study further recommends that cooperative learning should be part of the daily instructional methods used in all teacher training programs.

A Descriptive Account of Cooperative-Learning Based Practice in Teacher Education was given in an article by Jones and Jones (2008). The purpose of this article is to provide a descriptive analysis of engaging teaching through cooperative learning at the graduate level, using an analysis of the teaching strategies and interactions between 33 pre-service teachers and their professor. Field notes were analysed along with interview data to generate a description of engaging teaching practices and its effects on
students. The authors propose that this teacher’s effectiveness was defined by the professor-student classroom interactions, a collaborative learning environment and use of cooperative learning. The consequence was increased student learning and motivation as well as a constructivist educational philosophy instilled in the minds of future educators.

A study conducted by Goyak (2009) titled ‘The Effects of Cooperative Learning Techniques on Perceived Classroom Environment and Critical Thinking Skills of Pre Service Teachers’ analysed the effects of cooperative learning techniques versus lecture techniques on the following aspects of a higher education classroom: (a) the perception of the student’s learning environment and (b) a student’s critical thinking skills. The results indicated significantly higher means in cooperative learning groups related to the perception of student’s learning environment. Thus the outcome of the study suggests that cooperative learning techniques have merit and profit in the undergraduate classroom.

In a study conducted by Ruys, Keer and Aelterman (2010) titled ‘Collaborative Learning in teacher education: An exploratory study on related conceptions, self efficacy and implementation’ revealed that Collaborative Learning is highly valued as a teaching strategy for primary school children; however student teachers do not prefer to collaborate themselves during the learning process. In this study, the actual position of collaborative learning (CL) in teacher education is examined. One hundred and twenty teacher educators and 369 student teachers are surveyed on general educational beliefs, mental models and conceptions related to CL. The self-efficacy and the implementation of CL are also taken under scrutiny. Student teacher’s self efficacy towards the use of Collaborative Learning is moderate. Collaborative learning is implemented once in a while in teacher education, and student
teachers are not extensively trained in the pedagogical use of Collaborative Learning for their future classroom practice.

2.3.4. National/ Indian Research in Cooperative Learning on pre service teachers:

A study was conducted by Badhe (2010) to find the effectiveness of Cooperative Learning method by using work cards for teaching the topic ‘Image Formation’ in science on D.Ed. students in terms of students’ achievement of the content. The sample consisted of 45 D.Ed. students. The findings indicated that all the student’s showed improvement in qualitative and quantitative evaluation when work cards and cooperative learning method was used in teaching ‘Image Formation’ to D.Ed. students. Majority of the students showed positive responses towards cooperative learning method and the use of work cards. There was an improvement in the students of all streams.

The present system of education dominantly nurtures a competitive learning environment focusing primarily on the cognitive domain. Somewhere, somehow the social nature of learning holds ‘cooperation’ in high esteem. Helping students develop socially and emotionally is important. If not more important, as helping them progress academically. Keeping this in mind, the effectiveness of Cooperative Learning was studied by Agarwal and Nagar (n.d.) in relation to Individual and Group Cooperative work. In all, 48 teacher trainees were chosen for the study from a teacher training college of Lucknow, Uttar Pradesh. It revealed that teaching through Cooperative Learning is able to bring significant changes in the cooperative behaviour of teacher trainees.
Acharekar (2013) conducted a study titled ‘Interactive Influence of Cooperative learning Model with Learning Styles and Personality of B.Ed. students on their learning outcomes in the subject of environmental education. The findings indicated that both learning styles and personality interacting with cooperative learning as a treatment did not have a significant effect on the pre service teacher’s interpersonal relationships or on their environmental awareness. However emotional intelligence and its interaction with cooperative learning treatment had a significant effect on the pre service teachers’ interpersonal relationships. This research proved helpful in identifying the cooperative learning techniques selected for the present study.

2.3.5. Mixed Methods Research in Teacher Education:

Pelch and McConnell (2016) conducted a study titled ‘Challenging instructors to change: a mixed methods investigation on the effects of material development on the pedagogical beliefs of geoscience instructors. They investigated changes in the teaching beliefs of college faculty resulting from their participation in the Interdisciplinary Teaching about the Earth for a Sustainable Future (InTeGrate) project that guided them in the development of reformed instructional materials for introductory college science courses. A convergent parallel mixed methods design was employed using the Teacher Belief Interview, the Beliefs about Reformed Science Teaching and Learning survey, and participants’ reflections on their experience to characterize pedagogical beliefs at different stages of their professional development. Qualitative and quantitative data show a congruent change toward reformed pedagogical beliefs for the majority of participants. The majority of participants’ Teacher Belief Interview (TBI) scores improved toward more student-centered pedagogical beliefs. Instructors who began with the most traditional pedagogical beliefs showed the greatest gains. Interview data and
participants’ reflections aligned with the characteristics of effective professional development. Merged results suggest that the most significant changes occurred in areas strongly influenced by situational classroom factors.

Palak and Walls (2009) conducted a study following a sequential mixed methods design. In the study titled ‘Teacher’s Beliefs and Technology Practices: A Mixed- methods Approach’ the exploratory mixed methods design (QUAN→QUAL) was followed by collecting quantitative and qualitative data sequentially across two phases. The quantitative data was collected using two inventories. The qualitative data was collected through classroom observations, interview, lesson plans and the written reflections of four open ended questions about the educational beliefs and practices of technology using teachers from technology rich schools. The quantitative data was analysed using multiple regressions and correlations. Grounded theory was used to analyse the qualitative data.

Though these researches were not based on cooperative learning, they gave essential guidelines to help in selecting the mixed methods design used in the present study. Further these researches also helped understand how to analyse the qualitative data.

2.4. Importance of the Review to the Present Study:

The importance of the Review of Literature to the present study has been categorized under 7 main aspects or focus area as shown in figure 2.12 given below:
Table 2.2 given in the following page presents all the reviews that have been presented in Chapter 2. These reviews have been categorized under ‘Research Review’ and ‘Conceptual Review’ according to the aspects or focus areas. The researchers, authors or the websites of these reviews have also been presented in the table. Further the table shows the importance of the respective reviews for the present study.
TABLE 2.2
Categorization of the review according to the Aspects or Focus Areas

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Aspect or Focus Area</th>
<th>Conceptual Review/Research Review</th>
<th>Researcher/Author/Websites</th>
<th>Importance for the present study</th>
</tr>
</thead>
</table>
• Thousand, Villa and Nevin (1994).  
• Rivera (2013)                                                                 | • Gave a detailed description regarding the theoretical background of Constructivism and its various forms.  
• Explained the Social Interdependence theory as a basis of cooperative learning.                                                                                                                                                                       |
| 2.     | Cooperative Learning         | • Conceptual Review               | • Douma (2006, June)  
• Johnson and Howell (2005).  
• Kagan (1994).  
• Thousand, Villa and Nevin (1994).  
• Williams (2002).  
• Truter (2009).  
• Hoon (2004).                                                                 | • Clarified the relationship between Lev Vygotsky’s Social Development Theory with Cooperative Learning.  
• The concept and elements of cooperative learning as given by different authors.  
• Gave the historical perspective of the researches conducted in social psychology that ultimately culminated to the area of cooperative learning.                                                                                                                                 |

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<th>Sr. No</th>
<th>Aspect or Focus Area</th>
<th>Conceptual Review/Research Review</th>
<th>Researcher/Author/Websites</th>
<th>Importance for the present study</th>
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</table>
• Wigati (2011)  
• Colorin Colorado (2015)  
• Meredith & Steele (2011)  
• Sonawane and Vartak (2010)  
• Texas Education Agency (2013)  
• eworkshop.on.ca (2005) | • Helped in understanding the various pair work and group work cooperative learning activities. |
|        |                      | • Research Review | • Hatipoglu (2012)  
• Acharekar (2013) | • Aided in selecting the techniques of cooperative learning and realizing the importance of planning the activities according to the elements of cooperative learning. |
| 4.     | Research Method      | • Conceptual Review | • Creswell (2014) | • It helped in selecting the mixed method design i.e. Convergent Parallel Mixed Methods Design. |
|        |                      | • Research Review | • Kaul (2008)  
• Qiu (2010)  
• Rivera (2013) | • Helped in deciding the use of control group for the present study. |
|        |                      |                       | • Behera and Pattanaik (2010) | • Assisted in understanding and deciding the mixed method approach and design to be selected by the researcher.  
• This study hinted at the use of Raven’s Progressive Matrices to equate the experimental and control group. |
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<tr>
<th>Sr. No</th>
<th>Aspect or Focus Area</th>
<th>Conceptual Review/Research Review</th>
<th>Researcher/Author/Websites</th>
<th>Importance for the present study</th>
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<tbody>
<tr>
<td>5.</td>
<td>Tool Development</td>
<td>• Conceptual Review</td>
<td>• Sharma and Sharma (2008)</td>
<td>• The article helped in selecting the type of cooperative learning i.e. informal cooperative learning to be used in the classroom interaction. It also helped in designing the lesson plan.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Research Reviews</td>
<td>• Clevenger, Dusing, Houck, and Zuber (2008).</td>
<td>• Gave a framework to develop the observation sheets and feedback sheets according to a 4 point rating scale.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Brahmer and Harmatys (2009).</td>
<td>• Helped in constructing the feedback sheet for the Experimental Group</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Kishore (2009).</td>
<td>• The worksheets used in the study were helpful in planning the worksheets for the experimental group in the present research.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Mandole, Y. (2010).</td>
<td>• The research helped in constructing the items under the ‘personal’ aspect of the feedback sheets for the experimental group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Deepa and Sadananthan (2012).</td>
<td>• Aided in the construction of the Survey Questionnaire for the Teacher Educators and the ‘As a Teacher’ aspect of the feedback sheets for the experimental group.</td>
</tr>
<tr>
<td>Sr. No</td>
<td>Aspect or Focus Area</td>
<td>Conceptual Review/ Research Review</td>
<td>Researcher/Author/Websites</td>
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<td>5.</td>
<td>Tool Development (Continued)</td>
<td>- Research Reviews (Continued)</td>
<td>• Afeefa (2001).</td>
<td>• Assisted in framing the ‘As a teacher’ section of the feedback sheet for the experimental group.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Dikici and Yavuzer (2006).</td>
<td>• Helped in developing the survey questionnaire for the present study.</td>
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<td></td>
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<td></td>
<td>• Goyak (2009).</td>
<td>• The feedback sheet for the experimental group was aided in construction.</td>
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<td></td>
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<td></td>
<td>• Ruys, Van Keer and Aelterman (2010).</td>
<td>• Gave a background to the development of the feedback tool for the experimental group</td>
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<td></td>
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<td>• Allinder (2012).</td>
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<td></td>
<td>• Carey (1998)</td>
<td>• Helped understand MANOVA</td>
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<td></td>
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<td></td>
<td>• Critchton (2000)</td>
<td>• Explained the use of Wilk’s Lambda Test</td>
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<td></td>
<td>• Coe (2002)</td>
<td>• Described the meaning of effect size</td>
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<td></td>
<td>• Levine and Hullet (2002)</td>
<td>• Explained the use of partial eta squared.</td>
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<td></td>
<td></td>
<td></td>
<td>• Palak and Walls (2009)</td>
<td>• Assisted in deciding the statistical tools to be used in the present study</td>
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<td></td>
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<td></td>
<td>• Qiu (2010)</td>
<td>• Helped in understanding the procedure of using grounded theory for analyzing the qualitative data.</td>
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<td></td>
<td></td>
<td></td>
<td>• Puspanjali and Satyaprakash (2010).</td>
<td>• Gave details about types of triangulations in mixed methods research designs.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Rivera (2013)</td>
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<td></td>
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<td></td>
<td>• Pelch and McConnell (2016)</td>
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<td></td>
<td>• Karim (2007)</td>
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<td>Conceptual Review/Research Review</td>
<td>Researcher/Author/Web sites</td>
<td>Importance for the present study</td>
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<td>Jones and Jones (2008).</td>
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<td>Goyak (2009)</td>
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<td></td>
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<td>Agarwal and Nagar (n.d.)</td>
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</tbody>
</table>
The researcher has reviewed the literature presented in this chapter from different sources. Table 2.3 gives the number of reviews along with its sources.

**TABLE 2.3**

Number of Books, Journals and Research Papers used for review of related literature:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Source of Review</th>
<th>Media</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Books</td>
<td>Print</td>
<td>06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Digital/ Websites</td>
<td>01</td>
</tr>
<tr>
<td>3.</td>
<td>Journals</td>
<td>Print</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Digital/ Websites</td>
<td>08</td>
</tr>
<tr>
<td>4.</td>
<td>Dissertations</td>
<td>Print</td>
<td>04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Digital/ Websites</td>
<td>04</td>
</tr>
<tr>
<td>5.</td>
<td>Research articles from ERIC (Education Resources Information Center)</td>
<td>Digital/ Websites</td>
<td>05</td>
</tr>
<tr>
<td>6.</td>
<td>Conceptual/Theoretical articles</td>
<td>Digital/ Websites</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>54</td>
</tr>
</tbody>
</table>
The highlights of the conceptual and research reviews which were studied by the researcher can be summarized as follows:

- Constructivism views learning as a process in which the learner actively constructs or builds new ideas or concepts based upon current and past knowledge or experience.
- The constructivist model of learning suggests that constructive learning is an individual matter.
- Social Constructivism states that the interaction among students increases their mastery of the concepts in the tasks.
- Cooperative learning is based on social constructivism in which small groups work together to maximize their own and each other’s learning to achieve a common goal.
- Positive Interdependence, Face to Face Promotive Interaction, Individual Accountability and Group Accountability, Interpersonal and Small Group skills and Group Processing are the five main elements of cooperative learning.
- Cooperative learning designs can be done on the whole class or whole group, on dyads, triads and quads.
- There are a number of cooperative Learning teaching strategies following the designs.
- Research indicates that cooperative learning helps to keep students on task if it is used as an intervention.
- There is a positive impact of cooperative learning and self recorded strategies on student effort on complex problems in math and science classrooms.
Studies indicate that cooperative learning activities are more effective than individualistic learning activities in science.

Cooperative learning has also shown improvement in achievement of students in subjects like Mathematics and History.

There is an increase in achievement motivation and reduction in anxiety and off task behavior among students engaged in cooperative learning.

Research also suggested that quite a few secondary school teachers had a favourable attitude towards cooperative learning, however it also indicated a need for training the teachers to use Cooperative teaching learning approach.

A few studies have been conducted on Pre Service teachers regarding cooperative learning. Some of these studies indicate that it develops personal qualities like positive self esteem and social benefits of working in groups.

Other studies indicated that pre service teachers have a positive attitude towards implementing cooperative learning strategy in their classrooms if given proper training in its implementation in classroom.

The review also gave a framework of how the pre service teachers can be trained in the techniques of cooperative learning.

Research also suggests that pre service teachers trained in cooperative learning helped them to improve on their lesson plans.

Using cooperative learning showed an increase in per service teacher's learning, motivation and instilled the philosophy of constructivist education in them.

Another study showed that though pre service teachers highly valued cooperative learning teaching strategy for teaching primary school children, they did not prefer to collaborate themselves during the learning process.
However other studies show that the pre service teachers benefit from using cooperative learning in bringing about a significant change in their cooperative behavior.

2.5. Gaps observed from the Previous Studies:

Some gaps observed in the above studies were identified. They are as follows:

- Very few researches included lesson plans for conducting cooperative learning techniques in classrooms as guidelines for other teacher educators.
- No research was found that dealt with Psychology as a subject using cooperative learning teaching techniques.
- A very limited number of cooperative learning techniques were used in the studies conducted on pre service teachers. Many of the researches used not more than two techniques of cooperative learning.
- The opinions of the pre service teachers as learners using cooperative learning technique have not been studied much.
- The opinion of teacher educators regarding cooperative learning teaching strategy has not been done, especially in the Indian scenario.
- Handbook containing cooperative learning techniques for teacher educators to use on pre service teachers was not found, more so related with the teaching of psychology using cooperative learning.
- Development of assessment tools for expert observes was also rarely seen in the past researches.
- No research was found which studied the opinion of pre service teachers regarding cooperative learning and its impact on both their personal as well as professional life i.e. as learners and as future teachers.
The researcher did not come across Indian studies conducted on cooperative learning at pre service teacher level using convergent parallel mixed methods approach.

2.6. Significant Features of the Present Study:

The features of the present study that highlight its importance, application and possible outcomes in Teacher Education are as follows:

- The study is methodical and practical as it includes lesson plans which can give an idea to teacher educators as to how cooperative learning techniques can be used on Pre service teachers.
- The researcher has used mixed method approach in the data collection and data analysis for the present study.
- The opinions of the Pre service teachers have been systematically obtained, which consists of their opinions of the effect of cooperative learning techniques on them as a person, as a learner and as a teacher.
- The study has used a total of 10 cooperative learning techniques for covering the selected syllabus.
- It focuses on using cooperative learning teaching strategy at Pre Service Level.
- It also attempts to give the pre service teachers a direct experience of cooperative learning technique as learners.
- The present study tries to incorporate the suggestions given in the NCF to implement cooperative learning at higher education level.
- It also tries to improve the academic performance of the pre service teachers in the selected paper of the B.Ed. syllabus.
This study gives opportunity to the preservice teachers as future teachers to implement the cooperative learning teaching strategies that they have experienced while learning.

The rare significant feature of the study is that the researcher’s reflections have been analysed using grounded theory. It has been linked with the quantitative data obtained from the observations made by the neutral observers and the feedback given by the experimental group of pre service teachers.

2.7. Conclusion:

The present Chapter gives the details of the conceptual and research literature reviewed by the researchers to identify the gaps in the field of research in cooperative learning. The researcher thus felt the need to conduct the present research in an attempt to bridge the gaps. The following chapter i.e. Chapter III gives the plan and procedure followed while conducting the research.