CHAPTER–II

REVIEW RELATED TO THE LITERATURE

“Practically all human knowledge can be found in books and libraries, unlike other animals that must start a new with each generation man builds upon the accumulated and recorded knowledge of the past.”

- Best

This chapter provides a review of the research literature. Review of related research is a vital pre-requisite to actual planning and for the execution of any research work before embarking on making a fresh study.

Realizing the importance of review Best (2008) says, "A familiarity with the literature in any problem area helps the students to discover what is already known and what is still unknown and untested”.

Billey (1971) held that in the inception of any kind of research, it is essential that the researcher surveys the literature for research studies and authoritative writings related to the problems under investigation. In fact, the researcher, who undertakes a research project without systematically reviewing other studies and writings related to the problem is not only derelict in his personality as a researcher, but also endangers the successful completion and evaluation of his research. Identification of a problem, development of a research design and determination of size and scope of a problem, all depends upon to a great extent on the care and intensity with which a researcher has examined the literature related to the intended research.

It serves multiple purposes and is essential for a well-designed research study. It helps the investigator to acquaint him with current knowledge in the area in which he is going to conduct the research. It is a valuable guide in defining the problem, recognizing its scope and significance, suggesting relevant hypotheses, gathering devices, making appropriate study design and sources of data. The review of the related literature provides some insight regarding strong points and limitation of the previous studies and Survey of related literature is an essential prerequisite to actual planning and execution of any research project.
The review of related literature studied by the researcher is divided into following categories.

- Study of the related literature in Blended Learning Modules.
- Study of the related literature on Student Engagement.
- Study of the related literature on Learning Effectiveness.
- Study of the related literature on Self-Efficacy.
- Study of the related literature on Creativity.
- The Study conducted in abroad and India in the area related to present study.

### 2.1 STUDIES RELATED TO BLENDED LEARNING

In the present study, the investigator discusses the related literature on blended learning strategies. While the concept of blended learning has probably been around since the beginning of Instructional Design, the term became popular in the late 1990s. A blended learning approach combines face to face classroom methods with computer-mediated activities to form an integrated instructional approach. In the past, digital materials have served in a supplementary role, helping to support face to face instruction. Possible benefits of a blended learning approach include: Increased learner engagement, improved learning effectiveness, better outcomes for learners, increased efficiency in class time and optimizes resources, cost-effective way to relieve overcrowded classrooms, convenient alternative to the traditional classroom experience, accommodate various learning styles and support learners at different phases in the learning process, increased variety of delivery and learning strategies, informal and formal, decreased delivery limitations by having a mix of delivery modes, increased flexibility in managing schedules, task loads, out-of-class factors and increased learner participation and accountability in the learning process.

Morris (2010) researched on blended learning or technology-enhanced learning and found that it is increasingly becoming an expectation for higher education students. Blended learning allows for the enhancement of face-to-face interaction between
tutors and students, using internet or computer-based tools. In this paper, a range of case studies are described which illustrate methods to engage students with technology-enhanced learning and improve academic performance and student satisfaction. In the first case study, first-year undergraduate students were provided with short video lectures and formative assessment opportunities in addition to face-to-face lectures, and the impact on examination performance was analyzed. Results showed that students in multiple cohorts performed significantly better on multiple choice questions that were supported by online blended learning resources. Student usage of the resources was also analyzed, and revealed that the majority of students engaged with the online resources after the live teaching event. In the second case study, students were provided with podcasts of lectures with mobile assessments (completed via SMS on mobile telephones) to assess the effect on examination performance and the results showed significant improvement in academic performance. In the final case study, students have been issued with personal response system handsets to increase interactivity and feedback in teaching sessions. The results of these case studies provide evidence for the use of blended learning approaches to improve students’ academic performance in higher education courses, as well as enhancing student satisfaction.

Azizan et al. (2010) found that advantage of blended learning environments is its potential to offer many sources for learners and concluded that utilization of technology in physical classrooms offer extra resources for the students and this is expected to enhance learners’ confidence and competence as well as improve the quality of learning.

Harrington (2010) coined the combination of traditional classes with online ones as ‘hybrid classroom’ and stressed that educators are increasingly engaged in hybrid classes as they have become aware of the benefits. Moreover, she emphasized that most EFL/ESL students enroll in hybrid classes too.

Lu and Chiou (2010) proposed and researched on sole e-learning instruction believe on some benefits of such educational environments like immediate communication, processing learning based on each individual pace, using web technology facilitators (e-mail, chat, video conferencing), etc. Studying through online mode, however,
revealed that the feeling of isolation is real and that this negative element is removed through blended learning. The blended learning environment motivates students to participate in online classes more eagerly as they have the opportunity to meet and discuss virtually with their classmates.

Perera (2010) concluded that as compared to the virtual learning environment, blended learning offers a more successful learning experience since it contains some aspects of traditional classes. Moreover, mere virtual learning still consists of many problems in the area of education.

Tselios, Daskalakis, and Papadopoulou (2011) investigated Greek students’ views towards blended learning. The findings showed that both perceived usefulness and simplicity of use have a toward using blended learning in the university.

Linden and Kim (2014) reviewed institutional approaches to blended learning and the ways in which institutions support faculty in the intentional redesign of courses to produce optimal learning. The chapter positions blended learning as a strategic opportunity to engage in organizational learning.

Guido (2014) conducted a study on Evaluation of a Modular Teaching Approach in Material Science and Engineering. This revealed that the evaluators trusted that the module was very valuable to the course which made students’ learning experience well stimulated.

The study of Transforming K-12 Rural Education through Blended Learning: Teacher Perspectives revealed the results that the positive impacts on students in the areas of motivation, student engagement, personalized learning and self-directedness (Kellerer et. al. (2014).

Wei Li (2016) conducted a case study “Transforming Conventional Teaching Classroom to Learner-Centered Teaching Classroom Using Multimedia-Mediated Learning Module.” It was noted that the learner-centered teaching environment successfully helped 27 students to gain the better understanding, made the learning process more interesting and engaging as compared to conventional teaching.

Kintu, Zhu and Kagambe (2017) investigated the effectiveness of a blended learning environment by analyzing the relationship between student characteristics/
background, design features and learning outcomes. The results indicate that some of the student characteristics/backgrounds and design features are significant predictors of student learning outcomes in blended learning.

Smirnova, Galina, Katashev, Valery (2017) conducted A Study Module in the Logical Structure of Cognitive Process in the Context of Variable-Based Blended Learning. The results indicate that the approaches suggested significantly stir students' interest, thus, enhancing students their learning motivation, development of critical thinking and self-reflection, which altogether facilitate understanding theoretical material, encourage the development of practical skills and promote the pursuit of academic goals.

Conclusion

The investigator reviewed the studies related to the topic of blended learning and the results of these studies which have provided evidence for the use of blended learning approaches to participate in face-to-face interactive activities that helping them to engage with other students and blended learning as a strategic opportunity to engage in organizational learning.

2.2 STUDIES RELATED TO STUDENT ENGAGEMENT

In the present study, the investigator discusses the related literature on student engagement. Engagement is the students’ active participation in academic discussions and activities both inside and outside of class. Student engagement also refers to a student's willingness, need, desire and compulsion to participate in and be successful in the learning process. Indicators of the absence of student engagement include unexcused absences from classes, cheating on tests, and damaging school property. Engaged students share the values and approaches to learning of their lecturers; spend time and energy on educationally meaningful tasks; learn with others inside and outside the classroom; actively explore ideas confidently with others and learn to value perspectives other than their own. When students are part of a learning community, they are positive about their identity as a member of a group; focused on learning; ask questions in class; feel comfortable contributing to class discussions;
spend time on campus; have made a few friends; and are motivated in some co-curricular activity.

Reflection through student engagement was found to augment teach (Hayward et. al., 2001) and made learning explicit (Canale and Duwart, 1999; Hayward et. al., 2001). It enabled students to become aware of their personal growth and learning through their experience (Hayward et. al., 2001) and their professional growth (Canale and Duwart, 1999). Two studies utilized student mentors to engage with students participating in work experiences. The researchers found that the student mentors realized they were engaged in problem-solving when devising mentee e-mails (Canale and Duwart, 1999) and that their reflection was stimulated by connecting their personal past experiences with the current experiences of their mentees (Hayward et. al., 2001). These studies show that both mentors and mentees learned through student engagement.

With higher education institutions facing increasingly straitened economic conditions, attracting and retaining students, satisfying and developing them and ensuring they graduate to become successful, productive citizen’s matter more than ever. Kuh (2003) demonstrates that what students bring to higher education, or where they study, matters less to their success and development than what they do during their time as a student. If student engagement can deliver on its promises, it could hold the magic wand making all of this possible.

Carini, Kuh and Klein (2004) examined (1) the extent to which student engagement is associated with experimental and traditional measures of academic performance, (2) whether the relationships between engagement and academic performance are conditional, and (3) whether institutions differ in terms of their ability to convert student engagement into academic performance. The sample consisted of 1,058 students at 14 four-year colleges and universities that completed several instruments during 2002. Many measures of student engagement were linked positively with such desirable learning outcomes as critical thinking and grades, although most of the relationships were weak in strength. The results suggest that the lowest-ability students benefit more from engagement than classmates, first-year students and seniors convert different forms of engagement into academic achievement, and certain
institutions more effectively convert student engagement into higher performance on critical thinking tests.

Parsons, Jim, Taylor, Leah (2011) reviewed research literature in the area of student engagement to discover curricular and pedagogical ideas educators might successfully use to better engage student learning. Student engagement has historically focused upon increasing achievement, positive behaviors, and a sense of belonging to help students remain in school. The authors suggest that work in student engagement has grown from a focus upon disengaged students (who are not learning) to engage learners (who are learning) and theorize that older work attempted to reshape and renegade students into schooling, but current work revises schools to fit student needs.

Lester (2013) in a review of the student engagement literature, concluded as it is defined for K-12 and higher education settings. This article first identifies the various definitions of engagement and then describes the reasons for growing practitioner and academic interest to increase student engagement. The article concludes with a review of some studies of student engagement, engagement practices that improve student learning, and a review of a national test used to measure engagement levels at institutions of higher education.

Bundick, Matthew, Quaglia, Russell, Corso, Michael, Haywood, Dawn (2014) researched on student engagement and its role in promoting a host of desirable outcomes, including academic outcomes such as higher achievement and reduced dropout, as well as various well-being and life outcomes. Nonetheless, disengagement in our schools is widespread. This may be due in part to a lack in the student engagement literature of a broad conceptual framework for understanding how students are engaged at the classroom level, and the ways in which teachers may play an active role in promoting student engagement. The present work seeks to summarize and synthesize the literature on student engagement, providing both a greater appreciation of its importance as well as a context for how it might be better understood at the classroom level. It considers how the primary elements of the classroom environment the student, the teacher, and the content interact to affect engagement, and proposes a conceptual framework (based on a previously established model of classroom instruction and learning) for understanding how student
engagement may be promoted in the classroom. This study combines a review of the extant research on the structure and correlates of student engagement, with elements of an analytic essay addressing how selected literature on motivation and classroom instruction may be brought to bear on the understanding and promotion of student engagement in the classroom. This article offers a variety of research-based practical suggestions for how the proposed conceptual model which focuses on student-teacher relationships, the relevance of the content to the students, and teachers' pedagogical and curricular competence might be applied in classroom settings.

Lee and Jung-Sook (2014) examined the relationship between student engagement and academic performance, using U.S. data of the Program for International Student Assessment 2000. The sample comprised 3,268 fifteen-year-old students from 121 U.S. schools. Multilevel analysis showed that behavioral engagement (defined as effort and perseverance in learning) and emotional engagement (defined as the sense of belonging) significantly predicted reading performance. The effect of emotional engagement on reading performance was partially mediated through behavioral engagement. Findings from the present study suggest that educators, policymakers and the research community need to pay more attention to student engagement and ways to enhance it.

Vaughan (2014) The article student engagement and blended learning: making the assessment connection demonstrates how collaborative learning applications and a blended approach to learning can be used to design and support assessment activities that increase levels of student engagement with course concepts, their peers, faculty and external experts, leading to increased student success and satisfaction.

Saritepeci and Çakır (2015) the purpose of this study is to analyze the Effect of Blended Learning Environments on Student's Academic Achievement and Student Engagement. Pretest-posttest control group quasi-experimental design was utilized. The study was conducted with 52 students in the experimental group and 55 students in control group. According to the results of this study in blended learning environment had the meaningful increase in average academic achievement when compared to students in the face-to-face learning environment. In addition, blended learning has a medium level effect size on students' levels of academic achievement.
No meaningful statistical differences were detected for students’ engagement between both groups. However, in blended learning approach, average development of student engagement showed a meaningful rise when compared to face-to-face learning approach.

Everett and Donna (2015) suggested that how student engagement adds value to student learning is crucial and worth the time and effort to enhance learning outcomes.

Leach and Linda (2016) researched Enhancing Student Engagement in One Institution and recommended that other institutions could use this different approach to review their current pedagogy and student engagement strategies.

Laura (2017) studied the effects of blended learning on K-12th grade students. Twenty-five peer-reviewed studies published between 2008 and 2016 were selected for analysis in this review. The reviewed research indicates that student engagement, student achievement, and positive student perceptions of learning increased when blended learning was used. Students also developed additional skills through the use of blended learning, such as the ability to self-pace and self-direct.

Deschaine, Mark, Whale &David (2017) suggested interactivity seems to be a key to keeping students involved and achieving, with specific activities routinely favored by students. It is recommended that time spent engaging students is worthwhile and results in greater course satisfaction and academic effort.

Sawang, Sukenlaya, O'Connor, Peter, Ali and Muhammad (2017) evidence founded the significant effect of positive attitude and social pressure on the intent to use Key Pads and use of Key Pads leads to the actual use of Key Pads which is directly associated with the level of student engagement. We also found evidence for the relationship between extraversion and level of engagement such that compared to extrovert students, introvert students felt more engaged.

Schmidt, Jennifer, Rosenberg, Joshua, Beymer and Patrick (2018) concluded that Students' momentary engagement profiles are related to learning activity as well as types of choices.
Isiaq, Sakirulai, Olufemi, Jamil, Md and Golam (2018) found that behavioural and emotional engagement in simulator-based sessions are shown higher but cognitive engagement is shown low when compared with traditional programming sessions.

**Conclusion**

The investigator reviewed the studies related to the topic of student engagement which showed that student engagement and engagement practices that improve student’s learning and classroom instruction and there may be used to produce better understanding and promotion of student’s engagement in the classroom.

2.3 STUDIES RELATED TO LEARNING EFFECTIVENESS

In the present study, the investigator discusses the related literature on Learning Effectiveness. Learning effectiveness means progress, outcomes and reflection in student learning. Once learners are in the system, engage them with additional learning content to help reinforce what happens in the classroom to achieve greater learning outcomes.

Swan (2003) found that online environments support learning outcomes that are generally equivalent to those resulting from traditional and face-to-face instruction. On the other hand, the research suggests that unique characteristics of the medium may afford and constrain particular kinds of learning. Such affordances and constraints, in turn, suggest certain strategies and approaches that might enhance the learning effectiveness of online instruction. With suggestions for practice that might either capitalize on unique their affordances or ameliorate their unique constraints.

A review prepared by Thomas Russell of the International Distance Education Certification Center found that there is no significant difference in learning outcomes, commonly measured as grades or exam results, between traditional and e-learning modes of delivery (Hrastinski, 2008).

Ahmad (2010) has researched out the effectiveness of innovation methods of teaching over traditional method of teaching at junior college level in biology teaching.
Leung, Chi-Hung, Ng, Raymond, Chan, Ella (2011) researched on a total of 575 students from the Associate Degree Foundation Program and the Associate Degree Program. The two purposes of this study were to use the time series between/within experimental design to examine whether participation in co-curricular activities could (1) enhance student learning effectiveness and (2) have positive effects on the academic performance of self-funded sub-degree students in Hong Kong. It was found that participation in co-curricular activities could not enhance student learning effectiveness. Associate degree students were too preoccupied by the need to attain good academic results in the first 2-3 terms of study. Rather, this study suggests that student learning effectiveness is affected by the time factor. High learning effectiveness was observed in the middle of the academic year but relatively low learning effectiveness at the end of the year.

Leung and Chi-hung (2012) researched on Developing the OBTL Curriculum with Blended Learning to Enhance Student Learning Effectiveness in the Undergraduate ECE Program and revealed the results that students’ achieved the more learning outcomes and higher the scores in academic performance.

Shieh, Chich-Jen, Liao, Ying, Hu and Ridong (2013) investigated in their study that partially significant correlations between Web-based Instruction and Learning Behavior, between Learning Behavior and Learning Effectiveness, and between Web-based Instruction and Learning Effectiveness.

Chen, Bryan, Chiou and Hua-Huei (2014) researched on Learning Style, Sense of Community and Learning Effectiveness in Hybrid Learning Environment and investigate that students in a hybrid course had significantly higher learning scores and satisfaction than did students of the face-to-face courses. Analysis of learning style indicated that learning style had significant effect on learning outcome in the study group.

Abdelraheem (2014) the aim of the study was to investigate the effectiveness of blended learning strategy on enhancing students’ learning and raising their self efficacy. A sample of 28 students participated in the study. They were divided randomly into two groups. One group studied through blended learning (BL) strategy and the other through regular conventional methods. Both groups were asked to
respond to a self efficacy scale and take achievement test. The results indicated that students in the blended learning strategy group outscored in grades significantly their counter partners in conventional method. However there were no significant differences among the two groups in the self-efficacy measures. Within the scope of this study, the results implied that BL in teacher education might be applied in order to provide better learning environment.

Eryilmaz (2015) tried to find out in the experimental study is to measure the effectiveness of a blended learning environment which is laid out on the basis of features for face to face and online environments. The study was applied to 110 students who attend to Atilim University, Ankara, Turkey and take Introduction to Computers Course. During the application, students took the lesson face to face, online and blended. Blended learning environment has been designed in the form of online material sharing, forum, exam, text, picture and lesson summaries supported by videos. Following the training, a scale had been applied to the students on the effectiveness of blended learning environment. According to the results of the analysis, significant difference between students’ view in relation with blended learning environment as well as online and face to face learning environments. In their answers, students have expressed that they learn more effectively in a blended learning environment.

Yang, Kai-Ti, Wang, Tzu-Hua, Chiu and Mei-Hung (2015) found that Interactive Whiteboard group students have significantly better learning effectiveness and more positive attitudes towards their learning environment. Verbal interactions in the IWB group tend to involve less lecturing and more active participation by students.

Sun, Jerry, Chih-Yuan, Wu and Yu-Ting (2016) researched on Analysis of Learning Achievement and Teacher-Student Interactions in Flipped and Conventional Classrooms and it was indicated that learners in the experimental group scored higher for learning achievement.

Hong, Jianzhong, Pi, Zhongling, Yang and Jiumin (2018) revealed the results that learners’ cognitive load is increased by adding the instructor in a video lecture. The results recommended that learning effectiveness of video lectures depend on the type of knowledge being taught and the presence or absence of an instructor.
Conclusion

The investigator reviewed the studies related to the topic of learning effectiveness and the results of these studies are  (a) Student learning effectiveness is affected by the time factor. (b) Students' academic self-efficacy was significantly improved by the end of the two courses and (c) findings revealed that the partially significant correlations between Web-based Instruction and Learning Behavior, Learning Behaviour and Learning Effectiveness, and Web-based Instruction and Learning Effectiveness.

2.4 STUDIES RELATED TO SELF-EFFICACY

In the present study, the investigator discusses the related literature on self-efficacy. The psychological concept of ‘self-efficacy’ originates in the social cognitive theory of (Albert Bandura, 1977). The social cognitive theory has its roots in social psychology and behaviorism, but emphasizes ‘social learning’, thereby situating the individual within a social context and within social relationships. Albert Bandura extends that to describe self-efficacy as your belief in your ability to succeed in specific situations. Three conclusions about self-efficacy and similar construction such as self-esteem, self-concept, and locus of control.

Vibha (2001) examined the effect of Mastery learning Strategies on Achievement and Self-Efficacy in English in Relation to Entry Behavior. The sample comprised of 235 students.57 students were selected for Bloom’s Mastery learning Strategies, 62 students were selected for Keller’s Personalized System of instruction, 66 for Eclectic Mastery learning Strategies and 50 subtends for Conventional Group Strategies. ‘t’ ratio was calculated for different combine pairs of Instructions Strategies for Achievement Gain Scores. Results revealed that significant differences at 0.01 and 0.05 level of confidence were found.

Poyrazli (2001) examined the extent to which gender, English proficiency assertiveness, academic, experiences and academic self-efficacy predict psychological adjustment among graduate international students. A total of 122 graduate international students (51% masters, 48% doctorates, 55% male, 45% female) participated in the study. Findings indicated that three variables contributed uniquely
to the variance in students’ general adjustment level, English proficiency assertiveness and academic self-efficacy. Assertiveness and academic self-efficacy were uniquely associated with adjustment. Students with the higher level of assertiveness and academic self-efficacy reported fewer adjustment problems. Results from the variant correlation indicated that the students with higher level of assertiveness repotted being more self-efficacious academically. Suggesting that the students who are more assertive probably initial more academic interaction or ask for academic help (i.e. utilizing writing centers, inquiring about an assignment with a professional or classmate) and for having a higher academic self-efficacy.

Dussler (2002) examined self-efficacy in a sample of 21 college students attending Georgia College and State University in the spring of 2002. The intent of the study was to examine the effect of an experiment based class versus a traditional based class on participant self-efficacy. Results indicated that statistically significant increase in participant self-efficacy occurred equally within both experiential and traditional based classes. These findings do not support the hypothesis that participants in an experientially based class with have a more significant increase in self-efficacy than participants in a traditional based class.

Wannasilapa (2003) tried to find out the language learning through Language Laboratory in relation to Self-Efficacy and Learning Approaches of technical college students in Thailand. The initial sample comprised of 400 randomly selected technical college students. Because of some deficiencies in the data due to either drop out of the students at one or the other stage of furnishing incomplete information or due to absence from the college on specific days, some students were excluded from the final analysis and again randomly allotted to the experiment treatment classification of students was made on the basis of learning approaches and self-efficacy. Each significant f-ratio was followed by ‘t’ test. Results clearly indicated that 4.92 t-values for gain means of rhythm in words for high and low for English self-efficacy group is significant at 0.01 level and 3.24 t-value for gain means of intonation on words for high and low for English self-efficacy group is significant at 0.01 level.

Ling, Qin and Pual (2007) investigated that direct and moderating effect of general self-efficacy on the relationship between stressors and well-being in Chinese
societies. Survey data were calculated from 386 and 306 employees in Hong-Kong and Beijing respectively. The results consistently showed that general self-efficacy was positively related to mental well-being and physical well-being. A series of hierarchical regressions revealed that general self-efficacy moderated the relationship between stressors and mental well-being yet did not moderate the relationship between stressors and physical well-being. Results verified that general self-efficacy plays an important role in employee’s well-being in the collectivist society of China.

Ghaderi (2009) investigated the relationship between self-efficacy and anxiety among Indian and Iranian students studying at University of Mysore. The data were collected from 160 students (80 Indian and 80 Iranian) pursuing postgraduate and Ph.D. programs from different departments of University of Mysore. The students’ group composed of 40 male and 40 female students from Iran, and 40 male and 40 female students from India. Self-efficacy Scale developed by Mathias Jerusalem and Rolf Schwarzer (1995) was employed. To assess anxiety, the Depression Anxiety Stress Scale (DASS) by Lovibond and Lovibond (1975) was used. Two-Two ANOVA was employed to find out the difference between students with low and high self-efficacy along with country, gender and educational levels. Results revealed that students with low self-efficacy had higher anxiety, and Indian students had higher anxiety compared to Iranian students. Students studying in masters had higher scores on anxiety compared to students pursuing Ph.D. programs.

Aggarwal (2011) examined the relationships between the occupational stress of academic faculty to their emotional intelligence, self-efficacy, organizational commitment and coping strategies. The sample comprised of academic faculty members working at various universities of Punjab viz. Panjab University (N-131), Punjabi University Patiala (N-132), Guru Nanak Dev University Amritsar (N-112). The faculty members from Panjab University, Punjabi University Patiala, Guru Nanak Dev University Amritsar were taken from the faculty of Arts, Science, Pharmacy, Management, Business Administration, Computer, Language and Law. After collecting data, similar faculties from all the universities were included in the students. Apply one Professor, One Reader and two lecturers were selected from all the concerned departments. Results revealed that significant differences at 0.05 (1.96)
and 0.01(2.58) level of confidence were found only in some cases and rest insignificant differences were found.

Rani (2011) examined the effect of concept mapping on Science achievement among IX grade in relation to test anxiety and self-efficacy. The experiment of the study was conducted on a sample of 120 students of class IX in senior secondary school. The school was selected by purposive sampling technique out of various senior secondary schools of Mohali District where Science was taught in English medium at IX level. Randomized sampling technique was used. To select 135 students from three schools selected for the study. The average age of students selected ranged from 13-15. Results revealed that (i) ‘t’-ratio 2.49 between concept mapping instructional strategies and conventional method on post-test Science achievement scores were significant at 0.05 level,(ii) ‘t’-ratio 1.303 of means of post-test scores of all boys and girls is not significant at 0.05 level is 1.98 for 118df.,(iii) ‘t’ value 1.59 not significant 0.05 level for 1.98 at 118df. Of test anxiety scores of all boys and girls and (iv) ‘t’ value 1.64 not significant 0.05 level for 1.98 at 118df. of self-efficacy scores of all boys and girls and.

Anand (2011) investigated teaching through smart classrooms in relation to the development of self-concept and self-efficacy among class 6th students. 100 students were selected randomly from Govt. model and Henderson Memorial School. To determine the significance of the difference between the different group. ‘t’ test was applied. The male and female students have no significant difference in self-concept. The male and female students have no significant difference in self-concept and self-efficacy. The male and female students have significant difference in self-concept when they are taught through the smart classroom. The male and female students have no significant difference in self-efficacy when they are taught through the smart classroom.

Scott (2012) tried to find out the quantitative correlation study to evaluate high school special education teachers’ self-efficacy in teaching students with disabilities the skill they need to lead their Individualized Education Program meeting. A sample of 84 high school special education teachers completed the Teacher survey of student involvement in IEP meeting Questionnaire (TSSIIMQ). A two-sample t-test was
performed on the participant’s responses. ‘t’- value was 3.971. The results showed that special education teachers’ support from the administration was statistically significantly correlated with their level of self-efficacy.

Amareswara and Samiullah (2012) studied the relationship between the teachers’ Self-efficacy and academic performance of their students. The impact of gender and job tenure on teachers’ self-efficacy was also studied. 160 B.Ed. colleges constituted the sample of the study. Bandura’s self-efficacy Scale was used to assess the self-efficacy of the B.Ed. students. Positive co-relationship was found between Teachers’ Self-efficacy and the academic performance of their students. To test whether there is any significant difference between men and women teachers with regard to their self-efficacy, the data subjected to ‘t’ test and the obtained value 0.99 was not significant. Gender had no significant impact on Teachers’ Self-efficacy. Teachers, with long Job Tenure, were found to have more self-efficacy as compared to the teachers with short Job Tenure.

Kaur and Kaur (2013) conducted the descriptive study on 200 B.Ed. students of the different college affiliated with Panjab University, Chandigarh to investigated their teaching aptitude and attitude towards teaching in relation to their level of occupational self-efficacy (high, average and low) and to find out the relationship between teaching aptitude, the attitude of the student teacher towards teaching and their occupational self-efficacy. The sample was stratified at the level of gender and discipline (Science and Arts teaching subjects). Teaching Aptitude Test Battery (TATB) Teacher Attitude Inventory (TAI) and Occupational Self-Efficacy Scale (OSES) were used to collect data. Mean scores, Standard Deviations, Critical Ratio and Coefficients of correlation revealed that student teachers with high occupational self-efficacy differ significantly from the student teacher with average and low occupational self-efficacy on the variables of teaching aptitude and attitude towards teaching irrespective of their gender and discipline and there exists a positive correlation between teaching aptitude, attitude towards teaching and occupational self-efficacy of student teachers.
Tai and Hung-Cheng (2016) revealed the results that instructional method effectively enhanced the learners' writing performances along with influenced the latent structures of the learners' self-efficacy from theoretical constructs toward pedagogical meanings, with the learners' writing self-efficacy beliefs being altered by the instruction and becoming consistent with the assessment criteria. In addition, both the learners' pre and post-test self-efficacy levels had significant causal relationships with their individual learning progressions.

Bradley, Rachel, Browne, Blaine L.; Kelley and Heather (2017) Statistical analyses show that there is strong correlations between self-efficacy and self-regulatory scores for both online learning environments and traditional learning environments and suggested that high self-efficacy and positive self-regulatory behaviors are reliable predictors of academic success in online courses.

**Conclusion**

The investigator reviewed the studies related to the topic of self-efficacy and the results of these studies are (i) mapping instructional strategies and conventional method on post-test and Science achievement scores were significant (ii) male and female students have no significant difference in self-efficacy when they are taught through the smart classroom and (iii) there is strong correlations between self-efficacy and self-regulatory scores for both online learning environments and traditional learning environments.

**2.5 STUDIES RELATED TO CREATIVITY**

In the present study, the investigator discusses the related literature on creativity. Theories and ideas about creativity stem from far back in history. In England, there have been two recent periods in which creativity has been recognized as a desirable aim for inclusion in the curriculum, particularly in primary education. The first was in the 1960s with the publication of the Plowden Report and the second during the late 1990s. (Ryhammer and Brolin, 1999) points out that the development of new ideas and original products are a particularly human characteristic. Creativity is essentially a human phenomenon. It is a process in man which helps him achieve
dignity and meeting in life. Creativity is the process of having original ideas that have value. The concept of creativity has traditionally proved an elusive one to pin down. Creativity is the ability to produce new knowledge (Dacey and Lennon, 2000). Although creativity has a very long history, systematic study of it began at the turn of the last century. The early years of the twentieth century saw a move toward the empirical investigation of creativity within the new discipline of psychology. There were four major traditions in which this took place: psychoanalytic tradition (including Freud’s discussion of creativity as the sublimation of drives and Winnicott’s work on development which makes creativity central and intrinsic to human nature), the cognitive tradition (stemming from Galton’s work and including Mednick’s exploration of the associative process and Guilford’s exploration of divergent production of ideas and products), the behaviorist tradition (including Skinner’s discussion of chance mutation in the repertoire of behaviors), the humanistic tradition (including Rogers, May and Maslow whose discussions focused on the self-realizing person acting in harmony with their inner needs and potentialities).

Rambo (1964) in his comparative study of academic achievement of highly creative and low creative students of VIII, IX, and X class, found that highly creative students similar to the low creative students in their grade points. The study conducted on a sample of 500 students showed that academic achievement. It is found that students of class VIII, IX and X that are highly creative scored significantly higher in achievement than low creative students.

Singh (2007) in the present study descriptive survey method of investigation was applied. Sample of 889 subjects were selected randomly from the school located in different Districts of Punjab State. The sample comprised both male and female adolescents studying in the class eleventh. Mean Q.D. S.D. and t - ratio techniques were used to analyse the data. The results revealed that no significant differences were found.

Mahmood (2009) found that the extent of the relationship between creativity and achievement motivation of the students and academic achievement. A representative sample of 450 students studying in class X was drawn using survey method. The
findings revealed that there was the significant positive relationship between creativity, achievement motivation and academic achievement.

Joshi and Joshi (2009) tried to find out the effect of types of school, creativity and parental encouragement of boys and girls on the classroom morale of the students. The study was conducted through normative survey method on a sample 160 boys and girls each. The data obtained on the measuring instrument of types of school, creativity and parental encouragement, were administered on the students of both the sexes. The significantly reliable and valid results have been analyzed by conducting analysis of variance of (2×2×3) factorial design.

Kumar (2009) tried to find out the relationship between the creativity, Ego-Strength and Locus of Control of Navodaya Vidyalaya Students. The sample comprised of 300 male and female Arts and Science students of Grade XII, was selected from the Navodaya Vidyalaya Haryana. Creative was measure by B. Mehdi’s Verbal Test of Creative Thinking. Ego-Strength was measured by Q. Hassan’s Ego-Strength Test. Locus of Control was measured by N. Hasnain and D.D. Joshi’s Locus of Control Test. Mean S.D. Correlation and t-test were calculated to analyse the data. The findings revealed that significant differences and differences were found on the basis of ‘t’values at 0.5 level of significance. The results showed that boys are more fluent, flexible and original as compared to the girls, Arts students are more fluent and flexible as compared to the Science students and Science students are more original as compared to the Arts students.

Sharma and Chauhan (2010) found the relationship between creativity and personal trait-extroversion and introversion. In the study simple random sampling technique was employed. 4 Schools were randomly selected; the total number of students taken for the Extroversion-Introversion test comes to be 100. Out of these100 students 86 were found average and 14 were Introvert and Extrovert Baquer Mehdi Creativity Verbal Test, the Neymen Kohilstedt Diagnostic Test for introversion-extroversion (Indian Adaptation by Dr.Jai Parkash) have been used in the present investigation. To test the signification, ‘t’ test was used. T value 1.18 was insignificant at both 0.05 and 0.01 level. Hence there was no significant difference between the creativity of extrovert and creativity of introvert. This research denies any relationship between the
creativity of extroverts and introverts, which will help the entire person related to the student personality development.

Nautiyal and Negi (2011) studied on the adolescent students of Class XII attempts a comparative assessment of creativity (i) in girls versus boys,(ii)in students enrolled in government-run schools versus those enrolled in private schools, and(iii)across different economic groups of students. Adolescents, in the age group between 15 and 18 years, and studying in the 12\textsuperscript{th} standard were selected across six different schools: Private run-3 and government funded-3 located within the township of Pithoragarh, Uttarakhand. Altogether 178 adolescents, represented by 103 boys and 75 girls were selected randomly. Measurement of potential creativity was done through Passi tests of creativity. In an overall appraisal of difference between sexes in ability, achievement and readiness, the difference between was very slight, and creativity not sufficient to warrant the fact that differs across the sex. However, a sharp difference is conspicuous in the functioning of the creativity of the adolescents, the enrolled in the private run with those enrolled in government-run schools, with creativity level being significantly more in adolescents enrolled in the former. Creativity shows a positive correlation with the socio-economic status of the family, irrespective of the sex of the students. It is strongly felt that if the potential of creativity is to be harnessed, a requisite motivating environment, which boosts up their self-concept and achievement motivation, remains obligatory.

Siddiqi (2011) investigated differences between boys and girls in terms of the relationship between aspects of creativity. A sample of 50 boys’ and 50 girls’ studying into secondary schools of Aligarh city was randomly selected. The investigator had personally met the participants and administered the tool. Torrance Test of Creative thinking (Verbal Form A) designed by E.P. Torrance (1968) was used. Mean S.D.S. and t-test were calculated to analyse the data. The findings revealed that boys do not differ significantly in all the variables of verbal creativity, except the measures of originality from the girls.

Amarpali and Kaur (2011) conducted the study among secondary school students to study academic interests and study habits in relation to creativity. A sample of 500 students (250 boys and 250 girls) studying in XI and XII classes of different schools
in rural and urban areas of Amritsar and Tarn Taran districts were taken. The sample was selected by using Stratified Random Sampling Technique. A New Test of Creativity by Dr. Roma Pal, Study Habits Inventory of M.N. Palsane and Sadhna Sharma and Educational Interest Record by Dr. S. P. Kulshreshtha as tools were used. The results were obtained with the help of mean, standard deviation, skewness and kurtosis and correlation statistical techniques. Results clearly indicated that a positive and significant correlation was found between study habits and creativity of total sample of boys and girls. In case of correlation between academic interest and creativity, it was found that science and creativity were positively and significantly correlated in case of boys’ sample.

Desouza (2011) explored the concept of creativity in depth to find an answer to the question that has occupied his mind for many years, namely, whether creativity is individualistic or social in nature. Through his research and reflection, he realizes that the various views and opinions regarding the nature of creativity point to the fact that creativity is neither purely individualistic nor purely social. In this sense, creativity is both individualistic as well as social but at the same time, it must be accepted that there is something unique and special emanating from the creative person or persons in every creative endeavor.

Nayar and Senapaty (2011) determined the effect of constructive approach on students’ ability. The study was a pre-test, post-test quasi-experimental design and it was conducted in winter 2009 where class-V students participated from two different English medium schools of Bhubaneswar city, Odisha. Learning in the constructivist framework has been applied to experimental group and traditional teaching method following by control group. The Creativity Ability Test (CAT) used by the researcher to estimate the students’ creativity from both groups. The hypothesis was tested at 0.05 level using t-tests. The result showed that learning in constructive strategy improves students’ overall creative ability as well as other two different dimensions( Fluency, Flexibility) and no such difference found in case of originality aspect of CAT. The researcher concluded that the constructivist approach is an effective strategy, which teachers need to incorporate in their teaching.
Kingra (2012) conducted the study on the sample of 300 students of class 7th of Government and Private Secondary schools of Punjab School Education Board from the urban locality of Faridkot District of Punjab. ANOVA and t-test were applied. The results indicated that there was the significant difference in the level of academic achievement, scientific attitude and creativity among students taught through computer-assisted and activity oriented and conventional instructional strategies in science.

Deep (2012) conducted the study on 614 students of IX class of various schools. F-ratio was calculated to examine the weight age of self-concepts, creativity and personality to prediction achievement in Mathematics. Significant differences were obtained.

Tripathi and Kaur (2012) attempted was made to find out the relationship of Personality pattern and Creativity of Government and Non-Government Secondary School students. The sample consisted of 200 students-100 from Government and 100 from Non-government Secondary schools of Dabwali City. Multidimensional Personality Inventory by Km. Manju Aggarwal and Verbal Test of Creativity by Dr. Baqer Mehdi were administered. Subsequently, the data were subjected to statistical analysis. Results clearly indicated that Government Secondary School students are more creative than Non-Government Secondary School students whereas Non-Government Secondary School students display better personality patterns in comparison to Government Secondary School students. Further, significant difference was observed in the personality pattern of high and low creative school students.

Chaudhary (2018) investigated the effect of the integrated curriculum through blended learning strategies on creativity, critical thinking and leadership qualities of primary school students. Results clearly indicated that 8.675 t-value for gain means of creativity is significant at 0.01 level. The experimental group taught by integrated curriculum by blended learning strategies resulted out better creativity control group taught by traditional strategies.

Conclusion

The investigator reviewed the studies and the findings revealed that (i) creativity is both individualistic as well as social, (ii) Government Secondary School
students are more creative than Non-Government Secondary School students whereas Non-Government Secondary School students displays better personality patterns in comparison to Government Secondary School students and (iii) significant difference was observed in the personality pattern of high and low creative school students.

**Summary of Reviews**

Hence, in the light of above facts, the present investigation which attempts to investigate the effect of blended learning modules in Science on student engagement, learning effectiveness and self-efficacy in relation to creativity of IX graders.

*****