CHAPTER III
REVIEW OF RELATED LITERATURE

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3.1 INTRODUCTION

Review of related literature is an essential part of any research study. It acts as an important pre requisite to actual planning and execution of a good piece of research work and becomes a link between the research proposed and the studies already done. Review of related literature helps an investigator to eliminate the duplication of what has been done and project provides useful hypothesis and helpful suggestions for significant investigation (Best and Kahn, 1999).

In this chapter, the literature review and studies in close proximity to the present study have been discussed. An attempt has been made here to review the researches that have been done in India and abroad. The points emerging from the review of the related literature have also been objectively discussed. The studies and literature have been reviewed and classified under the following sections:

3.2 Studies on Commerce Education

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3.2 STUDIES ON COMMERCE EDUCATION

Commerce education is described as an ordered endeavor to mould the citizens for enterprising and managing business competently and fruitfully. The principal intent of commerce education is to endow with skilled manpower mandatory by the business strata in different sections. It aims at humanizing the quality and productivity of personnel in business. Thus, commerce education is concerned not only with the development of vocational skills in purely economic terms but also with social usefulness. But often, the prevailing modes adopted to materialize the goals of commerce curriculum are far from satisfactory. A challenge has been put here to bring some of them which are closely associated with the present study.

Paul (2012) did a research study on the area of challenge based learning strategy and stated that Challenge Based Learning strategy asserts students learn more and are more through active engagement when they are solving problems, especially authentic, real world one. The study investigates the Effectiveness of Challenge Based Learning on the Academic Achievement of commerce students at higher secondary level. The investigator found that Challenge Based Learning is an effective instructional strategy on the Academic Achievement of commerce students at higher secondary level. Also this strategy is effective in developing skills of problem solving, creative thinking and decision making.
Roshan, Ara (2011) presented the sum up of the proceedings of a workshop held in Jammu & Kashmir, Board of School Education on the significance of commerce education. The workshop highlighted the need for making student centered and stresses free commerce curriculum and focused the need for restructuring the existing commerce curriculum when the entire business world is undergoing significant changes requiring advanced study and research.

Krishnamurthy and Amutha (2011) conducted a study entitled on “Higher secondary student’s achievement in commerce in relation to their emotional intelligence”. The study concluded that the higher secondary school student’s achievement in commerce is at moderate level. Further; gender, locality and type of school make significant difference in the achievement of commerce students. But religion, family size and family income make no significant difference. Similarly with regard to emotional intelligence, entire and sub samples fall in the category of average level of emotional intelligence. Gender, locality and religion causes significant difference in the emotional intelligence level and type of school, family size and family income cause to significant difference. But higher secondary school commerce student’s achievement is significantly related to their emotional intelligence for both entire and sub sample wise.

Sajikumar (2011) did a study on “Effectiveness of certain behavior modification models on achievement in commerce among students at higher
secondary level”. The major findings of the study holds that under appropriate conditions, a sizeable portion of the population can be brought to a level of achievement in the subject, interest in the subject and attitude towards the subject. The study suggested that the teachers can tailor instruction to the needs of most of the students in the classroom by employing behavior modification models in the classroom. For this, it is desirable that the teachers should have a fresh outlook at their teaching approach in terms of behavior modification models.

**Awi, Asnaini (2008)** conducted a study on “Relationship between teacher’s knowledge of the commerce learning experience and evaluation and the teachers’ management on the implementation of the commerce in secondary schools”. The results showed that teachers’ level of knowledge of commerce learning experience and evaluation is moderate; meanwhile the level of the commerce’s instruction and its implementation management is moderate. The results revealed that no significant relationship exist between teachers’ knowledge of the learning experience and the implementation of the instruction based on the aspects of management of teaching, classroom management and test management.

**Arumugarajan (2008)** engaged in a study on “Abstract reasoning of commerce students studying in school”. The study found that the level of abstract reasoning ability of higher secondary commerce students is moderate. The level
of achievement of higher secondary commerce students is average. Also the study realized that there is significant difference between plus one and plus two commerce students with reference to abstract reasoning.

**Obul, Reddy (2007)** presented a paper on “Revitalizing commerce education” highlighted the broad objectives of liberal education with the aim of fostering students with an attitude of objective enquiry, understanding of the society, social change, problems of human relationships, human and social implications of technological change, developing a capacity to appreciate the higher values of life and the like. These objectives are taken as implied in the case of business education also. Education should be a three-fold process of imparting knowledge, developing skills, inculcating proper attitudes and values towards life and society in general.

**Vinayagamoorthy (2006)** did a study on “Move with the world changes imminent in commerce education and curriculum” stated that commerce education is the backbone of business and that it should keep pace with the changing trends, asserts that if we should impart the most modern skills blended with innovative teaching and best infrastructure on instructional system we should ensure cost effective and professional excellence. More opportunities should be provided to students to exhibit their skills, triggering their creativity, enhances their communication skills, motivate leadership qualities etc. would certainly enrich their overall dimensions of personality.
Bhatia, Harjeet Kaur (2006) published a paper on “Teaching commerce at higher secondary stage” and highlighted that the National Curriculum Framework 2005 has adopted a step motherly attitude towards commerce education. The paper recommended that

- Design teaching learning materials that appears interesting for the students
- Case studies may be presented to students in audio-visual mode
- Students may provide opportunities for asks to infer, and interpret the concept they were supposed to learn
- Develop and practice different instructional methods and strategies for effective transaction of curriculum.

Ram, Mehar; Maninder, Singh Sarkaria and Hakumat, Rai Nischal (2006) did a case study on “Status of commerce education at school level in Punjab”. The study has observed that certain sharp turns influences in the popularity of the subject. The country has been experiencing substantial rise in commerce and business activities since the process of liberalization and globalization initiated a decade ago; resulting in proportionate rise in job opportunities in the areas of business and commerce which consequently has enhanced the demand of personnel equipped with adequate training and skill in this field.
Jeya, Jayaprakash (2005) in a study on “Strategies in teaching accounting in higher education”. The study made a conclusion that teaching accounting is not only to develop the intellectual skills of students but also to provide them with opportunities to work individually, in pairs, small and large groups. Students with intellectual skills also need to equip themselves with professional competence like decision making, problem solving, critical thinking and teamwork. In order to achieve this, the teaching strategies used must therefore be in line with the contextual learning theory where the aim of education is the integration of content learnt with the real world experiences. Therefore, teaching tools such as interactive case studies, Problem Based Learning, simulations and games, group work are widely recommended by several research organizations.

Prabhuling, Dandin (2005) in a paper on “Commerce education and Industry interface” and pointed that commerce education needs to be competitive vis-a-vis corporate requirements in India and around the globe. For these aspects students are required to go beyond theories and equip themselves with practical skills which can be applied in real world. The paper concluded that commerce students can be made practical managers in all fields.

Angus, Duff (2004) did a study on “The role of cognitive learning styles in accounting education: Developing learning competencies”. The study revealed that the potential for cognitive learning style (CLS) to develop students' learning
competencies is limited by the variety of conceptualizations, constructs and instruments. The origins of cognitive learning style, its fundamental dimensions, and methods of assessment are also reviewed. The study suggested that accounting educators can make use of cognitive learning style and associated measures to help students ‘learn how to learn’ are developed.

Rajendran (2001) engaged in a study on “Commerce education- A need for re-engineering”, mainly for examined the present state of commerce education in the light of Liberalization, Privatization and Globalization (LPG) and indicated the inadequacy of commerce education to meet the challenges posed by LPG. Also the study highlighted the need of re-designing the curriculum of commerce education to provide practical training and learning and to develop desirable skills and competencies to meet the expectations and requirements of the business world and also the product of the commerce education.

Obul, Reddy (2000) conducted a study on “Re-designing commerce education in India in the context of changing business environment”. The study made a conclusion that commerce education has expanded quantitatively but its quality had degenerated gradually over the years. The study pointed out the insufficiency of the prevalent courses and instructional approaches of commerce education not systematically equip the learners either for taking jobs in the competitive market or for attaining higher ventures.
**Johnstone and Biggs (1998)** involved a study on “Problem Based Learning: introduction, analysis, and accounting curricula implications”. This study analyzes Problem Based Learning (PBL), a teaching method that may enable accounting educators to implement Problem Based Learning in their own curricula. Therefore, we conclude that Problem Based Learning is an appropriate means to implement in various curriculum transaction aspects of accounting discipline.

**Aggarwal, Raj Rani (1997)** did a study on “Effect of teaching strategies in relation to creativity on conceptual learning of Grade XI students of commerce”. The study found that advance organizer model and concept attainment model were found to be more effective than the conventional model in fostering concept learning. The study reported that advance organizer model and concept attainment model were significantly differing in the measures of concept retention while both were found equally effective in fostering concept learning.

**Babu and Gnanaguru, Selvaraj (1997)** engaged in a study on “Teacher effectiveness and involvement in teaching of commerce at higher secondary level in Tamilnadu” and the study concluded that: a) Teacher effectiveness in teaching commerce was found to be good and b) The involvement of teachers in teaching commerce and their effectiveness of teaching were found to be correlated significantly.
Nancy, Bagranoff (1993) in a paper on “Adopting commercial software in the accounting classroom: A focus on learning”. The paper concluded that an educational objective for accounting is to teach students on ‘how to learn’. Because “learning to learn” involves teaching students through learning strategies, accounting educators need to find new ways to help students acquire these strategies. This paper will be useful for instructors seeking ways to assist students in developing strategies for learning that will better prepare them for careers in a complex and dynamic environment.

CONCLUSION

The studies point towards the need for revamping existing practices of curriculum transaction of commerce education and develop suitable instructional strategies that focus students more through active engagement when they are solving authentic and real world problems. Also teaching strategies more concentrated on conceptual learning because commerce is related with the association and integration of concepts and principles. The teachers in the classroom must see that the learning objectives set for a course are achieved through properly chosen strategies and content. Commerce is related with life and this context commerce education should be a three-fold process of imparting knowledge, developing skills, inculcating proper attitudes and values towards life and society in general. It must enable the individual to develop the activity and skill to earn and carry on reasonable standard of living and it must also enable
him to develop his creative faculties to the utmost so that intellectually, morally, physically and spiritually he is in a position to enrich his personality.

In conclusion, there is need of re-designing the curriculum transaction modes of commerce education through appropriate instructional strategies and approaches to develop desirable skills and competencies namely problem solving, decision making, predicting, critical thinking, creative thinking and the like to meet the expectations and requirements of the business world in particular and of the users of the product of the commerce education in general.

In order to transact the curriculum effective, adoption of certain instructional strategies is essential. It was thus analyzed by the investigator to go further in to studies related to various instructional strategies those in close proximity to constructivist paradigm and cognitive processing which are scaffolds for creating and crafting new knowledge. In this aspects, the next sections of the review are set apart to understand the impact of a constructivist strategy viz; Problem Based Learning through which how students engaged an ill structured problem based activities and to attack similar problems in a comprehensive and systematic manner to analyze the various dimensions of curriculum transaction strands and also the review of a cognitive strategy viz; Graphic Organizer, though which how that framework supports students learning by presenting component information in an organized manner and by linking related information together (Boyle and Yeager 1997). To infer these framework
aid students by highlighting the various schemes of curriculum transaction scaffolds by visual displaying of relationship between ideas and serves as guides for further learning.

3.3 STUDIES ON PROBLEM BASED LEARNING

Problem Based Learning has its roots in constructivist learning theories, as a useful instructional alternative to conventional teaching. Such learning environments are designed to help students to construct an extensive and flexible knowledge base, become effective collaborators, develop self-directed learning skills, develop effective problem solving skills, and become intrinsically motivated to learn (Hmelo, Silver 2004). Hence the investigator classified this section into two parts; one part focuses on analyzing how far Problem Based Learning approach enhances the academic performance and the remaining part focuses on verifying the extent of excelling the curriculum transaction attributes through the effect of Problem Based Learning.

3.3.1 PROBLEM BASED LEARNING AND LEARNER PERFORMANCE

In this segment the investigator attempted to gather, describe and explore a few studies in close linkage with Problem Based Learning strategy to various aspects of learner performance.

Bayat, Sahar and Tarmizi, Rohani Ahmad (2012) presented a research study on “Collaborative Problem Based Learning in mathematics: A cognitive
load perspective”. This study examined the effects of Problem Based Learning on educational statistics course. Comparing students’ performances based on two tests showed that there was significant difference between the mean performance of the PBL group and that of the conventional group – indicating PBL efficacy.

Duran, Mesut and Sendag, Serkan (2012) presented a paper on “Comparing pre-service teachers’ perceptions of instructional activities implemented in an online Problem Based Learning and online instructor-led learning”. Findings indicated that pre-service teachers in online Problem Based Learning group found the ill-structured problem scenarios encourage in gaining content knowledge. The study highlights that pre-service teachers develop different perceptions about the course, the instructor and learner’s role when different online instructional strategies were implemented.

To find out the effects of Problem Based Learning on the students’ success in physics course, conducted by Silay, Iihan et al. (2011) determined that there was statistically significant difference between two groups in terms of students’ total mean scores in favor of PBL group and PBL is effective on student’s achievement in physics.

Abu, Rosini et al. (2010) did a study on “Effects of Problem Based Learning on Mathematics Performance and Affective Attributes in Learning Statistics at Form Four Secondary Level”. The findings of the study indicated that PBL is efficient as the conventional teaching strategy in enhancing
student's mathematics performance. Even though both groups of students showed positive perception towards group work, interest in mathematics and perception towards the learning experience they went through the PBL strategy.

Mokhtar, Mohd Zin et al. (2010) in a study entitled “Problem Based Learning: Engaging students in acquisition of mathematical competency”. The results indicated that there was no significant difference in the mean scores of the overall mathematics performance between the PBL group and the control group. PBL instructional strategy has promising implications in teaching and learning specifically in enhancing learning, thinking and communication among learners.

Bayat, Sahar and Tarmizi, Rohani Ahmad (2010) presented a paper on “Effects of Problem Based Learning Approach in Learning of Statistics among University Students”. Comparison of students’ performance based on tests showed that there is significant difference between mean performances after undergoing PBL intervention.

Caliskan, Serap and Selcuk, Gamze Sezgin (2010) presented the their research findings based on the study of “Comparing the effects of Problem Based Learning (PBL) and traditional methods on student teachers’ satisfaction with an introductory physics course”. Results indicated that the experimental group was more satisfied than the control group.
The effects of Problem Based Learning and traditional teaching methods on students’ academic achievement, conceptual development and scientific process skills according to high school students conducted by Bakac, Mustafa and Tasoglu, Aslihan Kartal (2010), revealed that PBL method is more effective on students’ conceptual development.

This study was undertaken by Sulaiman, Fauziah (2010) to assess students’ perception towards implementing an instructional method known as Problem Based Learning in a physics course. The findings in general come up with two themes: communication and sharing knowledge; and help in understanding concepts in modern physics/physics content knowledge through the effect of Problem Based Learning.

To examine the “Effects of PBL and motivational styles of high school students’ attitudes on biology courses and on their academic achievement” did by Solak, Kemal et al. (2010). The results of the study indicated that, method and motivational styles did not affect on the attitudes of high school students towards biology.

Rajeswari (2010) did a study on “Problem Based Learning in physics”. The study found that the Problem Based Learning strategy is more effective to increase the achievement in physics of higher secondary school students in Kerala. The Problem Based Learning strategy study also will help teachers to
expand the boundaries of their creativity and also the creativity of their students beyond the walls of the classroom.

**Eryilmaz, Ali and Ates, Ozlem (2010)** focused a study on “Factors affecting performance of tutors during Problem Based Learning implementation”. The findings of this study indicated that tutors’ level of adaptation of the PBL and their content expertise were commonly mentioned as factors which affect their performance positively during PBL implementation.

**Kucukuturan, Ayse Guler and Hatisaru, Vesife (2009)** had done a study on “Vocational and technical education Problem Based Learning exercise: Sample scenario”. The study is conducted based on previous research findings, showed that the industrial vocational high school students’ success in mathematic lessons is low. As a result, student centered education methods should be preferred instead of teacher based education in mathematic lessons. In Problem Based Learning, subjects are introduced to students in scenarios prepared according to real life. “Factorial” was introduced to students in a scenario and students were able to solve the problem systematically in formed groups.

**Sayek, Iskender et al. (2009)** did a study aimed to determine students’ and tutors’ perceptions of the role of tutors in Problem Based Learning sessions, and the relationship between students’ and tutors’ views. The difference between the mean values for dimensions in the tutors’ total scores were as statistically
significant as were the students’ scores. The correlation between the scores of students and tutors was analyzed and found not to be statistically significant.

**Keser, Hafize and Gursul, Fatih (2009)** did a study aimed at finding out the effects of the online and face to face Problem Based Learning environment in mathematics education on student's academic achievement. According to the results, the ranked mean scores of achievement level of the students at the online Problem Based Learning group had higher than the students in the face-to-face Problem Based Learning group, which was also statistically significant.

**Sudharma (2008)** examined the potential difference between PBL and prevailing instructional approaches. She made an attempt to conceptualize the PBL approach on pedagogic landscape with a benchmark in social science instruction. The results indicated that the changed scenario of social science demands systematic process of instruction and a master strategy of teaching and learning that can give the students a variety of life oriented experiences.

**Orhan, Akinoglu and Ruhan, Ozkardes (2007)** conducted a study on “Effect of Problem Based Active Learning in science education on student’s academic achievement, attitude and concept learning”. The study concluded that the implementation of Problem Based Active Learning Model had positively affected student’s academic achievement and their attitudes towards the science course. It was also found that the application of Problem Based Active Learning
Model affects student’s conceptual development positively and keeps their misconceptions at the lowest level.

The research on **Beer (2005)** resulted that no statistically significant change in pre/post-test scores recorded. Problem Based Learning in this study does not seem significant improvement on student’s learning of ‘content’. However Problem Based Learning as undertaken in this study does promote greater engagement with the subject.

**Bhattacharya and others (2005)** in a study regarding the attitude of students and teachers on PBL. From the study it was concluded that the implementation of PBL is flexible even in the traditional set up despite limited resources.

**Maxwell and Mergendeller (2005)** in their study examined the potential differences between PBL and traditional instructional approaches in building knowledge of macro-economic concepts and principles in high school students. They found strong evidence of an increased instructional interaction on students’ learning of macro-economic using PBL. The result suggests that PBL can improve students’ learning if instructors who are well trained in both PBL technique and economics implement it.

**Senocak (2005)** made a study on “Problem Based Learning approach in the gas state of matter unit”. In the light of the findings, the study concluded that
the Problem Based Learning approach is more influential than the traditional teaching approach.

Porath and Jordan (2004) described an approach to learning required a pre-service course in special education using PBL. They found that pre-service teachers engage in solving problems, which are representative of actual situations they may encounter in their teaching practice. They are challenged to identify the problem with their peers in problem solving groups.

Goodnough, Karen (2003) conducted a self study to explore Problem Based learning as an instructional approach in the context of a large pre-service science education course. The study found that, nearly all participating students liked the PBL experience. Those disliked it or did not like or confused because of the open ended nature of the problem, and believed that the content could have been learned equally well individually. The study concluded that in PBL, problems were designed to large and felt, it would have been better to start in small group sessions.

Beers (2002) investigated the effect of Problem Based Learning on objective test scores of students in a school of nursing. Results indicated that no statistically significant difference in the scores of two groups. That means there is no difference in objective test scores based on lecture versus Problem Based Learning method.
Visser (2002) compared the effects of Problem Based Learning and lecture based instruction on student’s problem solving and attitudes in a high school genetic class. The investigator found that statistically significant differences in learning outcomes and motivation for students in the Problem Based Learning as compared with lecture/discussion treatments, yet recounting more confidence in their learning.

Lancaster et al. (2002) in a study on investigating the curricula’s influence on medical student’s perceptions of learning environment; as measured with PBL and conventional Lecture Based Learning (LBL) tracks over three years. Results indicated that PBL students’ attitudes were significantly more positive than LBL students’ after the first year.

McDonald, James (2002) done a study entitled “Using Problem Based Learning in a Science Method Course”. The study revealed that teaching methodologies such as Problem Based Learning as an effective tool that teaches co-operative learning and an inquiry based methodology for science instruction.

Kim, Heeyoung; Chung, Ji-Sook and Kim, Younghoom (2001) done a study on “Problem Based Learning in web based science classroom”. The study concluded that Problem Based Learning in web based science program developed student’s scientific thinking and problem solving skills through a set of interaction including teacher-to-student, student-to-teacher, student-to-student, group-to-group, student-scientist and student-cognitive tools.
Pederson, Susan and Liu, Min (2001) had done a study on “Effect of Modeling expert cognitive strategies during Problem Based Learning”. Result suggested that the cognitive modeling offered through the expert tool in which students worked during periods of self-directed study in to the line with expert actions and impacted the quality of the rationale and suggested best solutions.

Polanco, Rodrigo; Calderon, Patricia and Delgado Francisco (2001) had done a study on “Effect of a Problem Based Learning program on engineering students’ academic achievement, skill development and attitudes in a Mexican University”. The study found that the PBL curriculum seemed to improve the academic achievement of these students, but students’ attitudes were very similar to those of students in the traditional courses in spite of their enhanced academic achievement.

Culver (2000) conducted a meta-analysis of studies comparing the impact of Problem Based Learning and lecture/discussion instruction and concluded that there was no convincing evidence that Problem Based Learning improves knowledge base.

Mergendoller et al. (2000) compared the learning and attitudes of high school students studying economics using Problem Based Learning and lecture/discussion methods. They found that no statistically significant pre/post differences in learning for individual units, but there was a statistically significant pre/post difference in general economics knowledge from the
beginning to the end of the semester, with the lecture/discussion classes learning more.

Finucane & Johnson (2000) concluded that Problem Based Learning supported and enhanced student information gathering skills and clinical sciences, where student knowledge, interests, and motivation are increased.

Erickson (1999) conducted a study on “Problem Based Learning approach to mathematics instruction”. The study found that Problem Based Learning environment provides students with opportunities to develop their abilities to adopt and change methods to fit new situations. Meanwhile, students taught in traditional mathematics education environments are pre-occupied by exercises, rules and equations that need to be learned, but limited use in unfamiliar situations. In addition to this, students in Problem Based Learning environment have greater opportunity to learn mathematical processes associated with communication, representation, modeling and reasoning.

Hendry et al. (1999) revealed that Problem Based Learning is an excellent way of embodying constructivism in higher education.

Smith (1998) noted that students in problem based environments typically have greater opportunity to learn mathematical processes associated with communication, representation, modeling and reasoning.
Barr and Tagg (1997) noted that Problem Based Learning would encourage students to adopt a deeper learning approach, increase student motivation and hence involvement in the learning process help student to develop the skills necessary to become self-directed learners.

Karen Lee and Others (1997) conducted a study on “PBL in a graduate education classroom”. The study proved that Project based and Problem Based Learning are instructional methods that are being used to promote active and authentic learning.

Achilles and Hoover (1996) presented a paper providing a brief conceptual discussion of PBL and the idea that incorporates PBL as a method for moving students to high levels of learning. The paper made a conclusion that PBL was an effective model for addressing varied learning styles, improved general classroom behavior and made teaching learning experiences more exciting. A conclusion is that PBL might not be the complete answer to school improvement. However, it permits flexibility, encourages communication and mutual respect and shows cases student’s talents.

CONCLUSION

The above studies provide enlightening vision in to the development and execution of Problem Based Learning as an instructional strategy that has promising implications in teaching and learning process. Research studies proved
that PBL was an effective model for addressing varied learning styles, improved general classroom behavior and made teaching learning experience more exciting that leads excellent way of embodying constructivist principles in classroom scenarios. Students in Problem Based Learning environment have greater opportunity to improve their mental processing associated with communication, representation, modeling and reasoning that initiate them for high academic achievement in their concerned disciplines.

3.2.2 PROBLEM BASED LEARNING AND ATTRIBUTES OF CURRICULUM TRANSACTION

There is a considerable literature review that prompts the influence of instructional strategies for effective curriculum transaction in all disciplines. Problem Based Learning strategy is based on constructivist philosophy and principles that foster effective professional and academic development strategy, a way of creating collaborative environment that facilitates independent interaction of problem situation and reflect on their experiences. Through organized investigation and analysis, it is a way for individuals to create critical thinking skills, motivation, group dynamics etc. those are the core outcomes of curriculum transaction strands in the prevailing activity oriented learning approach based on constructivism. The investigator, for the purpose of the study, has traced many literature and research findings in the area. An exertion has been made to compile only those studies or reviews in close immediacy with the present study.
In view of the fact that the inception of Problem Based Learning, various researchers have addressed to add an enhanced perceptive of various dimensions and focal themes of effectual curriculum transaction attributes.

**Rahman, Saemah and Yasin, Ruhizan (2011)** presented a paper in the 3rd world conference in educational sciences on the topic “Problem Oriented Project Based Learning (POPBL) in promoting Education for Sustainable Development”. They highlighted that higher education is not excluded in realizing the effort of promoting Education for Sustainable Development (ESD). This paper will discuss the framework of teaching and learning a course using Problem Oriented Project Based Learning in an effort to promote education for sustainable development. Problem Oriented Project Based Learning is developed as an intervention in an action research cycle.

**Zakaria, Zaiton et al. (2011)** did a research on “Problem Based Learning: With or Without Facilitator”. Basic science knowledge, critical thinking skills, motivation and group dynamics were tested in the study. Comparison of basic science knowledge between the control groups with mean and observed groups was not significant. Overall this study showed that there were no significant differences in the parameters tested between PBL groups with facilitators and without facilitators.

**Manoj and Devananthan (2011)** conducted a study on “Effectiveness of Problem Based Learning strategies on science process skills in relation with
scientific attitude”. Analysis of data showed that Problem Based Learning group students attained significantly higher scores than conventional group students for process skills. Process skills in biological science and scientific attitude were positively correlated and Problem Based Learning strategy has significant bearing on enhancing scientific attitude.

**Vandana (2010)** published an article on “Instructional designs to promote self-directed learning” and this paper pointed that Problem Based Learning and Inquiry Based Instruction are the designs to promote self-directed learning; through which students collaboratively solve problems and reflect on their experiences.

**Edward and Hammer (2006)** published a paper reporting the perception of a group of pre-service educator has to their perception in a unit of study conducted using PBL scenario. The findings reported that PBL offers the opportunity for pre-service educator to participate in a learning experience that supports them in developing skills appropriate to their profession and in understanding how theory may be related to practice.

The study by **Song Deok et al. (2006)** focused on reflective thinking skills in PBL, as they help learners become deeply engaged in learning. The results of the study indicated that middle school students perceive the learning environment factor as more important to prompt their thinking, while college students perceive the scaffolding method as more important. Based on these results,
suggestions are given for designing developmentally and an appropriate PBL environment that support reflective thinking.

**Sungur, Semra & Ceren Tekkaya (2006)** did a study on the “Effect of Problem Based Learning and traditional instruction on self-regulated learning”. The result revealed that Problem Based Learning students had higher levels of intrinsic goal orientation, task value, use of elaboration learning strategies, critical thinking, meta-cognitive self-regulation and peer learning.

**Murray et al. (2005)** conducted a study entitled “Enhancing teacher education students’ generic skills through PBL”. The results of the study give us confidence that PBL offers more than a method for motivating and engaging students’ with the subject matter. Students do indeed develop problem solving skills through PBL.

**Prince (2005)** in his review of action learning suggested two views about Problem Based Learning: firstly, that it is difficult to conclude if it is better or worse those traditional curricula, and secondly, that it is generally accepted that Problem Based Learning produces positive student attitudes.

**Evenson and Hamelo (2003)** did a study and concluded that PBL fosters student’s motivational beliefs, self regulation strategies and learning strategies. Although PBL had a positive influence on student’s intrinsic goal orientation and task value, it did not affect control of learning beliefs, self- efficacy for learning
and performance. Regarding learning strategies, they found that PBL chances students’ use of collaborative strategies, critical thinking, meta-cognitive self-regulation, effort regulation and peer learning.

Galand et al. (2003) have done a research study which showed that Problem Based Learning students use more deep processing strategies. Furthermore, the researchers reported that Problem Based Learning students use more adaptive strategies which helped them integrate and connect new information more that did control-group students. In addition, PBL students appeared to use meta-cognitive self regulatory activities, such as planning, and monitoring, more than did control group students.

Grabowsk (2003) conducted a study on instructional design factors prompting reflective thinking in Problem Based Learning environment. The study concluded that reflective thinking skills are important in a Problem Based Learning environment by helping learners engage deeply in problem solving process. This study investigated student’s perception on design factors prompting reflective learning in middle school students.

Bernstein and others (2002) conducted a study on PBL curriculum and found that students and faculty had more favorable attitude towards PBL after direct experience with it than before. They recommend that PBL is an effective instructional strategy for transacting curricula through interaction with different programmes and projects.
Gordon et al. (2001) did a research study revealed that PBL appears to improve critical thinking, communication, mutual respect, teamwork, interpersonal skills and increase student’s interest in a course. In PBL classes, students can confront meaningful problems because of their real life context. When PBL students solve problems, teachers encourage them to explore possibilities, invent alternative solutions, collaborative with other students, tryout ideas and hypotheses, revise their thinking and finally present their best solutions.

Ngeow and Kong (2001) in a study on “Learning to learn: Preparing teachers and student for problem learning”. The study concluded that, students engaged in PBL become more responsible for their own learning, but the transition to self directed learning can be difficult for some. Group based learning is also integral to PBL and students must learn effectively in groups.

Branford et al. (2000) found that PBL enhanced retention and transferability of information and concepts and it motivated self-directed learning.

Krulik and Rudnick (1999) have done a study on “Innovative tasks to improve critical and creative thinking skills: Developing mathematical reasoning in grades 1-12”. The result of this study indicated that PBL is a classroom strategy that organizes mathematics instruction around problem solving activities
and affords students more opportunities to think critically, present their own creative ideas and communicate with peers mathematically.

**Prawat (1997)** did a study entitled on “Problematizing Dewey’s way of problem solving”. The study found that within PBL environment, teacher’s instructional abilities are more critical than in the traditional teacher centered classrooms. Teachers in PBL settings should have deeper understanding of mathematics that enables them to guide students in applying knowledge in a variety of problem situation.

**Gallagher et al. (1996)** did a study on Problem Based Learning and the research revealed that PBL creates an environment in which students: (a) actively participate in the learning process,(b) take responsibility for their own learning and (c) become better learners in terms of time management skills and evaluate the validity of these resources.

**Savery and Duffy (1995)** in their research have pointed out that the focus in PBL is on students as constructors of knowledge in a context similar to the context in which they use that knowledge. The students are encouraged to think critically and creatively and to monitor their understanding. PBL students have ownership of the problem, and all learning focused on meta-cognitive processes.

**Albanese and Mitchell (1993)** in a study entitled as “Problem Based Learning: A review of literature on its outcomes and implementation issues”. The
study comes to a conclusion that PBL provided learners with instructional mechanisms that can increase their reflective thinking while exploring authentic and ill-structured problems, participating in social interactions and receiving coaching from peers and teachers.

Barrows et al. (1986) has done a research and concluded that in PBL environments, students act as professionals and are confronted with problems that require them to: **(a)** Clearly define an ill-structured problem, **(b)** Develop hypotheses, **(c)** Access, analyze and use data from different sources, **(d)** Revise the initial hypothesis as data are collected and **(e)** Develop and justify solutions according to evidence and reasoning.

**CONCLUSION**

The literature review of this section reveals that students in Problem Based Curriculum become self-regulated learners that motivate them to activate their prior knowledge more effectively. This should promote mental processing, greater understanding and recall; and learning in a context that resembles real world situations. The literature reviews consolidated that Problem Based Learning encourage them to explore possibilities, invent alternative solutions, collaborative with other students, tryout ideas and hypotheses, revise their thinking and finally present their best solutions. In addition to this, Problem Based Learning equip the learners for developing vocational skills and competencies appropriate to their profession and in understanding how theory
may be related to practice. This fact had urged the investigator to explore the scope of Problem Based Learning strategy for effectual transaction of curriculum especially in a vocational discipline by enhancing their higher levels of intrinsic goal orientation, task value, use of elaboration learning strategies, critical thinking, meta-cognitive self-regulation etc; those are the key objectives of prevailing modes of curriculum transaction.

3.4 STUDIES RELATED TO GRAPHIC ORGANIZER

Graphic Organizers are visual representations of a text or a topic. Organizers provide templates or frames for students or teachers to identify pertinent facts to organize information and to record relationships between facts and ideas within a learning task. Literature supports the use of organizers to facilitate and improve learning outcomes for a wide range of learners and also to strengthen their cognitive processing. While considering these aspects the investigator went through certain outstanding reviews and research findings correlated to these faculties to crystallize a mental frame of the investigation in terms of learner excellence and cognitive processing.

3.4.1 GRAPHIC ORGANIZER AND LEARNER EXCELLENCE

Zahra Rostami Sarabi and Shahid Beheshti (2012) conducted a study on “the Effect of Graphic Organizer and Marginal L2 Glossing Training on the Reading Comprehension of ESP Students”. The study revealed that there
was a significant difference between the means of Graphic Organizer and marginal glossing groups. The result of this study indicated that the Graphic Organizer group performed significantly better than the other two groups in reading comprehension of business texts.

**Mariam Mohamed Nor, Ng Yu Jin (2012)** did a study entitled on “Graphic Organizer and Paragraph Frame to Rectify Tunnel Vision. Is It Achievable?” The study concluded that majority of the students lack the pre-requisite language knowledge and reading skills to cope with the Intensive English Program reading comprehension tests. This was an experimental action research project investigating the effectiveness of a reading model.

**Fu-Pei Hsieh and Sung-Tao Lee (2011)** did a research study on “Utilizing Graphic Organizer for Promoting Pupils’ Argumentation”. The results indicated that Graphic Organizer Instruction was an effective method for promoting argumentation. The study showed that the low achievers benefited more from Graphic Organizer Instruction than the high achievers and the Graphic Organizer Instruction can facilitate both the comprehension and argumentation ability.

**Syaza Hazwani Zaini; Siti Zalina Mokhtar and Mokhtar Nawawi (2010)** in a study named on “The Effect of Graphic Organizer on Students’ Learning in School”. This research study illustrated the use of Graphic Organizers on the effects of students’ learning in schools. It was found that
Graphic Organizers had effect on the improvement of students’ comprehension, performance and motivation in learning.

**Cameron, Spears (2010)** did a study on “The Dynamic Graphic Organizer and its Influence on Making Factual, Comparative, and Inferential Determinations within Comparative Content”. An experiment was performed to investigate the effectiveness of these dynamic Graphic Organizers as instructional tools. The results of this study suggest that dynamic Graphic Organizers are equivalent to traditional static Graphic Organizers that benefit both instructional designers and educational researchers as new curricula are designed and new instructional tools are studied, respectively.

The study conducted by **Zaini, Mokhtar and Nawawi (2010)** on “Effect of Graphic Organizer on Students’ Learning in School”, emerged that Graphic Organizer is an instructional tool that helped students to organize and structure information and concepts to relate with the other concepts. As an instructional tool, Graphic Organizer is used to illustrate students’ prior knowledge about a topic or section of text that have been highly recommended to be used in classrooms.

**Andrea, McArthur Capizzi and Sally, Barton Arwood (2009)** in a study on “Using a Curriculum-Based Measurement Graphic Organizer to Facilitate Collaboration in Reading”. The study found that Curriculum-based measurement (CBM) is a useful tool for both general and special educators to
evaluate and improve student achievement.

Emily, Rowland et al. (2009) engaged a study on “Investigating the Interaction of Graphic Organizers and Seductive Details: Can a Graphic Organizer Mitigate the Seductive-Details Effect?” The study goes through the interaction between seductive details and a Graphic Organizer was investigated. Results suggested that the Graphic Organizer might have mitigated but did not reverse the seductive details effect, provided evidence for both the diversion hypothesis and the distraction hypothesis.

McCarthy (2008) writes, “According to Brunn (2002) Graphic Organizers and other visual organizers help students understand relationships by presenting information explicitly and spatially”. The Graphic Organizer assists in comprehension of vocabulary by allowing the child to map out the meaning of a word in order to build understanding.

Graphic Organizers have been shown to improve the performance of students in a secondary mathematics setting (Ives, 2007) however; this can also be applied to the kindergarten classroom.

A study by Githua and Nyabwa (2007), indicated that the use of analogies increased students’ success in solving mathematical problems in enhance learning. They proposed six steps for creating and using Graphic Organizers for teachers which were state objectives, oral presentation, integrative
reconciliation, promotion of active reception learning, encouragement to adopt critical approach, application to solution of problems.

Clark (2007) found that Graphic Organizers not only enable students to record and categorize information, but also help students to understand difficult concepts, generate thoughts, and identify connections between ideas. When used effectively, these visual tools can have a positive impact on student achievement. Students who work with Graphic Organizers often show improved writing and critical thinking skills as they guide students through the inquiry process.

In order to find out the effectiveness of explicit instruction at the primary-grade level, Williams et al. (2007) have evaluated the effectiveness of comprehension cause-effect instructional program for academic failure on their study. From findings, the content area of social studies and strengthened the conclusion that explicit comprehension instruction can be effective at the primary school level and necessary for difficult effect concept.

The Graphic Organizers contribute value of specific design to comprehension of a health education brochure. From that, a research by Kools et al. (2006) had examined the effect of Graphic Organizer on the comprehension of a health education brochure text and compared subjective with objective comprehension measures. The experiment reported the Graphic Organizers reflected information on the macro level of the text and concluded that health
education texts could benefit from relatively simple techniques to increase comprehension.

To examine the effects of Graphic Organizers on reading comprehension for students with learning disabilities, an extensive research from Kim et al. (2004) stated that, by using Graphic Organizers was associated with improved reading comprehension overall for students with learning disabilities across all grade levels, effective outcomes showed at the elementary and secondary level for the use of Graphic Organizers.

Studied by Robinson and Molina (2002) stated that, the relative involvement of visual and auditory working memory when studying adjunct displays by using outlines or Graphic Organizers. By using the models of text learning and help to explain Graphic Organizers are more effective than outlines in helping students learn concept relations in text.

Brunn (2002) revealed that Graphic Organizers enable students to understand difficult concepts and understanding the fine distinction that differentiate a concept from a similar concept is a difficult task for novices in a subject.

Brook, Bank and others (1999) in their short master’s project, introduced Graphic Organizers in their 1st, 2nd, 5th and 7th grade classrooms as a strategy to improve reading comprehension and vocabulary skills. 80% of the 1st, 2nd, 5th, and
7th grade students participating in the study attained mastery for the areas of comparing and contrasting, sequencing and part/whole relationships. At least 80% of the 5th and 7th grade students also attained mastery for classifications and analogies.

Egan (1999) found that Graphic Organizers have been reported to be effective teaching devices at all levels of the learning and that their use in education widespread.

Culbert Elizabeth; Flood Michelle; Windler, Rachel; Dabra (1998) in their study investigated the use of Graphic Organizers in classrooms. Findings showed that Graphic Organizers improve student’s presentation of materials and most teachers complete Graphic Organizers with their students, instead of completing them alone and presenting them to the students.

Robinson and Schraw (1996) investigated whether Graphic Organizers were easily searchable because of fewer words or because of computationally efficient indexing. The results from this study suggested that the Graphic Organizer treatment groups found the answer to a pattern question more quickly than both the outline and text treatment groups. They concluded that the facilitative advantage of Graphic Organizers is a result of their computationally efficient indexing.
Fisher et al. (1995) reviewed the literature for validated inclusive practices. They found that Graphic Organizers were one of the best teaching devices that allows the integrity of the curriculum to be maintained, and that are practical in terms of time and implementation.

Cassidy and Hossler (1992) in a study concluded that the use of Graphic Organizers helped students to understand the concepts of main idea which leads to improved comprehension.

Korey (1992) conducted a study on the effect of Graphic Organizers on mathematics and science comprehension with high school special education students. Results revealed that the use of Graphic Organizers generated higher scores in mathematics.

CONCLUSION

The above studies conjecture the path in which Graphic Organizer embarks into the varied strata of learner excellence and how it promotes their retention and academic achievement. Some of the studies accentuated the augmentation of student’s comprehension of text and those students were more engaged in learning when they participated in the completion of Graphic Organizers. The studies also point towards that Graphic Organizers equip learners for integrative reconciliation, effective presentation, promotion of active reception learning, encouragement to adopt critical approach and application to solution of
problems. Also the ability to sort words into categories based on meaning or other factors determined by the student is a high-level comprehensive activity for young children. The studies concluded that the effect of Graphic Organizers would be sufficient for the improvement of students’ comprehension, academic performance and motivation in learning.

3.3.2 GRAPHIC ORGANIZER AND COGNITIVE PROCESSING

Karla, Suarez (2011) conducted a project on “Graphic Organizers and Higher Order Thinking Skills with Nonfiction Text”. The results of the study revealed consensus on 12 Graphic Organizers deemed most effective for direct instruction of higher order thinking skills. This resource guide can promote social change by enhancing students’ critical thinking skills and academic achievement, leading to improved motivation and a greater likelihood of becoming lifelong learners.

Florentina Iofciu, Cristina Miron and Stefan Antohe (2011) in a study entitled on “Graphic Organizer for constructivist approach of advanced science concepts”. The study revealed that informational staying in unprecedented development of technical applications is a real challenge for science teachers wishing to offer to their interested students to reach advanced science concepts.

Hoffmann, Kristin Fisher (2010) engaged in a study on “The Impact
of Graphic Organizer and Meta-cognitive Monitoring Instruction on Expository Science Text Comprehension in Fifth Grade Students”. Students in the Graphic Organizer plus Meta-cognitive Monitoring Condition and students in the Meta-cognitive Monitoring Condition showed increased reading comprehension scores over the course of the six-week intervention on seven expository science passages, whereas students in the Graphic Organizer Condition showed no improvement in passage comprehension scores. With regard to the increase in reading passage and comprehension test scores, findings from this study revealed that score increases occurred only in conditions where students received meta-cognitive monitoring strategy instruction.

**Patsalides (2010)** writes that using a Graphic Organizer moved her kindergarten class from lower to higher-level thinking. In order to initiate higher-level thinking skills, the select samples for experimentation students are converted as researchers. Gradually the students more responsibility in each vocabulary lesson. They began to contribute by writing on the whole-group Graphic Organizer.

**McElroy and Coughlin (2009)** concluded that Graphic Organizers are a set of learning strategies which involve translating words expressed in linear form into visual structures. When written material or difficult concepts are expressed graphically, the students can develop alternative structures for understanding the course concepts. Graphic Organizers also enhances students’ ability to learn to refute arguments.
Robinson, Katayama, Beth, Odom, Hsieh, Vanderveen, and Katayama (2006) investigated text comprehension and graphic note taking using partially completed Graphic Organizers in a study designed around three quasi-experiments and one true experiment. The study reported that participants showed a propensity for note-taking on Graphic Organizers, as this activity increased over the course of each of the experiments.

Spears and Kealy (2005) explored the use of “retinal variables” to improve a Graphic Organizer’s effectiveness toward helping learners perform higher-order thinking skills such as inference-making. No differences in inferential judgment performance were observed for the retinal variable treatments versus the text-only treatment.

Tsai, Pei-shiuian and Manlai You, Manlai (2000) conducted a study on “The implementation of Graphic Organizers for Instructional Activities of Creative Design in Elementary School” The result of the study showed that a) regarding the use of Graphic Organizer, the explanations of object structures and time sequences had high percentages b) regarding the assignments, the teacher’s guidance was needed to complete the more difficult aspects and c) regarding the contents of the assignments, it was shown that students could use Graphic Organizers as planning tools, and some students exhibited a higher degree of creativity on the assignments.
Boyle and Yeager (1997) in a study noticed that Graphic Organizers are learning frameworks that support student learning by presenting component information in an organized manner and by linking related information together. More especially during academic activities, cognitive frameworks and students by highlighting the important points. Visually displaying the relationships between ideas and serving as guides for studying after the lesson.

CONCLUSION

The literature demonstrates that graphical visualization provides a framework to systematize ideas, facts, and concepts that promotes development of higher order thinking skills facilitates for effective student learning. Many students are visual learners, thus, a visual approach to brainstorming or organizing information is essential. The studies revealed that students are obligatory to think in manifold directions when using Graphic Organizers which make learning an active and meaningful process, create intellectual metaphors to go along with information and create graphic representations for information.

Research also proved that Graphic Organizers are an exemplar of an effective established strategy, tender a doorway spot into complex matter for visual learners, increase comprehension and retention, and can be benefited with all students, ranging from gifted and talented to those with mild cognitive disabilities. Research supports the utilization of Graphic Organizers as a causative factor in excelling performance in classroom instruction. The focus
centers on the relationship of information as opposed to memorization of isolated facts. Also research findings and reviews concluded that Graphic Organizers are key to strengthening cognitive processing like thinking skills, localize information, metaphoric and analogical learning, inference-making etc, that become scaffolds to excel academic performance.

The insight that enacted from a meticulous analysis of the research reviews locate the juncture for crafting the present study of its brand and for developing the select strategies for effectual curriculum transaction. The methodological approach adopted, the analysis and interpretations made and findings and conclusions derivates are portrayed in the successive chapters.