Chapter III

Review of related literature

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3.1 Introduction

A through study of related literature is an essential part to obtain clear understanding of the research problem as well as to get insight into the problem. The investigator has made a profound study of available literature related to the present study. This chapter summarises research studies related to blended learning, achievement, e-quest and ICT readiness along with Indian scenario and Meta synthesis out of the survey.

3.2 Studies Related to Blended Learning and Achievement

3.2.1 Foreign Studies

Amanda Jefferies and Ruth Hyde (2010) made an attempt to build future blended learning experience from current research findings. Objective: To evaluate student’s reflections about learning environments and construct learning environments for future higher education. Method: Between March 2007 and February 2009, the Joint Information Systems Committee (JISC) funded a Learners’ Journeys project at the University of Hertfordshire. This was part of their second phase of investigation in research into the Learners’ Experiences through their E-learning Programme and was known as LXP2. STROLL (STudent Reflections On Lifelong e-learning), as the Learners’ Journeys project was known, researched into the experiences of current undergraduate students in Higher Education (HE) and Further Education (FE) primarily through a series of diaries constructed by student volunteers. Using video and audio recording to capture students’ own reflections on their learning and their use of technology over the two year period the project data has offered many reflections from students on their use of technology for both learning and leisure. Building on this and other recent research data, the authors now suggest that for many HE students,
technology has become a ubiquitous part of their lives to the extent that they may own or access regularly multiple items of personal technology that are used interchangeably for learning and leisure, including their computers and their mp3 players. At the University of Hertfordshire access to technology enhanced learning has included use of the managed learning environment (MLE) which is called StudyNet. This MLE has been highly praised by the campus-based undergraduates and especially those participating in STROLL for making their learning accessible wherever and whenever they want to access it. Findings: This research indicates that technology can be a vital support for students in their complex balancing act between their busy studying, working and personal lives and the students have enthusiastically reported that technology is a key enabler for them. This paper presents the ways in which students use technology in higher education and raises the questions of how institutions might support some of the diverse needs of future students.

Dragana Bjekic Radojka Krneta Danijela Miloševic (2010) compared teacher education from e learner to e teacher in a master curriculum. Objective: To investigate the responsibility of the e teacher. Method: The Master curriculum of e-learning and an example of the programme realization are presented. The university curriculum of e-learning at Kragujevac University - Technical Faculty in Cacak (Serbia) was developed as a part of the international project (TEMPUS JEP-41016-2006). The curriculum focuses on the development of different e-roles for teachers and e-teachers: e-creator, e-designer, e-facilitator, e-tutor, e-moderator, etc. This master programme is a part of teacher in-service formal education for primary and secondary school teachers. In addition, the curriculum is adaptable to teachers’ pre-service education. Findings: It is more effective
as a part of in-service education than as a part of pre-service undergraduate education, because the active teachers recognize their professional roles better than prospective teachers.

Kathleen Gray and Jacinta Tobin (2010) introduced an online community into a clinical education setting to study student and staff engagement in blended learning. Objective: To investigate the process of implementing blend of online and face to face learning in a clinical education setting. Methods: This study designed an online community to complement a series of on-site workshops and monitored its use over a semester. Quantitative and qualitative data recording 43 final-year medical students' and 13 clinical educators' experiences with this blended approach to learning and teaching were analysed using access, adoption and quality criteria as measures of impact. Findings: The introduction of the online community produced high student ratings of the quality of learning and teaching and it produced student academic results that were equivalent to those from face-to-face-only learning and teaching. Staff had mixed views about using blended learning.

Melek Yaman Dittmar Graf (2010) evaluated an international blended learning co-operation project in biology teacher education. Objective: To rate and evaluate international virtual learning environment. Method: The project presented in this article included the development, implementation and evaluation of a cross-national blended learning seminar on the didactics of biology. The class included three focus topics dealing with different aspects of biology education. The sample comprised students training to be biology teachers at the University of Technology Dortmund and Hacettepe University in Ankara. All students attended a class called “Teaching Biology” during the
winter term 2008/09. The open source e-learning platform Claroline (www.claroline.net) was chosen as the learning environment. Participants had the opportunity to exchange ideas and information, to reflect on the learning process and to complete assignments in international teams. After completing the class, the students evaluated the concept based on their experience. In-class sessions, individual learning, exercises and application ranked higher than online phases, group work, discussions and information exchange. Findings: Items evaluating the overall concept received relatively high ratings. Despite the cautious ratings some items received, the positive overall results support efforts to further develop such international teaching concepts.

Mustafa Caner (2010) reported a blended learning model for teaching practice course. Objective: The aim of this study is to introduce a blended learning environment and a model for pre-service teaching practice course in English Language Teacher Training Program at Anadolu University. Method: It is supposed that providing a blended learning environment for teaching practice course would improve the practice and contribute to the professional growth of pre-service teachers. Since it will increase the contact hours among students and university supervisors and facilitate peer feedback among pre-serve teachers, which in turn, create a productive learning environment for them. Thus, the present paper aimed at providing a blended learning model for teaching practice courses at teacher training institutions and give impetus for the researchers or instructors who would like to implement blended learning in their own teaching environments. Additionally, the present study intends to contribute expanded understanding to the way blending the learning environments, and contribute additional understanding to the knowledge base about the implementation of blended learning for a
teaching practice course. Findings: Finally, through illustrating a blended learning environment for teaching practice course, it is hoped that this study might contribute to the growing body of knowledge of blended delivery and blended learning in higher education.

Rehana Masrur (2010) investigated the impact of web based resource material on learning outcome in open distance higher education. Objective: To study the impact of web based resource material practices on MPhil, Teacher education course of Allama Iqbal Open University. Method: A sample of 68 students was selected. Thirty-eight students comprised the control group, whereas another group of 30 students was named as experimental group. The study package of control group included self instruction material comprising of two study guides (six credit hours course), recommended book, four assignments, and assignment submission schedule. Experimental group received the same package plus CD having web based articles related to each unit of study guide, and a list of web sites for further reading. After the submission of assignments a one week workshop on the topic assigned to him/her before the commencement of workshop. The final examination was held at the end of semester. The marks obtained by both groups were compared by t-test. The scores of experimental group were higher on all assessment components. Findings: The study concluded that integration of IT in teaching-learning increased the understanding of subject related knowledge.

Serap Samsa (2010) studied the effects of Scenario based blended learning environment on attitudes of pre-service teachers towards teaching profession. Objective: The purpose of this study was to define the effects of experiences that have been acquired at the Teacher Experience Course and skills acquired at the blended learning
Environment on attitudes of pre service technologies teachers toward teaching profession.

Method: In the study, a pretest-posttest quasi-experimental design was used. The study group is consisting of 37 students who were registered for Teacher Experience Course of Computer Education and Instructional Technology, Faculty of Education Science, Ankara University. In order to collect data a 5 point Likert scale with 34 items, which was developed by Ustuner (2006), was used. The scale was used both at the beginning and at the end of semester. At the beginning of the semester students who would go to the public schools institutions once a week were randomly assigned to one of the five schools. The study took 10 weeks. Beginning from 4th week, students were given scenarios once a week, totally 8 scenarios. The main aim of these scenarios was to assist students in order to improve their standpoints according to the problems that they encountered in the school. Scenarios and solutions were discussed at the face to face courses, semiweekly. The period of Teaching Practice and generated solutions according to presented problems were assessed with students at the last week of the study. Descriptive statistics and t-test statistical technique were used to analysis of data.

Findings: the pre service teacher’s satisfaction was significant over the conventional method.

Bopelo Boitshwarelo (2009) explored blended learning for science teachers professional development in Africa. Objective: This paper explores a case study of teacher professional development in Botswana where a blended learning solution was attempted. Method: Meticulous case study. Findings: The paper concludes with three recommendations: 1) Schools should support ongoing teacher learning in the workplace and should manage ICT resources for use by both teachers and students; 2) Government
should support participatory and localised learning and institutionalise ICT access and use; and 3) Training providers should use blended methods and should model good ICT practices. The author also notes that change is needed in the culture of teaching and learning so that ongoing, situated, participatory, and collaborative approaches are accepted. Finally, collaboration between the training providers and the schools is necessary as is a change in beliefs about the use of ICTs in education.

Bridget Melton and others (2009) studied achievement and satisfaction in blended learning versus traditional general health course designs. Objective: The purpose of this study was to evaluate student achievement and satisfaction with blended learning course delivery compared to a traditional face-to-face class format in a general health course. Method: Surveys were distributed to randomly selected classes during the fall 2007 semester: three blended and one traditional sections participated (n=251). Findings: Total satisfaction scores between blended (54.986) and traditional (49.788) classes were significantly different (p< 0.01). Achievement by students of blended and traditional sections brought mixed findings, yet blended students’ overall grades were significantly higher (p=0.048). Findings: Results indicated that a blended course delivery is preferred over a traditional lecture format, and promising data emerged to challenge teachers’ traditional approach to teaching general health courses at the university level.

Doo Hun Lim and Michael Lane Morris (2009) evaluated learner and instructional factors influencing learning outcomes in a blended learning environment. Objective: To examine the influence of instructional and learner variables on learning outcomes for a blended instruction course offered for undergraduate students. Method: Data analysis indicated that age, prior experiences with distance learning
opportunities, preference in delivery format, and average study time are those learner antecedents differentiating learning outcomes among groups of college students and regression analysis. Findings: The influence of learner, instructional, and motivational variables on learning outcomes found to be consolidated around one variable in learning application that is the blended learning strategy.

Gary Motteram and Pete Sharma (2009) studied blended learning in a Web 2.0 world. Objective: To explore the role that Web 2.0 technologies can play in enhancing language learning development in a blended world. Method: Through the data collected from the questionnaire the paper argues that technologies are not enough on their own to make a difference, but that teachers bring a particular understanding of language and the needs of their learners to the creation of suitable activities. It will show that the use of technologies is also changing our understanding of the profession of language education and that socio-cultural theory can help us understand why this is occurring. Findings: Blended learning as a type of classroom activity will be explored showing how different definitions may be interpreted in the classroom context. The types of blended activities that can be used are illustrated through three vignettes.

Jennifer George-Palilonis (2009) studied students’ reflections on a multi media course in visual communication class. Objective: To improve the multi media course by getting reflections from visual communication students. Method: To add parsimony to these two areas of study, and to assess how a blended model has been introduced in a required, 100-level visual communication course through a longitudinal study that followed 174 students through two versions of the same course. Findings: The results revealed that the blended model was in no way different from the traditional course in
terms of engagement and attachment. Journal data revealed students in the blended sections were significantly less negative about the course material, personal achievement, technology, and their emotional reactions than their traditional counterparts. Additionally, statements made by students regarding the issue of fear of the course and problems regarding technology substantially faded over the 15-week semester. The overall findings indicate that students are able to adapt well to the technology and processes that make blended learning different from traditional classroom learning. Implications for pedagogy and future research are discussed.

Maria Neonaki and Christopher Branford - White (2009) made an attempt to enhance the bioscience education through blended learning. Objective: To investigate the possibilities of enhancing bioscience learning through blended learning. Method: London Metropolitan University the latest addition being a first-class teaching and research science centre featuring a "superlab" with 280 workstations sharing both conventional and digital technology. Instruction of Bioscience provision that addresses the Science Technology Engineering and Mathematics agenda has been traditionally divided into three parts: lectures, tutorials and practical classes. To maximize use of the new state of the art facilities, additional e-learning material was developed to complement the live sessions. The e-learning strategy adopted comprised learning through reflection (access to virtual lecture notes), learning by doing (forensic science application), and learning through conversation (e-forum). The effectiveness and impact of implementing this strategy is being evaluated via a three step, three phase process that involves a front-end, followed by a formative and concluded by a summative evaluation. Phase I involved implementation of the blending model to Bioscience master classes for
sixty hours 10 (ages 14-15) Gifted and talented students from ten different London urban schools and feedback has been both invaluable and positive. Findings: Blended e-learning facilitates interest in the Biosciences, enhances performance and increases student engagement and eventual success in the learning process.

Mei-Ya Liang and Curtis J. Bonk (2009) investigated principles and practices of interaction in blended learning for teaching English as a foreign language. Objective: This paper applies the concept of interaction to the challenge of creating a BL curriculum for an EFL class. Method: General principles of interaction based on three dimensions of interaction—textual, social, and technological interaction are presented and then applied specifically to EFL classes at a Taiwanese university by adopting the following practical steps: (1) setting course objectives; (2) formulating techniques and strategies; (3) selecting media and tools; (4) organizing activities and technologies; and (5) evaluating student learning. Students’ reactions to and comments on six BL curriculum units indicate that various combinations of BL based on level and dimension of interaction are well adapted to the specific university EFL class. Findings: Findings suggest that the interaction-driven approach should be the focal point for future development and implementation of BL in EFL classes.

Olaf Hallan Graven and others (2009) evaluated a computer game modeling in a blended learning environment. Objective: To determine the viability of using a computer game specifically designed to incorporate abstract learning materials as part of a blended learning environment. Method: Routing is the process of determining a data packet’s path through a network. The students participating in the experiment play a short computer game where the word is a network modelled as a labyrinth. Findings: The conclusion
drawn from the experiment is that, overall the students felt they learned just as much from this as from a traditional lecture/lab, but they enjoyed this more.

Özgen Korkmaz Ufuk Karakus (2009) investigated the impact of blended learning model on student’s attitudes towards geography course and their critical thinking dispositions and levels. Objective: The present study aims to determine the impact of blended learning model on student attitudes towards Geography course and their critical thinking dispositions and skills. Method: An experimental pattern with pretest-posttest control group was used in the study. The study group consists of a total of 57 students – 28 in the experiment group and 29 in the control group – at Kirsehir High School. The experiment group was subject to hybrid learning through the Geography web page, while the traditional learning model was used for the control group. The data were collected through literature review, the Geography Attitude Scale, and the California Critical Thinking Disposition Inventory with Cronbach Alpha values of 0.92 and 0.88, respectively. The data were then subjected to percentage, arithmetic mean, t-test, ANOVA, Scheffé and Pearson correlation tests and the results were interpreted (p<0.05). Findings: Blended learning model contributed more to student attitudes toward geography course when compared to the traditional learning model; blended learning model contributed more to student critical dispositions and levels when compared to the traditional learning model; and there was a positive correlation between student attitudes toward geography course and their critical thinking dispositions and levels.

Regina K. Masalela (2009) assessed the potential benefits and complexities of blended learning in higher education. Objective: To evaluate the benefits and complexities of blended/hybrid learning in higher education as a training and educational
delivery method of choice. Method: Based on the interviews with 15 faculty members and one administrator that had direct experience with this form of delivery at the University of Botswana (UB) the findings suggested two major themes that dominated faculty members’ accounts: potential benefits and challenges of blended learning. The study was guided by the Diffusion of Innovation theory. The potential benefits of blended learning included improved pedagogy; engagement in learning; and added flexibility in the teaching and learning to mention a few. Findings: Faculty members perceived complexities such as lack of students’ readiness to use the course management system, slow network and breakdowns; lack of computers for students and lack of time. The article concludes by suggesting future directions for blended learning.

Zehra Akyol and others (2009) explored online blended communities of inquiry. Objective: The goal was to explore the developmental differences of the three presences (social, teaching, and cognitive) in the community of inquiry framework and students’ perceptions of a community of inquiry. Method: A graduate course delivered online and in a blended format was the context of the study. Data were gathered from the Community of Inquiry Survey, transcript analysis of online discussions, and interviews with students and the course instructor using multiple qualitative and quantitative data sources. Findings: This paper discusses findings of a mixed method approach to a study of the development of a community of inquiry in an online and a blended learning environment. The results indicated that in both the online and blended course a community of inquiry developed and students could sense each presence. However, the findings revealed developmental differences in social and cognitive presence between the two course formats with higher perceptions in the blended course.
Feza Orhan (2008) studied about redesigning a course for blended learning. Objective: The purpose of this study is to investigate the students’ perceptions of the blended learning environment and to trace the integration between online and face-to-face learning environments. Method: For this purpose, 30 students were given statements on the redesigned course, which they rated on a 5-point Likert scale. To probe more deeply into their positive and negative responses, a focus group discussion was held to gather the students’ views. Findings: The findings reveal that the majority of the students (90%) enjoyed being in the blended learning environment. However, improvement in methods of application and online study materials are needed. Additionally, other factors that may be salient in blended learning environment are also discussed.

Galina Kavaliauskiene (2008) studied podcasting as a tool for listening skills. Objective: To investigate podcasting as a tool for improving listening skills. Method: Podcasting as online communication technology is a new way to inspire learning: it provides an exciting way for students and educators to explore and discover educational content. Applicability of podcasting to teaching English needs researching. This paper describes research into learners' perceptions of online listening to podcasts, self-evaluation of their own performance in individual listening practice and reflections on ways of improving listening skills were taken for the study. Findings: The findings give insights into a practice of developing listening competence. Some implications of research are described including a recommendation for blended learning, i.e. combination of multiple approaches to learning by harmonizing online listening with classroom audition activities in teaching / learning English.
Irene Anderson and others (2008) studied an approach to embed blended learning in the curricula and institution. Objective: The aim was to enhance the leadership and change management skills of 50 academic staff in order to effect sustainable change in curriculum design and to enable the staff to become change agents for further blended learning curriculum enhancement. Method: Key outcomes from CABLE were the embedding of blended learning in six Academic School strategic business plans and an increased use of blended learning within academic programmes. Findings: The paper summarises the Change Academy for Blended Learning Enhancement (CABLE) process and its outcomes, and evaluates its effectiveness. Participants including students have formed a thriving community in which good practice and transformative change is shared, supported and embedded. These aspects of the project are discussed further in the context of the cultural change required to fully embed changing practice across the institution.

Julia Burgess (2008) verified whether blended learning approach is suitable for matured, part-time finance students. Objective: to investigate suitability of blended learning approach to part-time finance students. Method: Many dimensional case studies on blended learning and the students’ experience were noted.. Findings: The results of this investigation have been used as the basis for developing the course to allow a more blended style.

Neil A. Williams and others (2008) reported improving student achievement and satisfaction by adopting a blended learning approach in inorganic chemistry. Objective: To evaluate the impact of blended learning approach in learning inorganic chemistry. Method: A blended learning approach to the teaching of a level 2 inorganic chemistry
module is presented. Lectures were replaced by study packs, which were supported by formative on-line assessment delivered via Blackboard and a programme of 20 workshops. Learning activities written using the Lockwood format were included in the study pack to facilitate active learning. The formative on-line assessments were designed to provide rapid and helpful feedback to the students in advance of the workshops. The tracking and grade book facilities in Blackboard allowed staff to monitor student activity and progress. Attendance at the workshops was encouraged by including end-of-workshop summative assessments. An analysis of module results revealed an improvement in performance compared to previous years and other core chemistry modules. Findings: After introducing blended learning to the level 2 inorganic chemistry module in 2004/5. The improvement was maintained in 2005/6. Module questionnaires revealed a significant improvement in student satisfaction with subject content, delivery and performance feedback on adopting a blended learning approach.

Satya Sundar Sethy (2008) analysed the overwhelming desire towards blended learning in the age of globalization. Objective: The aim of this paper is to discuss the nature and status of distance education in the age of globalization, i.e. how best it fits for the present educational scenario. Method: In this connection, we will discuss how blended learning is one among the other learning strategies mostly helpful for the learners. Keeping this view in mind, this paper is divided into three sections. The first section aims to discuss the nature of distance education in the age of globalization. The second section devotes a discussion on why we need blended learning in ODL system and in which way it plays a vital role for maximizing the benefit of the learners, tutors, and the institutions. The third section explains the pros and cons of blended learning to
evaluate how successfully it can be implemented in the ODL system. Findings: The paper concludes with an established view that blended learning is a globalised approach to the distance education.

Susan L. Greener (2008) investigated self aware and self directed conceptions of students on blended learning. Objective: This paper reports on an investigation into student conceptions of “blended learning”, (hybrid in US) in the light of their experience of a Higher Education Masters level module at a British university. Method: The small scale study used a rigorous qualitative method to discover in the students’ words a range of conceptions relating to this learning experience. The students’ conceptions were related to the stage of study and an analysis of motivations for learning in this context. Findings: The study identified a new dimension of learning motivation with practical implications for attempting to blend traditional face-to-face teaching methods with online support and study options.

Gary Long and others (2007) assessed communication for deaf and hard of hearing students through blended learning. Objective: To better understand student perceptions of communication in blended (online and traditional) learning courses. Method: Through qualitative feedback questionnaire from the hearing impaired and English as Second Language (ESL) students. They were positive about blended learning. Findings: The findings indicated that deaf and hard-of-hearing students reported that both the quality and quantity of their interactions with the professor and other students was greatly improved by the inclusion of an online component. ESL and hearing students were also positive about the blended experience; but the greatest benefit to communication access was observed by students with a hearing loss.
Julija Lapuh Bele and Joze Rugelj (2007) reported their views as blended learning an opportunity to take the best of both worlds. Objective: To present theoretical foundations for effective ICT supported learning content development and course design. Method: Through survey the practical use of these tools is described in the development of blended learning courses for improvement of computer literacy of unemployed people in Slovenia. Findings: The results of the survey about the efficiency of learning within these courses and about user satisfaction in the described courses are also presented. Findings indicate that a great majority of the participants of the courses find blended learning a convenient and efficient approach to learning and that most of them plan to use it for learning in the future.

Momna V Hejmadi (2007) studied improving effectiveness and efficiency of teaching large classes through novel e resources in cancer biology. Objective: To investigate the development and evaluation of a blended learning resource in the biosciences, created by combining online learning with formal face-to-face lectures and supported by formative assessments. In order to improve the effectiveness and efficiency of teaching large classes with mixed student cohorts. Method: Teaching was delivered through a variety of media which included three main components; (1) an interactive online tutorial, based on the cellular processes of DNA replication, damage and repair in relation to oncogenesis (2) formative assessment in the form of multiple choice questions to allow self evaluation and (3) small group follow-up workshops, to encourage deeper learning. The online tutorial was designed using Flash© software to help conceptualise complex cellular processes in time and space. It was supported by formative quizzes, references and printer-ready notes. Findings: Introduction of these resources in 2005 led
to significant improvements in summative assessments across all student cohorts compared to scores from 2004. Students highly valued the usefulness of self-paced learning combined with supportive formative assessments which helped enhance the learning process. Teaching in small group workshops that followed on from the tutorials was also more effective, allowing a better interaction with the students, encouraging confidence and deeper learning among students. The efficiency of teaching was also improved with reduced assessment times and less pressure on institutional resources (availability of large lecture halls). This study therefore supports the use of blended learning as a means of improving both the effectiveness and efficiency of large group teaching.

Stavros Demetriadis and Andreas Pombortsis (2007) studied e lectures for flexible learning and learning efficiency. Objective: To investigate the level of student learning when using e-lectures to increase the flexibility of the learning experience. Method: Two cohorts of students were presented with the same material in lecture format. The control group attended a traditional live lecture, while the treatment group was offered an e-lecture with the same content. Both groups were asked to work on specific review questions and encouraged to pose their own, as preparation for a knowledge-acquisition post-test. There were no significant differences in post-intervention measures regarding students’ level of knowledge, but students in the e-lecture group (lacking immediate teacher-student communication) employed a strongly acquisitive mode of learning, thus undermining teacher-student dialogue later in classroom. Findings: The results of this study indicate that students may learn efficiently at the introductory level by using e-lecturing material and they are also satisfied by the flexibility of the experience.
However, the adoption of e-lectures to support flexible learning should be explored in close relationship to models of course re-engineering that also foster instructional cohesiveness, by integrating the various learning events as interrelated nodes of a productive learning network.

Susan Silverstone (2007) verified using 21st century technology in online business education. Objective: To explore the effects of some new technological options which were recently provided to marketing students in order to make their online learning experience more exciting and meaningful. Method: National University’s online classes are offered on the eCollege platform. Students interacted with each other asynchronously through discussion boards and synchronously in weekly chat sessions. Chat sessions had been offered in a text-based format, but the School of Business has invested in iLinc software which provides Voice over Internet Protocol (VoIP) capability. In iLinc, students can see and hear each other as well as the instructor in real time. The system allows application sharing, group web-browsing, the display of PowerPoint® slideshows, voting, and independent group work. Using this technology, the instructor acted as both a discussion moderator and a live lecturer. The traditional text-based chats are no longer used due to the high student acceptance and delight with the iLinc system. Outside of the virtual classroom, the marketing students were tasked to analyze and comment on the content of selected television shows. National University’s students are adult learners who grew up passively watching television from an early age. These assignments were designed to get them to think beyond the surface entertainment to the underlying marketing and business messages given in these shows. In both classes the students were told to look at these programs critically and share their comments with the class. The use
of these current mass media presentations, (which afforded live action cases that demonstrated the immediate consequences of managerial actions), was shown. Findings: Overall, the students appear to thoroughly enjoy this addition of topical and live learning tools to their online learning experience. While not tested empirically as yet, these new classroom tools seem to increase student comprehension and retention of the course material.

Wenli Chen and Chee-kit Looi (2007) incorporated online discussion in face to face classroom learning with a new blended learning approach. Objective: To examine the advantage and disadvantage of innovative blended learning strategy. Method: This study includes an innovative blended learning strategy which incorporates online discussion in both in-class face to face, and off-classroom settings. Online discussion in a face to face class is compared with its two counterparts, off-class online discussion as well as in-class, face to face oral discussion, to examine the advantages and disadvantages of the proposed strategy. By integrating online discussion into the flow of the classroom, learners are given dedicated time to foster a habit of critical thinking, reflection and articulating these online, which can subsequently seed further in-class oral discussions, and off-class online discussions. Findings: It is found that in-class, online discussion can provide a wider spectrum of discussion perspectives, equalise participation in discussion, and promote cognitive thinking skills and in depth information processing. However, the lack of face to face interactions and the need for sufficient time to do online postings pose challenges in implementing online discussion for face to face classroom learning.
Yun Jeong Park and Curtis J. Bonk (2007) made a question whether online life is a breeze through a case study in a blended learning graduate course. Objective: To examine a synchronous online teaching practice in a blended course in which distance and residential students jointly perform multi-media presentation and verbal critique to improve individual students’ projects in media design. Method: This case study research focused on the pedagogical strategies, tools, and issues associated with synchronous teaching. The researchers looked at how learning was promoted, and how interaction was mediated using a combination of communication tools - Breeze (now called Adobe Connect Professional) shared screen and Breeze voice, telephone, or text-based discussion. Online instructors’ perceptions of the benefits as well as disadvantages of the synchronous mode were identified and discussed. Findings: Based on the findings suggestions are offered to instructors and institutions interested in the integration of synchronous technology into their courses and programs.

Yun Jeong Park and Curtis J. Bonk (2007) studied synchronous learning experiences of distance and residential learners’ perspectives. Objectives: This study focuses on learner experiences in a real-time communication mediated by the Breeze web-based collaboration system. It also combined conference mediums. Method: Eight students, 4 residential and 4 learning at a distance, were interviewed to examine the perceived benefits and challenges of synchronous interaction. Findings: Study findings showed that learners valued spontaneous feedback, meaningful interactions, multiple perspectives, and instructors’ supports. On the other hand, time constraints, lack of reflection, language barriers, tool-related problems, and peers’ network connection problems were viewed as challenges. Due to pervasive time pressures, the synchronous
interactions mainly focused on task-related issues. Nevertheless, students felt a need for connecting to others in the course and a sense of social presence. Interestingly, no differences were found between the distance and residential students in terms of learning strategies for synchronous discussions.

Buket Akkoyunlu (2006) studied student views on blended learning environments. Objective: To examine students’ views on blended learning environment. Method: The study was conducted on 64 students from Department of Computer Education and Instructional Technologies in 2005–2006 fall semester in Instructional Design and Authoring Languages in PC Environment at Hacettepe University. Findings: The results showed that the students enjoyed taking part in the blended learning environment. Students’ achievement levels and their frequency of participation to forum affected their views about blended learning environment. Face-to-face interaction in blended learning application had the highest score. This result demonstrated the importance of interaction and communication for the success of on-line learning.

Karl L. Smart (2006) made a comparative study on student’s perceptions about online learning. Objective: To examines students’ perceptions of integrating online components in two undergraduate business courses where students completed online learning modules prior to class discussion. Method: A two group pre and post test research design was adopted with a total of 107 students followed by a Likert scale of five points. Findings: The results indicate that participants in an elective course rated the online modules significantly better than those in a required course. Overall, participants in the elective course rated the online modules marginally positive while those in the required course rated them marginally negative. These outcomes suggest that instructors
should be selective in the way they integrate online units into traditional, classroom-delivered courses. This integration should be carefully planned based on learner characteristics, course content, and the learning context. For most participants of the study (83 percent), this was their first experience completing an online learning activity or module. In addition, the largest dissatisfaction factor reported among the participants was the time required to complete the online modules. Future research is encouraged to explore: (1) how previous experience with technology and online learning affects students’ attitudes towards and success with e-learning; and (2) the effects of interspersing online units that are considerably shorter in length into the traditional classroom model. This additional research can provide greater insight into which factors promote e-learning success.

Monguet, Joseph M and others (2006) studied the effect of blended learning on student’s motivation and learning performance. Objective: To examine different amounts of blended learning during the learning process required in order to influence the learning performance and motivation of the students in an undergraduate course. Method: The learning strategy used is the case method, as a particular way of problem based learning. The instructor’s role and effort are also explored at different levels (low, medium and high) of blend. A virtual platform was developed ad hoc. Findings: Results suggest that a) Groups of students associated to the medium level of the mix gain a better performance. b) Motivation of the students evolves positively in all experimental groups; in the case of medium level of blended learning, the increase of the motivation is greater. c) Teacher’s effort measured in hours/activity is different for the three blended levels, exceeding the planned one for the medium and low groups.
Karl L. Smart and others (2005) gave an exploratory look at students’ perceptions of blended learning. Objective: To examine the use of blended learning in a required undergraduate course where students completed online learning modules prior to class discussion of these units. Method: An expository questionnaire was administered to bring out learners’ perceptions about blended learning. The study generated mixed results. Although some subjects recognized important benefits to the online modules, the success of this effort appears to be limited by two factors: (1) the time required for the online units was viewed as excessive by many participants for the course; and (2) few participants had prior experience completing online units. Findings: The outcomes suggest that students might respond more favorably to blended learning when instructors use smaller segments of online units rather than entire units that take several hours to complete.

Kathleen Matheos and others (2005) identified dimensions for blended learning technology and learner’s perspectives. Objective: To develop a better understanding of the different dimensions of blended learning technology. Method: Drawing upon learners’ experiences, it examines the circumstances in which learners are more likely to choose among different learning preferences and explores learners’ preferences for human and online learning support environments and the factors driving their choices through case study. Finally, the paper describes an instructor’s selection of and experiences in the use of technology to support students’ learning and how technology has impacted face-to-face interaction with students. Findings: The study concludes with a summary of the different dimensions of blended learning and how an understanding of
these dimension impacts significantly the theory and practice of blended learning within the educational environment.

Cardwell, C and Madigan, D (2004) studied promotion of e literacy through an open blended approach in higher education. Objective: To inquire collaboration between the library and faculty development center as well as to provide information about the rich learning environment they are able to create. Method: because of their shared teaching and learning philosophy. The authors considered a rich learning environment to be one that promotes the development of transferable skills. That is, instructors concentrate on developing high-level cognitive skills, such as critical thinking, problem solving, and team building; and avoid low-level or “how to” instruction. Additionally, the authors believe that an open, blended approach to teaching and learning allows them to have a greater impact on student learning and success. Findings: They conclude by encouraging librarians and faculty development staff to seek out collaborative partnerships.

Fred Rovai and Hope Jordan (2004) made a comparative analysis of traditional and fully online graduate courses. Objective: To examine the relationship of sense of community between traditional classroom, blended, and fully online higher education learning environments. Method: The present study used a causal-comparative design. Findings: Evidence is provided to suggest that blended courses produce a stronger sense of community among students than either traditional or fully online courses.

Richard Lynch and Myron Dembo (2004) investigated the relationship between self – regulation and online learning in a blended learning context. Objective: To review the distance education and self-regulation literatures to identify learner self-regulation
skills predictive of academic success in a blended education context. Method: Five self-regulatory attributes were judged likely to be predictive of academic performance: intrinsic goal orientation, self-efficacy for learning and performance, time and study environment management, help seeking, and Internet self-efficacy. Verbal ability was used as a control measure. Performance was operationalised as final course grades. Data were collected from 94 students in a blended undergraduate marketing course at a west coast American research university (tier one). Findings: Regression analysis revealed that verbal ability and self-efficacy related significantly to performance, together explaining 12 percent of the variance in course grades. Self-efficacy for learning and performance alone accounted for 7 percent of the variance.

Curtis J. Bonk and others (2003) examined learning from focus groups of blended learning. Objective: The purpose of this research was to investigate how various distance-learning technologies affect student learning in a high-level course in the military. Method: This training comprised three phases: asynchronous, synchronous, and residential instruction Initial site visits indicated that this course was extensively planned and supported. At the end of one training course experience, two focus groups of students, as well as three instructors and the course advisor were interviewed about their on-line experiences. Findings: Each group mentioned distinct advantages and disadvantages of the different components of the course. For example, on-line learning appeared to allow for greater and timelier feedback, authentic and meaningful learning, problem-solving, communication, and convenience. At the same time, participants noted several problems including the lack of learning management system flexibility, technology downtime, and overwhelming tool choices and content to learn. They also felt
that the time commitments of the program resulted in many students dropping out of the program. Ten key Web-based instruction considerations or issues mentioned across participants related to feedback; meaningfulness of content; content size; course development and organization; the role of the on-line instructor; structuring small groups; flexible and active learning; use of technology; assessment practices; and general skills such as on-line communication, problem-solving, and teamwork. Participants offered many relevant recommendations for fine-tuning this program as well as building similar programs.

3.2.2 Indian Studies

Aparna Marwah and Daljeet Singh Bawa (2011) reported the potential of using blended learning for higher educational structure through webCT. Objective: To explore the possibility of making blended learning a potential prospect for higher education. Method: Descriptive method. Findings: Blended learning through web based technologies is the new age mantra that has the potential to become one of the key success factors for making higher education wide spread and versatile in all aspects.

Megha M. Uplane and others (2011) probed whether CAI an effective international method for secondary school low achievers. Objective: To identify low achievers in physics to develop text book based computer multimedia software package. To test the effectiveness of the software package developed for enhancing the academic achievement in physics. Method: Mixed method of research involving both quantitative and qualitative method was employed at various stages of research to find solution to the objectives of the study. Findings: There is significant difference in the mean achievement score obtained in pre-test and post-test obtained by low achievers in physics. On the identified lessons the computer multimedia software packages were found to be effective.
The results of the study proved that computer multimedia software packages developed by sound research methodology can be effectively used for the enhancement of low achievers in physics.

Arikrishnan, R (2010) analysed e- resources for engineering and technology. Objective: To analyse the type of resource available for engineering and technology. Method: Descriptive study. Findings: Engineering institutions are facing challenges due to continuous reduction in the subscription to scholarly journals and data bases which affect the research and academic activities. The professional journals that are available in the net have provided a great help to the research and development work in the academic institutions.

Deepak Jaiswal (2010) identified m- learning as a new paradigm in education. Objective: To make an emphasis over m- learning as a new paradigm of education. Method: Descriptive study through survey method. Findings: Its common use with traditional education will improve educational quality. The educational process will become more flexible and will fulfill the needs of life long learning. M- learning also can assure good educational opportunities for disabled people.

Nausad Husain (2010) highlighted the importance of wiki a web based technology for reflective, collaborative and constructive learning in higher education. Objective: To emphasis the importance of wiki in higher education for collaborative learning. Method: Case study method was adopted along with descriptive study. Findings: Wikis and other emergent technologies are beginning to fill a gaping void in existing practice. They enable extremely rich, flexible collaborations that have positive psychological consequences for their participants and powerful competitive one for their organizations.
By incorporating wikis into the classroom educators can better prepare students to make innovative uses of collaborative software tools.

Srinivasan, P. and Muthumanickam, R (2010) developed an innovative computer assisted instructional programme (CAIP). Objective: To construct CAIP in the lesson ‘learning’ in educational psychology for the trainees of Diploma in Teacher Education and to assess its effectiveness. Method: Two group experimental method was adopted. Findings: Subject show higher achievement when taught through CAIP, moreover they found to enjoy it. They are self motivated; this self motivation of learners may be due to novelty of learning through computer, Individualization of instruction and self evaluation.

Donnipad manjunath (2009) studied the use of mathematics laboratory for teaching mathematics. Objective: To study various methods of teaching mathematics in regular classes. To study teacher’s opinions about mathematics laboratory to develop a strategy for use in a mathematics laboratory set-up. Method: Independent variable was the use of strategy evolved in a mathematics laboratory to teach mathematics and the dependent variable was performance of students. For this experimental study, two different samples were chosen. The sample of the study consisted of a total of 80 students of class X standard of Kendriya Vidyalaya, Ojhar and 100 teachers of mathematics working in schools in and around Nasik. The sample of 80 students was divided into two groups: controlled and experimental, matched on the basis of their marks obtained in class IX and on the basis of continuous and comprehensive evaluation. Findings: The difference between the mean scores of experimental group and control group on posttest was quite significant. The t- value statistically arrived was 5.59. The degree of freedom was 78 for which the level of significance at 0.05 level was 2.00 while the level of
significance at 0.01 level was 2.66. Hence, the strategy developed for the purpose of teaching mathematics in a mathematics laboratory atmosphere was effective.

Kanmani, M. and Radha, M (2009) studied the effectiveness of CAI package in basic electronics teaching. Objectives: To study the level of gain scores of experimental and control group students. To study attainment of knowledge, understanding and application level objectives in the gain scores. To study association between the habit of journal reading and gain scores of students. Method: The study chose the pre-test –post-test equivalent group design, for conducting the experiment. Pre-tests (010-3) were administered before the application of the experimental and control group treatment and post-tests were conducted after the treatment period. Randomly selected 36 girl students of II year B.SC chemistry, Holy cross college, Nagercoil, Kanyakumari district, were chosen for the study which constituted the total sample. The tools utilized were 1. CAI package in basic electronics, 2. Achievement test in basic electronics, 3. Catell’s culture fair intelligence test, and 4. Personal data sheet. Findings: In the experimental group 22% of the students had higher level of gain score than control group. There was a significant difference between the control and experimental group students in the gain scores. Hence, the experimental group students are better than the control group students in the gain score. It is inferred from the finding that the experimental treatment is effective to the students. There is significant difference between the control and the experimental group students in attainment if knowledge level objective in the gain scores. There is a significant difference between the control and experimental group students in attainment of understanding level objective in the gain scores.
Singaravelu, G (2008) studied the effectiveness of virtual tour in learning social science at standard V. Objective: To assess the problems of the young learners using the present methods of learning social science at standard V in Pooluvapatti panchayat union primary school, Coimbatore. To find out the significant difference between the post test of control group and post test of experimental group in achievement mean scores of the pupils in social science. To find out the significant difference between the pre test of experimental group and post test of experimental group in achievement mean scores of the pupils in social science. To assess the impact of virtual tour in learning social science.

Method: Experimental method (control group and experimental method) was adopted for the study. Eighty pupils of standard V from panchayat union primary school at Pooluvapatti in Coimbatore were selected as sample for the study. The investigator’s self made achievement test was used for the pre – test and post test of both control group and experimental groups. The same question was used for both pre and post tests to evaluate the pupils’ skills in social science through objective types of questions. Findings: The study reveals that the learners of standard V at panchayat union, primary school of Pooluvapatti, had problems in learning social science by using traditional approaches. Hence virtual tour will be more supportive to promote primary education.

3.3 Studies Related to e quest

3.3.1 Foreign Studies

Jennifer Reinhold and others (2010) investigated web based instruction on substance abuse and drug diversion. Objective: To develop a pilot study to assess the effectiveness of a Web-based educational module on enhancing understanding of substance abuse and drug diversion, and to assess students' abilities and confidence in
applying the information. Method: A Web-based instructional module was presented to students enrolled in their second pre-professional year, and students were informed that it was part of a research study. Knowledge was tested using 10 pre- and post-module questions. Students were also presented with 5 survey questions assessing abilities related to the learning objectives. Assessment of the median percentage of correct responses increased from 60% (Inter quartile range [IQR] 20%) for the pre-module questions to 90% (IQR = 10%) for the post-module questions. The median percent gain in knowledge was 20% (IQR = 20%) which was significant (p < 0.0001). Findings: Conclusions Web-based instruction is an alternative method for engaging students in course content, and found that 59% of the pilot study group worked in a pharmacy. From the success of the pilot study, the module was implemented as an extra credit assignment in a required course to provide a foundation for developing professional skills and responsibility.

Paul Kawachi Frsa (2010) evaluated e-portfolios, convergence and open resources. Objective: To study the interconnection between the new trend in education of e-portfolios for learning communities, and the two recent trends of convergence and open education resources. Method: e-Portfolios were used to promote the professional self-development of pre-service or in-service teachers. Pre-service teachers have not only used e-portfolios to develop their abilities in reflecting on given teaching principles in certain contexts, but have remarkably demonstrated their applying these skills to new contexts outside of the course. Findings: All the in-service teachers participating in a pilot study investigating the efficacy of e-portfolios showed significant benefit with 30% of them showing excellent development. One additional benefit not covered in their study was that the e-portfolio was carry-away.
Ramos-Elizondo A.I and others (2010) made a case study to develop cognitive skills with mobile learning. Objective: To analyze mLearning resources in four courses to identify how they help develop cognitive skills in students. Methods: Focus group interviews, surveys, document analysis and non-intrusive observation were used. The data was analyzed quantitatively and qualitatively in order to link the results and the theoretical information within the two variables that guided this study: mLearning and cognitive abilities. Findings: The results show that by using mLearning resources it changes the learning environment by converting any setting into a collaborative and innovative environment. Results also show that the design of mLearning resources must be based on educational theories and strategies to be effective, and also the nature of the subject and resource type are related to the developed cognitive abilities. Also it was found that although students are not aware of it, mLearning resources and the use of mobile devices assists them in developing strategies that promote cognitive skills such as problem solving, decision making, critical thinking, creative thinking and melioration.

Teoh Sian Hoon and others (2010) studied the effect of an interactive courseware in the learning matrices. Objective: To integrate cooperative learning strategies, mastery learning and interactive multimedia to improve students’ performance in Mathematics, specifically in the topic of matrices. Method: It involved a quasi-experimental design with gain scores and time-on-task as dependent variables. The independent variables were three instructional strategies (CCL, CML and CCML) with academic abilities as the moderator variable. The sample for the study was 262 Form Four Malaysian students. A courseware entitled "Matrices" was developed using Macromedia Author ware as the authoring tool. In this study, the collected data was used to investigate the effects of the
three learning strategies on the gain scores and time-on-task. Based on the gain scores and time-on-task, the effectiveness of the three learning strategies was discussed. Findings: This study showed that the CCML and CML strategies were superior compared to the CCL strategy; CCML strategy produced the highest gain score. For students with low academic ability, the CML strategy was found to be the most effective strategy. The findings of this study also suggested that high academic ability students would obtain high gain scores regardless of the instructional strategies. In terms of time-on-task, students in CCL and CML strategies demonstrated significant lower time-on-task than CCML strategy.

Ada W.W. MA (2009) studied the computer supported collaborative learning in promoting life long learning skills. Objective: To re-examine the role of assessment in learning and attempt to devise a peer assessment design in a technology enhanced environment as part of the learning activities for full-time teacher-educators. Method: In the three studies of this project, the creation of assessment rubrics, the submission of intra-group reflective journals, which formed the basis of the group’s growth (learning process), and the inter group review, which gained from peers’ feedback to their project presentation and report (learning product) were incorporated as the assessment measures. Findings: It was encouraging to witness that learners of the same cohort had improved their lifelong learning skills progressively over the period of three years by engaging in peer assessment tasks. The findings of these studies indicated that skills fostered through peer assessment were highly relevant to their workplace as teachers when teamwork, interpersonal skills and the ability of self-reflection were emphasised. This study has
demonstrated some good practice that supports student-centered learning, prepares students to be lifelong learners and which is suitable for adaption to suit other contexts.

Boude Figueredo and others (2009) studied ICT and problem based learning as meaningful agents in competence development. Objective: To identify the abilities that the Nursing students could obtain through independent work in a learning environment. Which makes use of digital educational material, based on problems about computer networks. Method: 22 Nursing students from Universidad de La Sabana which are studying the subject, "Telemática" throughout the second semester of 2007. They turned to the subject in question, now that they are allowed to see the learning environment from all sides. They also understand internships and imaginativeness of the actors who intervene. Moreover their relationships, strains and transformations. Findings: 27% of the students exceeded the expected levels in the development of the given abilities. 63% reached the expected levels and only 14% reached the minimum level. These achievements were related with factors such as interchanging of knowledge, in pairs, outlines of their own thoughts, the student's availability and attitude as the main person in the learning process. Currently, we found that the students developed other ways of learning that were not given. The environment helps to develop abilities in students, if it stimulates the process of sharing with peers.

Carolina Armijo de Vega and others (2009) investigated attitude and perceptions of students in a system engineering e-learning course. Objective: To assess teacher and students’ perceptions about the e-learning courses experience. Method: Personalized interviews with some of the students were carried out. ATTLES and COLLES surveys were also applied to students. The teacher and students were interviewed about the
advantages and disadvantages experienced over their e-learning experience. The teacher recognized the benefits of the flexibility in an asynchronous environment, the democratic values of the media which gives voice to each one in the class and the possibilities for a reflexive practice. It is also recognized the volume of work involved and the need to develop strategies to cope with numerous students. From the student point of view, the greatest difficulty detected is fear to the unknown and the perceived workload to comply with the requirements of the course when compared to a traditional face to face course. Their lack of planning and organizing abilities are the main cause for the manifested students’ lack of interest to participate in online discussion forums. Communication strategies and adaptation strategies are proposed to involve the student into discussion and create a more comfortable and trusting environment. Findings: It is concluded that attitudes towards thinking and learning, as measured by ATTLS, find a balance between connected knower and separate knower. The results from COLLES survey permitted to conclude that in general in the three courses students perceive that they found in the course what they initially expressed as desirable.

Ed Smeets and others (2009) investigated the teaching styles of teacher educators and their use of ICT. Objective: To investigate the teaching styles of teacher educators and their use of ICT. Method: In the present study, teaching styles of teacher educators, both without and with the use of ICT, have been studied by means of a web survey. Participants were 262 teacher educators from 12 teacher training institutes in the Netherlands. Findings: The study showed that, when using ICT, there is more emphasis on knowledge construction, as compared to knowledge transfer. Several variables have been identified that are linked to the teacher educators’ teaching styles, including teacher
educators’ views on modelling learning environments and on their students’ abilities at autonomous and co-operative learning, the self-assessment of their competencies in using ICT as a pedagogical aid, subject area, and the encouragement by management to use ICT in education.

Luís Manuel Barreto and others (2009) verified achieving new abilities with ICT. Objective: To develop a set of tools and learning environments that will allow people to develop, or update, their abilities. Method: The first step of the project, as it is supported in a set of Web based tools and ICT technologies, is to give their users some basic computer skills. And then, users through a cycle of continuous improvement, supported in virtual learning environments, will be able to gain, or improve, new abilities. This continuous improvement cycle is called IPAT- Personalized Itinerary through Technological Adaptation. In its first phase the IPAT will allow disfavored people like unemployed, young people with low qualifications and older actives acquire the necessary abilities to use the basic Web and ICT tools. This phase is supported in a Flyer and a CD-Rom. The Flyer shows the basic steps of turning on a computer and accessing the CD-Rom. The CD-Rom is composed by a set of interactive tutorials that, in a very clear and simple manner, will allow the user to acquire competencies in using the basic ICT tools and, also, the tools used in the project. In its second phase the IPAT will lead the user to trace its goals of career, using for that, professional profiles adjusted to the work market and to the new and emergent job types, in order to take a place in the work market. Findings: The out comes are significant with ICT technologies.

Mai Neo and Tse-Kian Neo (2009) studied the perception of students about a multi mediated constructivist learning. Objective: To investigated students’ perceptions
while working on a multimedia project that was embedded within a constructivist-based learning environment. Method: The impact was studied of using multimedia on students who have little experience with working in a problem-solving design environment. Students worked in groups and created an interactive multimedia application with Macromedia Director. They were responsible for all project development decisions during their learning process. A survey questionnaire administered at the end of the project captured their perceptions. Findings: The students showed positive attitudes towards the project with respect to their learning motivation and understanding, skills and their teamwork abilities. By incorporating multimedia into a constructivist learning environment, students learned to design multimedia, as well as to experience critical-thinking, creative, presentation and communication skills; enhanced motivation and understanding various levels of the subject domain. These skills would all be useful in their future undertakings. Findings provide strong support and encouragement for Malaysian educators to incorporate multimedia technology and constructivist learning into the classrooms for the enhancement of teaching and learning.

Nagihan Yildirim and others (2009) verified the effectiveness of cooperative learning in pre service Chemistry teachers’ usage of teaching technologies. Objective: To determine pre service chemistry teachers’ ability to use teaching technologies with cooperative learning. Method: A case study methodology was used. To collect the data, an unstandardized survey, observation notes and teacher candidates teaching material folders prepared during Chemistry Teaching Method II were used. The sample consists of 39 fifth year undergraduate chemistry teaching students attending the Department of Chemistry Education at Karadeniz Technical University in Trabzon in the fall semester of
2006-2007 academic year. The study took fourteen weeks. Findings: It was found that the study was effective for students to see their inadequacies and improves their abilities using teaching technologies during instruction.

Ranjit Kaur and others (2009) probed self-directedness through asynchronous online interactions Objective: To explore Malaysian adult learners’ self-directed abilities through one mode of Computer Mediated Communication in a local private university. The areas of self-directedness explored include planning, monitoring, decision making and computer skills. Method: The sample population comprised sixteen Third Year adult course respondents (n=16) pursuing the Listening and Speaking Course (LSC) for their Bachelor in Education (TESL) degree program. The sample within the case comprised six (n=6) case respondents and one tutor (n=1). This descriptive case study employed a mixed method approach in its data collection procedure. Quantitative data was collected through a survey questionnaire and qualitative data was obtained by analysing threaded asynchronous online interactions (AOI), semi-structured interviews and analysing case respondents learning logs. Findings: findings divulged that generally course respondents rated their abilities in planning, monitoring, decision making and computer skills as average (M = 3.3). In depth analysis of six case respondents abilities also displayed average abilities (overall average score = 3.3). Micro analysis further revealed that two case respondents (R2 and R4) showed the highest level of self-directedness. This was followed with R1, R5, R3 and R6 respectively. This study also portrayed that AOI has the potential in fostering self-directedness. These findings augur well for local and global IHLs as AOI is seen as the next e-trend of the future. However, for students to fully benefit from quality AOI first, the necessary skills, attitude and knowledge must be
Corinne Laverty and others (2008) assessed student teachers’ knowledge of web searching. Objective: To assess the knowledge of web searching strategies of student teachers. Method: This study examined the web searching strategies of 253 teachers-in-training using both a survey (247 participants) and live screen capture with think aloud audio recording (6 participants). Findings: The results present a picture of the strategic, syntactic, and evaluative search abilities of these students that librarians and faculty can use to plan how instruction can target information skill deficits in university student populations.

Debra L. Fleming (2008) made a study to enhance collaborative learning. Objective: The primary purpose of this exploratory study is to provide insight on how to use online discussions to foster collaborative learning and how to design assessment processes to evaluate the effectiveness of those discussions. Method: This study focuses on the pedagogical role of discussion, effective practices in discussion, guidelines for creating discussions to enhance learning, and the use of rubrics for assessment and evaluation. This study also provides an overview of the pedagogy of online assessment with an emphasis on mastery learning instructional methods. Effective practices in the use of online assessment and guidelines for aligning learning objectives with the most appropriate assessment tool are also emphasized. Findings: This study concludes that using best practices in online discussion and assessment can enhance collaborative learning which results in students having a deeper understanding of course content because of more time on task, increased motivation, more engagement, improved
teamwork and interpersonal skills, enhanced critical thinking abilities, improved self-esteem and increased ownership of their own learning.

Nilgün Seçken (2008) investigated the self directed learning process of pre-service Chemistry teachers through internet assisted education. This study aims to examine the effects of computer-assisted education on self-directed learning (SDL) process of pre-service teachers in teaching renewable energy and in increasing their level of knowledge. Student teachers were facilitated from computer-assisted teaching through acquiring information via the Internet. Students’ basic knowledge on energy, energy sources, efficient and productive utilization of energy was found to be quite inadequate. Internet assisted education application resulted in an important increase in the self-directed readiness levels of students together with the improvement in their self-learning abilities and abilities to determine their needs plan their learning and apply their learning plans. Findings: The evaluation results of the Renewable Energy knowledge test of 25 questions displayed a significant increase in students’ level of knowledge at the end of the internet-assisted education. Moreover, a statistically significant improvement was observed in students’ attitudes towards computer (SATC).

Gayle Bogel (2007) probed the information literacy skills of the students. Objective: To investigate whether the expectations for Internet searching strategies outlined in provincial curriculum goals are being met in Nova Scotia Schools. Method: Survey questionnaire consisting of yes/no, multiple-choice, Likert style, and open-ended responses. Setting – Twelfth-grade students from four high schools in one district in Nova Scotia. Total participants: 198. Subjects – Questionnaires were analyzed from 243 general practitioners, practice nurses, and practice managers in four Nottingham primary
Findings: The researchers state that actual practice in Nova Scotia schools does not reflect the standard instructional strategy of modeling as recognized by the Nova Scotia Department of Education. They feel that the results of this study show that very little modeling is being done by classroom teachers; that the modeling is instead being done by peers and family at home. This magnifies the disparity in effective skills for those who do not have Internet access at home. They also note that the goal of integrating search strategy instruction across the disciplines is not being reached. The researchers suggest two ways to offer the needed instruction: compulsory classes in information seeking for all students, or the hiring of teacher-librarians to support instruction in the schools, working collaboratively in all disciplines. Research supporting the presence of teacher-librarians in teaching effective information literacy skills, including Internet searching, is noted.

Julie Stephens (2007) investigated information literacy skills in teacher and students' viewpoint. Objective: To examine student and teacher views of information literacy skills in school assignments in order to determine: 1) To what extent did students value the use of a research model booklet PLUS (Purpose, Location, Use, Self-Evaluation)? 2) How confident were the students about doing a good assignment and did the PLUS booklet affect their confidence? 3) What benefits and limitations did students identify from individual brainstorming and concept mapping in relation to learning more about their topic and producing a good assignment? 4) To what extent did students see value in doing preliminary reading to revise their initial keywords and concept maps? 5) What reading and note-taking strategies did students adopt when using print and electronic resources? 6) To what extent (and why) did students prefer to use electronic
rather than print resources? 7) What are the implications for teachers and school library media specialists (SLMS)? Method: Qualitative, action research; collaborative inquiry over fifty-two students (high school/co-educational) in the second year of high school (year 8) enrolled in a science class studying sound technology; the school library media specialist (SLMS); science teachers of Ripon Grammar School, Yorkshire, United Kingdom. Findings: The study suggested that students are capable of reflecting on their use of information literacy skills. It also indicated that students saw the value in brainstorming, concept mapping, and the use of a research model such as the PLUS booklet, even though these strategies did not necessarily suit the learning styles of all students. There was overwhelming evidence that students prefer electronic resources over print resources and reasons why they prefer electronic resources were articulated. Implications for teachers and school library media specialists include: collaboration, the importance of seeking and analyzing student feedback, examining transfer of information literacy skills across subjects, and exploring student use of print and electronic resources.

Manir Abdullahi Kamba (2007) examined internet as a tool for interactive learning. Objective: To examine the usefulness of the Internet as a tool for interactive learning, teaching and research in Nigeria. Further to exhibit the impact of the Internet in advancing research, teaching and learning abilities and techniques of the researchers, teachers and students respectively. Method: Survey research method was employed. Questionnaire was the main instrument utilized for data collection. Findings: The study exhibits that a number of teachers and students are aware of the benefit of the Internet as a tool for interactive learning, teaching and research; the study shows that the respondents lacked access in their schools and colleges. Only 40% of the respondents make use of the
Internet for Interactive learning. In addition to this 50% of the teachers only use it for interactive research. None of the teachers used it for interactive teaching.

Palmira Peciuliauskiene and Marija Barkauskaite (2007) assessed the future teachers’ competence in applying ICT for development. Objective: To assess would be teachers’ competence in applying ICT and to probe the pre conditions for development. Method: survey method was employed with an administration of questionnaire over 103 subjects. Findings: Research disclosed that would-be teachers had fully mastered ordinary abilities demonstrating basic and educational competencies in ICT. The development of would-be teachers' competence has been accepted as a permanent process starting yet before the studies at university within the process of learning informatics in forms 11 and 12.

3.3.2 Indian Studies

Jagdish Arora Prakash, P (2011) studied the ICT enabled services and activities of the INFLIBNET. Objective: To present a fact on figure about INFLIBNETand it’s activities. Method: Meticulous case study and descriptive method. Findings: The INFLIBNET centre has taken a number of new and timely initiatives for providing effective and efficient information support to the higher education community in Indian Universities it serves. The centre has also added new dimensions to its ongoing programmes and activities that were due for a long period of time. In precise the centre has done note worthy job in the past couple of years that has duly been recognized by the academic community in India.

Ajathaswamy, A.M (2010) analysed the internet awareness and competence among high school students and teachers. Objective: To find out the extent of awareness
and competence of internet among high school and teachers. Method: Through stratified random sampling technique 100 students and forty teachers were selected for survey method. Test of internet awareness and test of competence of using internet were the tools administrated. Findings: This method has significantly enhanced the competence of using internet among the teachers and students.

Amruth G. Kumar and Rajesh, K. (2010) investigated the relationship between information literacy and institutional climate perception of post graduate students. Objective: To estimate the relationship between information literacy and institutional climate perception. To estimate the relationship between information literacy and sub variable like academic climate perception, social climate perception, physical and administrative climate perception. Method: Over a sample of 400 students selected through random sampling information literacy inventory and institutions climate perception questionnaire were administered. Co-efficient of correlation suggested by Karl Pearson was employed. Findings: The study revealed that there was positive and significant relationship between information literacy and institutional climate perception. The study also revealed that a positive and significant relationship between information literacy and sub variable of institutional climate perception.

Francisca, S and MaryRani (2010) investigated internet knowledge of research scholars and their usage. Objective: To study the internet knowledge of research scholars and their level of usage. To study the significance of difference if any between scholars in internet knowledge and usage with reference to gender, location, area of specialization, research status and research degree. To study the significance of correlation if any between the above said variables. Method: Survey method was adopted over 200 research
scholars. Internet knowledge test standardized by Dr. Rajasekar was the tool administered. Findings: There is significant difference between research scholars in internet knowledge with reference to gender. But male and female researchers significantly differ in their level of usage. There is no significant correlation between internet knowledge and usage with reference to research degree – M.Phil. There is significant correlation between internet knowledge usage with reference to research degree – Ph.D.

Neeraj Kaushik and Anita Sharma (2010) assessed computer and internet awareness in school going students. Objective: To assess the computer and internet awareness level among the students of class IX and X. Method: Exploratory cum descriptive in nature through survey method by administering questionnaire. The sample size was 100 by random selection. Findings: (i) 62.7% had used computer already, (ii) 46.6% had exposure to computer, (iii) 26.6% had known various applications, (iv) 34% had e-mail I.D, (v) 100% perceived that internet is informative.

Saikumari, K (2010) studied computer phobia of IX standard students and their attitude towards educational usage of computers. Objective: To investigate the level of computer phobia among IX standard students. To investigate the computer phobia of IX standard students in terms of locality, age, and type of management school. To investigate the attitude of IX std students towards computer usage in education. Method: the investigator used random sampling technique for selection of students from three types of schools Government, Aided and Private. The sample size was 310. The sample included boys and girls of the age group 13-15 with both urban and rural back ground. Computer phobia scale developed and standardized by Rajasekar and Vaiyapuri (2006)
was used. Findings: the investigator found that the factors like gender, locality of the school and type of management of school do not influence the computer phobia of IX standard students and their attitude towards computer usage in education. The study reveals that the role of teachers is significant in helping the students get rid of their computer phobia. So the teachers must be given computer literacy to guide their students.

Sibichen, K.K and Annaraja, P (2010) assessed teacher trainees’ computer competency and their technology use in classroom teaching. Objective: To find out the techno pedagogical skills, skills in learning, preparing lesson plan, preparing teaching materials, implementing instructional strategies, communication, evaluation and guidance of the secondary teacher education students. Method: Survey method was adopted on the sample of 75 B.Ed. students of Mahathma Gandhi University, Kottayam through stratified random sampling technique. The sample consist of 37 men and 38 women students. Techno pedagogical skill assessment scale developed by the investigator was the tool employed. Findings: t test result revealed that there is significant difference between secondary teacher education student who have attended computer course and who have not attended computer course in their skill in learning and techno pedagogical skills.

Rajasekar, S and Vaiyapuri Raja, P (2007) studied higher secondary school teachers’ computer knowledge and their attitude towards computer. Objective: To study the level of computer knowledge of teachers. To study the teachers’ attitude towards computer to study the significance of the difference between the sub – samples of the teachers in respect of their computer knowledge and their attitude towards it. To study the nature of the relationship existing between the teachers’ computer knowledge and their
attitude towards computer. Method: Survey method, cluster sampling technique has been used in the selection of the sample of as many as 670 teachers working in higher secondary schools situated in the Cuddalore district of TamilNadu, India. Findings: The present study has revealed many interesting findings. Viz., the majority of teachers working in the higher secondary schools, situated in the Cuddalore district of TamilNadu, India, belong to the low level of computer knowledge and majority of teachers have a relatively favorable attitude towards computer. This reveals that the computer knowledge of the teachers needs to be improved.

3.4 Studies Related to ICT readiness

3.4.1 Foreign Studies

Elsayed Hussein Elsayed Ali, Islam (2010) measured staff members’ e readiness towards e learning Egyptian faculties of Tourism and Hotels. Objective: To measure e readiness of the staff members. Method: Data were collected through a questionnaire of 92 staff member (professor, assistant professor and lecturers) of tourism studies, hotel management and Tourism Guidance departments. Also this research is based on a basic hypothesis that there is a shortage and insufficiency of staff members e readiness for e learning. The paper also contains typical e learning quality framework. SPSS program was used to analyse the data and reach the finding of this study as frequencies, standard deviation, means, t test per pair between the two dimension pedagogical and technical competencies and also average mean to measure this dimension. Cronbach alpha was made to ensure the reliability, beside the validity achieved. Findings: The findings indicate that the staff member at faculties of tourism and hotels have a good level in
pedagogical factor and have a bad or shortage in technical factor, so the study recommends them to improve their technical competencies.

Galina Kavaliauskiene and Ligija Kaminskiene (2010) used ICT in English for specific purposes. Objective: The goal of this research have been to investigate learners’ attitudes to the application of e portfolios in learning English for Specific Purposes (ESP), and to analyze learners’ reflections on e-learning in view of fostering sustainable lifelong learning. Method: The method of investigation is a specially designed questionnaire to study learners’ attitudes to e-learning and statistical treatment of the data by means of SPSS software. The participants of research are the students who learn English for Specific Purposes at tertiary level. The study investigated learners’ perceptions of employing electronic language portfolios for conducting various assignments in English for Specific Purposes classes. The research involved university students of different specializations. Learners’ experience of applying weblogs and reflections on their benefits for improving language skills have been analyzed and statistically treated using the SPSS software. Findings: The results have shown that students are positive about application of ICT in ESP classes. Writing e-entries encourages students’ critical thinking, develops their creativity, motivates learners to use digital technology and encourages collaboration of learners.

Gutiérrez-Martín A. and others (2010) studied the existence of digital tribes in university class rooms. Objective: To argue that the ICT changes are not as immediate, automatic or beneficial as the dominant political and technological discourse on the benefits of ICT would have us believe, and that they give rise to many different situations that characterize university teaching and learning practice. Method: Using the ratings of
three Likert questionnaires on information processing and communication in three different environments (Moodle, Tuenti and the classroom itself), and applying multivariate techniques (factor analysis and cluster analysis). Findings: Investigators have found four clusters: pro-ICT students, anti-ICT students, listless student and neutral student. The presence of such segments of students allows us to conclude that, although computers are nowadays taken for granted in Higher Education classrooms. Perhaps overestimating both the real impact of ICT on teaching and students’ digital competencies, and that this false perception of reality benefits technology vendors but not methodological and pedagogic innovation, which can only be achieved through the necessary reflection on education matters from educational principles.

Jesús M. Suárez Rodríguez and others (2010) studied teachers’ competences in ICT and their relation to the use of the technical resources. Objective: The aim of this paper is a study of the teachers’ competence on ICT and their relation to the use being made of these technologies, both professional-personal and with their students. Method: For it a survey design has been used. The target population constitutes the teaching staff of centers of primary and secondary education of the Comunidad Valenciana. Information was collected through questionnaires. Starting from the technological and pedagogic competences in TIC, we have been obtained teachers’ consistent competencies profile with four increasing levels: without knowledge, entrance, adoption and innovation. Likewise, we has been a narrow relationship among this profile and the use that the teachers carries out, more closely connected with the personal-professional who with the use with the students. Findings: Findings contribute keys to guide the professional development and teacher initial education programs.
Naser Jamil Al-Zaidiyyeen and others (2010) investigated teacher’s attitude and levels of technology use in classrooms. Objective: To investigate the level of ICT use for educational purposes by teachers in Jordanian rural secondary schools. The paper will contribute to the body of knowledge regarding the level of ICT use and also, concerning the importance of teachers' attitudes towards the use of ICT for educational purposes. Method: The data for the study were collected through the use of quantitative data. In October 2008, a questionnaire was distributed to 650 teachers in Jordan, randomly selected. Four hundred sixty teachers responded to the questionnaire. The survey included questions concerning the level of ICT use as well as questions related to the attitudes of teachers towards the use of ICT. Findings: revealed that, teachers had a low level of ICT use for educational purpose, teachers hold positive attitudes towards the use of ICT, and a significant positive correlation between teachers’ level of ICT use and their attitudes towards ICT was found. The findings suggest that ICTs use for educational purposes should be given greater consideration than it currently receives. In general, the results were consistent with those previously reported in studies related to the use of ICT in the educational settings.

Nicol Pan and others (2010) made a study on sharing e learning innovation in Engineering as well as in teacher education. Objective: This paper details a collaborative effort between the engineering and the education disciplines, in using ICT to support students’ learning in teacher education. Method: An eLearning platform was created for the training of student teachers in developing their professional knowledge in teaching and learning and gaining understanding of the work of a teacher. Through the platform,
student teachers gain understanding about the teaching profession from different people of the education sector; and they can reflect and share their teaching practicum experiences with each other using the online communication tools. A program evaluation study later showed that students were satisfied with the quality and the contents of the program. The written feedbacks seem to suggest that an eLearning platform that is rich in multimedia contents about actual teaching experiences may have played a role in the process of knowledge transfer from one generation of teachers to another. Findings: The findings suggest that although ICT and new web technologies play an important role in enriching student teachers’ learning experiences, the success of its application still depends on factors that are beyond the technologies or pedagogies. Nevertheless, the project has been a remarkably encouraging experience for interdisciplinary collaboration in the effort to advance teaching and learning practices.

Onasanya, S.A. and others (2010) probed the attitude of lecturers towards integration of ICT into teaching and research. Objective: The study surveyed the attitude of lecturers towards integration of Information and Communication Technologies (ICTs) in tertiary institutions in Kwara State, Nigeria. Method: To elicit responses for the study, four research hypotheses were formulated. One hundred and fifty lecturers, 90 males and 60 females from three tertiary institutions in Kwara State participated in the study. Data were collected for the study through the administration of 29-item questionnaire. A test re-test method was used to determine the reliability of the instrument, the result was appropriately scored. The data obtained were analysed using t-test and ANOVA in testing the hypotheses. Findings: The findings showed that gender has no effects on the attitudes of lecturers towards integration of ICT into teaching and research in tertiary institutions.
Science oriented lecturers attitudes towards integration of ICT in tertiary institution is higher than other non science oriented lecturers. Less experienced lecturers are more exposed to the use of ICT than moderately and highly experienced lectures. University lecturers acquired more ICT skills than their counterparts in polytechnics and colleges of education. Many lecturers lacked adequate training and competence in using computer as a tool for effective teaching and research purposes. It was recommended among other things, that higher institutions should encourage their lecturers to be computer literate by organising conferences, seminars and workshops. Old lecturers should be encouraged to develop good attitudes toward the use of ICT for teaching and research work. Recommendations were made toward effective integration of ICTs in tertiary institutions in Nigeria.

Prasart Nuangchalerm (2010) studied the in-service teachers’ perception towards e-journals with respect to their internet usage. Objective: This study aims to investigate internet user and electronic journals perception of in-service science teachers. Method: Thirty eight of in-service science teachers were asked experiences of internet in use and electronic journals perception. All of them participated in the workshop on implication of ICT for science teaching during September 2009. Findings: The results showed that significant implications of internet use and future electronic journals were reported. They had significantly high acceptance of internet for academic purpose, and also possibly expected in electronic journals in terms of future scholarly referenced information.

Rugayah Hashim (2010) assessed the attitudes of distance learners towards the use of ICT in education. Objective: The objective of this study was to assess the attitudes of distance education students toward the use of ICT in learning and teaching. Method:
The sample and units of analysis were 500 adult students undertaking distance education studies at the Institute of Education Development (InED), UiTM. The variables studied were computer anxiety, confidence, liking and, usefulness. The response rate was 56.8%. Findings: The findings showed that even in this K-economy, there are still some students who are uncomfortable with using ICT, that is, the students do not favor the use of ICT through InED’s learning management system. The findings are important to gauge the students’ performance as well as to modify and strengthen InED’s policy for using ICT and other technologies to impart knowledge and education

Sanches Lam and Kin Fai Ho (2010) carried out a case study in two cities of China about personal development through ICT in corporate learning. Objective: This paper argues that the use of ICT in corporate education and training is likely to empower their employee’s skill sets. Method: Meticulous qualitative case study in two cities with remarkable development and where the developmental activity of government and private sector are at their vogue. Findings: The results of this study suggest the use of ICT could be an effective teaching tool for multi-national corporate learning in developing cities. The authors also have developed a 4Is framework for discussion.

Bulent Cavas and others (2009) studied Science teachers’ attitudes towards ICT in education. Objective: The purpose of this study was to reveal Turkish primary science teachers’ attitudes toward ICT in education and then explore the relationship between teachers’ attitudes and factors which are related to teachers’ personal characteristics (gender, age, computer ownership at home, and computer experience). Method: In order to collect data, an instrument (STATICTE) was developed by researchers and administered to 1071 science teachers almost uniformly distributed in 7 geographic
regions of Turkey. In data analyses, descriptive statistics were used to describe and summarize the properties of the mass of data collected from the respondents. Findings: The results indicate that Turkish science teachers have positive attitudes toward ICT and although teachers’ attitudes toward ICT do not differ regarding gender, it differs regarding age, computer ownership at home and computer experience. It is hoped that the outcomes of this study can be used in shaping innovational practices in the Turkish Educational System.

Ching Sing Chai and others (2009) compared the beliefs and attitude of pre service teachers of Singapore and Taiwan. Objective: To assess the beliefs and attitude of pre service teachers studying in Singapore and Taiwan. Method: Teachers' epistemological and pedagogical beliefs and their attitude towards ICT use are identified as the second-order barrier for the integration of ICT in the classrooms. Data obtained from a recent survey that was conducted among Singaporean and Taiwanese pre-service teachers (N=108) were taken for the study. Findings: The results indicate that pre-service teachers' epistemological beliefs were generally relativistic. They were inclined to believe in the constructivist notion of teaching. The results also suggested that pre-service teachers from Singapore and Taiwan hold beliefs that are congruent to the educational reform effort from their respective countries. However, the pre-service teachers' attitude towards ICT use does not seem to be associated with their epistemological and pedagogical beliefs. The findings suggest that further efforts are required to foster more productive use of ICT to support constructivist teaching.

Deniz Deryakulu and others (2009) compared satisfying and frustrating aspects of ICT teaching on the basis of self efficacy. Objective: The purpose of this study was to
determine the most satisfying and frustrating aspects of ICT (Information and Communications Technologies) teaching in Turkish schools. Another aim was to compare these aspects based-on ICT teachers’ self efficacy. Method: Participants were 119 ICT teachers from different geographical areas of Turkey. Participants were asked to list salient satisfying and frustrating aspects of ICT teaching, and to fill out the Self-Efficacy Scale for ICT Teachers. Findings: Results showed that the high self-efficacy teachers listed more positive and negative aspects of ICT teaching than did the low self-efficacy teachers. The satisfying aspects of ICT teaching were the dynamic nature of ICT subject, higher student interest, having opportunity to help other subject teachers, and lecturing in well-equipped labs, whereas the most frequently cited frustrating aspects of ICT teaching were ICT-related extra works of schools and colleagues, shortages of hardware and technical problems, indifferent students, insufficient teaching time, and the status of ICT subject in school curriculum. This information could be useful in redesigning ICT teachers’ roles and responsibilities as well as job environment in schools.

Ed Smeets (2009) studied the teaching styles of teacher educators and their uses of ICT. Objective: To study teaching styles of teacher educators, both without and with the use of ICT, by means of a web survey. Method: Participants were 262 teacher educators from 12 teacher training institutes in the Netherlands. Findings: The study showed that, when using ICT, there is more emphasis on knowledge construction, as compared to knowledge transfer. Several variables have been identified that are linked to the teacher educators’ teaching styles, including teacher educators’ views on modelling learning environments and on their students’ abilities at autonomous and co-operative
learning, the self-assessment of their competencies in using ICT as a pedagogical aid, subject area, and the encouragement by management to use ICT in education.

Maimun Aqsha Lubis (2009) studied teaching and learning through multi cultural approach and applying ICT. Objective: To assess the effectiveness of multi cultural approach and ICT in teaching Arabic language. Method: The research design was qualitative approach. Data collected from conducting interview and observational field data. Furthermore, data elaborated on grounded theories analysis. Teachers conceptualize multicultural approach as content related to various ethnic and cultural groups. Then, the process on teaching and learning Arabic proficiency through ICT on various ethnic and cultural groups of students was carried out. Findings: This approach helped students a mean to learn Arabic language. The Function of Arabic language as medium of instruction at Pesanteren is able to unite the multilingual students. The usage of ICT is very important in the teaching Arabic so that the material taught becomes more understandable and for students to gain more experience and to enable them to make use of the information easily and at the same time can achieve the objective of teaching and learning Arabic in the classroom.

Nwachukwu Prince Ololube and others (2009) investigated use of instructional technology in higher education in selected Universities of Nigeria. Objective: This article examines the effectiveness of instructional technology in higher education institutions in relation to the role and usage of Information Communication Technology (ICT), its effectiveness in faculty teaching and its impact on student learning in universities in the Niger Delta of Nigeria. Method: This study applied the Need Assessment Approach (NAA). A self-designed questionnaire, that employed benchmarks from similar studies
conducted in the West, was used to collect data for this study. One hundred and twenty five (n = 125) respondents participated in the study. Findings: The results suggest that there are significant relationships between the impact of instructional technology, the usage of instructional technology and students’ academic achievement. An absence of ICT instructional materials, ineffective policy implementation and a lack of other resources (infrastructures) to aid teaching and learning are responsible for short comings in the effective implementation of ICT in education. The study revealed that experience makes it easier to employ and exhibit greater proficiency when using ICT instructional material in the teaching and learning process. The findings and nature of this study bare implications for higher education administrators, faculty and researchers. By design, this research was based on a narrow field of literature and a small sample size. Consequently, it is recommended that further studies are based on a more widespread survey of literature and a larger sample size, which might also involve multiple case studies.

Stephen Hargreaves (2009) enquired the challenges of a split class setting while providing ICT as a complementary application. Objective: To explore the extent to which split-class teaching (SCT) is successful in training students’ four skills in language learning in this specific type of blended learning setting. Method: This quasi experimental study was set up as a pre-, post-test design. Participants were 109 secondary school students, between 16 and 19 years old, with an artistic curriculum and an average of 2 hours of English per week. Data were collected using formative and summative testing covering a 4 month time span. Afterwards, the participants’ learning environment perceptions were gauged in a 14-item questionnaire. The four experimental and three control groups all had strong four skills results in formative and summative testing, with
a slight advantage in favour of the experimental groups. Findings: The experimental groups significantly perceived the split-class as more motivating and more effective in a one factor scale measuring the language learning environment perception in general. This paper presents a thorough general overview concerning positive and negative ICT research outcomes and specific conclusions for ICT sustained language learning. Results are in line with other recent research findings. Nevertheless, this research focuses on a new approach linking communicative language teaching (CLT) and focus on from (FonF) with ICT in a novel language training environment. The paper ends with some advice on SCT implementation and new directions for further research are proposed.

Yavuz Akbulut (2009) studied students’ perceptions of change readiness about the faculty to ICT. Objective: To investigate the change readiness of faculty members through students’ perceptions. Method: To investigates the involvement of the institution and teaching staff in technology integration from observers’ perspectives through administering a personal information form and a 31-item Likert questionnaire to 475 senior students of the Faculty of Education. Findings: Findings revealed that what were reported by instructors in the previous study seem somewhat different from what is being reported by their students in the current study. More specifically, students found their instructors and the infrastructure of the faculty quite inadequate in terms of the integration of information and communication technologies (ICT) within classroom settings. Implications and suggestions regarding the integration process are provided.

Ab. Rahim Bakar and Shamsiah Mohamed (2008) checked the trainee teachers’ confidence to use ICT in their teaching. Objective: To identify trainee teachers’ confidence in teaching using ICT. Method: The respondent comprised 675 trainee
teachers at Universiti Putra Malaysia (UPM). They were all were final year students in the teacher education program. Their confidence was assessed using 12 statements on their ability to integrate Information and Communication Technology (ICT) in teaching. Findings: The study showed that trainee teachers were quite confident integrating ICT with teaching. The study also showed a significant difference in the level of confidence between students with teaching experience and students without teaching experience. Older students were more confident integrating ICT in teaching than younger students.

Ajayi I.A. (2008) studied about the effective use of ICT in Colleges of Education. Objective: To examine the use of ICT for teaching in Colleges of Education in South West Nigeria. Method: Five general questions and 5 hypotheses were raised. A descriptive research design of the survey type was adopted in the study. The sample consisted of 300 lecturers selected from 6 Colleges of Education using stratified and simple random sampling techniques. A self designed questionnaire was used to collect data for the study. The data collected was analyzed using frequency counts, percentage scores and t-test statistic. All the hypotheses were tested at 0.05 level of significance. Findings: The study revealed that ICT facilities such as internet, electronic notice boards and projectors were not available in some of the colleges and ICT facilities were not adequately used for teaching in the Colleges. It was also found that the capacity for the use of ICT for teaching was low. The major problems of using ICT for teaching include epileptic supply of electricity, inadequate ICT facilities and lecturers incompetence in the use of ICT facilities. The study also revealed that Federal and State Colleges of Education were not significantly different in terms of availability and use of ICT facilities.
for teaching. Based on the findings, recommendations were made on how to ensure effective use of ICT for teaching in the Colleges.

Denis Vavougios and Theodoros Karakasidis (2008) studied application of ICT technology in Physics Education. Objective: To assess the effectiveness of using ICT in Physics Education by a combination of laboratory exercises and simulation. Method: Simulations were performed using a general purpose package, MATHEMATICA®, which is widely employed in our departments, and presents some important advantages such as ease of writing mathematical relations, small extent of programs necessary for the solution, ease of creating graphical representations/animations. In the employed process we construct an experimental setup of the physical system using a general purpose package students construct a model of the system that already know from the laboratory students produce solutions for various initial conditions, represent graphically the results and produce animations corresponding to the time evolution of the system. Findings: The results show that the above process offers the students many different representations of the physical problem leading to a better understanding, contribute to the development of critical spirit and to the familiarization with the use of ICT.

Emily M.L. Wong and others (2008) identified ICT as an impetus for change. Objective: To study the impact of the relevant contextual factors on teaching and learning, and how these factors interact with each other, in particular the relationship between technological innovations and pedagogical innovations. Method: By adopting a qualitative case study approach to examining the impetus for change, four different types of ICT implementation strategies have emerged from a sample of eight schools in Hong Kong and Singapore, the technologically driven type, the pedagogically driven type,
balanced type, and the uncoupled type. Those schools which have realized changes in classroom practices are characterised by ICT-pedagogical innovations. Findings: To make this happen, pedagogical innovations must be rooted in teachers’ experiences of moving away from a teacher-centred approach to one that is more student-centred. Leadership and the climate for collaboration and experimentation are fundamental to the integration of technology into pedagogical innovations. However, other factors such as region, school level, and type of school do not seem to account for the differences.

Mayada Al-natour and others (2008) enquired the status quo of using ICT in teaching among special education teachers in Jordan. Objective: This study aims at evaluating the status quo of using ICT among special education teachers in Amman-Jordan schools. Method: The study describes the extent to which ICT has been made available to teachers and students, and obstacles that hinder their use. A questionnaire was developed and sent to 137 teachers who participated in the study. 97 questionnaires were returned, representing 70% of the total population. Findings: Results indicated that availability of tools and devices was limited. Educational programs available in resource rooms were Word Processor, PowerPoint, graphic related programs, and educational games. Difficulty in accessing the internet, lack of educational programs for students with special needs, and lack of educational devices were the obstacles encountered by special education teachers. On comparing use of ICT by special education teachers in public and private schools, private schools made significantly greater use. Results showed significant differences among special education teachers based on their educational qualifications. Teachers with Doctorate or Master Degrees used ICT more often than teachers holding Bachelor degrees.
Patrick O Erah and Emmanuel A Dairo (2008) investigated Pharmacy students’ perceptions to use LMS in patient oriented pharmacy. Objective: To evaluate pharmacy students’ perception of the application of learning management system (LMS) in their education in a Doctor of Pharmacy program in Benin City. Method: In a special ICT class, 165 pharmacy students were introduced to LMS using an open source program, DoceboÔ after which a questionnaire with core questions in five domains, namely, socio demographic data, access to computer and internet, problems in applying ICT facilities, perception of e-learning and LMS was administered. Students’ responses to the questionnaire were analysed. Results: Although most students (84%) had access to internet, only 16.1% owned computers and majority (82.1%) use cybercafés for internet access. Frequent electric power failure, inadequate computer facilities, skilled personnel, and slow internet speed were identified by 64.8–82.5% of the students as problems in using computer facilities in the University. While willingness to pay was not considered a problem, 80.4% of the students were only willing to pay not more than US$ 7.96 per semester for internet access. Over 92% of them felt that LMS will make teaching and learning more exciting and effective when combined with the traditional teaching approach. Conclusion: The use of LMS will improve the teaching and learning of pharmacy students.

Yasemin Gulbahar and Ismail Guven (2008) surveyed the perceptions of Social science teachers on ICT usage. Objective: To shed light on the use of ICT tools in primary schools in the social studies subject area, by considering various variables which affect the success of the implementation of the use of these tools. Method: A survey was completed by 326 teachers who teach fourth and fifth grade at primary level. Findings:
The results showed that although teachers are willing to use ICT resources and are aware of the existing potential, they are facing problems in relation to accessibility to ICT resources and lack of in-service training opportunities.

Adeyinka Tella and others (2007) assessed the ICT usage of school teachers. Objective: To examine the secondary school teachers’ uses of ICTs and its implications for further development of ICTs use in Nigerian secondary schools. Method: The study through census drawn on 700 teachers from twenty five purposefully selected private secondary schools in Ibadan, Oyo state, Nigeria. This comprised 430 males and 270 females. Their age ranged from 25 – 45 years with a mean age of 35 years. A modified instrument tagged Teachers ICT use survey adapted from ICT survey indicator for teachers and staff by UNESCO (2004) and ICT Teachers Survey by New Zealand Ministry of Education MINEDU (1999) were used for the collection of data. Findings: The results showed that teachers generally have access to ICTs in their various schools except e-mail and Internet because their schools are not connected. Technical support are lacking in the schools and teachers lack of expertise in using ICT was indicated as being the prominent factors hindering teachers readiness and confidence of using ICTs during lesson. Furthermore, the results show that teachers perceived ICT as being easier and very useful in teaching and learning. For continuous uses of ICTs by teachers, it was recommended among others that teacher training and professional development oriented policies should support ICT-related teaching models that encourage both students and teachers to play an active role in teaching/learning activities. And that emphasis must be placed on the pedagogy behind the use of ICTs for teaching/learning.
Rumpagaporn. M.W. and Darmawan; I.G.N. (2007) examined students’ critical thinking skills through ICT pilot project in Thailand. Objective: To examine what extent the Thai ICT (information and communication technology) schools have classroom learning environments that are associated with certain teacher characteristics. Method: This study is exploratory, using questionnaires, interview surveys, and computer-based classroom observations in order to collect data from 13 Thai ICT model schools. The data analysis was carried out using statistical analysis techniques as well as using descriptive analysis. It is proposed that students can be assisted to learn critical thinking skills that have particular supportive learning environments. Findings: The significant findings offer opportunities to develop and support students' critical thinking skills through cooperation between students and their peers to achieve their student assignments among cooperative classroom learning environments with ICT. In particular, the findings of this study have major implications for teachers and school management where ICT schools are being established and incorporated in Thailand.

3.4.2 Indian Studies

Chandan Tilak Bhunia and Onime, C (2011) studied the ICT based education in changed scenario to connect the global gaps and deficiencies. Objective: To identify the gaps and deficiencies of ICT based education in changed scenario. Method: Comprehensive case study method was adopted. Findings: Even though ICT based education and training has appealing advantages, it is not without other challenges. These are particularly relevant to the developing countries. Low cost affordable ICT systems should be made available with adequate bandwidth and wireless infrastructure to the
common people in the developing countries. And existing digital divide must be removed.

Jessy Abraham and Babita Sharma (2010) reported the relevance of ICT components in pre-service teacher education curriculum. They state that teacher in India need to be prepared to face the challenges of the 21st century for imparting new age education. The authors stress that teacher education programmes in India should integrate ICT components in such a way that teachers are enabled to face the new demands in this noble profession.

Muthusamy, I. and Thiyagu, K (2010) reported the role of ICT in the governance of higher education. Objective: To underline the role of ICT in the governance of higher education. Method: Descriptive method. Findings: ICT has the potential to bridge the knowledge gap in terms of improving quality of educational opportunities. The use of ICT in education not only improves classroom teaching learning process, but also provides the facility of e-learning.

Priya Pathak and Swati Gupta (2010) investigated empowering women’s participation in ICT and role of Universities. Objective: To list the courses of low participation of women in ICT and how universities can encourage and empower women’s participation. Method: Survey method. Findings: Low participation of women in the area of ICT is a critical problem and there are so many causes like socio-cultural barriers, technology and application related barriers etc. But these barriers can be minimized by using and developing some guidelines. These guidelines can help the universities in empowering women and maximizing the awareness, competence and participation in the area of ICT.
Rajasekaran V and others (2010) reported the role of ICT in teaching and learning mathematics. Averring that information communication technology (ICT) is a very powerful resource that can bring about substantial changes in teaching and learning of subjects especially mathematics. The authors state that ICT will enable the students to manipulate diagram dynamically and encourage them to visualize the geometry as they generate their own mental images.

Umamaheshwari, K. and others (2010) assessed the ICT literacy among high school students. Objective: To analyse the general awareness of ICT literacy among the high school students. To study the difference if any in ICT literacy among locality, gender, medium and type of school sub variables. Method: by cluster random sampling technique 229 students from government schools and 196 students from private schools were selected. Findings: There is significant difference in the achievement of students belonging to urban, private, boys, and English medium sub variables.

Yasothapriya, M (2010) studied the role of ICT in improving the quality of education. Objective: To assess the reasons for using ICT. Method: Case study, Comparative description. Findings: ICT will play a significant role in teaching in the future. The innovative use of ICT is defined as ‘the use of ICT application that support the educational objectives based on the needs of the current knowledge society’. The faculty members and teachers will have to be updated regarding the improvements in the technology.

Arulchelvan, S and viswanathan, D (2006) studied the role of educational television in higher education. Objective: The study was conducted to examine the situation in Indian contexts. The focus of the study was to trace the pattern of TV viewing
and usage among graduate students, especially with regard to the exposure, access, purpose of use, perceived benefits. The study also attempted to find out the variations in the pattern of usage of TV among students of different demographic characteristics.

Method: This study has adopted the survey method and descriptive research design. Data were gathered using a self administered questionnaire prepared specially for these purpose. The researcher has taken up 840 respondents from each place for the final analysis. Total numbers of respondents whose responses were taken up for analysis were 11,760. The chi-square test, simple percentage, Friedman’s two way ANOVA and cross-tabulation were used for the analysis of this study. Findings: A vast majority of the respondents (96.31%) possess TV sets. Majority of them (65.36%) watched TV every day in a week. 86.64% of the students watched TV at home in that, 78.40% of the respondents watched TV for entertainment, 69.91% for news, 35.08% for education. Among the educational programmes majority of viewers (68.12%) claimed that they watched syllabus-based programmes on TV whereas only 38.12% claimed that they watched scientific programmes and expert lectures. Data showed that the majority of the viewer’s spend not less than an hour on an average. The regular and distance mode of students have lot of variations in teaching learning. With regard to the TV viewing pattern both regular and distance mode students are alike. TV programmes are very popular among both rural and urban areas. There is a significant relationship between medium of instruction and watching TV.

Rajender Kumar (2006) made a comparative study of the effectiveness of communication technology for teaching information technology to secondary school students. Objective: To compare the effectiveness of audio video instructional system,
multimedia instructional system and conventional instructional system in terms of achievement for teaching “information technology” to study (a) the relative retention in learning through audio–video instructional system, multimedia instructional system and conventional instructional system (b) the interaction effects in terms of achievement in teaching ‘information technology’ having three instructional system and two levels of intelligence (c) the interaction effects in terms of achievement in teaching of ‘information technology’ having three instructional systems and two levels of sex (d) the interaction effects in different levels of intelligence and sex factor (e) the interaction effects in terms of achievement in ‘information technology’ having three instructional systems, two levels of intelligence and two levels of sex. To develop audio-video instructional system on selected content of information technology. To develop multimedia instructional system on selected content of ‘information technology’ the conventional instructional system on selected content of ‘information technology’ to construct achievement test on selected content to study the effectiveness. Method: Experimental research method was adopted in the present investigation the population of the present investigation consisted of all the 9th class students of Bhiwani district public schools affiliated with CBSE. Total 120 students were selected randomly, out of these 40 students were selected for one treatment. Thus three groups of students from three secondary schools constituted the sample for the present investigation. Findings: Multimedia instructional system was found to be the best instructional system than two instructional systems i.e. audio-video instructional system and conventional instructional system. Audio-video instructional system was better than conventional system. The relative comparison of three instructional systems on retention by using the assumption
that a method lower on mean score i.e. mean score of multimedia instructional system would be termed as more effective on retention as compared to a method having higher mean scores.

3.5 Meta synthesis

By the review of the related literature based on the research work carried out in India and abroad, the researcher assimilated the following points to form the basis of his study.

Andre Edginton (2010) had reported that students rated highly about blended learning classes than on line interaction.

Malek Yaman Dittmar Graf (2010) had investigated international teaching concept. Subjects rated highly as well as cautiously about the course.

Rehna Marsur (2010) investigated the impact of web based resource material and concluded that integration of Information Technology in teaching learning increased the understanding of subject related knowledge.

Serap Samsa (2010) studied blended learning approach and reported that pre-service teachers’ satisfaction was significant over the conventional class.

Bridget Melton (2009) reported that blended course delivery is preferred over the traditional lecture method.

Naser Jamil Al- Zaidiyeen (2010) had revealed that ICT use for educational purpose should be given greater consideration than it currently receives.

Nicol Pan and others (2010) had found that although ICT and new web technologies play an important role in enriching student teachers’ learning experiences.
The success of its application still depends on factors that are beyond technology and pedagogy.

Ching Sing Chai and others (2009) had studied the attitude of pre-service teachers and reported positive attitude towards ICT inclusion.

Ada W.W. MA (2009) had established that computer supported collaborative learning can promote life long learning skills.

Boude Figueredo and others (2009) had found ICT and problem based learning as meaningful agents in competence development.

Luís Manuel Barreto and others (2009) had proved that new abilities can be achieved with ICT.

As it has been mentioned no investigator has so far undertaken a study to assess the effectiveness of blended learning model in science education with reference to e quest and ICT readiness in B.Ed. level the present study has been taken up.