CHAPTER 3

LITERATURE REVIEW

3.1 INTRODUCTION:

In the present research, before starting literature review various dimensions of the research topic “Information literacy” were identified. As, present research was focused on developing and implementing information literacy programme for students of pre-service teacher education, the following dimensions were identified:

Figure 3.1
Dimensions of information literacy

[Diagram showing the dimensions of information literacy, including Teacher Education, Assessment, Teaching instructions, Programme, Learning instructions, Collaboration, and Curriculum, all interconnected to Information Literacy at the center.]
After this stage various databases i.e. ERIC, EMERALD, EBESCO, Science Direct, LISA and LISTA were accessed for research articles. Along with databases various journals, reports of seminars and conferences at state, national and international were also perused. While searching the literature, it was observed that an extensive literature is available on the information literacy programme. Following paragraphs elaborates the research on various dimensions of information literacy as represented in Figure No. 1 and the conclusion is drawn after summarization of research on all the dimensions.

3.2 INFORMATION LITERACY AND TEACHER EDUCATION:

This dimension covers the surveys and other research expressing the need and facts about information literacy skills for pre-service and in-service teachers.

Though the concept of information literacy was evolved in 1974, roots of this concept could be found in 19th century in terms of library instructions. The need for library instructions was first identified by Emma Adams in 1898. She surveyed twenty “foremost” normal schools and found that 19 out of 20 schools were providing library instructions in various forms like formal instructions, library class, assignments etc. (Adams, 1898).

In 1915 the National Education Association (NEA) conducted a survey of 100 school supervisors to determine what knowledge a teacher should have about libraries. After analyzing results, the committee recommended a standard course required for the use of the library for all normal school students along with a lengthier course in directing children’s reading and an optional course in library organization and administration to prepare teacher librarians (NEA, 1915).
Harris (1934) summarized above researches to ascertain the status of library instructions for teachers at that time using the catalogues of 114 accredited state teachers' colleges as her source. She proposed that teacher education students complete an advanced bibliography course to provide practice in research techniques. She also presented a sample curriculum for a model programme. She recommended an introductory bibliography course focused on learning about reference sources along with children literature course.

Garber (1954), a public librarian, presented anecdotal evidence to demonstrate that the teacher's lack of library skills leads to construction of inappropriate and frustrating assignments for pupils.

Saddler (1970) reported a study of information presented about libraries in Kentucky teacher-training programmes to assess the attitudes conveyed by instructional materials and the accuracy of information presented. She found that while almost three-fourths of the institutions responding had formal library instruction programs for education graduate students, only one fourth taught a unit on the library as a part of the undergraduate education curriculum.

O'Hanlon (1987) surveyed faculty in Ohio elementary teacher-training programs to assess attitudes towards library instructions in teacher training curriculum and towards the role of elementary school teacher in library skills development of pupils. All the respondents strongly supported the provision of library instructions for teacher trainees. Respondents also indicated that elementary school teachers should play an important role in fostering information skills in pupils. Half of the respondents reported that current graduates of their teacher training programmes were inadequately prepared to assume this role.
O’Hanlon (1988, 528) conducted a historical analysis of articles and documents (published between 1904 & 1987) that described “continuing efforts by academic librarians in United States to promote library instructions in teacher education programmes and found that the academic librarians have attempted to convince teacher educators of the value of bibliographic instructions for more than 80 years without much success”. She further suggested that “library literate teachers, working cooperatively with school library personnel could ensure successful resource based instructional programmes that simultaneously strengthen their students’ library research skills, critical thinking abilities, and problem solving skills”.

From above literature, it can be understood that teacher-training institutes were not much keen towards providing effective library instructions. They were satisfied only in providing library orientations or some library periods or some library classes. All the authors up to 1988 strongly expressed the need of standardized format of library instruction in teacher training course.

In 1989, the ALA Presidential Committee on Information Literacy issued its “Final Report”. The committee recognized that teachers must be information literate if they are to prepare their students “for a lifetime of learning” in their “information age” (ALA, 1989, 1). The committee noted that students are all too often passive consumers of readymade information and suggested that inquiry based approaches to teaching and learning would better promote the development of the critical thinking abilities and problem-solving skills that these learners will need if they are to succeed in 21st century economy. The Committee recommended that teacher education programmes adopt information literacy performance standards and modify programme requirements so that teachers become facilitators of knowledge construction. The committee further recommended that teacher education programmes prepare teachers to integrate the
concept of information literacy into the preschool-Grade 12 Curriculum and adopt inquiry-based approaches to teaching and learning that utilize the “information resources of the real world” (ALA, 1989, 7).

The Education and Behavioral Sciences Section (EBSS) of the Association of College and Research Libraries (a division of the American Library Association) developed guidelines and position statements on what information-literate teachers need to know. EBSS emphasized on conceptually based skills for searching, retrieving and evaluating information for learners who are undergraduate students, graduate students, practitioners and researchers. The EBSS identified a sequence of skills that begins with understanding that the generation and communication of knowledge in education include recorded and unrecorded sources and formats that differs in publication cycles and authority (AASL, 1995). The AASL issued a position paper in 1995 on information competencies that stressed application instead of concepts. The paper emphasized on the different roles of the administrator and the teachers in providing the integration of information literacy into the curriculum, supporting collaboration in planning and teaching among teachers and school library media specialists and providing access to and using resource based learning experience.

As quoted by Thomas (1998) National Educational Technology Standard Project (NETS) began to effectively support use of technology for teaching-learning and administration. Their first set of standards focused on a technology foundation for students and includes the use of technology research tool “to locate, evaluate and collect information from a variety of sources” and to “evaluate and select information resources”. In June 1998, the American Association of School Librarians (AASL) and the Association for Educational Communications and Technology released “information literacy standards for student learning” and addressed issues
in information literacy, independent learning, and social responsibility, as a guide for “school library media specialists and other K-12 educators as they cultivate and refine their students’ information literacy skills in print, non print and electronic format” (AASL, 1998).

In 1998, the Association of College and Research Libraries (ACRL) issued “A progress Report on Information literacy”. This report updated the findings of the ALA Presidential Committee on Information literacy (1989) and described progress made towards implementing the committee’s recommendations. The ACRL reported that teacher education programmes had made no real progress in modifying course requirements and performance expectations to address information literacy concerns (ACRL, 2000).

Johnson and O’English (2003) compiled an annotated bibliography of articles on information literacy education in the United States and Canada published since 1980s. They noted that successful and innovative programmes where exposure to librarians, integration of IL instructions, and attentions to library research can produce new information literate teachers who are equipped to collaborate with school librarians and teach information literacy and research skills to their students.

Usluel (2007) conducted a survey with 1702 students in Turkey teachers using the information literacy self-efficacy scale and duration of ICT usage. The results showed that student teachers level of self-efficacy and duration of ICT usage were determining factors for information literacy and self-efficacy. He strongly stated that training during university education has an important role in increasing information literacy and self-efficacy.

Wen and Shin (2008) carried out a study to establish information literacy competency standards for elementary and high school teachers in Taiwan. The process included a set of two
expert round table discussion and three rounds of Delphi technique survey. The study found that the dimension "attitude" is the most powerful force for promoting teachers' information literacy competence and their willingness to apply information technology in teaching. Authors also suggested the proposed standards, hope that it could serve as a self-evaluation tool for teachers as well as the basis for staffing and training programmes for elementary, and high school teachers in Taiwan.

Probert (2008) surveyed 138 teachers from 3 school in New Zealand in order to investigate teachers' understanding of information literacy and their associated classroom practices. In finding, she reported that while some of the teachers in the project had a reasonably good understanding of the concept of information literacy, very few reported developing their students' information literacy skills.

Duke and Ward (2009) conducted a meta synthesis of the literature available on information literacy instructions in teacher training. In findings, they reported that (a) Pre-service and in-service teachers often lack adequate information literacy skills, many teachers are unable to locate, critically evaluate, and effectively use educational research that might strengthen their instructional practices. (b) Effective library instructions can strengthen the information literacy skills of pre service teachers. (c) Library instructions are the most effective when integrated into education courses. (d) Collaborative instruction between academic librarians and teacher educators is particularly effective. From all the above and other literature it is revealed that, though abundant research conducted and is going on, an information literacy education is not seen as the natural part of teacher education programme.

Sadioglu and others (2009) undertook the study to determine information literacy skills of teacher candidates. For collecting data "Information literacy Survey" developed by Aldemir was
used. In findings, they reported that, the average score of the teacher candidates in the information literacy scale centered on the “I am not sure” option. This means, they did not have detailed or accurate knowledge of the subject and thus they needed to be offered a course on information literacy in the beginning of their undergraduate studies. Authors also suggested that starting from the first year and spreading throughout the following years of study, courses on information literacy should be offered in the teacher-training programme at universities.

Kovalik and other three also surveyed 160 teacher educators from 46 institutions across 16 states in USA in order to investigate faculty knowledge inclusion and assessment of information literacy in teacher education programme and the degree of collaboration between librarian and faculty in teaching of information literacy. Data gathered through questionnaire. Findings reported that 2/3 of the respondents reported the need of collaboration, majority of teacher education faculty were aware much about standards (Kovalik et.al, 2010).

Seely and others undertook a research regarding formative assessment of information literacy skills of students of pre-service teacher education. The researchers compared the pre-service teachers’ and researchers’ evaluation and analyzed final projects by using Perrault and Leigh’s index of reliability. In conclusion, they stated that pre-service teachers, who received formative feedback from librarians, improved in most information evaluation areas (Selly et.al, 2011).

Akarsu (2011) surveyed 144 pre-service teacher education students by using information literacy questionnaire. The aim of the study was to investigate what level of knowledge pre-service teachers enrolled in science education and primary school teacher preparation programmes possess regarding information literacy. In findings author reported that the average
pre-service science and early childhood teachers showed high average of information literacy based on the statements answered.

Kokin (2012) undertook a study with a goal of evaluating primary teacher education programme in Croatia. The evaluation of primary teacher education programme was conducted by using content analysis method. The study indicated that the majority of the current primary teacher education programmes include goals that could linked to information literacy standards. It also indicated that future teachers are more frequently taught how to evaluate information but lack instruction on fair use of information. Author suggested to raise information literacy among teacher educators and to align course syllabi with the common theoretical framework.

Klebansky and Frasor (2013) applied a strategic approach to curriculum design for information literacy in teacher education. A collaborative partnership between the faculty and the library at the University Of Tasmania (UTAS) aimed to contextualize information literacy and lifelong learning outcomes within units through constructive alignment to ensure that they are taught, applied and developed within unit content, then form a part of the summative assessment in unit assessment task. The approach advocated by UTAS TEIL conceptual framework consists of six distinct elements that strongly emphasized on the collaborative effort, sustainability, and equitability with teacher education, contextualized within unit content.

3.3 INFORMATION LITERACY INSTRUCTIONS:

While searching the literature on information literacy instructions, researcher found various researches on instructional approaches and methods. Research on various approaches and methods of imparting information literacy are summarized in following paragraphs.
3.3.1 NATURE OF INFORMATION LITERACY INSTRUCTIONS:

Information literacy instruction is the important component in information literacy programme. Various instructional strategies, approaches have been applied in teaching information literacy. Spitzer, Eisenberg and Lowe (1998) stated that information literacy instruction in an academic setting includes a variety of instructional approaches, such as course related library instruction sessions, course integrated projects, online tutorials and stand alone course. However, these approaches are strongly depending upon the educational, social and cultural background of the students for whom the course is designed. Breivik (1998) supports this, she stated, higher education institutions vary widely in mission and student body, information literacy instruction programmes should be designed to meet specific needs rather than a prescribed set of criteria.

According to Association of College and Research Libraries (ACRL) information literacy instructions are now shifted to develop a set of critical thinking skills involving the use of information from any information sources. ACRL has given the emphasis on "skills development" issue while preparing Information Literacy Competency Standards for Higher Education (ACRL, 2000). ACRL provided a detailed outline of the recommended components for excellent information literacy instruction planning, collaborative information literacy pedagogy, outreach to academic departments and other efforts necessary for creating successful information literacy programme (ACRL, 2000).

Kasowitz-scheer and Pasqualonio (2002) supported the same issue. According to them information literacy instruction includes teaching critical and analytical thinking skills regarding the use of information as well as the ability to generate new ideas from current information and prior knowledge. They also stated that the general impression of an information environment that
appears to be constantly reinventing itself, impacts on views of what should be taught when teaching information literacy.

3.3.2 INNOVATIVE INFORMATION LITERACY INSTRUCTIONS:

Some researches on innovative practices on information literacy instructions were found in the literature. These practices are summarized in following paragraphs.

Gutierrez and Wang (2000) used workbooks for instructions in information literacy. They conducted a comparative study of an electronic Vs print workbook for information literacy instruction. They compared the attitudes and performances of two groups of freshman college students assigned print and electronic workbooks respectively. The result showed that students were generally more satisfied with the electronic workbooks than printed workbook as it found very user friendly, easy and taking less time to complete than the print workbook.

Brier and Lebbin (2004) carried out research on “Teaching Information Literacy” by short story. According to them, short stories give meaning to abstract concepts. According to them, it aids memory, makes learning fun, and is time efficient. In this, research authors tried to establish a connection to the ACRL Information Literacy Competency Standards for Higher Education. In conclusion, they stated that the compactness of short stories leads themselves to both short and long-term classes. Often, the power and emotional impact found in a short story offers a dramatic way to introduce students to deeper meanings about the value and need for information literacy that can be achieved in longer or more technical work. Short stories invite students to engage in more active and informed discussion of their information seeking behavior and values.
Brendle-Moczuk (2006) argued that 50-minute library instruction session could not be highly valued by students. Such short sessions may have impact in the context of lifelong learning. He further stated that an information literacy session that simply teaches how to search is not going to affect student’s cognition and behavior.

In the School of Information, University of Michigan, Markey (2008) developed a web-based board game for teaching information literacy skills and concepts. He developed a web-based board game called Defense of Hidgeom: the Plague Years. The game teaches incoming undergraduate students information literacy skills, specifically, the general-to-specific model for conducting library research. He also described the premises of information literacy in which games can be played. Though he faced some problems, he concluded with positive findings that the age did much more than early test players about what they already know with regard to information literacy concepts.

Verlander and Scutt (2009) in their research, discussed about various teaching and learning practices to teach information literacy to a large group with limited time and sources. In their research, they used various teaching methods viz. Cephalonia Method, Personal Response System, Group Work Exercise and evaluated the effectiveness of use of these methods. In conclusion, they stated that where hand-on sessions in Information Technology Lab are not possible, a range of interactive methods incorporated into a lecture-based session could help in facilitating the learning process and ensure that different learning styles are accommodated. Not all methods may be appropriate for all groups in all circumstances and a range of techniques should be considered and piloted. In large group teaching, instead of hands-on sessions, interactive methods followed by follow up exercises could be used.
Spackman and Camacho (2009) thought that though many of the instruction methods vary in their degree of complexity and the depth of student involvement, all these methods attempt to make students active partners in the learning process. They conducted a research about effects of case study as a method of instruction for information literacy; they used three examples of case studies for which students can work in group or alone. This study was carried out for the students in Brigham Young University. They concluded that “case teaching” core to so many business schools, is an effective pedagogical approach that can be adapted to a library instruction context. Though it requires additional preparation, it allows librarians to introduce principles of information literacy in the natural course of an active learning process.

3.3.3 COMPUTER BASED INSTRUCTIONS:

Due to advent of information communication technology, the use of internet, web based tools is widely increasing. For teaching information literacy, various academic libraries are using web-based tools as a mean for offering information literacy instructions via internet. Most common online instruction tools are the web based guides viz., Pathfinders, Webliographies (Vander, 2000). Donaldson (2005) also supported the same. He stated that in this web-based environment, various web-based tutorials have been developed and these tutorials are becoming popular due to their interactive nature. These tutorials sometimes replace or supplement in-person library instruction sessions.

Kraemer, Lombardo and Lepkowshi (2007) conducted a research to compare effectiveness of mode of instructions i.e. instruction by librarian, instructions by machine and instruction by both simultaneously. In findings he stated that only librarian or only machine oriented instruction are not much effective. The technology based teaching means teaching by
librarian with the help of machine is more effective as it is interactive as well as seamless than online.

Kate (2001) applied online approach in teaching information literacy through distance education. He designed a program for California State University. Hayward undergraduate students were availing this facility through distance education mode. In findings, he reported that students are less prepared to function technologically and cognitively in a web-based environment. Design and delivery of course content proved time consuming, with few possibilities for short cuts, and teaching methods had to be adapted to help the students to become autonomous learner.

The Chinese University of Hong Kong Library also developed a web-based programme “Summer Certificate on Information literacy Skills”. It includes an introduction to information sources, effective databases, searching skills, locating information, evaluating information, citing, and managing references using bibliographic management software (Li et. al, 2007).

Bobish (2010) stated that web 2.0 tools if used thoughtfully in information literacy instructions, are not simply the latest flashy trend, that can have a solid pedagogical basis that enhances students learning while at the same time making connections with technologies that are already being used for research purposes and in daily life outside of the classroom.

Chan and Cmor (2009) found that the blogs are effective to promote library events and to provide information literacy instructions. Wikis are also very useful in providing information literacy instructions, which facilitates as a tool to discuss academic research process (Mackey & McLaughlin, 2008). Social sharing sites like Flickr, PhotoBucer and You Tube have also had some success as tools for information literacy instructions (Magnuson, 2013). Jowitt (2008)
studied students’ perceptions of information literacy lectures delivered via podcasting and found that the majority of them considered the podcasts very good.

Use of social networking sites is also useful in information literacy instructions. Witek and Grettano (2012) conducted a research to study the effectiveness of Facebook in information literacy instructions. In findings, they reported that three Facebook functions - feeds, share and comment are very useful by which information literacy practices and behaviors are developed. However, they also suggested to develop a meta-literacy for the use of social media.

Luo (2009) reported that, all the studies regarding use of web 2.0 in information literacy instructions are simply discrete case studies that focused on the web 2.0 applications in a single information literacy programme, and only a small portion of the web 2.0 arsenals was explored in these studies. In order to explore the use of web 2.0 technology in information literacy instructions, he conducted a survey and semi-structured interviews to examine the adoption of the Web 2.0 technology in information literacy instructions. In findings they reported that librarians use Web 2.0 tools in three different levels: (a) 4% librarians use web 2.0 tools for their own purposes without engaging students; (b) 84% librarians use web 2.0 tools to facilitate the delivery of content to students and (c) 38% librarians use certain features of web 2.0 technology to better illustrate Information literacy concepts. In conclusion, he stated that there is a positive impact of using web 2.0 tools on teaching and learning information literacy.

Magnuson (2013) repeated same thought also after 4 years. He reported that while there have been many articles published about libraries and web 2.0, there is a lack of empirical research. Most studies are surveys of librarians’ teaching practices or practitioner-driven research that focuses on one type of Web 2.0 technology and its use in either instruction or library marketing. However, these studies provide how specific web 2.0 tools are being used in libraries.
for information literacy instructions. He conducted a qualitative case study to align web 2.0 in an online information literacy instructions course with ACRL's Information Literacy Competency Standards for Higher Education. In findings, he reported that web 2.0 found effective to enhance five information literacy standards related to collaboration, information organization, creativity, discussion and technology education. He explained which web 2.0 tools are effective to achieve certain outcomes in standards. He listed effective web 2.0 tools: Gloster, Prezi, PBworks and Diigo.

Use of Cell phones is not new for librarians to facilitate the users. Many libraries are providing library service through cell phone. The use of cell phones can be extended to information literacy instructions. Burkhartd and Cohen (2012) carried out research about use of cell phone. They used cell phone to ask poll questions about students' experiences about previous sessions and accordingly tried to facilitate in-depth inquiry into information literacy topic. They found cell phone polling as useful tool for any librarian to have in their pedagogical toolbox.

3.4 LEARNING INSTRUCTIONS IN INFORMATION LITERACY:

Along with teaching information literacy, an equal emphasis is also given on learning of information literacy. Various learning theories, learning styles applied for information literacy learning. Following paragraphs summarize the importance of learning, approaches, techniques and models of learning with reference to information literacy.

Brendle (2006) highlighted the importance of learning. According to him, instead of directly teaching students how to search for their information needs, engage students by having them compare and evaluate what they find in comparison with librarian and faculty resources.
He further described that let students explore, compare and evaluate search tools so that they realize that there are other search tools available. To affect students’ lifelong learning, that is, their cognition, behavior, and information literacy skills, we must encourage them to critically compare and evaluate all resources and search tools. To prove his statements, he conducted a research and proposed two graded assignments, compared and evaluated resources and compared and evaluated search tools. The findings showed that the students achieved efficiency in accessing the desired information as ability of comparison and evaluation of resources were developed.

Some authors also established a relationship between learner and information literacy. Bruce (1997) contended that in order to fully explore learning process, a clear understanding of the relation between the learner and the subject studies must be sought in combination with an evaluation of the learner’s perspective of information and the learning environment. Bruce described three pedagogical approaches to information literacy learning: 1) the relational approach 2) the constructivist approach and 3) behaviorist approach. Much literature was found regarding relational and constructivist approach but there was no evidence of applying behavioral approach in information literacy learning.

3.4.1 RELATIONAL APPROACH:

Bruce (1997) stated that the aim of relational models is to promote an holistic experience of learning that involves the ability to perform information literacy tasks, such as formulating an information problem and finding an appropriate solution to these problems. Lupton (2004) also explored the relational perspective of information literacy by examining the students’ relationship with information within a problem-solving scenario in higher education. According to her, there is a strong connection between information literacy and learning by examining the
students' attitudes towards an assessment task. She proposed three categories describing their level of engagement with an essay and with the underlying information literacy practice. These are seeking evidence, developing an argument and learning as a social responsibility. Lupton's research emphasized that information literacy cannot be decontextualized from learning process and as such it is seen not as a characteristic of the learner, but as a response to context. Edward's (2006) relational model of information literacy examined students in a higher education context. He focused on learner's experience of information searching when using internet and library databases rather than the accomplishment of an assessment task. He identified four main categories that described different ways of experiencing the each and revealed different awareness structures, different approaches to learning, and different search outcomes. These four categories are 1. Looking for a needle in a haystack. 2. Finding way through maze. 3. Using the tools as a filter. 4. Planning for gold. He concluded that there is a major conceptual gap between student in the first category, who experienced information, and those in category 2, 3, 4 whose conceptual engagement with the process of searching is illustrated by increasingly complex ways of interacting with the tools and complemented by reflective topic and search formulation practice.

Australian educators Bruce, Lupton and Edwards (2006) through their collaborative work promoted a systematic classification of information literacy through “Six Frames of Information Literacy”. They did not present information literacy as a theory of learning, but proposed that the participants' perspectives of teaching and learning influences their interpretation of, and attitude towards information literacy. The relational approach was promoted as one of the six frames and described the relationship between learner and information literacy in terms of complex and different ways of interacting with information. According to relational model (Bruce, 1997), this
frame supports the view that in order to improve learning we need to understand the students’ perspectives and appreciate the variation in the students’ conception of information literacy. This relational model frames information literacy into seven different ways of experiencing information use through active and reflective engagement with the relevant information practices. Bent and Stockdale (2009, 44) considered information literacy to be a recursive learning process rather than a simple ladder of skills to be attained. He explained, information literacy can be thought of as individual’s attitude to their learning and research such that they are explicitly thinking about how they use, manage, synthesize and create information, in a wise and ethical manner to the benefit of society as a part of learning life”.

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3.4.2 BACKWARD DESIGN APPROACH:

Backward design approach is also used for learning information literacy. According to Wiggins and McTighe (2005, 338) backward design is an approach to designing a curriculum or unit that begins with the end in mind and designs toward the end. In other words, instructors decide what the students should learn and then structure the class or curriculum to achieve this goal. Fox and Doherty (2008) also used backward design for information literacy instructions. They collaboratively created podcasts to address the need to increase students’ information
literacy competency. They found use of this design is effective in learning of information literacy.

3.4.3 CONSTRUCTIVIST APPROACH:

Another approach i.e. constructivist approach is also widely used in information literacy education for learning information literacy. Much literature was found on leaning techniques using constructivist approach. Tutorials can be a method of learning information literacy. Many of the best tutorials consistently incorporated the use of active learning. Unlike lecture-based format, these tutorials provided students with opportunities to interact and test few ideas as the lessons progressed (Dewald, et.al, 2000).

Edwards (2000) detailed the use of online tutorials for graduate level education students and he noted a shift in user expectations, commenting that users want to receive information from both inside and outside the academic library. He offered that the flexible nature of the web allows students to obtain instruction services “as many times as they want.” Beile and Bote (2004) also studied the efficiency of online tutorials; in fact they concluded that an online tutorial may produce the same cognitive outcomes as face to face library instruction.

Donaldson (2005) developed a five-module tutorial “Library Research Success”. It is interactive, modular and based on active learning. However, this tutorial was made only for the students of Business Management, the feedbacks from faculty, students are positive, and the college is trying to adapt this tutorial to meet the needs of other student groups.

Armstrong and Georges (2006) conducted a research to measure the effectiveness of a highly interactive animated tutorial that aims to teach basic information literacy concepts to undergraduates and to determine which factors enhance learning. Findings showed that animated
tutorial is effective in imparting information literacy concepts to undergraduate students. Students responded positively to the interactivity and game like nature of the tutorial.

Yang (2008) conducted a survey of current technologies used in creating information literacy online tutorials in academic libraries in USA. He surveyed 372 online tutorials on the library website of 100 academic libraries. About one third of surveyed academic libraries have developed their own online tutorials. Most of the tutorials teach search skills of specific databases. Tutorial contents also include general introduction to library resources, research in a subject area. One third of tutorials had been created by using tutorial software. The approaches used in developing tutorials include pdf, HTML. Ganster and Walsh (2008) also developed online tutorials devoted for specific course. Using Blackboard course management system, the authors created an online tutorial tailored to the required World Civilizations Course at the University of Buffalo. In this tutorial, the researchers added the elements like clear terminology, a quiz for self-assessment, opportunities for active learning and individual e-mail feedback between students and librarians and applied them to a specific course. After testing the online tutorials, the researchers discovered that students and instruction librarians at University of Buffalo were open and willing to use online tutorials as an addition to instructions. They also observed that the online tutorials provide supplemental interactive materials for students to engage in subsequent to the librarian’s presentation and a vehicle for absent student to learn the material.

Problem Based Learning (PBL) is another constructivist learning techniques used in education widely. This technique is also useful in information literacy learning. Several authors have carried out researches and found PBL technique effective in learning information literacy. PBL provides a means to introduce information literacy in a more complex way, especially to
students who think they already know how to search for information effectively (Macklin, 2001).

Diekema and others (2011) also supported the problem based learning that might enable students to experience information literacy in a richer way. PBL facilitates the recursive use, evaluation and synthesis of information. It requires that students seek out the information, determine its value, and then synthesize that information with the information provided by other group members. This can be a very messy process, which invariably produces more questions, requiring students to seek out additional information to solve their problem.

Spence (2004) also supported the same by stating that PBL technique is explored as a potentially useful instructional approach for information literacy. Problem based learning can be more engaging than traditional demonstration-based library instruction.

Snavely (2003) also recommended the PBL approach in information literacy instruction. According to him, PBL closely integrates information literacy with disciplinary content, and enable students to learn subject matter, information seeking, evaluation and synthesis skills, and critical thinking all at the same time. It could be integrated within a course or an entire curriculum, and can provide opportunities to practice and further refine their information literacy skills.

Another constructivist technique is video games. These are also used as a mean of learning information literacy. Gumulak and Webber (2011) conducted research to identify what motivates young people to play video games, and the extent to which video games are perceived as facilitating learning and information literacy. Findings showed that respondents used a variety of tests to solve gaming problems and to choose new games. They also reported information
behavior of respondents. It shows that they were carrying out activities that corresponded to models of information literacy and these activities are mapped to SCONUL seven pillars models.

Mitchell and Hiatt (2000) carried out a case study of their experience using the POGIL (Process-Oriented Guided-Inquiry Learning) technique. It is a teaching method based on constructivist principles that enables students to learn through grasp interaction and problem solving. This is the method suggested as being effective in delivering information literacy skills and content. It uses structured worksheets to take students through "understand", "identify", "analyze", and "create stages of learning". These stages are parallel to Bloom's taxonomy. The POGIL approach includes a wide range of pedagogical and assessment techniques. It allows the instructor to employ mix pedagogical techniques and provided students with documented frameworks, which they could use outside of the class.

3.4.4 INFORMATION LITERACY AND LEARNING THEORIES:

Various learning theories have been applied in information literacy education. Learning theory provides a theoretical basis for implementing information literacy programme.

Mokhtar, Majid and Foo (2007) carried out the research to check the effectiveness of project work based on Gardner’s Theory of Multiple Intelligence and Feuerstein Mediated learning experience. The quality of project work between control and experimental group was compared. Finally, they observed that students who had information literacy training did significantly better for their project work, than those without information literacy training. The students in experimental group who grouped according to their dominant intelligences performed better for the project work. However, they stated in conclusion that there is no singular pedagogical approach that can be claimed to teach information literacy most effectively.
educators should make an effort to experiment with the various approaches to find one or a combination of few methods that are best suited to the class that they teach based on the learning styles or preferences of the students. The present research is one such effort.

Simmons (2005, 302) made a direct reference to ACRL’s standards for information literacy learning to suggest pathways into critical literacy theory. With a focus on the final standard of ACRL, Simmons contended that students must ask ‘reflective question about information: who owns and sells knowledge? Who has access to information? In addition, what counts as information (or knowledge)? He used genre theory, specifically as a practical means to connect critical theory and information literacy instruction, asserting that “by highlighting the social nature of disciplinary discourse and practices.

Critical theory of learning has been a major movement in education literature for a numerous decades, and critical professional practice in libraries can be traced back to 1930. A recent resurgence of interest in critical theory in library and information studies is reasonable, considering the rejuvenation of library instruction programmes due to the need for information literate searchers, concerned about the digital divide and raised perspectives on library learners (Samek, 2007, 57). Bushman (2007) thought that democratic theory has been marginalized in library and information studies literature, He claimed that greater facility with democratic perspective on information use encourages a more informed and engaged citizenry.

3.4.5 OTHER LEARNING TECHNIQUES:

Mokhtar and Foo (2008) proposed Information Literacy Pedagogical Model- “The Tiered Information literacy Learning Spiral (TILLS)”. This model represents how information literacy can be taught and learned in a developmental manner in schools and beyond. Authors conducted
a quasi-experimental control group study by dividing the students in two groups and information literacy training was given to these two groups by using two different approaches i.e. mediated learning approach and multiple intelligences approach. The results of group reports and project evaluation done by three independent and neutral teacher examiner, as well as those from the pre-and post intervention tests, found that the application of either mediated learning or multiple intelligence helped students perform better in the learning and application of information literacy skills. According to these authors, there is no specific pedagogical approach that can be claimed to teach information literacy most effectively, however, an effort to experiment with the various pedagogical approaches in teaching information literacy, to find one or combination of a few methods that are best suited to the students that are taught, ought to be made.

In the context of learning of Information literacy, a new trend is emerged i.e. Learning Management System (LMS). Cox (2002) encouraged librarians to become partner in teaching with faculty and gain access to courses on LMS. To make the most significant impact on student learning, experts encourage librarians to integrate library resources into the systems students use most. In his article about Blackboard and the learning styles, he concluded that “students have no interest in learning how information is structured or organized.”

Kammerlocher et al. (2011) conducted a case study that provides details of the processes for implementing low cost alternatives to creating, managing and disseminating learning objects. The ASU libraries’ New Student Workgroup (NSW) proposed a series of learning objects that introduced core information literacy competencies, which could be placed in online library guides and Learning Management Systems. They also developed the learning object repository to promote the dissemination of learning objects to faculty and students. In findings, they stated that low cost solutions can give libraries an important information literacy presence within the
university learning landscape. Locally managed learning object repositories could be implemented with minimal fuss and facilitate faculty and student in a wide range of academic programmes access to library learning content.

Susie (2007) explored the adoption of a phenomenographic conceptual framework to investigate learning from the perspective of the learner, with the aim of reflecting on the features that this approach shares with information literacy education in general, and with the relational model in particular. She emphasized learning aspect of information literacy and illustrated "learn-how-to-learn" approach and phenomenographic person-world relation.

E learning was also plasticized in information literacy instructions. Hadengue (2004) developed a Computer Assisted Learning for Information Searching (CALIS) module for students in economics and dentistry. Through case study method, he found it effective to promote information literacy both on campus and to distance learning. In present research for learning information literacy handbook is prepared and distributed in both form i.e. print and electronic.

3.5 INFORMATION LITERACY AND CURRICULUM:

Much of the literature focuses on only teaching of generic skills related to the general process of retrieving and evaluating information, instead of teaching new skills required for acquiring knowledge or doing research. Literature focused on information literacy as a field of independent study. It isolates information literacy, though not fully, from knowledge about any particular field (Bruce, 1997). Knapp (1956) expressed that the library is an integral and organic part of a college, and the library instructions should not be offered as a discrete event, but rather should be woven into general curriculum. According to Breivik and Gee (1998) if library wants
to expand the information literacy beyond the library, it should be developed and implemented in the territory of knowledge for which students have been admitted. In symposia sponsored by Commission on Higher Education, Middle States Association of college and schools (CHE), the CHE characterizes the incorporation of information literacy into the higher education curriculum as an educational imperative that requires a collaborative effort by the administrative staff, faculty and information providers (CHE, 1995).

Mutch (2000) also supported the integration of information literacy with the curriculum. He argued that the quest for information literacy draws us inexorably into deeper questions about the nature of knowledge, pointing again to the need for it to be embedded in subject-based thought, rather than treated as a standalone specialism. Bruce (2001) also stated that information literacy does not have a life as its own, as like teaching and learning, rather it is a way of thinking and reasoning about aspects of subject matter. Grafstein (2002) described information literacy as being information literate crucially involves being literate about something. Acquiring that literacy entails having first learned a set of generic skills that enable subject-specific knowledge acquisition. It does not follow from integrated view that IL cannot be effectively taught as a value added addition to the regular course-based curriculum, nor can it be restricted to the domain of the library. Rather these skills are presented and developed as the curriculum of each course is taught.

Town (2002) also expressed the need of integrating information literacy with the curriculum. He stated that, if information literacy consists of a set of skills then the emphasis can be confined to training; however if information literacy is viewed as a personal and individualized corpus of knowledge and an attitude to or habit of learning, then a broader educative approach is needed.
Bent and Stockdale (2009) expressed similar thought. They pointed that education as opposed to training, engages the learner in reflective practice, learning specific skills alongside the development of a wider awareness of their learning. The aim of integration of information literacy into the curriculum is to allow students to develop a continually evolving personal learning process underpinned by up-to-date skills.

Breivik and Gee (2006) also argued that the integration of the library into the college curriculum means a closing of the gap between library and classroom is an essential component in developing information literate graduate.

Kong (2008) proposed a curriculum framework based on the rational of significant learning and designed on the principles of providing authenticity and creating reflection. It consisted of three parts: a core IT curriculum; use of knowledge about IT and information processing across curricula; and a school culture that fosters information literacy. He also described four issues for successful implementation of this framework: school based implementation models; the provision of service learning activities; support from parents and reduction of the digital divide between students.

Klebansky and Fraser (2013) also developed a conceptual framework of information literacy curriculum for teacher education courses at University of Tasmania. The implementation of the framework facilitates curriculum design that systematically, consistently and incrementally develops information literacy capabilities across entire teacher education course structure, thereby facilitating teacher education students to graduate as critical thinkers, problem solvers, informed decision makers and independent self-directed lifelong learners.
Trinity University in San Antonio, Texas has started to implement their five-year plan to integrate information literacy into liberal art curriculum as a part of the required reaffirmation of accreditation by the Southern Association of Colleges and Schools in 2008-09. The university has developed a curriculum and implementing it with the help of faculty. The program includes education, workshops and symposia (Millet et al., 2009). In New Castle University, the development of the students’ awareness of information literacy and its associated skills was planned as a golden thread, starting at the beginning of the first year and linking through the curriculum to the final year project: integrating information literacy learning objectives into the Environmental Science Program (Bent and Stockdale, 2009).

From above literature it is revealed that information literacy is not an isolated entity to teach or learn. It should be associated with specific discipline. Information literacy can be taught or learned in context with teacher education, information literacy in science, information literacy in nursing etc. A comprehensive curriculum should be developed in order to cover all the dimensions of information and skills required to access this information.

3.6 COLLABORATION IN INFORMATION LITERACY:

Collaboration is another dimension of information literacy on which a strong emphasis is given in the literature. As information literacy is not the single entity, also it is not just librarian’s responsibility.

In 1998, AASL and ACRL formed a joint task force to look at ways to encourage closer collaboration between K-12 and post secondary librarians. The AASL/ACRL blue print for collaboration identified existing collaborative partnerships and made recommendations for future collaborative efforts between the ALA divisions and their members. ACRL Information Literacy
Competency Standards for Higher Education also recommended that administrator should create opportunities for collaboration and staff development among faculty, librarians and other professionals who initiate information literacy programmes, lead in planning and budgeting for those programme and provide ongoing resources to sustain them (ACRL, 2000).

According the Breivik and Gee (2006) the effective information literacy program should be the shared responsibility of librarians, academic administration and classroom faculty. It is not the exclusive responsibility of only library. If library wants to expand the information literacy beyond library, the involvement of administration and faculty is mandatory and it should be developed and implemented in the territory of knowledge for which students have been admitted.

In terms of collaboration within the area of information literacy instructions, much of the literature focuses on partnerships between librarians and instructors. Russel (2002) suggested that there exists a strong positive relationship between school library programmes and students’ academic achievement. However, Owusu-Ansah (2003) pointed that there are also inherent tensions in such relationships and not all faculty members are open to work with faculty members. Robert and others (2001) developed and implemented an information literacy programme for Nursing in collaboration with faculty. It provides strategic opportunities to enhance health information literacy through undergraduate nursing research courses. Smith (2001) stressed the need for librarians to work with faculty across the curriculum in developing student learning outcomes and offering instruction in information literacy skills, claiming that faculty will not likely be receptive to including library offerings that complement their own teaching areas and expertise.

Middle States Commission (2002) explicitly listed collaboration among professional library staff, faculty and administrators in fostering information literacy among its Fundamental
Elements of Educational Offerings within its standards for accreditation. To encourage and promote such collaboration, the commission developed a framework outlines the key competencies of information literacy based on the ACRL definition, offers general examples of learning activities for each, and assigns primary instructional responsibility for each competency to either a librarian or teaching faculty member.

The model of collaboration by Mackey and Jacobson (2005) placed the librarians in the position of teachers and linked them directly to the faculty, thus creating the building blocks for this collaboration, resulting in constructive “teaching alliances”.

Rockman (2005) presented a compendium of best practices for building partnership between librarians and faculty by examining practical examples of current practices in integrating information literacy into the higher education curriculum.

As quoted by Saunders (2007), in outlining the revised standards for information literacy of Middle States Commission, Ratteray in 2006, acknowledged the importance of collaboration between librarians and faculty. He indicated that all personnel with any curricular responsibility must be involved in confronting information literacy, stating that responsibility for teaching information literacy ideally would be shared by faculty members and librarians as the primary loci of instruction, with administrative support. In supplement to their standards, the Middle States Commission (2002) warned that those institutions that relegate information literacy to a singly traditional library instruction session are placing at the lower end of information literacy delivery implying that a deeper level of collaboration is expected.

The education faculty librarian at the University of Wollongong has collaborated with the faculty’s academic staff to develop information literacy program. The aim of the program was to
provide students with the knowledge and skills to excel in their studies. A strong collaboration exists from dean of the faculty-to-faculty members. The program is integrated into education curriculum in the context of general education philosophy such as information technology for learning, Physical Education, Risk taking and young people etc. As the pre-service teacher education program of Wollongong University is of 5 years, the information literacy program is also designed, developed and implementing within this 5 years (Lipu, 2003).

Reed, Kinder and Cecile (2007) carried out the study to check the effectiveness of collaborative efforts between librarian and faculty in curriculum development, assignment development, in class teaching and assessment activities. In findings, they reported that a comprehensive collaboration between librarian and faculty resulted in strong increase in information literacy of students.

Floyd and others (2008) carried out a study related to collaborative information literacy programme at College of Education, Florida State University. The study was divided in two parts. In the first part, students in pre-service teacher education were assigned to develop case studies based on their experiences and expected to include research from the scholarly literature of the field using a rubric developed by the instructor for evaluating sources. The college also established collaboration between course instructor and librarian was established in which the Liaison Librarian conducted a workshop to improve the use of scholarly resources in the following semester’s class. In the conclusion, the authors reported that the increase in the percentage of scholarly material used. In addition, particularly the increase in the parentage of peer-reviewed journals used by the students who attended the library session indicated that the library instruction has a positive impact on the quality of students’ bibliographic practices.
Kovalik et al. (2010) surveyed to determine the extent to which teacher education programmes incorporate information literacy instructions with the objectives to study inclusion and assessment of information literacy in Teacher Education Programme and degree of collaboration between librarians and faculty. In findings, authors reported that teacher education faculties are, for the most part, knowledgeable about information literacy standards and many have actively worked to incorporate information literacy into their teacher education programmes. Many of these faculty members have also collaborated with academic librarians in order to address information literacy better (Kovalik et al. 2010).

Bruce (2011) also supported the use of web tools such as "Libguides" which can be used to encourage collaboration between librarians and faculty in creating portals to selected research information. Librarians and the faculty working together and using these and other web 2.0 methods, can provide a richer and more extensive reinforcement mechanism in learning to use library resources more effectively. He also expressed the need for the continued development and implementation of information literacy instruction in the library must continue to evolve as a collaborative effort between librarians and faculty to ensure higher levels of student success in library use and research activity.

From above literature, it is revealed that an extreme importance is given to collaborative efforts in all aspects of information literacy. It includes curriculum planning, program development, instruction delivery and assessment. There can be collaboration between librarian, faculty, policy makers, administrators etc. at various levels.
3.7 INFORMATION LITERACY ASSESSMENT:

Information literacy assessment plays an important role in assessing information literacy skills of students before and/or after training. It also serves as a tool to check the effectiveness of instructions or information literacy course. The literature provides various methods and tools for assessing information literacy skills of students. Assessment of Information literacy skills can and should implement at numerous levels. Lannuzzi (1999) described four levels of learning outcomes assessment: Within the library; in the classroom; on campus and beyond the campus.

O'Comor; Radcliff and Gedeon (2002) librarians at Kent State developed a standardized tool for measuring students' information literacy at the institutional level. Through literature review, they recognized three categories of literature on information literacy assessment: (a) studies describing the need for assessment, (b) theoretical articles about types of assessment and (c) reports of assessment projects. Based on this review, they developed project SAILS (Standardized Assessment of Information Literacy Skills), a web based standardized test of information literacy skills, based on ACRL standards. The SAILS assessment instrument employs item response theory as the measurement model and is intended to enable libraries to document information literacy skill levels for groups of students and to pinpoint areas for improvement. Blevens (2012) highlighted another commercial tool besides SAILS is iSkills developed by Educational Technology Services (ETS) for measuring information literacy skills of students in higher education. It uses real world scenarios and could be used in both education and work settings.

Coony and Hiris (2003) developed a case study model to improve and assess information literacy in a graduate business course at Long Island University. Their model combined collaboratively setting instructional goals for information literacy, and designing assessment
tools to evaluate the effectiveness of the instruction within one business course. For assessment he used five point Likert Scale.

Besides these general methods, some researchers have used portfolios for assessing the information literacy skills. Snavely and Wright (2005) documented their experience and provided a model for using research portfolios for information literacy assessment in an undergraduate honors programme. A case study by Rutz and Lauer-Glebov (2005) of writing portfolio assessment showed that faculty participation provided significant effects in the curriculum and student learning.

Scharf et al. (2007) and others pointed that there is no authentic method of student performance in applying information literacy skills. According to him librarian typically use indirect assessment employing interviews, focus groups, and survey techniques to measure information literacy.

Emmett and Made (2007) carried out a research to obtain preliminary evidence over a three-year period on the efficacy of a curriculum designed to foster information literacy skills in graduate students in a Chemistry bibliographic course. The researchers examined the application and results of an assessment tools and its connectivity to instructional strategies for improving literacy outcomes. ACRL's Information literacy competency Standards for higher education provided the basis for the construction of the assessment tool. The assessment results from all three years indicated marked improvements in the average student score from the pre-to the post-test. The assessment provided evidence of skills development over the course of semester for specified outcomes.
Rubric- a very popular tool in education for assessing learning outcomes was also used in assessing information literacy skills. Knight (2006) carried out a research to assess students’ achievement of information literacy learning outcomes in a first year research and writing course. Group of bibliographies prepared by students was the object of the rubric. The librarian and other faculty members collaboratively created a scoring rubric based in course learning objectives and ACRL’s information literacy standards. In findings, he reported that students’ academic work is a useful gauge of their achievement of information literacy based learning outcomes. A rubric is a valuable assessment tool that provides a reliable and objective method for analysis and comparison.

Oakleaf (2009) also used rubrics to assess information literacy skills. He developed “The Information literacy Instruction Assessment Cycle” (ILIAC) to describe the seven stages of the ILIAC by using rubric. In findings, he reported that by engaging in the ILIAC, librarians gain important data about the information behavior of students and a greater understanding of students’ strengths and weaknesses. It encourages librarians to articulate learning outcomes clearly, analyze them meaningfully, celebrate learning achievements, and diagnose problem areas.

Diller and Phelps (2008) applied assessment method based on an electronic portfolio along with rubrics to evaluate work in the e-portfolio. According to the authors, this method enables librarians to evaluate their information literacy program based on ACRL best practices guideline, authentic assessment techniques, and the tenets of phenomenography.
3.8 INFORMATION LITERACY PROGRAMMES IN TEACHER EDUCATION:

Various information literacy programmes are running all over the world. All the programmes are designed with a common goal of "imparting information literacy". However, many of these programs designed and developed based on information literacy programme characteristics laid down by ACRL. These guidelines or characteristics attempts to articulate elements of exemplary information programme for undergraduate students at four year and two year institutions these characteristics identify and describe features notable in information literacy programmes of excellence (ACRL, 2011). These characteristics do not attempt to define information literacy; instead, the focus is on defining the elements of best practices in information literacy programme (ACRL, 2011). The primary intentions behind developing these characteristics are to help interested people in developing, assessing and improving information literacy programmes. Ten categories of characteristics of information literacy programme are approved by ACRL. These characteristics identify and describe features notable in information literacy programmes of excellence. The characteristics represent a meta set of elements identified through examination of many programmes and philosophies of undergraduate information literacy (ACRL, 2011).

Fourie and Krauss (2011) wrote a research article on "Information literacy training for teachers in rural South Africa". It focused on an information literacy teacher training partnership between two departments from the school of information technology at the University of Pretoria and UNESCO to train teacher from a developing community in South Africa in information literacy. This programme focuses on internet search skills within the wider context of available information sources. The use of web sites, search engines and other search tools were contextualized against the need. The course design includes recognizing information
needs, translating the information need into search terms and search strategies, effective use of search tools such as Google and raising awareness of other tools. Exercises, examples, assessment were contextualized in the daily tasks of teachers and the context they face. In conclusion, they reported that there is a need for information literacy training, building ICT training for teachers in all developing communities and countries. They suggested a model to enhance research on information literacy training for teachers in developing South African Communities that may contribute to global perspectives on the issue.

Huge efforts are being taken by the Institute for Library and Information literacy Education (ILIE). This institute is funded through the Institute of Museum and Library Services (IMLS) and the US Department of Education. It was established to provide local, regional and national leadership in fostering successful collaboration among K-12 teachers and school library media specialists who are concerned with advancing library and information literacy in the K-12 curriculum. The institute focused on activities of information literacy with PK-10 teachers, library media specialists in pre service educations. ILIE awarded the grants to 13 higher education institutions, in Ohio, in order to find the development and integration of information literacy instruction initiatives within the University curricula for teacher education and to encourage ongoing collaboration between librarians and the education faculty. The goal is to address the development of information literacy skills in teacher education students so that they can be successful users of the professional literature and subsequently instill those skills in the students they teach.

As quoted by Earp (2007) Information literacy TAG at Kent State University implemented a project of duration of 5 months. 512 students and 22 faculties were participated in this programme. The goal of the programme was to incorporate information literacy to four TAG
course of education faculty. The programme was based on first three standards of ACRL Information literacy Competency Standards. The activities covered under this programme were assignments, online workshops on APA cheat sheet, Web site evaluation, Reading Research and Writing abstracts. Mount Vernon Nazarene University developed and implemented a Distance Information literacy Instruction for its graduate students. 157 students and 15 faculty participated in this programme. The goal of the programme was to work collaboratively with education faculty to embed information literacy modules in the graduate curriculum for the master of education professional education licensure programme and to provide faculty development activities and to create distinct modules that would be embedded into the curriculum. The programme is based on ACRL Information literacy Competency Standards. The survey revealed that the students assessing themselves weakest indentifying and articulating their information needs and in accessing information. Video and animated modules were prepared in this programme. The librarian interacted with the class through video conferencing (Feazel, 2007).

Otterbein College in Ohio State developed and implemented a programme “Learning more about our constitution: An information literacy collaboration between Pre-service Teachers and Fourth and Fifth Grade”. 61 students participated in this programme. Goal of the programme was to make students more aware of information literacy efforts in the K12 arena and to experience the value of collaboration between teachers and school library media specialists. The programme is based on first four standards of ACRL Information Literacy Competency Standards. A module – A guide for implementing an information literacy project into an education method course was prepared (Robinson, 2007).
Ohio University developed and implemented a programme “Library Lessons in Teacher Education”. 60 Teacher Education students were participated in this programme. An instructor in college of Education at Ohio University and Reference and Instructional Librarian in Ohio University collaborated in an effort to incorporate information literacy as a topic in an introductory education class. The goals of the programme was to develop a template for teaching information literacy to pre service teachers that could be repeated with future classes and instructors and to teacher undergraduate education students about information literacy concepts and how these concepts could be used in their future class rooms. ACRL Information literacy Competency Standards were used in this programme. The librarian met the class twice in Library and in an education building. The library session dealt mainly with evaluation of and searching for materials. The topics of discussion were related to real life occasions. The programme emphasized on critical evaluation of resources and accessing databases (Fantine, 2007).

Cincinnati University developed and implemented an information literacy programme titled “Prospective High school English Teachers work with High School Library Media specialists to engage students in the critical use of the internet”. The goals of the programme were to add information literacy to the University of Cincinnati English Teacher Preparation Programme, to prepare prospective English Teachers to help high school students become more critical users of internet, to link prospective high school English teachers with high school library media specialists and to engage high school students in the critical use of the internet. The programme is based on first three standards of ACRL’s information Literacy Competency Standards. The programme was implemented in two phases. In the first phase 15 prospective English teachers set up meetings with school-based mentor teachers and public school library media specialists. In this meeting, an introductory lecture on information literacy was organized.
and each prospective English Teacher designed a project that engaged high school students to evaluate both the source and the content of internet information. In the second phase these prospective English teachers created and implemented an information literacy project as a full time teacher of English Language. The programme was implemented collaboratively in the classroom (Laine, 2007).

The University of Findlay developed and implemented the project SLIP (Science Literacy is a Power) for the duration of 10 months. The goal of the programme was to form a partnership between the project directors to develop standalone resources in order to provide it in a useful format that is well received by the students. Under this programme, a CD-Rom resources was developed for pre-service, adolescent/Young Adult science students which will familiarize them with scientific literature in the area of Biological sciences and eventually other disciplines. The CD Rom is disseminated through the teacher education programme at the University of Findlay (Rife and Quintus, 2007).

Kent State University, Stark Campus developed and implemented an information literacy programme - "Preparing Middle School Educators for teaching Information literacy" for the duration of 6 months. 19 students, 2 faculties, 2 school library media specialists and 1 K12 teacher participated in this programme. The Programme was based on Ohio Information literacy Standards. The goal of the programme was to raise visibility for the need for instruction in information literacy as early as the middle school grades. The librarians and high school teachers developed the assessment questions. The classroom teachers helped to frame the assignment and provided assistance in developing of lesson plans. The librarians helped students understand the information literacy standards. The students, as part of their semester project, presented their
information literacy lesson plan to the entire class. The CPS (Classroom Performance System) and Smart Board were used for instructional purpose (Kairis, 2007).

Bunce School of Education, Jeanette Albiez Davis Library developed and implemented an information literacy programme titled “Integrating information literacy into curriculum progress report” for the duration of 5 months. 36 students and 5 faculty members participated in this programme. The programme was based on Ohio Academic Content Standards for Information literacy. The goal of the programme was to enhance information literacy instruction currently provided to teacher trainees and to develop a lesson plan that uses the Ohio Academic Content Standards for information literacy and to establish related benchmarks for the appropriate grade level for their upcoming student teaching experience. Librarian developed a 50 minute presentation to teacher trainees which emphasized on evaluation of online resources and copyright issues. A web site was created by using WIKI technology that focused on information literacy. Assignments were given to students that include researching a topic, identifying two relevant web sites and evaluating those web sites as to quality. Students were instructed to use "web page evaluation checklist (Gulati, 2007).

The Ohio State University at Marion developed and implemented an information literacy programme titled “Preparing Pre service students to become Master Teachers through information literacy instruction”. 23 students, 4 faculty members and a librarian participated in this programme. The goal of the programme was to provide students with enhanced research skills to equip them with skills necessary to become life-long learners, both personally and professionally. The programme included the organization of three 90 minutes seminars with one taught in each of the first three quarters of the M.Ed. Pre service Teacher Programme for the Early Childhood cohort. Seminar topics addressed using keywords and Boolean operators to
construct and use effective search commands to search library resources, learning how to prepare annotated bibliographies and how to write research literature reviews. Three in-class activities were developed. First activity was a “L.S.I.: Library Searching Investigation” and dealt with a searching strategy scenario. Activity two was a “Which Words” worksheet using performance based assessment as a topic and developing keywords. Activity three was a Boolean game, using aspects of the students as “data” (Blankenship, 2007).

Central State University at Ohio developed and implemented an information literacy programme entitled “Central State University information literacy in Teacher Education” 17 students and 5 faculty members participated in this programme. Purpose of the programme was to incorporate information literacy skills and the use of education-specific reference sources to formulate hypotheses and conduct educational research in selected courses within the College of Education Programme, to develop a list of skills to be mastered by the teachers in training and organize the list of potential resources in both print and electronic format. The programme was divided into several stages: planning, pretest, teaching of basic content, teaching of information literacy skills, individual project research, preparation of student products, presentation of products, post test, digitizing of projects and other course materials (Sanders, 2007).

In June 2000, The Illions State Board of Education adopted new curriculum standards for all accredited teacher education programmes. Witt, and Sickinson (2003) carried out a case study that provides an overview of Illion’s progress towards a standard based model and described how Illions Wesleyan University library faculty initiated a collaborative project with the educational studies department to address information literacy skills instructions as a means of fulfilling objectives of the state’s core standards. The Illions State Standards, in their information literacy programme made little distinction between technology literacy and information literacy. They
implemented information literacy programme with the strong collaboration between library, IT
department and Education studies department. The expected focus of each department was
clearly defined. In conclusion, authors reported that methodologies employed in this
collaboration between the education studies department and library will act as a campus wide
model and further the library's role in shepherding the development of the university's
information literacy programme.

Emos et. al. (2009) developed an information literacy programme for teacher education at
University of Mexico. The motivation behind this programme was Federal Mandate-No Child
left behind (2001) and Individual Disabilities Education Act (2004) of USA. The purpose of the
programme was to assess the effectiveness of infusing information literacy skills throughout the
coursework of an undergraduate teacher preparation programme. The programme was
implemented by experimental research method. The programme was implemented after pre test
of only experimental group and followed by a post test of both the group. In findings, they stated
that there was a significant difference between pretest and post test scores of teacher preparation
cohort.

Río Salado College in Arizona District working in the field of teacher education
developed an integrated series of information literacy modules for inclusion in an online distance
post baccalaureate teacher preparation programme through collaboration between faculty chair of
Library Science and Education. The programme was based on ACRL Information literacy
Competency Standards with some modification. The programmed contained 6 sub modules – An
introduction to information literacy, Online Catalogues and E-Books, Features of Electronic
Databases, Electronic Newspapers Databases, ERIC and AP Photo Archive, Searching and
Evaluating Web sites and copyright and plagiarism. Author found the barriers in implementation
of the programme as the lack of time, lack of faculty experience in information literacy (Gulati, 2007).

Asselin, and Doiron (2003) carried out the study to investigate how teacher education programme address the role of school libraries in supporting current educational and curriculum reform, especially integrated information instruction. Instructors, coordinators and library staff from 17 Teacher Education Programmes in Canada were surveyed and interviewed with three objectives: to examine the extent and character of the erosion of school library education in Canadian Faculties of Education, to identify alternatives that faculties of education may have found for including the role of school library in pre service programmes, to identify if and how faculties of education prepare pre service educators for their role of developing literate citizens. In findings, authors reported that school libraries are not playing much of a role in the preparation of pre service teachers in the 17 faculties of education programmes. It was disheartening at the best and a serious call for action for the library community across the country.

Crouse and Kasbohm (2004) developed an instructional module through collaborative efforts of Teacher Education Departments and librarians. The Information literacy Instructional Module is instructional plan for teacher education faculty members and academic librarians to use to focus their initial collaborative efforts for Information literacy. This module consists of 6 sub modules: Introduction to research in the discipline, introduction to the ERIC database system, introduction to online book catalogue, introduction to findings dissertations, using information appropriately and ethically, and introduction to the World Wide Web for education research. They concluded that information literacy skills could no longer be considered a byproduct of education. Teacher candidates must adopt the development of information literacy
skills as a goal of their work. Teacher Education Faculty members must teach information literacy skills through an integrated information literacy instruction programme. Teacher Education Department faculty members must emphasize to candidates that information literacy and research activities and assignments have been designed to ensure that they have transferable skills that will be sustained through lifelong learning.

3.9 CONCLUSION

A number of research papers and conceptual papers on various dimensions of information literacy programmes were studied for writing this research. Almost all the research work was carried out in countries other than India. Very few conceptual papers written by Indian Authors have found so far. Many research papers on various dimensions of information literacy i.e. teaching of information literacy, learning of information literacy, collaboration in information literacy programmes, integration of information literacy with curriculum have studied. In Indian scenario except Delhi University and recently the proposed project of information literacy by Kendriya Vidyalaya, none of the university or organization has developed information literacy programmes. In Many Indian Universities, doctoral researches is information literacy are ongoing but not published.

Through the literature review, it is revealed that the relation between information literacy and Teacher Education established since 1934 in terms of library skills. Much research has been carried out in the field of teacher education about information literacy. The Information literacy skills assessment, information literacy programmes are developed and implemented for elementary, secondary and higher education teachers and teacher education students-both pre-service and in-service. It is globally accepted fact that there is a strong need to impart information literacy skills within teachers so that they can play an important role in fostering
information literacy skills in pupils. Most of the information literacy programmes are integrated with teacher education curriculum and give strong emphasis on teacher and librarian collaboration for planning, developing, implementing and evaluating the information literacy programme. Most of the leading teacher education institutions have carried out case studies, surveys and programmes on information literacy. Specialized information literacy tests have been developed for teacher education students. ACRL has developed specialized Information literacy Competency Standards for Teacher Education. More attention is paid towards the library or information skills for teachers globally. Many foreign universities have developed a variety of information literacy programmes and applied new approaches in implementing those programmes. A variety of tutorials in both versions i.e. prints and online is available especially for teacher education. Stand alone course, introductory course, integrated course, summer courses have been developed by many universities and institutions collaboratively by librarians and faculty in the field of teacher education. Various researchers, professional organizations have expressed the need of information literacy education in teacher training course. Various researches also supported the same. But from above literature and researcher’s experience, it is revealed that still there is tremendous scope for imparting information literacy in teacher training courses. Though various teacher educators and library professionals have researched many dimensions and strongly expressed the need, developed models, standards and programmes for teacher education, information literacy is not unanimously accepted as a natural dimension of teacher training. In Indian scenario, no evidence of research on information literacy tied with teacher education was found in the literature.

At international level governments and educational organizations, associations are giving planned emphasis on information literacy skills for teachers. As these all initiatives are being
taken at global level, in India we have the clean slate regarding information literacy and teacher education. None of the Indian Universities or institutions, educational organization or association and policy makers except Knowledge Commission of India has taken initiatives in fostering information literacy to teachers. The present research is an effort in developing and implementing a need-based information literacy programme for the students of pre-service teacher education during their pre-service teacher training.

Through the literature available on information literacy instruction, it is revealed that the emphasis is given on instruction creatively. Teaching information literacy to students does not mean to make them orient about library services and bibliographic instructions. It includes variety of instructional approaches like course related library instruction sessions, course integrated projects, online tutorials and standalone courses. Various instructional methods or techniques have been applied in teaching information literacy skills viz. Cephalonia method, personal response system, group work exercise, application of Bloom’s Taxonomy, POGIL technique, unit based instruction, inquiry teaching, instruction by using games and short story, use of workbook, graphic organizers. With the creative methods and techniques and web 2.0 instructions are also applied in various information literacy instruction sessions like online tutorial, web based games, CAI programmes, use of multimedia etc. After deep study of above literature it can be stated that there is no standard approach or method recommended unanimously. Though various approaches and methods were used by researches, all these methods have certain limitation related to education system, level of students and infrastructure. After deep study of information literacy instruction, researcher would like to state that the nature, approach and type of instruction should be based on the educational system and students’ understanding level. In the present research, short story, game, demonstration and of course
lectures were used. The handbook created in the present research was made available to all student teachers through their mail. Majority of the sessions were technology based sessions, which included power point slide show and demonstration through internet.

Through Literature review on learning, it is revealed that much literature is available on explaining relationship between learning and information literacy and that there is a strong connection between learning and information literacy. The emphasis is given upon use of learning theories, various learning styles and various learning techniques. Various learning techniques have been used so far e.g. learning management system, gaming, and self directed learning, printed as well as online tutorial, comparing and evaluating information sources etc. more it is strongly recommended that the information literacy learning should be based on one of the learning theories and appropriate learning style should be applied. Through above literature it could be stated that a equal emphasis is given on learning. Various learning approaches have been used. But as information literacy is related to cognitive skills development, a constructivist approach is mostly used by many researchers. Various learning techniques based on constructivist approach have been used. As like teaching, not one learning technique is effective, learning technique is to be selected based on education system and level of students. In the present research, an emphasis is also given on learning. In order to facilitate student teachers’ learning of information literacy, concept mapping and self directed learning techniques were used. Tutorials in the form of handbooks was also created and made it available to all student teaches in both form i.e. hard copy and soft copy.

In case of teacher education in India, the research is not giving even a bit of emphasis on learning in the area of information literacy. However, in the present research an emphasis is given on the learning aspect of information literacy. The tutorial in the form of Information
literacy Handbook was distributed for self-learning in both the form i.e. printed and online form. Self directed learning technique was applied during the practical session of “applying search techniques”. Game was used for learning evaluation of information and concept mapping technique was applied for exploring information sources.

In case of literature review on “context” aspect of information literacy, it is revealed that information literacy is not an isolated entity. Like teaching and learning, it is always associated with relevant subject matter and context. Much research is carried out in the information literacy in content with English, Arts, Nursing, Firefighter and Teacher Education. In the context with curriculum, the strong emphasis is given on the integration of information literacy with the curriculum of specific discipline. It is recommended that information literacy programme should be developed in integration with curriculum of specific discipline. Many universities and institutions abroad have integrated their information literacy programme with the curriculum in the discipline like Nursing, Biology, History, English, Computer studies and Teacher Education. In the present research, this curriculum aspect of information literacy is also considered. The present information literacy programme is developed in the context with Teacher Education and based on the classroom teaching learning practices, which are expected in the B.Ed. curriculum of Savitribai Phule Pune University.

Much literature was found on the collaboration aspect of information literacy programme. It is strongly recommended that the collaboration have greater impact on the success of information literacy programmes. Literature has emphasized on the collaboration between librarian and faculty, libraries of two different universities, library and a university department. Also various levels of collaboration were explained in literature. Without participation of manpower in whole institution, i.e. right from policy maker to classroom teacher, everyone
should work collaboratively in planning and designing information literacy programme, deciding topics to be included, deciding instructional methods, organizing classroom instructional session, creating tutorials and making critical evaluation of Information literacy skills of students.

Regarding information literacy assessment, various tools and techniques have been used viz. case studies, rubrics, portfolios, action research and various information literacy standards. Along with these tools few professional tools also have been used so far like SAILS and ILIAC. In the present research, the assessment of information literacy skills in pre-test and post-test was carried out by using information literacy test for teacher education which is based on ACRL’s information Literacy Competency Standards for Teacher Education.

In the present research, all the aspects of information literacy education have been covered. The information literacy programme is based on pre-service teacher education curriculum, and it includes a variety of instructional and learning techniques and according to ACRL Information literacy Competency Standards for Teacher Education. Thus, this is a unique research about information literacy for the students of pre-service teacher education.