The review of literature is a step in the research process that positions the research problem within the context of the literature as a whole. The review of related literature serves multiple purposes and is essential to a well-designed research study. It generally comes early in the research process, and it can contribute valuable information to any part of the research study. There are two major parts when reviewing the literature, each with several subparts. The first is the selection of the specific pieces in the literature that will be included in the review of the literature. The second is the actual writing of the review (Wiersma & Jurs, 2009).

With the amount of information available from a variety of sources, the review of the literature is by no means a trivial task. It is a systematic process that requires careful and perceptive reading and attention to detail. In the review of the literature, the researcher attempts to determine what others have learned about similar research problems and to gather information relevant to the research problem at hand.

According to W.R. Barg, "The literature in any field forms the foundation upon which all future work will be built. If we fail to build the foundation of knowledge provided by the review of literature, our work is likely to be shallow and naive and will often duplicate work that has already been done better by someone else."

Besides providing a context for the research study, Wiersma, W. (2009) has enumerated the following purposes of the review of related literature:

1. More specifically limiting and identifying the research problem and possible hypotheses.
2. Informing the researcher of what has already been done in the area.
3. Providing possible research design and methodological procedures that may be used in the research study.
4. Providing suggestions for possible modifications in the research to avoid unanticipated difficulties.
5. Identifying possible gaps in the research
6. Providing a backdrop for interpreting the results of the research study.

There is no scarcity of reports of research studies related to education. Studies are published in books, periodicals, technical reports, conference proceedings, and academic theses. Most of the recent reports are available in the electronic form and can be accessed at your institution’s library or from remote sites if you have appropriate authorization. Usually the authorization is offered to all registered students. Following are the sources of review of related literature.

- The Library
- Periodical Literature
- Indexes and Abstracts
- ERIC (Education Resources Information Center)
- Reports of Meta-Analysis
- Review of Educational Research (RER)
- Theses and Dissertations
- Books
- Computer Searches of Databases on Internet

According to Good, C.V., "The keys to the vast storehouse of published literature may open doors to sources of significant problems and explanatory hypotheses and provide helpful orientation for definition the problem, background for selection of procedure and comparative data for interpretation of results. In order to be creative and original, one must read extensively and critically as a stimulus to thinking".

Thus the existing body of available knowledge and material related to the research problem provide information to identify the problem. The review of the related literature itself consists of several specific activities in a sequential manner, from searching the literature, to summaries and to write the review of the literature. Step by step working for reviewing the literature may enhance the efficiency and relevancy of the literature. Sufficient, relevant and efficient information obtained and
noted from the review of related literature reduces confusion later about the results of the study or research.

This chapter is devoted to review the available literature relevant to the present study. The researcher has not come across any research study related to CAL programme (under SSA) however, an effort has been made to present a review of pertinent literature which is likely to have a direct or indirect bearing on this study. The review of those related studies is presented as follows:

**Anders and Lindberg (2018)** examine a study on Students’ voices about information and communication technology in upper secondary schools. The aim of this study was to explore upper secondary school students’ voices on how information and communication technology (ICT) could structure and support their everyday activities and time at school. Sample of this study was 46 Students from upper secondary schools divided into 11 groups. Interviews method was used for conducting the study. The results show that ICT plays a central role in the students’ schooling, not in terms of “state-of-the-art” technology, but rather as “state-of-the-actual”, by for example supporting the writing process and for peer support, digital documentation and storage. The originality of the study was focused on students’ voices about how the basic use and functionality of ICT could structure and support their everyday activities at school.

**Juan C. Burguillo (2016)** conducted a study on Using game theory and Competition-based Learning to stimulate student motivation and performance. This study introduces a framework for using Game Theory tournaments as a base to implement Competition-based Learning (CnBL), together with other classical learning techniques, to motivate the students and increase their learning performance. The study also presents a description of the learning activities performed along the past ten years of a course where, in five of them, Competition-based Learning has been used. Finally, the experience gained is described together with an analysis of the feedback obtained from the students' surveys. The good survey results, and their similarity along the years, suggest that the combination of game theory with the use of friendly competitions provides a strong motivation for students; helping to increase their performance.
Nami, Marandi, & Sotoudehnama (2016) examine a study on CALL teacher professional growth through lesson study practice: an investigation into EFL teachers' perceptions. In an attempt to contribute to this research base, this study shares the findings of a case study on English as a foreign language (EFL) teachers' perception of the impact of lesson study on their professional growth. Participants' responses to question through interview method was use in this study. The result indicated that participants appreciated the teaching practice and peer observation for promoting their knowledge of technology, technological pedagogical knowledge, knowledge of technological glitches, and their confidence in teaching with technology. It was also observed that teachers preferred peer critique to positive feedback for improving the quality of their lesson plans. The results could provide CALL teacher educators and program designers insights into benefits and challenges of engaging EFL teachers in lesson study during CALL teacher education.

Vernadakis and Avgerinos (2015) conducted a study on the Use of Computer Assisted Instruction in Preschool Education: Making Teaching Meaningful. The purpose of the present study was to discuss research avenues employing computers as a learning tool. Analyse the results obtained by this method at the preschoolers learning level. Specifically this research was to determine if computer assisted instruction (CAI) was a useful tool to enhance cognitive, emotional, linguistic, and literacy skills in preschool children. CAI programmes may never replace the book and the blackboard but one should be aware that they were more accessible by young children, who learn better with pictures and sounds, and the proper use of appropriate programmes could make a considerable difference. Results demonstrated a significant contribution of computer use in the classroom as a learning tool. Such use, however, should keep pace with the development of children at preschool age. The CAI programmes applied should be developmentally appropriate to achieving specific learning goals; a learning tool of any type would have little effect if the objectives and plans of the lessons and means of teaching are not developmentally appropriate.
Hoffman and Blake (2013) carried out a study on "Computer literacy: Today and Tomorrow" and examined the computing and technology departments often offer service courses in Computer Literacy that provide the entire academic community with the opportunity to develop skills in the use of computers. These courses have been around for many years, but all too often they have not been updated to reflect new skills and knowledge that students are now bringing with them. The flow of new technology, minicomputers to PCs to the web shaped what was considered standard knowledge. Today portable and mobile technology continues the integration of computing technology into society that began in earnest with the web. Computer literacy has changed: skills are taught on demand, computer literacy has taken its place as one of many forms of literacy and social and ethical issues are viewed from non-computing perspectives. Our Introduction to internet studies course attempts to implement this new model of computer literacy.

Kalu and Ekwueme (2013) conducted a study on "Assessment of teacher’s level of literacy and attitude towards information and communication technology application in science, technology and mathematics education". The purpose of the study was to ascertain the literacy level and attitude of science teachers towards information and communication technology (ICT) application in science, technology, and mathematics education. 151 science teachers (80 males and 71 females) randomly drawn from 9 private and 13 public schools randomly selected from the secondary schools in Calabar metropolis participated in the study. A 41-item Teachers’ ICT Literacy and Attitude Assessment Questionnaire was used in data collection the data collected was analyzed using simple percentages and t-test. The results indicated that 51.0% of the science teachers are computer literate though only 90.9% of these literate teachers can operate a computer without assistance; only 14.3% of those that have operated -a 'computer have actually accessed the unique science apparatus software; 72.7% of the schools have a computer but none is linked to the internet the science teachers' awareness of and knowledge ability of the educational applications of ICT are respectively far below expectation.

Achuonye Keziah (2012) conducted a survey that involved collection of data though questionnaire for the purpose of describing the existing condition in rural and
urban primary schools. "A comparative study of computer literacy in Urban and Rural Primary Schools in rivers state of Nigeria" it was found that challenges retarding computer literacy in Nigerian Primary Schools, particularly in the rural areas are enormous. This reveals the needs of urgent interventions from the government and public spirited organizations and individuals. Government should not pay lip service to ICT-policies to afford the teeming population of Nigerian children the opportunity to meet up with rest of the world.

**Gajjar (2012)** conducted a study on teacher’s awareness about computer in relation to gender, area and with reference to its teaching subjects. It was found that more than half of the teachers were aware about internet and more awareness was seen about internet and less about internet explorer. The gender and area effect was not found on the awareness about computer of the higher secondary school teachers.

**Son, Robb & Charismiadji (2012)** examined the current level of computer literacy of a group of Indonesian teachers of English as a foreign language (EFL) and investigated factors affecting their use of computers in classroom. The findings of the study provide a picture of the indonesian teachers’ use of computers in their local contexts and recommend increasing the teachers online opportunity, skills and competencies in the use of computers for their teaching practices and professional development.

**Elizabeth M. Pierce & Karl Brett Lloyd (2012)** conducted a study on "Lessons learned from piloting a computer literacy test for placement and Remedial decisions". The objective of the study was to identify students who already have a good foundation in computer literacy and allow them to exempt out of the Micro-based Computer Literacy course for credit. This would open seats for students who lack the required computer skills. To answer this question, a computer literacy test was devised to ascertain the computer literacy level of incoming freshmen. The result of the test will help determine which students should be placed out of our computer literacy course. Out of the 170 students who participated in the pilot, 9 students satisfied at least one of the exemption criteria and were exempted from the course for a pass rate of approximately 5%. Students performed best in the concept area, on
average knowing slightly more than half of the questions. In terms of the software skills, the median for all four software packages ranged between 40 and 45% of the tasks completed correctly.

Thilaksha & G.P. Lakraj (2011) conducted a study entitled "An Assessment of computer awareness and literacy among Entry-level University of Colombo Undergraduate". The study revealed that University of Colombo freshmen who are likely to be both computers aware and computer literate possess several characteristics. These respondents are Internet users, and their monthly family income level is high. Further they use more locations for using a computer and they obtain computer knowledge from several sources such as computer courses, self-study, family members, another person and school. In contrast, for the respondents who are likely to be both non-computer aware and computer illiterate, it is the other way round; i.e. most of them are non-Internet users from families having low monthly income. In addition, they choose only one location for using a computer and obtain computer knowledge from few sources such as school and/or computer courses.

Poelmans Stephan (2010) conducted a study on "Perceived computer literacy among different types of (Under) Graduate students" studies have shown that (under) graduate students essential computing skills and knowledge are frequently overestimated. In order to improve ICT-related education and create more awareness towards computing capabilities and risks, a project was started at the association of the Katholieke University of Leuven (Belgium). Perceived computer literacy was measured as a multi-dimensional second order factor, consisting of 5 primary factors (Security, information, retrieval, legal issues, internet risk awareness and multimedia storage). It was found that female students have significant lower computer literacy score than male students. Computer experience has a major positive impact on all our literacy factors as well. The data indicates further that students of the exact sciences have a significantly higher score than students of other branches. Particularly medical students have a lower score on perceived computer literacy.

Dana Jenkins (2009) conducted a study on "Computer literacy, Access and use of technology in the Family and consumer Sciences classroom". The purpose of
this study was to determine if a relationship exists between computer literacy and use of technology as well as if a relationship exists between teachers access to technology and their use of technology in family and consumer science education classrooms in the state of Kentucky. The study found that Computer literacy and use of technology had a substantial relationship while access to technology and use of technology had a moderate relationship.

A study was conducted by **Azim Premji Foundation, (2004)** in Karnataka and Andhra Pradesh. The result of the study reported that the intervention in the form of computer aided learning in the Andhra Pradesh schools has been a considerable impact on the students in terms of their learning levels. Similar results were however not visible in the Karnataka schools (N=225). While it is tempting to compare the results in the two states, it must be noted that there are differences on several counts between them. There are differences in the pedagogy in terms of the curriculum, the textbooks, the method of teaching etc. Further, even in terms of the availability of uninterrupted power for running the computers during school hours there would be differences between the two states. In addition, when the Karnataka intervention was designed, the focus was somewhat different than when the AP plan was developed. Hence comparison between the two states is ideally not advisable. It must also be borne in mind that this is only a summative assessment at the end of the year. No base line has been carried out.

**Leigh Linden, Abhijit Banerjee & Esther Duflo (2003)** evaluated Computer-Assisted Learning: Evidence from A Randomized Experiment in Vadodara, India that attempts to improved school quality and test scores, implemented under the aegis of Pratham, a Bombay-based Non Governmental Organization.(N=98).This paper reports the preliminary results of a computer assisted learning program. While the first semester of the intervention showed very insignificant effects, the overall effect over the entire year showed substantial improvements over the first four months. Average scores on a 50-point math test goes from 14.9 to 29.0 in the treatment group but only from 15.5 to 25.0 in the control group. This intervention had a somewhat bigger effect on the bottom third of the
students, which might have been due to the selection of competencies reinforced by the software. The use of computer assisted learning, however, has the capacity to allow each child to move through the competencies at their own pace. The second year of the CAL program is experimenting with allowing children to move forward immediately after mastering a particular competency.

Angrist & Lavy (2002) evaluated a computer assisted learning program in Israeli schools with disappointing results. Among the fourth and eighth grade students evaluated with math and Hebrew exams, the data show no benefits for computer assisted instruction and provide some evidence that children who received such instruction are actually at a disadvantage.

Joke Voogt (1987) in the study "Computer literacy in secondary education: The performance and Engagement of Girls" examined performance and engagement in computer literacy of boys and girls (N=873). Performance and engagement in computer literacy are established with CAST. Computer Alfabetisme Schalen Twente, a Dutch version of the Minnesota Computer Literacy Awareness Assessment. The result of the study was that girls perform lower and are less engaged in computer literacy than boys. Research on sex differences in mathematics and science education shows that three factors are important for the design of action programs for girls, viz, the expectation and behavior of significant others, the perception of the usefulness of the subject for a future career and a positive attitude towards the subject. This study shows that these factors scam to be relevant for computer literacy too. It has been found that a positive attitude towards mathematics and physics is positively related to a positive attitude towards computer literacy. An examination of the relation between performance in computer literacy and attitude towards mathematics and physics shows no differences in performance between boys and girls with a negative attitude towards mathematics and physics. For boys and girls with a positive attitude towards mathematics and physics however a difference in performance in computer literacy has been found in favor of boys.

Marshall & Bannon (1985) conducted a study on computer attitudes and knowledge in rural settings. The sample was comprised 198 students and 43 educators
in Missouri and southern Illinois. It was found that the teachers used computers in the classroom. The primary use of computers was only for drill and practice, followed by simulation activities, programming and then inquiry. Half of the administrators stated that they used a microcomputer in the office. In no school was a computer available to teachers in the staff lounge.