2. REVIEW OF LITERATURE

2.1. INTRODUCTION

The use of multimedia technologies for language teaching has gained momentum in recent years. This review was carried out in order to understand the current trends related to multimedia integration and writing pedagogy. The order of the discussion presented in this chapter is thematic. The first part of the chapter deals with the rationale of multimedia integration. The second part deals with the conceptual background of the study. Subsequently, research studies related to multimedia instruction are analysed comprehensively. The fourth section deals with recent research on multimedia integration, and teaching writing. The limitations of multimedia instruction were also explored, and the research gap was identified. As the current study is on Multimedia Supported Process Approach (MSPA), previous studies related to Process approach and L2 writing were analysed in the last part of the chapter.

2.2. MULTIMEDIA

Multimedia is defined in different ways by different researchers. According to Lee and Shin, “Multimedia is a combination of text, video, animation, audio, graphics, visuals and interactive applications” (65). Mayer’s definition in his work (multimedia learning) is specific. He defines multimedia as representing both words (such as spoken text or printed text) and pictures (such as illustrations, photos, animation, or video) (2).

2.2.1. Rationale for Multimedia Integration

Warschauer and Healey state that multimedia technologies have been used for language teaching since the 1960s. According to them multimedia will play a pivotal role in both teaching and learning in future. They suggest that teachers have to find ways to teach the students using a
combination of multimedia such as texts, images, sounds and video without diluting the attention to language (57-71). Kern and Warschauer have noted that there has been increased use of technology, especially in the last two decades. As a result of this teachers are creatively using it in classrooms (3). Gunduz, claims that “with the advent of multimedia computing and the internet, the role of computers in language learning has now become an important issue confronting scores of language teachers throughout the world” (193). Debopriyo & Crable have recorded that the students today naturally possess digital literacy enabling easy ICT integration (131). In a similar context, Crystal notes that a plethora of foreign language teaching tasks can be initiated using computers (377). These comments represent the growing importance of multimedia technologies for language teaching.

Eminent researchers have extrapolated on the impact of multimedia on teaching English in the EFL and ESL context. Recent studies that postulate the importance of multimedia instruction are presented in this chapter. Nerantzi, & Gossman have remarked that ICT environment fosters collaborative learning and has the potential to increase learner engagement and performance (n. pag). Other researchers who advocate this view are (Tour, 124) and (Lakkala, & Llomaki, 12). Ayres, study has reported on the beneficial impact of computer-assisted technologies on the improvement of learners’ attitude (241-249).

Chapelle states that "in the 21st century everyday language is inextricably linked to technology, and it has important implications in SLA” (1). Research testifies that computer-assisted instruction leads to enhanced learning outcomes. Other studies that report on the importance of multimedia technologies are (Dale, 9) (Kangas, 14) (Tacchi, 103). According to Conole, “teachers and designers should indulge in interventions and learning activities that make efficient use of technology” (6).

These reflections underscore the importance of multimedia technologies. Therefore, it would be beneficial to integrate multimedia for
teaching writing. As the rationale for multimedia integration is justified the chapter proceeds to present the theoretical premise.

2.3. THEORETICAL FRAMEWORK

The importance of cognitive paradigms on learning outcomes in ESL context is well documented by Adesope et al. in their meta-analysis (207-245). The conceptual framework for this study is based on Mayer’s Cognitive Theory of Multimedia Learning (CTML). CTML provides a promising framework for the design of multimedia tasks. Its principles can be effectively applied in the context of teaching writing. Hence it was chosen as the theoretical background of the study.

2.3.1. Cognitive Theory of Multimedia Learning (CTML)

According to Mayer and Moreno, CTML is based on three premises. They are a) the dual-channel assumption, b) the limited capacity assumption, and c) the active processing assumption. The dual channel premise states that people learn effectively from words and visuals than from words alone (312). Mayer’s second premise the limited capacity assumption states that the brain has limited processing capacity (Elements of the science of e-learning, 297). He argues that if the content is relevant and presented in multiple modes, it can foster effective learning. For avoiding cognitive overload, he suggests reducing extraneous material and including what is essential (Multimedia learning, 57).

Mayer’s third premise is active processing assumption. It states that people construct knowledge in meaningful ways when the instructor organizes the material coherently and associates it with learners’ existing knowledge. In active learning, the learners construct knowledge, and it is demonstrated by applying it to new situations (Multimedia Learning 59).

Mayer’s work Multimedia learning deals with the basic principles of multimedia instruction. They are i) Multimedia Principle: people learn from words and pictures rather than words alone, ii) Modality Principle: effective
learning takes place when the input is given in different modes, iii) Coherence Principle: people learn better when extraneous material is excluded, iv) Signalling Principle: people learn better when cues that highlight the organization of the material is added, v) Temporal Contiguity Principle: people learn better when corresponding words and pictures are presented at the same time rather than in succession, vi) Segmenting Principle: people learn better when a multimedia lesson is presented in user-paced segments, vii) Pre-training Principle: people learn more deeply when they receive pre-training on the use of multimedia tools, and viii) Personalization Principle: people learn effectively from a multimedia presentation when it is personalized (97-201). The principles suggested by Mayer can be effectively applied to the design of multimedia tasks at ESL writing classrooms. Table 2.1 clearly reinforces the importance of these principles.

<table>
<thead>
<tr>
<th>Multimedia principle</th>
<th>Individuals can effectively learn through visual context. Multimedia principle greatly facilitates learners' understanding. Lessons containing words (printed or spoken) and pictures (illustrations, photos, animations, or video) enhance learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modality principle</td>
<td>Most learners easily acquire information if it is presented in both visual and auditory mode. For example, if the instructor wants to teach his students on how to interpret a statistical bar graph he is advised to use visual and audio narration instead of visual and onscreen text.</td>
</tr>
</tbody>
</table>

Table 2.1: Importance of Mayer's Principles
(Source: Extracted from Clark & Mayer, 2011)
<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coherence Principle</td>
<td>Eliminating unnecessary information in a multimedia presentation helps the learner understand the content. Adding interesting but irrelevant materials to multimedia courses may distract the student.</td>
</tr>
<tr>
<td>Signalling Principle</td>
<td>Signalling principle guides the learners to focus on the core elements in the lesson thereby reducing the cognitive overload on the learner. It helps in understanding the concepts.</td>
</tr>
<tr>
<td>Temporal Contiguity Principle</td>
<td>Learners learn effectively when text and visuals are presented concurrently rather than successively. For example, introducing a text and visual on the same slide is better than presenting them in two different slides.</td>
</tr>
<tr>
<td>Segmenting Principle</td>
<td>If complex lessons are broken down into smaller parts efficient learning will take place.</td>
</tr>
<tr>
<td>Pre-training Principle</td>
<td>Pre-training can help users to manage the processing of complex materials. For example, pre-training on how to use multimedia software makes it easier for the beginners to use it in the classroom.</td>
</tr>
<tr>
<td>Personalization Principle</td>
<td>If multimedia presentations are customized according to the needs of the learners, they will perform better.</td>
</tr>
</tbody>
</table>

These principles postulated by Clark & Mayer are used in the design of materials in the present study. In the following section, some important studies on multimedia integration are presented.

2.4. PREVIOUS STUDIES ON COMPUTER ASSISTED MULTIMEDIA TECHNOLOGIES

According to Garrett integration of computers into foreign language learning involves a dynamic process in which technology, theory, and pedagogy are inseparably interwoven (23). Chapelle enlists six
characteristics that are essential in call instruction. They are 1. language learning potential 2. learner fit 3. meaning focus 4. authenticity 5. positive impact and 6. practicality (55). These characteristics emphasize the importance of multimedia technologies. In a similar vein, Egbert & Hanson reported that CALL research has been technology driven. According to them previous research in CALL has given less importance to pedagogical aspects. In their work, they provide effective principles for CALL integration. They are i) providing opportunities to interact using CALL ii) initiating interaction in an authentic environment, iii) using authentic tasks, iv) providing rich content v) assessing the efficacy of CALL instruction vi) catering to different learning styles vii) reducing learners anxiety in the use of technology and vii) fostering learner autonomy (11).

Keppell, Suddaby, and Hard’s review of 33 teaching projects related to multimedia technologies provide evidence on the valuable impact of technology implementation. One of the central themes that emerged from their study is that technology-enhanced teaching approaches improve student learning. In their review, they have summarized ten best practice outcomes of technology integration. They are 1) focus on learning design 2) engaging learners through authentic materials 3) developing projects on technology 4) engaging teaching approaches 5) providing technology-enhanced assessment and feedback 6) integrating multimedia across courses 7) sharing knowledge and resources using technology 8) providing effective learning environments 9) using new technologies that support learning and 10) taking sustainable initiatives on technology integration (1-13).

Bret considers computer-based multimedia as an appealing tool for education since it can deliver combinations of text, sound, graphics, still images, animations, and video. He made a comparative study between traditional teaching tools and multimedia tools using a survey method. Results of his study favoured multimedia instruction. It indicated that multimedia could tremendously impact teaching a foreign language if it is implemented properly (191-212). Bird & Edwards explored the effect of
technology usage on children. In their study, they have reported that multimedia technologies enabled the learners to generate meaningful content (1160).

Dai and Fan acknowledge the importance of multimedia instruction in their study. They implemented multimedia instruction in vocational schools. The findings of their study suggested that multimedia training provided a rich learning environment and relieved the burden of large classes. They also found that it increased interaction among learners and provided high-quality feedback (1144-1148).

Abtahi investigated on the beneficial impact of multimedia on dyslexia individuals. The target learners had difficulties with reading, spelling, writing and numeracy. Qualitative approaches were used to analyse the data. The study revealed that the students enjoyed the multimedia interface. Structured activities and multisensory approaches were recommended in the study. Breaking down the content in small steps using multimedia led to effective learning for dyslexic students (1206-10).

Ketsman claims that a blend of technology and pedagogy will lead to effective learning. She argued that the multimodal input as an instructional strategy will result in active learner engagement. The results of her study indicated that use of multimedia has a positive influence on foreign language learning. It not only increased the motivation for learning but also assisted in language acquisition. Multimedia technologies enabled the teachers to tailor the instruction according to the needs of the students. The study revealed that a blend of technology and effective pedagogy improved language learning skills (98).

Kessler made a comparative study on traditional and multimedia instruction. He exposed the experimental group to audio books and journals, in a language laboratory. The studies showed a significant difference in the fluency of the multimedia group. The retention level was also better among students who were exposed to multimedia instruction (361-75).
Marzban explored the role of multimedia annotations in EFL reading comprehension. He compared the effects of audio and video annotations used by 68 pre-intermediate level students who were randomly divided into two groups, one group was exposed to the multimedia condition, and another group was exposed to the paper-based condition. The multimedia group was taught using different kinds of simulations such as audio, verbal and visual. The participants of this study were chosen from among 80 pre-intermediate EFL students from 3 institutions in Iran. The students who took the reading comprehension tests scored better than the students who took paper-based reading comprehension (72-77).

Liu et al’s review on CALL literature provides evidence on the impact of multimedia on foreign language teaching. He observed that the studies predominantly reported on the effectiveness of multimedia technologies. Compared to the positive findings very few negative findings were reported. The results of their study indicated that technology had positively affected the student’s learning process. (250-273)

Koehler investigated the effectiveness of the multimedia programme for teaching grammar. He used Swellers’ cognitive theory as a background for his study. An experimental design was employed in the investigation. The study was targeted at ESL learners who were at an intermediate level. The learners who were exposed to multimedia programme showed better learning and retention skills. The posttest scores revealed the effectiveness of the learning process. The findings of this study provide ample proof on the beneficial effect of the multimedia intervention. This evidence-based study indicated that multimedia instruction catered to different learning styles (1-68).

Williams examined the use of multimedia materials in an ESL context. His study investigated the effectiveness of using multimedia in teaching second language grammar among intermediate learners. The sample size was 53 college students from a Chinese university. It investigated the
outcome of three different modes. They are text alone mode, text with pictures, and text with video clips. He reported that a text with video clips was more effective than a text with pictures. The video mode was very helpful in reducing the cognitive overload and improving the success of learning. The results indicated that multimedia materials could significantly enhance the acquisition of grammar (56-69).

Nutta et al. carried out a similar study. They investigated the effect of foreign language acquisition in a multimedia environment. Students who studied using multimedia exhibited more involvement in learning and were willing to spend more time in learning the language. They noticed a distinct improvement in the post-test of the multimedia group. Delayed post-tests also revealed considerable improvement in computer-based instruction. The study proved that the retention level was higher in the multimedia group (293-306). The results suggested that multimedia materials will foster better learning and also help in increasing the retention level.

Mai, Neo et al. carried out a study on authentic learning strategies in a multimedia environment. He designed content and course materials that were web-based. He used the pretest-posttest method to investigate the impact of authentic modules in a multimedia environment. The students showed apparent improvement in the mean scores after multimedia intervention. The results of his study strongly favoured multimedia environments for effective learning. In addition to the tests, the students were given a survey questionnaire to understand their perceptions of learning with multimedia. The results indicated that multimedia materials provided rich content and increased their understanding (50).

Green explored the effectiveness of technology integration in instructor’s practices in foreign language departments in universities. He used a survey approach and a pilot study to understand the extent of multimedia technologies on learning. Teachers who exhibited a better attitude towards technology and who used it effectively in classrooms always had better results. He concluded that although computer use has become
widespread throughout foreign language education, availability of computers alone is not sufficient for increasing their use. According to him, teachers must experiment with technology to become comfortable with its use. Those who are serious about having their faculty integrate computers into their teaching need to provide periodical training, along with one-on-one assistance. Professional training will enable the teachers to become familiar with the resources available and allow them to deliver the materials effectively (n.pag).

Ali et al. explored the impact of technology on the motivational levels of the students of Iran. The study investigated the significant relationship between the use of technology in Iranian university classes and the students’ motivation to learn English. An overwhelming 85 percent of the students participating in the study believed that multimedia materials actively engaged them in the learning process. The results indicated a great relationship between language learning and the use of multimedia (814-23). The results of his studies were consistent with other studies on multimedia assisted language learning.

Zainal studied the effect of teaching English using ICT. He observed the lessons of four ESL teachers from three different schools in Malaysia. Case study and classroom observation were used as methods of data collection. Each teacher participated in an interview after every lesson. The study pointed out that the teacher’s use of technology should be guided by the relationship among teachers’ technological, pedagogical and content knowledge. Increased attention level and motivational level were found in classrooms where teachers effectively integrated technology (234-237).

Diyyab et.al explored the impact of multimedia instruction for developing the speaking skills of the students of the second year in a teachers’ college. The sample consisted of 30 students from Egypt. After text-based instruction, a pretest was conducted. A multimedia-based fluency course was integrated into their curriculum. After the training phase, a post-test was carried out to assess their speaking skills. The results of the
posttest indicated a noticeable improvement in the speaking skills of the students. The test-retest method was used to determine the reliability of the EFL speaking fluency test. There was a positive correlation between the sample scores on both the pre and the post-EFL speaking test. The findings of the study also indicated that multimedia integration provided pedagogically sound tasks for enhancing their linguistic skill.

Kurt’s evidence-based study reported on the use of multimedia software. Questionnaires, pretest and achievement tests were used as tools of data collection. He studied the impact of multimedia software that was created using a conversational style. The findings of his study indicated that personalised multimedia instruction had improved student’s performance and attitude towards learning (185-92). Bax suggests that multimedia technologies have to be incorporated into teachers’ everyday practice. He proposes an upgradation of technological infrastructure in classrooms. According to him, CALL programmes have to be integrated in a holistic way for better learning outcomes (27). Motteram proposes similar views in his work on “communicating with computers” (73).

Kovacs investigated on the impact of multimedia on foreign language learning. He used videos with subtitles to enhance the English language skills of intermediate learners. Grammar visualization tools were also used for developing their grammar skills. He observed that exposing the learners to video-based content over a period helped them to improve their vocabulary, pronunciation and grammar skills. Feedback from the participants indicated that language learning was enjoyable in a multimedia environment (n.pag).

Majzub, and Buang researched on the reading difficulties among preschool children using a quasi-experimental study. They designed a module called Multimedia Integration Module (MIM). They selected 100 students for the study and subjected them to a reading module that was in practice. After the reading practice, they conducted a pretest to these students. After integrating (MIM), a posttest was conducted. The results of
the achievement test indicated a considerable improvement in the reading skills. A t-test was used to identify the difference between pretest and posttest. They found that the mean scores increased from 30.08 to 82.48. The test performance obtained using Cronbach Alpha indicated a high reliability. Based on the findings they recommended the use of MIM (595-598).

These studies reviewed above provide valuable insights on methodological and pedagogical aspects of multimedia integration. The following section will still narrow down to studies on multimedia integration and L2 writing.

2.5. STUDIES ON MULTIMEDIA INTEGRATION AND WRITING

There are a few notable studies on multimedia and writing pedagogy. Long, and Richards argue that after the proliferation of CALL the nature of written communication has changed dramatically both in L1 and L2 writing. According to them, multimodal input not only helps the learners to improve their skills but also creates an interest to write. They state that technology-oriented writing will complement traditional pedagogy and promote deep learning. They further claim that computers have created new opportunities for communication between both learners and teachers and among second language users. Language teachers see immense potential in computer-mediated teaching and learning (9). Other researchers who support writing instruction in a multimedia environment are Mueller & Jacobsen (2015) and Yeh (2014).

Ahmad’s study explored the effect of media technology in improving learners’ writing skill. He used a survey and a pretest-posttest method to understand the efficacy of multimedia integration. The study revealed that ninety percent of the participants who took part in the survey preferred multimedia integration. A pretest and posttest were conducted to assess the writing performance. Only ten percent of the students had performed well in the pretest. After the multimedia intervention, more than 40 percent of the
students had performed well. The study indicated that the students preferred multimedia technology during writing instruction (924-29).

Jean Simard argued that writing skills can be fostered in an environment that is rich in multimedia. According to him, multimedia environments provide a springboard for writing. He points out that “idea-generators, brainstorming software, databases, electronic libraries, and CD-ROM applications can significantly enhance the way writing is taught in classrooms. He recommends pre-writing activities using multimedia such as group brainstorming, questioning via electronic mail, initiating listening groups, observing pictorial representations and reading electronic data from CD-ROMs. He recommends multimedia technologies such as spell checker, written language recognition software, software for correcting orthography, grammar, and syntax with interactive voice-activated software. According to him multimedia environment facilitates the writing process and appeals to all learning styles (n.pag).

Truong and Zanzucchi’s study has shown that multimedia plays a major role in writing instruction. They investigated the impact of multimedia for fostering writing skills using case study research. They observed that new technologies could significantly improve learning. They recommend multimedia technologies for intensive writing courses (263-288).

Zaid studied the effects of web-based pre-writing activities in a hypermedia environment. His objective was to find if multimedia based concept mapping is effective in improving writing quality. The participants were 108 students who have enrolled in a writing course in King Khalid University. He had segregated them into three groups with one control group and three experimental groups comprising of 36 members each. He employed a quasi-experimental design to understand the effect of the intervention. A pretest was conducted to all the groups before the intervention. The pretest indicated a similarity between groups. He trained the control group in a traditional environment and the experimental groups in a web-based environment. After the instructional phase, posttests were
given to all the groups. He used TOEFL scoring guideline to assess writing quality. There was a significant difference in the post-test scores. Analysis of variance (ANOVA) indicated improvement in the intervention group who were exposed to concept mapping in the pre-writing stages. The study revealed that multimedia environments are more suitable than Blackboard environments for developing writing skills (77-85).

In a similar study, Lohr et al. proposed a hypertext environment using process writing framework. She examined the effect of hypertext environment on writing skill at the school level. The objective of the study was to find the students, reaction to multimedia features. She also wanted to determine the degree of improvement in the writing skill after they used the multimedia features for eight weeks. Assessment, interviews and questionnaires were used as methods of data collection. The results of the students’ survey indicated that 75 percent of them liked writing in a computer-assisted environment. The results of the interviews and achievement tests corroborated to the survey results. It was clear that the students liked the hypertext environment. It also led to an improvement in writing skills (33-51).

Ruefman examined the predominating influence of multimodal technologies in the composition writing courses. The purpose of his study was to identify the new technologies that are currently in practice in the first year writing classrooms. He also wanted to ascertain the current pedagogical practices in a multimedia classroom setting. He used a cross-sectional case study. He found that the students were required to use word processing applications for writing assignments. Microsoft Word, PowerPoint and YouTube videos were extensively used in the classrooms. In the computer labs, the instructors used Moodle for learning beyond the classroom and second life for virtual learning. His study indicated that most of the faculties were hesitant to use advanced technologies because they felt that the learners may not have access to them outside the classroom. Despite restrictions regarding accessibility, all three instructors who participated in the case study felt that multimedia environments will foster
writing skills. They felt that introducing aspects of visual design in writing classrooms has positively impacted the writing environments (n.pag).

Khoii, Roya, and Tabriz investigated on the positive impact of multimedia input for the improvement of writing ability in an EFL context. The participants of their study consisted of 70 students from three classes. They were randomly assigned to a control group and an experimental group. A paragraph writing pretest was given to ensure parity between groups. A composition writing post-test was given to measure the impact of the intervention. The multimedia group received the instruction using Adobe. The control group was exposed to the traditional paper and pencil writing. The study was conducted for 18 weeks. The results indicated that multimedia technologies would positively affect learning behaviour and performance (n.pag).

Lin, Show Mei investigated the efficacy of Computer-Mediated Communication (CMC) and its effect on English Language Learners (ELL) writing performance”. The study incorporated online bilingual dictionaries and websites. Tutorial writing lessons, interactive multimedia-based grammar practices, and online writing links were used to enhance the writing skills of the target learners. He used a control group and an experimental group for his study. The control group was exposed to traditional instruction, and the experimental group was exposed to computer-mediated communication. The pretest scores indicated poor writing skills of both groups. The post-tests of the experimental group indicated improved performance. The study found that majority of students had positive perceptions of computer-mediated communication. It had a favourable impact on writing aspects such as critical thinking, spelling and grammar (n.pag).

Dina, Silivia and Ciornei explored the effect of multimedia resources for developing oral and written communication for less widely used languages at different levels. The qualitative study argued that a blend of good pedagogy and technology will enable the learners to learn the
language effectively. It was found that the students who were taught using computer-assisted learning need less time for the learning compared to students who are exposed to traditional instruction (246-50).

Chuo studied the effect of web quest writing instruction programme on EFL learners writing performance. The study explored the effects of web quest writing instruction called as (WQWI) programme. It was an experimental design conducted in Taiwan with 54 samples each in the control group and experimental group. The control group was exposed to traditional instruction and the experimental group to (WQWI). The data was analysed via t-test, analysis of covariance and descriptive analysis. The students who were exposed to writing instruction experienced a significant reduction in apprehension. Strangely no significant correlation could be detected in their performance (n.pag).

Alshumaimeri and Bamanger analysed the effects of web quest writing instruction on the written performance of the male EFL learners of Saudi. The aim of this study was to find out the difference between students who are taught using web quest writing compared to those who are taught using traditional in-class instruction. It was an experimental pretest-posttest design. Before the instruction phase, a pretest was conducted to find out if there was a difference in writing ability between the control and the experimental groups. The Mann-Whitney U-test indicated that both the groups were homogenous in the pretest. The experimental group was trained using web quest instruction for five weeks. The control group was exposed to traditional instruction for the equal number of classes. The findings indicated that the students who were taught using web quest produced better pieces of writing, especially in content, vocabulary and grammar (960-68).

The application of modern technology in EFL writing classes has been reiterated by (Dichev, and Baggio). Chen found that students who received computerised error feedback did more editing and improved their writing, but those who received more detailed and personalised error feedback did not
improve their writing much (133-34). Parker Beard recommends a new method for teaching compositions called multimodal compositions. He examined how video documented essays in the first year composition courses enhanced the writing skills. Parker used surveys, interviews, and reflection essays to collect the data. He found that the multimodal compositions enhanced the composing process and improved their writing. The study indicated that the students' perception and attitudes towards multimodal compositions were positive compared to traditional instruction.

The studies reviewed in this section are extremely relevant in the context of this research as they deal with multimedia integration and teaching writing. It enabled the researcher to understand the methodological and pedagogical aspects employed by previous investigators. It also helped the researcher to identify the research gap which is dealt with in the final part of the review.

There is a growing body of literature that reports on the positive impact of multimedia integration. However, there are a few studies that deal with the pitfalls of multimedia instruction. Although these studies have reported on the lacunae in multimedia instruction they have given effective solutions for overcoming the difficulties. They are presented in the following segment.

2.5.1. Limitations of Multimedia Instruction

According to Warschauer and Kern “despite the apparent advantages of multimedia technologies, today's computer programmes are not yet intelligent enough to be truly attractive”(10). Liu et al. remarks that the application of multimedia in English language teaching is not widely used as expected. The reason for this could be the underdevelopment of technology and immature pedagogy about using multimedia in teaching the foreign language. He states that teachers need to be adequately trained to use multimedia technologies (7). They feel that teachers who are aware of multimedia instruction and its applicability tend to focus too much on
technology and ignore the aim, objective, and content. In a similar context, Chiu comments that technology-enhanced learning environment needs to be supported by suitable learning materials and strategies for effective learning outcomes. He asserts that effective pedagogy is indispensable to drive technology (34).

Yi, Le Xiang compared multimedia instruction to traditional teaching models. He pointed out that English language teaching supported by multimedia can tremendously enhance teaching productivity. However, he observed certain limitations in the multimedia instruction such as lack of teacher's expertise in the use of technology and lack of proper evaluation mechanism. Xiang suggests remedial measures like maximizing multimedia infrastructure, increasing recruitment of technicians and providing multimedia courseware for teachers (282-86).

Macaro et al. carried out a comprehensive review of the use of technology in an ESL context. They reviewed 42 recent studies that focussed on multimedia technologies in an L2 situation (n.p). They found that the beneficial impact of technology on the development of language skills is inconclusive. They also argue that (SLA) second language acquisition theories are not adequately applied in technology-enhanced language learning classrooms. Najjar in his comparative study on multimedia instruction versus traditional classroom instruction echoes the same view. He claims that there is inconclusive evidence on the positive impact of multimedia instruction (129-50).

It may be reminded that this study deals with multimedia enhanced process approach to writing. Having reviewed the previous studies on multimedia in the context of language teaching the final part of this chapter proceeds to discuss some relevant studies on the process approach to writing. The objective of the last part of the review is to justify the rationale behind using process approach for multimedia integration.

2.6. STUDIES ON PROCESS APPROACH TO WRITING
Tribble defines Process approach as an approach to the teaching of writing which stresses on the creativity of the individual writer and pays attention to the development of good writing practices rather than the imitation of models (160). Hyland states that “the process approach to writing emphasizes the writer as an independent producer of texts” (10). Pritchard and Honeycutt claim that process approach to writing cannot be clearly defined. According to them “The paradigms of process approach keep changing as it is unevenly applied across the research studies (28).

According to Nepomuceno writing is the most difficult of all the four macro skills. Learning to write has often been a complex and challenging task for students. (92) Parr & Jessen, echo a similar feeling. They state that “Writing is a complex activity and there is no consensus on an appropriate teaching strategy in the research literature on writing” (13). According to Macarthur et al. over these years different approaches have been introduced in the language classroom. However, it is the process approach that emerged in the 1970s that has a positive impact (277).

Considerable research has been carried out on the Process approach to writing. Most of these studies have reported on its benefits. Nunan makes a striking comparison between product and process approaches. He remarks that in the “product-oriented approach the teachers focus on the end-result of the students”. In product-oriented writing, students are engaged in activities such as “imitating, copying and transforming models of correct language.” While in the process approach, the teachers focus more on various classroom activities such as idea gathering, group work, and conferencing which are presumably important elements that a writer has to go through when writing (Language Teaching Methodology, 68). In Process approach, writing becomes a process of discovery for the students as they discover new ideas and new language forms to express them. Process approach gives students greater responsibility and ownership for, their learning. Students make decisions about genre and choice of topics, and collaborate as they write (Raimes 10).
Research findings from most studies on the effectiveness of the Process approach espouse that it is, in general, an effective approach to improve the writing skills and attitudes towards writing (Cheung 1999, Cheung and Chan 1994). Meta-analysis on the Process approach to writing provides empirical evidence of its effectiveness. Some of the seminal studies on the Process approach to writing are Graham and Perin (2007) and Bangert-Drowns et al (2004). These studies provide empirical evidence on the effectiveness of Process approach. Goldberg claims that the writing process is more collaborative, iterative, and social in computer-oriented classrooms as compared to traditional environments. “An overall finding of research on the process approach states that all the stages must be fully implemented if students are to build a repertoire of writing strategies” (Pritchard and Honeycutt, 28).

Koster et al. carried out a meta-analysis on effective instructional practices adopted by teachers in writing classrooms. They reviewed 32 evidence-based studies on writing. They have reported that the latest developments in CALL have led to a positive change in writing approaches. In their meta-analysis, they have reported on different kinds of writing approaches. After analysing numerous empirical studies, Koster concluded that process approach to writing resulted in modest improvement in writing styles. He observed only two studies on process approach that has reported negative results (299-334).

The Process approach to writing provides considerable scope for multimedia integration at all three stages such as prewriting, while writing and post-writing stage. Studies on the integration of multimedia technologies using a Process approach to writing are not to be found in the research literature. It is assumed that if multimedia tools are incorporated at every stage of the Process approach, the writing output of students will be more effective. Process writing pedagogy can be developed further by integrating multimedia technologies at every stage of the writing process. Hence the
present study proposes a new approach named Multimedia Supported Process Approach.

2.7. RESEARCH GAP

After reviewing the rich body of literature available in the field, these inadequacies were observed. Computer-aided instruction is increasingly used in English as a Second Language (ESL) classroom. However, studies with a blend of technology, theory and pedagogy are scarce. Golonka et al. reviewed 250 studies on multimedia technologies. The results of the meta-analysis indicated that despite a plethora of studies on the use of technology in language learning most of the CALL studies focus on affective filters such as motivation and attitude during learning activities. According to them empirical evidence on the beneficial impact of CALL is limited in the International literature (70-105). Zhao reported that there is a paucity of well-designed empirical studies in multimedia technologies. According to him the studies on technology integration in ESL contexts were usually short-term and limited to one aspect of language learning such as vocabulary or grammar (7-27). Other seminal researchers who share the same view are (Smith, and Lafford, 868-883).

Most of the previous studies on technology and writing pedagogy were limited to students from a single university. A cross-sectional study is not to be found. Although there is a growing body of research on using collaborative platforms such as Blogs, Wikispaces, and Google documents for teaching writing there are only a few studies that deal with multimedia technologies for teaching writing. The previous studies on writing deal with online environments. Offline tasks and multimedia components such as mind maps, graphic organizers, word-clouds, videos, podcasts, songs and slideshows for teaching writing are not carried out on a large scale. None of the studies in Second Language Acquisition (SLA) has applied the Cognitive Theory of Multimedia Learning (CTML) as a theoretical base. Most of the studies on technology integration and writing are limited to one genre of writing. Though there are some quantitative studies, more clarity is required
to understand the effect of multimedia instruction for teaching writing skills at tertiary level.

2.8 CORRELATION OF THE LITERATURE REVIEW AND THE RESEARCH STUDY

The review of literature has been constructed in alignment with the research problem and hypothesis. The problem stated in the study is that traditional approaches and teaching environments are fundamental problems in writing classrooms. Based on the research questions the hypothesis was formulated as “The students who are exposed to the Multimedia Supported Process Approach will demonstrate better writing skills than the students who are exposed to the traditional approach. In conjunction with the research questions and hypothesis the review of literature was carried out. Initially, the previous studies on CALL and Multimedia Technologies were analyzed. Previous Studies on multimedia technologies and teaching writing were dealt with in the second part of the literature review. The literature chosen for the review was predominantly from Scopus and Web of Science. The synthesis of literature had a specific connection to the study conducted as it helped the researcher to understand the nature of research carried out in multimedia technologies and writing pedagogy. It also helped the researcher to identify the research gaps.

2.9 CONCLUSION

Even though there has been a growing body of research in the Process approach to writing, none of the studies has so far proposed a Multimedia Supported Process Approach (MSPA) for teaching writing. Thus this study is different from the earlier studies. The following chapter deals with the survey on the use of multimedia infrastructure in engineering institutions and on the approaches employed by teachers of engineering for teaching writing.