CHAPTER 2

REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter introduces the literature associated with the main areas of interest of the present study. The areas include an overview of the theories related to language learning, and second language acquisition in particular, and the place of technology within the framework of these theories. This is then followed by a section dealing with technology and the nature of writing. The section deals with the associated potential in terms of the opportunities and challenges posed by the use of technology. The subsequent section deals with the principles in designing technology enabled language learning with the varied affordances made by technology in enabling language learning. Finally, the chapter concludes with an evaluation of TELL and the implications of the research on the current study.
2.1 Technology and theories of language learning

The instructed approach to second language learning or L2 learning has given rise to the field of inquiry of second language acquisition (SLA). Under this inquiry, two main paradigms have developed within SLA. The first paradigm that is based on cognitive theories is informed by psychology and linguistics. Within the cognitive paradigm, language learning is internalised. Under this, the focus is on the processes within an individual’s mind that can contribute to language development and on activities that can help to stimulate these processes. On the other hand, the second paradigm which is influenced by social-cultural theories thinks language as contextualised and sees language learning as an interpersonal process situated in a social and cultural context.

While these theories have been developed in the context of the traditional language teaching and learning in the classroom, they could also help with the examination of learning and teaching online. Levy (1998) points out that both the theoretical positions, that is, the cognitive and socio-cultural positions have the potential to inform research and practice in educational computing and any other form of technology enabled language learning. In other words, each of these paradigms informs concepts which have been developed around learning processes and contexts of learning. These are
concepts that could be useful in the context of technology enabled language learning.

A central theme that has been noticed in the research on technology enabled language learning is the potential of information and communications technology to assist second language acquisition. New technologies, when developed on the basis of cognitive, socio-linguistic or constructivist theories could provide ‘limitless possibilities’ (Schär and Krueger, 2000).

2.1.1 Technology and the cognitive theory of SLA

The cognitive model for second language acquisition is based on the input-output model of language acquisition, wherein input is the language the learner is exposed to and output is the language that the learner produces (Lamy and Hampel, 2007).

a) Comprehensible input

Ellis (1985) explains the idea of comprehensible input by stating that the input refers to the language which learners are exposed to. This can be ‘comprehensible’ which means input that they can understand or ‘incomprehensible’ which means input that they cannot understand. When
native speakers speak to L2 learners, they frequently adjust their speech to make it more comprehensible. Access to comprehensible input may be a necessary condition for acquisition to take place.

b) Comprehensible output

The concept of comprehensible output can be explained by observing that when students respond to the teacher’s or their fellow students’ questions, raise queries and give comments, they are actively involved in the negotiation of comprehensible input, which is essential to language acquisition (Beatty, 2003). When students produce the target language and try to make themselves understood, they are in fact testing out the hypotheses they are forming about the language. Similarly, as asserted by Swain (1985), the production of comprehensible output is also essential to the acquisition of the target language. And that it is not enough for learners to see and hear language in use; to truly understand they need to have opportunities to use the target language.

c) Interaction

In addition to this, a central concept of second language acquisition and research is that of interaction. Lamy and Hampel (2007) posit that a crucial
site for language development is interaction between learners and other speakers, especially, but not only, between learner and more proficient speakers but also between learners and certain types of written texts, especially elaborated ones. In addition, while providing a brief summary of a theoretical account of how discourse affects language acquisition, Ellis (1998) states that ‘acquisition is promoted when the input to which learners are exposed is made comprehensible as a result of interactional modifications that arise from a communication breakdown – a process known as the negotiation of meaning’ (p.160). Therefore, in other words, interaction allows learners to negotiate meaning, that is, to make the meaning comprehensible.

As Beatty (2003) mentions, a computer can provide a high level of ‘comprehensible input’ in various media. In terms of Computer- assisted language learning (CALL), Krashen (as cited in Kenning and Kenning, 1990) describes optimal input for acquisition as having four characteristics:

1. it is comprehensible
2. it is interesting and /or relevant to the acquirer
3. it is not grammatically sequenced
4. it is provided in sufficient quantity ( p. 87)
CALL, and more recently, technology-enhanced language learning (TELL) can generally deal with all of these criteria, including adding a wide range of extra-linguistic clues through sound, images, animation and video. The use of various forms of technology in language learning courses can provide not only comprehensible input, but also a platform for interaction, where learners can work with text and negotiate meaning with peers or a tutor through technology. In addition, technology based language learning can also give learners an opportunity to produce comprehensible output (Lamy and Hampel, 2007).

In other words, in order to facilitate English language learners’ language learning include TELL increases the learners’ access to comprehensible input (Warschauer and Healey, 1998), provides English language learners opportunities for output production (Blake, 2000), and gives learners opportunities to negotiate meaning (Fernández-García and Martínez-Arbeiaiz, 2002). Thus, studies in computer-mediated communication or technology-enhanced learning need to be exploited in contexts where English language learners need to improve their English, because though interaction, TELL has the potential of providing learners with comprehensible input, of encouraging learners to produce comprehensible output, and fostering negotiation of meaning.
2.1.2 Technology and the sociocultural theory of SLA

The framework of the sociocultural theory also known as ‘Social Development Theory’ focuses Vygotsky’s ideas on interaction and social aspects of learning. Compared to the cognitive paradigm where interaction is seen as the means by which input is made available to the human mind or as an opportunity for producing output, in the sociocultural context, interaction is defined in social terms. Vygotsky stressed the importance of social interaction such as peer collaboration, in developing cognition (Beatty, 2003). For teachers, this meant that providing students opportunities to interact was the single most important factor in stimulating the development of higher-order thinking.

a) Zone of proximal development

An important aspect of the Vygotsky theory is the idea that the potential for cognitive development is limited to a certain gap, which he calls the zone of proximal development (ZPD). The zone of proximal development (ZPD) represents the most crucial of Vygotsky’s postulates owing to its potential implications for education. The underlying assumption is that psychological development and instruction are socially embedded. Vygotsky defines the ZPD as, ‘the distance between the actual developmental level as determined
by individual problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Vygotsky, 1978, p.86).

Learning during the ZPD depends upon full social interaction. Vygotsky felt that the range of skills that would be developed with teacher guidance or through peer collaboration would exceed those that might be achieved by a learner working alone (Beatty, 2003). The ZPD thus, focuses on the language learners’ active creation or use of new means to accomplish and understand an activity. The language learner, as such, is not seen as a mere passive recipient of the teacher’s instruction, nor is the teacher simply the fount of all-knowing behaviour. Instead, the teacher and the language learner achieve intersubjectivity in joint problem-solving activity, in which both share knowledge and responsibility for the task. More importantly, Vygotsky’s ZPD actually represents a change of focus from teacher-fronted instruction to student-centred learning (Erben, Ban and Castañeda, 2009).

From Vygotsky’s theoretical perspective, technology has the potential to mediate students’ learning in a multitude of creative ways and open up many potential dynamic zones of proximal development (Erben et al. 2009). In other words, technology can be useful in providing learners with the opportunity to interact and collaborate with others in many ways. Moreover,
Lamy and Hampel (2007) state that there is no point to networked learning if you do not value learning through co-operation, collaboration, dialog, and/or participation in a community, thus asserting the social aspect of language learning. Opportunities for second language acquisition or even language enhancement can be offered by technology, as learners are exposed to new language and when learners are prompted to engage in collaboration that promotes negotiation of meaning (Beatty, 2003). Using technology in creative student-centred ways for language learners thus, brings one more step removed from relegation to silence and non-participation. The sociocultural theory thus, offers a theoretical framework for understanding technology enabled language learning, which, with its emphasis on communication, has claimed to provide excellent conditions for interactive and situated learning.

2.1.3 Technology and constructivist theory

In addition to the cognitive and socio-cultural theories of language learning, a theory conducive to second language acquisition is the theory of constructivism. Constructivism is a humanistic model suggesting that learning is a process by which learners construct new ideas or concepts by making use of their own knowledge and experiences. The learner has greater control and responsibility over what he or she learns and relies on schema or
mental models to select and transform information, create hypotheses, and make decisions (Beatty, 2003). In addition, constructivism assumes that the learner comes to the classroom with a rich set of ideas and experiences. According to the constructivist theory of learning, a student never enters a classroom as a \textit{tabula rasa} or a blank slate waiting to be filled with knowledge by the teacher. Instead, students come to each task of learning with the expertise and knowledge from prior experiences, which in turn influences the way in which a student approaches each new task of learning and internalises and constructs new knowledge from the task. In other words, constructivism allows and encourages learners to build on what they already know and go beyond the simple collection and memorization of information to develop individualized internalized principles. Thus, in a constructivist environment, the learner is the centre of the learning process, the one who constructs knowledge and meaning, linking incoming or new knowledge and information with existing knowledge.

Moreover, constructivism supports key constructs of collaboration and negotiation of meaning. Collaboration provides opportunities for negotiation of meaning as learners struggle to build new schemata and extend existing ones. Thus, the role of the teacher in a constructivist model includes presenting opportunities for learning and encouraging reflective thinking in learners, partly through collaborative peer activities. The teacher provides
the environment for relevant learning by creating whole, authentic, inherently interesting activities and by setting up multiple representations of reality and actual experience for learners, thus enabling them to construct their own knowledge. Thus, in the constructivist learning environment, learning is active rather than passive.

The pedagogical dimensions of constructive learning and approaches to instruction:

- provide a context for learning and stress the use of authentic materials,
- are process-oriented and experiential by nature,
- invite collaboration from many different sources,
- emphasize the use and development of higher order critical thinking skills such as decision-making and problem solving,
- regard reflection as crucial to the learning process, and
- assess learning in ways different from the traditional pen and paper test.

Instructional design using computer-based technology provides favourable settings for each of these pedagogical dimensions to take shape. Atkins (1993) reviewed several software packages which have been built on a
constructivist model along with the assertion of the importance of the history of technological developments and their design implications for learning and teaching applications. Thus, while constructivism informs various models of instruction, it particularly informs the computer-based instructional design. In other words, technology-enabled language learning could find its roots in the constructivist theory of learning.

2.2 Technology and the nature of writing

Pennington (1996) states ‘As a process of communication with the reader, writing is interactive and purposeful, fulfilling a wide range of functions.’ In its physical manifestation as (graphic) text, writing that fulfils various functions which include the mnemonic, distancing, reifying, social control, interactional, and above all aesthetic function. In other words, the function of writing is a system of communication which:

- supports memory (mnemonic function)
- expands communicative range (distancing function)
- renders communication in a tangible and depersonalized form (reifying function)
• regulates social conduct through its permanence and public nature in decrees, announcements, laws, contracts, and the like (social control function)

• coordinates a type of mediated, indirect interaction in letters, wills, recipes, instruction manuals, and the like (interactional function)

• makes possible literary genres such as the novel and certain kinds of poetry (aesthetic function) (Coulmas, 1989, p. 11-14)

Thus, with its purpose of fulfilling various functions, it can be noted that the form and process of writing has also evolved. With the evolution of the process of writing from pen and paper to a computer screen, it can also be noted that technology can function as a tool for writing which in turn serves the various functions of writing mentioned by Coulmas (1989). In serving the various functions of writing, Pennington (1996) further explains that the computer technology functions not only as tool, but also as a partner in creation and recreation of knowledge that formerly existed in the zone of proximal development to become the learner’s actual development. What’s more, for the non-native writer or for second language learners, the computer technology becomes an especially valuable partner, as it promotes a simple writing process that spurs the language learner to a higher level of performance in writing as well as in the creative construction process through which language develops (Pennington, 1996).
2.2.1 Opportunities offered by technology

Levy and Stockwell (2006) state that given the proliferation of technology, it is natural the technology in education practitioners see the existence of a technology that has the potential to be applied to a language-learning environment. Moreover, combining various technologies to achieve specific language-learning goals also provide learners with diversity and can help to increase productivity and motivation. The novelty and innovation that technology brings along with it may encourage second language learners to think of writing in English in new and positive ways as compared to writing in non-technology environments. With the essential use of computer technology for second language learners in promoting the writing skills, Pennington (1996) provides an elaborate list of the positive potential of technology in fostering writing skills of second language learners.

Firstly, as Phinney (1989) noted, the presence of technology in the form of a computer screen, for instance, helps learners imagine an audience in a way that they are not writing in a vacuum. Moreover, technology aids in the generation of a perceived objective distance from students’ own work which helps them gain a critical assessment, thus reducing the threats for revisions and corrections (Kantrov, 1991). The electronic medium allows second language learners write freely which results in improved attitudes towards
writing in English. Phinney (1989) also notes that technology can also provide opportunities for a pre-writing brainstorming environment that allows the writer to put down a great quantity of ideas in written form before they are forgotten or altered in short-term memory. This in turn may prove useful for generation of ideas. In addition, Pennington (1996) reports that the cycle of thought and translation of thought by using the electronic keyboard for typing out the generated ideas can not only become a self-reinforcing, recursive psychomotor process but also foster the activation of higher levels of cognition during the writing process.

Additionally, while the mutability of the text allows the piece of writing to be viewed and evaluated before being finalized (Pennington, 1996), the readable display may also encourage visual monitoring (Moya, 1987) on the other hand. In other words, the ‘ephemeral nature’ as noted by Kantrov (1991) and the emergent quality of the text helps reinforce the notion of writing as a process of evolving ideas and not only production of written text. Above all, when word processing is married to other computer capabilities such as hypertext, multimedia, hypermedia, with networking utilities, many of the features of writing on computer are enhanced. While hypertext ‘as a uniquely appropriate vehicle for reflective, non-linear exploration’, may help support an enriched network of thoughts and associations that assists writers in exploring and developing their ideas,
thereby enhancing the cognitive potentials of word processing. And multimedia enhancements to word-processed documents have also obvious motivating potentials beyond those of word processing per se that may encourage positive attitudes to writing, stimulate creativity and productivity, and help develop pride in the finished product (Pennington, 1996).

2.2.2 Challenges posed by technology

While on one hand technologies for writing hold a range of positive potential, on the other, studies have also shown the negative potential in the use of technology for writing. While the computer may be a real asset in terms of motivation to write, on the other hand, the novelty of the machine may make it seem alien and unapproachable (Piper, 1987). Negative attitudes towards technology may inhibit them from using it extensively and effectively in their writing (Phinney and Khouri, 1993). Learners may also lose some interest in composing if the range of technical options seems overwhelming as was the case in with one writer in the Owston and Wideman (1992) investigation of experienced computer users. Moreover, any physical difficulties that the ESL learner experiences on computer may be compounded by negative psychological reactions to the machine, resulting in a spiralling sense of inadequacy inimical to the development of ideas (Pennington, 1996). Also, the ephemeral, emergent quality of the
computer-generated text and the capability offered by word-processing of putting down thoughts in non-permanent mode may encourage writers plan less to the extent that they may produce regurgitative, unreflective, superficial writing (Haas, 1989). Thus, while the computer offers the potential benefit for non-native students of becoming self-sufficient writers, it can also promote a false sense of self-sufficiency which is actually a dependency on the computer and which ultimately results in isolating language learners from their teachers and from each other (Pennington and Brock, 1992).

In a broader sense, while technology may have opened up many opportunities for learning and exchange that were not possible through traditional means, there have also been some unexpected outcomes as a result of the use of new technologies for language learning. These may be issues such as:

- Breakdown in technology due to infrastructural or logistical problems
- Unanticipated events leading to technical difficulties
- Restricted access to certain resources due to regional security blocks
- Ascertaining appropriateness of web resources
- Availability of curricula time
- Plagiarism
• Hacking

• Translation tools

To begin with, technical difficulties such as power failures, breakdown in the Internet service or Wifi connection or not being able to launch or connect to the required program may end up easily frustrating students and teachers alike. Secondly, unanticipated events which may cause breakdown in logistics could also be de-motivating for both the learners and teachers.

Another important issue is that of restricted access. Depending on the socio-cultural context within which an institution of higher education may function, access to certain type of websites or websites with free adverts or pop-ups may be blocked. The specific restriction therefore, may act as a deterrent for language learners from accessing the web in general. Another challenge that students may be faced with, is the discernment in the appropriateness of a website. The availability of multitudes of resources online may be too overwhelming for the language learner, thus leading to confusion in the learner’s mind with regards to ascertaining how reliable and authentic the resources are. In addition, the ‘adjunct’ use of technology outside the curriculum may render it to a place of lesser importance. Hence, an important factor to be considered is the integration of the use of technology into the curriculum. Another growing concern among language
trainers and practitioners of technology is plagiarism, hacking, and most importantly, the use of translation software in linguistic production.

Thus, while the properties of a particular form of technology may contribute to favourable outcomes in one case, it may contribute to unfavourable outcomes in another. What makes the difference is, how good the match is between the properties of the medium, the attributes of the users, and the way in which it is implemented in a given context. Thus, while the potential for opportunities is also bundled with challenges, it becomes important to recognize the challenges and accordingly incorporate the use of technology in language learning in an optimal way that best benefits the language learner ultimately.
2.3 Principles in designing TELL

With the advent of information communication technology, language learning through technology has become a fact of life with important implications for second language acquisition (Chapelle, 2001). New theories and applications of language learning and teaching are exploring the benefits of information communication technology to facilitate SLA. In these activities, instructional design based on the communicative language teaching paradigm has shifted language teaching and learning practices in computer-assisted language learning or CALL environments (Box, 2003; Chapelle, 2001).

Educational research findings suggest that the success of any educational process should be based on sound pedagogical principles and interactions. Pennington (1996) notes that an ideal teaching system:

- Helps learners develop and elaborate their increasingly specified cognitive representation for the second language
- Allows learners to experiment and take risks in a psychologically favourable and motivating environment
- Offers input to both conscious and unconscious learning processes
• Offer learners opportunities to practice and to receive feedback on performance
• Puts learners in touch with other learners
• Promotes cultural and social learning
• Promotes interactivity in learning and communication
• Exposes the learner to appropriate contexts for learning
• Expands the learner’s ‘zone of proximal development’
• Builds to learner independence

2.3.1 Potential of new technologies

As technologies develop, they bring with them a range of functionalities that can be applied to language learning. Sophisticated storage options including devices and cloud computing have led to much more flexibility, versatility, and access as far as language learning is concerned in that it is far easier to store greater volumes of text, sound and video. Moreover, resources such as language learning websites are multifaceted and multifunctional and are able to contain and support wide range of language learning activities. And more recently, authoring tools and learning management systems (LMS) allow language teachers to tailor specific tasks and activities and even courses or programs to suit specific learning goals and objectives. LMS also known as course management systems or virtual learning environments (VLE), are
powerful tools providing delivery of content, bulletin board system or discussion boards, chat facilities, email links, as well as online activities, quizzes, and even submission of assignments electronically. In other words, an LMS provides an environment in which a number of tools that teachers require to manage a course can be located in one environment. While authoring tools may prove useful for individual learning tasks or activities, learning management systems provide the opportunity of integration of activities into one whole in a comprehensive and systematic way. In addition, the development in various technologies such as Sharable Content Object Reference Model (SCORM) or XML has extended the potential of authoring tools by opening up the exchange of information between formats and platforms. Also, technologies where information shared by several applications stored in a database open up possibilities such as knowledge pooling and reusability (Colpaert, 2004). In addition, technologies like audio and video conferencing for language learning contribute greatly to creating opportunities for language learners including those such as a form of highly individualized learning.

Thus, with greater choices come greater diversity, and this diversity opens up the avenues for further development ideas and concepts. While the development of new technologies gives rise to completely new ways of thinking and communicating, the introduction of new technologies thus,
brings a complete reassessment or reappraisal of the pedagogy used. As a result, this may lead to a readjustment of existing pedagogies in some cases or in others, developing a completely new pedagogy. Thus, the potential of technology providing opportunities for language learning, leads to the principles in the design of a technology-enabled language learning program.

2.3.2 Design with theory, pedagogy, and technology

Milton (2003) envisaged that an integrative design with online provision of language instructions and tools should support iterative stages of language exposure, review, practice and production, leading to communicative tasks. An integrative design should therefore help learners acquire relevant linguistic knowledge, skills and strategies by accessing comprehensible resources and tools of autonomous acquisition and relevant production. In other words, the design of the program or course should be coherent and planned while adhering to general cognitive learning principles by providing opportunities for self-discovery, problem solving, and collaboration (Alley and Jansak, 2001).

In addition, educational research findings suggest that the success of any educational process should be based on sound pedagogical principles and interactions (Box, 2003; Chapelle, 1998; Day and Shapson, 2001; Ellis,
While, Chapelle (2003b) pays considerable attention to determining principled designs for language learning tasks, Cohen’s notion of “multiple ability tasks” mentions that the tasks:

- Have more than one answer or more than one way to solve the problem
- Are intrinsically interesting and rewarding
- Allow different students to make different contributions
- Use multimedia
- Involve sight, sound, and behaviours
- Also require reading and writing
- Are challenging (Cohen, 1994, p.68)

Blyth (1999) in his study on students’ perceptions on use of computers in the language learning concluded that successful implementation of new pedagogical approaches in software design and learning activities had to consider the learning context as well as the background of the students. Bradley and Lomicka (2000) found that simply using the computer to generate materials, authentic or not, was not enough. Rather, tasks and activities that involve the use of such materials were found to promote successful learning. An observation made in the language learning was that it was through process of communication that students could draw on their
abilities to anticipate new information, notice insufficient knowledge, and relate the new information to pre-existing information. This resulted into the concept of communicative task, that is, a meaning-focus activity, which was based predominately on the notion of communicative language use. Studies showed that communicative language use proved a successful and powerful approach to language learning (Batstone, 2002; Gonzalez-Lloret, 2003; Izumi, 2002; Pica, 1991; Schollaert, 1998; Skehan, 1998).

In addition to the communicative aspect of language learning, Chávez (1990) determined that technology in combination with tasks that were based on “meaningful interactional purposes” could be used to promote a positive L2 learning environment. Such tasks or activities promoting linguistic/conversational adjustments promoted comprehensible input (i.e. elaborated learning routines). Moreover, these tasks created situations that encouraged the production of comprehensible output (e.g., a modified speech, written text) from the students. As a result, as shown by several studies, the arrival of new technologies could offer a turning point in design of English teaching methodology (Ganderton, 1998; Hellebrandt, 1999; Kelm, 1992; Lee, 1997; Sanaoui and Lapkin, 1992; Van Handle and Corl, 1998; Warschauer, 1996).
2.4 Affordances by technology

Previous research indicates that computer-mediated language learning can facilitate communication, reduce anxiety, encourage oral discussion, develop the writing/thinking connection, nurture social or cooperative learning, promote egalitarian class structures, enhance student motivation, facilitate cross-cultural awareness, and improve writing skills. In light of these positive effects, an increasing number of ESL/EFL teachers have embraced multimedia technology. The use of multimedia technology for foreign language instruction has expanded rapidly during the past two decades. Studies of the influence of technology-enhanced instruction on language learning have also appeared in growing numbers (Abrams, 2002; Al-Jarf, 2004; Blasszauer, 2001; Chikamatsu, 2003; Jogan, Heredia, and Aguilera, 2001; Meskill and Anthony, 2005; Muehleisen, 1997; Salaberry, 2001; Schwienhorst, 2004; Warschauer, 1995, 2000; Weininger and Shield, 2003; Yang, 2001).
2.4.1 New Literacies – Information, electronic, critical

An important point of consideration for the designing of technology-enabled language programs is the affordances made by the emergence of new literacies. Shetzer and Warschauer (2000) describe electronic literacy something which “involves what has been called information literacy—the ability to find, organize and make use of information—but electronic literacy is broader in that it also encompasses how to read and write in a new medium.” Warschauer (2004) further explains that in the era of print, the act of reading consisted of an attempt to understand the meaning of a single author. In contrast, reading in the online era has become an attempt to interpret information and create knowledge from a variety of sources. While reading and researching skills include selecting the right questions, choosing the right tools, finding information, archiving and saving information, interpreting information, and using and citing information, conducting research online is different, since the very act of reading cannot be done without making critical decisions at every step. As a result, since virtually all literacy necessitates critical judgement, this gives rise to the incorporation of “critical literacy” in language education. And it is the Internet that is playing a major role in the emerging new literacies. With the use of e-mail, the ability to conduct Internet searches and Web page production as skills, computer technology is no longer just a possible tool
for teaching English—rather it is an essential new medium of language and literacy practices, alongside face-to-face communication and the printed page. In recent years, the Internet has become, perhaps, the most visible example of the new hypertext, hypermedia literature. But using the Web effectively would require new skills. Shetzer and Warschauer (2000) developed a framework “for planning tasks and projects for the language classroom that use computers and the Internet as tools for personal and professional empowerment”. This framework included the creation, storage, and maintenance of Web pages. Such skills once learned, would allow teachers and students to communicate in a new mode. The provision of hypertext in the web pages could also provide a method for students and teachers to interactively collaborate on projects and present ideas with interactive visual and verbal messages. Thus, students enter a new type of literacy experience which from passive learners to active information explorers (Barnes, 1994). Similarly, Kress (1997) observes that as this new form of literacy requires them to differentiate between visual images that convey important information and those that embellish the sites, students have to engage in a high degree of visual analysis. Hence it has been noticed that in the 21st century, ideas of literacy are being rapidly reshaped by new Internet-based hypermedia technologies (Bicknell, 1999).
Consequently, educators in every field, including the teaching of ESOL, have been discovering ways to incorporate Web-based activities into their curricula as can be seen in several studies (e.g., Li and Hart, 1996; Metzler, 1998; Soltecz, 1996).

### 2.4.2 Technology-mediated tasks

In addition to the affordances made by new literacies, technology-mediated tasks have also formed the basis for the principles in designing TELL. A number of studies have validated the powerful effect mediation in second language learning. All the studies provide evidence to suggest that mediation acts as a cognitive amplifier that not only facilitates the English language learner interaction but also helps them to reconstruct their sociocultural, linguistic and professional discursive practices and promotes their socialization into target knowledge communities. Moreover, these studies have also established how meditational tools provide a key strategic and cognitive role in scaffolding in group activity in second language classrooms (Erben et al. 2009). It has been noted that the type of technology-based language learning through mediation can be categorized into two modes:
a) synchronous or real-time where the interaction occurs at the same time and

b) asynchronous with the interaction occurring at different times.

Synchronous interaction involves participants online at the same time in order to communicate in real time. Modes of synchronous tasks include Web-based chats whereas modes of asynchronous tasks include e-mail messages and bulletin board interactions. Examples of synchronous communication include telephone conversations, board meetings, voice conferencing, video conferencing, and electronic chat.

Asynchronous interaction involves participants communicating over elapsed time. In this type of interaction, a time delay exists between the time the sender sends a message and when the receiver reads the message. Examples of asynchronous technologies include email, text messages transmitted over cell phones, and bulletin boards or discussion forums. Lamy and Goodfellow (1999) found that asynchronous bulletin board messages in a foreign language class promoted three degrees of interactivity, described as (a) monologic (i.e., “contain[ing] no invitation to interaction,” p. 48), (b) conversational (i.e., social in nature), and (c) reflective (i.e., allowing participants to negotiate meaning through personal exchanges, focus on
formal features of language and strategies, and produce modified output within a structured setting).

Other recent studies (Kamhi-Stein, 2000; Schlagal, Trathen, and Blanton, 1996; Yildirim and Kiraz, 1999) have suggested that using asynchronous computer mediated communication modes such as, Web-based bulletin board systems and e-mail in practicum courses allowed student teachers to collaborate with their peers, mentor teachers, and supervisors and that it reduced the student teachers’ feelings of isolation. Thus, students using the asynchronous Web-based bulletin board systems in addition to reducing the social distance between students and the course instructor, promoting continuous dialogues, and reducing anxiety, in particular among non-native English speaking students, most importantly allowed them to develop knowledge as a social activity rather than an individual activity. Consequently, the use of both asynchronous and synchronous technologies has intensified in all sectors of society including educational settings (Pérez, 2003).

Computer-mediated communication could allow for both synchronous as well as asynchronous communication. Activities could involve a variety of participant configurations and technology adds new and interesting dimension to the tasks developed through the Internet and therefore change
critical dimension of the task situations. (Chapelle, 2003b) suggests that the tasks could consist of both oral and written language, but interesting from the perspective of language teaching are the opportunities afforded by written interactive exchanges. This mode allows learners time to reflect on the language both during and after production. Moreover, research suggests that when communication occurs online, there is increase participation on the part of students, the teacher’s role as the instructor shifts from disseminator of knowledge to a moderator, thus increasing student participation, the quality of language generated by students is favourably impacted by their participation in computer-mediated communication (Erben et al. 2009).

2.4.3 Ease of access

The rise in sophisticated technological environments, in the last few years, has opened up the possibility of language programs to be designed by using learning management systems being accessed from anywhere and on any device. Sotillo (2002) mentions that wireless learning environments represent a shift from traditional approaches to learning and teaching to one that combines objectivist and constructivist knowledge and collaborate with classmates outside the classroom from anywhere on or off campus while working as part of a team. In addition, the cognitivist and sociocultural
pedagogical principles also inform the use of wireless technologies in educational environments. Ease of access to the Internet or other language programs designed with the integration of new technologies have proved to have increased students’ productivity. Central to the theme of collaboration which is made possible with the availability of easily accessible learning environments, Brown (1996) while discussing the importance of collaboration in electronic performance support systems (EPSSs), explains that these systems could allow learners to go beyond mastering basic skills and that the knowledge learners actively construct with others is based on personal experiences, mental structures, and belief systems that enable to interpret external reality events. Thus, both objectivist and constructivist approaches to learning seem to be enhanced by the use of wireless campus networks that enable students working from various campus locations to quickly download information from the Internet, hold brainstorming sessions online, and work collaboratively on group assignments. They do not need to be confined to a specific classroom or computer lab, or meet face-to-face with other students. With wireless connectivity, students could create their own learning environments and increase their learning potential and productivity (Holen, 2002; Lorion 2002; Olsen, 2002). Thus, it becomes important that the design of a technology-enabled language program incorporates the affordance provided by the ease of access of new technologies.
2.4.4 Interactivity through discussion boards

Another key affordance made by new technologies especially in most learning management systems is the integration of various forms of discussion boards for interaction. As Bikowski and Kessler (2002) observe that discussion boards which constitute asynchronous communication, where communication is not immediate and temporal, allow learners to take control of their own learning in a supportive and collaborative environment, and encourage them to reflect on how they accomplish tasks. Discussion boards meet several key constructivist concepts. Students are able to:

a) use other technologies for experiential learning tasks,

b) collaborate with others for completion of tasks,

c) reflect on the process they used to accomplish the task, and

d) increase control of their project and thus their learning.

Thus, together, all these experiences lead to increased student motivation and greater achievement. It has been noted that researchers who have compared small group interactions in oral and network-based modes have shown increased participation in electronic classroom discussions (Sullivan and Pratt, 1996; Warschauer, 1996). In reviewing early research on
innovative use of networked computers in language learning, Beauvois (1998) found that students in networked writing projects demonstrated more fluid conversation. ESL learners might have more time to think, phrase responses, and participate in networked writing.

The longevity and universality of discussion boards in various forms are a testament to their versatility and usefulness. Since, discussion boards provide flexibility, interconnectivity, once combined with other computer program and integrated into a course they could become rich teaching and learning tools. Thus, while designing a technology-enabled language enhancement program, it also becomes important to integrate the element of discussion boards.

2.4.5 Peer-review and feedback

A significant affordance made by technology especially in writing is the ability to review and provide feedback electronically. In the field of second language acquisition, researchers have shown that negotiations of meaning that occur during peer reviews of writing assignments or research papers shape second language learners’ revising strategies, increase their responsibility for the learning process, and allow them opportunities to develop audience awareness. Peer corrective feedback is congruent with
Vygotskian approaches to learning that emphasize collaboration, which eventually leads to independent problem solving. Thus, in some ESOL writing classes, teachers use peer-editing as a means of establishing a real audience, underscoring the point that writing is an interaction between a writer and reader, and that it must be comprehensible and meaningful to the reader (Bicknell, 1999).

Some studies have looked at community building while using technology. Several researchers discussed the benefits of developing peer response writing groups via email, chat rooms, and electronic bulletin boards (Sirc, 1989). Warschauer’s (1996) research indicated a number of benefits derived from incorporating collaborative writing technology into L2 writing procedures. One benefit was increased learner participation. At the same time, the role of the teacher became less focal, and her position as teacher was transformed at times to that of another voice in the online review process. In addition to the above, Sullivan and Pratt’s study (1996) suggested that L2 writing students were likely to receive more focused responses from peer evaluators using computers than from evaluators giving face-to-face feedback. The use of computer-mediated communication thus also increased writing practice. The students in this class also gained benefits from this collaborative experience. One benefit was that they experienced many opportunities for practicing extensive reading and
writing. Because the majority of the feedback in this study was written, students had more opportunity for writing. Another benefit was that the L2 writers learned a response rhetoric. They received e-feedback training and generally stuck to the taught format, providing praise, constructive criticism, and final encouragement. The training helped to prepare them for the task of responding with encouraging, high-quality responses. A third benefit was that the L2 writers developed a greater sense of audience. The responses they received helped them to see what areas of their texts they needed to revise to more effectively communicate their ideas (Sullivan and Pratt, 1996; Tsui, 2000).

While examining peer response through networked computers in writing classrooms, researchers have reported that Web-based response is easier than face-to-face response, being characterized by more participation, more discussion during interactions, more feedback, and gradually increased confidence (Beauvois, 1998; Braine and Yorozu, 1998; Cononelos and Oliva, 1993; Curtis and Roskams, 1999; Davis and Thiede, 2000; Hartman et al., 1991; Kivela, 1996; Ortega, 1997). Thus, studies in the effective language learning and the potential offered by technology for of peer-review makes it attractive for incorporating this feature into a language program.
2.4.6 Autonomy, control, and responsibility

Most importantly, an affordance offered by new technologies is the opportunity for building autonomy, control, and responsibility among language learners. Learner autonomy was defined by Holec as “the capability of taking charge of one’s own learning” (1981, p. 4), which provided an initial theoretical framework for future research in the field. Autonomous language learning (ALL) consists of three essential components: structure, control and responsibility (Murray and Kouritzin, 1997). In other words, learners must be operating within a structure that enables them to exercise control over their learning and to assume the responsibility that this entails (Holec, 1981). Learner autonomy in second/foreign language education has been promoted across the globe, and its popularity can be partially related to the increasing importance of computers in language learning (Schmenk, 2005).

Yan and Xiaoqing (2009) note that considered as being able to greatly increase the opportunities for learners’ exposure to English and other languages and to provide a more flexible learning environment accommodating individual needs and preferences, computers and networks have been integrated into various language learning curricula and self-access language learning centres based on computers and networks have been
established in universities and colleges worldwide. With the assistance of computers and networks, college English learning is supposed to be “free from the constraints of time or place and geared towards students’ individualized and autonomous learning” (National Education Ministry of the People’s Republic of China, 2004, p. 19).

Murray (1999) investigated the learners’ experiences of ALL in an interactive video program, Yumuk (2002) probed into how an Internet-information-search-based ALL program in an academic translation course promoted a more autonomous view of learning, Schwienhorst (2003) discussed how tandem learning via computer mediated communication could facilitate autonomy, and Luke (2006) reported increased autonomy in a technology-enhanced, inquiry based ALL program with a fourth-semester university Spanish class. Therefore, in the design of the a program which could incorporate more meaningful, motivational and challenging language activities both in and out of class, and to provide more specific and individualized guidance and support for the students, the possibility of enhancing autonomy among students could be fully explored.
2.5 Evaluation of TELL

With the development of the new technologies and their incorporation into language learning programs, several frameworks for evaluation of technology-enhanced language learning have also been discussed. For a technology-enabled language learning program which has been designed and motivated by the general principles drawn from language learning and teaching, it becomes important to mention the two important frameworks of evaluation of CALL which consequently hold true for TELL. The first framework is that of Hubbard (1992) which is an integrated methodological framework evaluation of courseware developed with the help of computer technology. Hubbard (1996) later asserted the principles underpinning his framework should:

1. Be based on or be consistent with exiting frameworks for language teaching methodology
2. Be “nondogmatic and flexible” and should not be tied to any single conception of the nature of language, language teaching or language learning
3. Link development, evaluation, and implementation explicitly
4. Identify the elements of the teaching/learning process and the multiple interrelationships among them
In contrast to Hubbard’s framework of evaluation which is essentially methodology driven, the evaluation framework by Chapelle (2001) is particularly theory driven. SLA theory, specifically, theories related to “ideal cognitive and social affective conditions of SLA” (p.45), is absolutely central to Chapelle’s framework of evaluation. There is a special emphasis on the design and structure of the language learning task as a means by which theory is put into practice. Thus, the perspective of evaluation embodies five principles:

1. Evaluation of CALL is situation-specific argument.
2. CALL should be evaluated through two perspectives: judgemental analysis of software and planned tasks, and empirical analysis of leaner’s performance.
3. Criteria for CALL task quality should come from theory and research on instructed SLA.
4. Criteria should be applied in view of the purpose of the task.
5. Language learning potential should be the central criterion in evaluation of CALL.

Thus, the emphasis on the theory in the evaluation framework, renders the traditional evaluation framework of checklists and comparisons with
traditional classroom instruction questionable. It may be acknowledged that some researchers may value the way of conducting research on CALL through comparison studies testing the differences in learning outcomes of students who have used CALL with those who have been taught in traditional classrooms. However, Chapelle (2003b) argues that “people wishing to see results of research comparing CALL with classroom study seem to assume that a case needs to be made for using technology in English language teaching” (p.70). In other words, these assumptions are questionable since it has become important to understand the variety of opportunities technology appears to hold for language learners today. Moreover, Chapelle (2003b) asserts that very little, if anything can be gained by conducting CALL vs. classroom comparison studies because the genuine questions about CALL cannot be addressed through such gross comparisons. As a result there is a need to for researchers and practitioners to see the potential of CALL in itself for the construction of better technology-based language tasks.
2.6 Implications for the current study

On the basis of the potential of technology in facilitating language learning theories, the principles of designing TELL and the evaluation of the effectiveness of technology-enabled language programs, the current study researches what Chapelle (2003b) calls useful, in the sense that, the study provides evidence about the design of the technology-enabled language learning program, the learner’s use of the program, and the way in which the tasks have been organised. Moreover, the study integrates the various affordances made by technology into a single program and thereby sets out to test the effectiveness of such a program in enhancing particular language skills, in this case, written communication. While theories have been used to help conceptualize and develop the research, the theory acts as a resource to make sense of the object of investigation in terms that allow for an understanding in of the results that extend beyond the data of a particular study to speak to the issues of relevance beyond the research (Chapelle, 2003b). With the foundation of theory, pedagogy, and tasks-based teaching and learning, the effectiveness and evaluation of the program through this study may prove useful in the design and implementation of future technology-enabled language programs based on substantial language learning theories and sound pedagogical principles.
2.7 Conclusion

This chapter thus, reviewed the literature associated with the main areas of interest on this study. A description of an overview of the theories related to language learning and second language acquisition in particular, followed by a section on the place of technology within the framework of these theories. This then led to the use of technology and the evolution in the nature of writing. Thus, this led to the examination of positive and negative potential offered by technology. The subsequent section dealt with the principles in designing technology-enabled language learning programs with the varied generic and specific features offered in the form of affordances made by new technologies. Finally, the chapter concludes with the evaluation of the technology-enhanced language learning and the implications of the current study.