CHAPTER -2

LITERATURE REVIEW
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2.1 Introduction

In the 21st century, HE is under increasing pressure to take advantage of new technologies. Using technologies to enhance learning as well as understanding and sharing knowledge in different ways become key challenges for individuals, organisations and educators. As discussed in the several literatures, this study concentrates on the notion that the individual is at the heart of learning, and sharing. Learning is an ongoing, everyday, lifelong and ultimate survival skill, taking place in numerous diverse ways such as communication, reading and writing. In this sense, it is informal, including “incidental learning” [115] and everyday learning. The researcher has reviewed the major works of literature in four wide areas namely WBL, Learning theories, KM, KS and social computing.

In this chapter, the researcher presents an overview educational theory for WBL. A large and growing body of literature has contributed to learning theories; the researcher focuses on important learning theories and discusses its implication towards WBL system. KS has been increasingly studied in KM field and brings a new dimension for learning in HE setting and it will be discussed on its applicability in WBLE environment. Moreover a special consideration will be given to social computing perspective to harness its potential to facilitate KS among students and educators.

The World Wide Web has created unparalleled interest among educators on a global scale. Research claims have been made that the web is a major revolutionary force that is reshaping the educational and training scenario. This is primarily due to its affordances of connectedness and accessibility to information. It has been suggested that the web can make learning more accessible and has the potential to improve learning—both achievable in a cost-effective and efficient manner [144]. Thus the Web holds particular promise in the higher education
context and web-based instruction has come to be seen as an important and effective means to provide sustainable, high-quality instruction to more students, without necessarily requiring an appreciable increase in numbers of faculty.

Web-Based Learning is defined vaguely in the literature. For example, Khan [95] defines web based instruction as “a hypermedia-based instructional program which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported”. He does go on to provide a little more detail such as: “A web based learning environment should include many resources, support collaboration, implement Web-based activities as part of the learning framework, and support both novices and experts” [95].

Various terms have been used to describe Web-based learning environments. Each term highlights the particular emphasis for which the Web is used:

- Web-based course-support environment
- Online learning environment
- Virtual Learning Community
- Computer-mediated communication environment
- Collaborative Learning Environments

Undoubtedly, WBL is quickly changing the face of higher education because it attracts students of all ages. Universities, continuing education institutions and commercial organizations are turning to online learning for valid reasons.

Though there are many advantages to offering web based education, web based education is not without its challenges. Many of the challenges are directly related to the same advantages of web-based education [42]
The goal of the research is to promote enhanced KS among students in the WBLE. Therefore, before any learning systems or resources are developed, it is absolutely essential to know the principles of learning and how students learn. This is especially true for the proposed WBL systems, where the educator and the learner are separated. The development of effective learning systems should be based on proven and sound learning theories. As discussed above, the delivery medium is not the determining factor in the quality of learning; rather, the design of the course determines the effectiveness of the learning [166].

2.2 Theories of Learning

There is ongoing debate about whether it is the use of a particular delivery technology or the design of the instruction that improves learning [38]. It has long been recognized that specialized delivery technologies can provide efficient and timely access to learning materials; however, Clark [37] has claimed that technologies are merely vehicles that deliver instruction, but do not themselves influence student achievement. As Clark [37] notes, meta-analysis studies on media research have shown that students gain significant learning benefits when learning from audio-visual or computer media, as opposed to conventional instruction, however, the same studies suggest that the reason for those benefits is not the medium of instruction, but the instructional strategies built into the learning materials. Similarly, Schramm [169] suggested that learning is influenced more by the content and instructional strategy in the learning materials than by the type of technology used to deliver instruction.

According to Bonk and Reynolds [21], to promote higher order thinking on the Web, WBL must create challenging activities that enable learners to link new information to the old, acquire meaningful knowledge, and use their meta cognitive abilities; hence, it is the instructional strategy and not the technology that influences the quality of learning. Kozma [99] argues that the particular attributes of the computer are needed to bring real-life models and simulations to the learner; thus, the medium does influence learning. However, it is not the computer that makes students learn, but the design of the real-life models and simulations, and the
students' interaction with those models and simulations. The computer is merely the vehicle that provides the processing capability and delivers the instruction to learners [38]. Kozma [99] is correct in his claim, but learners will not learn from the simulations if the simulations are not developed using sound design principles.

Online learning allows for flexibility of access, from anywhere and usually at anytime—essentially, it allows participants to collapse time and space.[39] however, the learning materials must be designed properly to engage the learner and promote learning. According to Rossett [165], online learning has many promises, but it takes commitment and resources, and it must be done right. “Doing it right” means that online learning materials must be designed properly, with the learners and learning in focus, and that adequate support must be provided. It was suggested by [165] that online learning should have high authenticity (i.e., students should learn in the context of the workplace), high interactivity, and high collaboration. This part discusses the foundation of educational theory for the design of effective WBL system, and suggests a model for developing online instruction based on appropriate educational theory.

There are many schools of thought on learning, and no one school is used exclusively to design WBL system. As there is no single learning theory to follow, one can use a combination of theories to develop WBL systems. In addition, as research progresses, new theories are evolving that should be used in developing WBL materials. The WBL system developer must know the different approaches to learning in order to select the most appropriate instructional strategies. Learning strategies should be selected to motivate learners, facilitate deep processing, build the whole person, cater for individual differences, promote meaningful learning, encourage interaction, provide feedback, facilitate contextual learning, and provide support during the learning process. The remaining part of this chapter will present the different schools of thought on learning, and will suggest how they can be used to develop effective WBL system.
2.2.1 Behaviourist Theory

Early computer learning systems were designed based on a behaviourist approach to learning. The behaviourist school of thought, influenced by Thorndike [187] Pavlov [146] and Skinner [175] postulates that learning is a change in observable behaviour caused by external stimuli in the environment [175]. Behaviourists claim that it is the observable behaviour that indicates whether or not the learner has learned something, and not what is going on in the learner's head. In response, some educators claimed that not all learning is observable and that there is more to learning than a change in behaviour. As a result, there was a shift away from behaviourist to cognitive learning theories.

2.2.2 Cognitivist Theory

Cognitive psychology claims that learning involves the use of memory, motivation, and thinking, and that reflection plays an important part in learning. They see learning as an internal process, and contend that the amount learned depends on the processing capacity of the learner, the amount of effort expended during the learning process, the depth of the processing [45] and the learner's existing knowledge structure [12].

2.2.3 Constructivist theory

Recently, there has been a move to constructivism. Constructivist theorists claim that learners interpret information and the world according to their personal reality, and that they learn by observation, processing, and interpretation, and then personalize the information into personal knowledge [43]. Learners learn best when they can contextualize what they learn for immediate application and to acquire personal meaning.

Constructivists see learners as being active rather than passive. Knowledge is not received from the outside or from someone else; rather, it is the individual learner’s interpretation and processing of what is received through the senses that creates knowledge. The learner is the center of the learning, with the instructor
playing an advising and facilitating role. Learners should be allowed to construct knowledge rather than being given knowledge through instruction [53]. A major emphasis of constructivists is situated learning, which sees learning as contextual. Learning activities that allow learners to contextualize the information should be used in online instruction. If the information has to be applied in many contexts, then learning strategies that promote multi-contextual learning should be used to make sure that learners can indeed apply the information broadly.

Learning is moving away from one-way instruction to construction and discovery of knowledge [185]. In his transformation theory, Mezirow [122] uses both constructivism and cognitivism to explain how people learn. He sees learning as “the process of using a prior interpretation to construe a new or revised interpretation of the meaning of one’s experience in order to guide future action”. Transformative learning involves “reflectively transforming the beliefs, attitudes, opinions, and emotional reactions that constitute our meaning schemes or transforming our meaning perspectives”. Mezirow [122] claimed that learning involves five interacting contexts: the frame of reference or meaning perspective in which the learning is embedded, the conditions of communication, the line of action (process) in which the learning occurs, the self-image of the learner, and the situation encountered during the learning process.

**Implications for Online Learning**

1. Learning should be an active process. Keeping learners active doing meaningful activities results in high-level processing, which facilitates the creation of personalized meaning. Asking learners to apply the information in a practical situation is an active process, and facilitates personal interpretation and relevance.

2. Learners should construct their own knowledge rather than accepting that given by the instructor. Knowledge construction is facilitated by good interactive online instruction, since the students have to take the initiative to learn and to interact with other students and the lecturer, and because the
learning agenda is controlled by the student [128]. In the WBLE, students experience the information at first-hand, rather than receiving filtered information from an instructor whose style or background may differ from theirs. In a traditional lecture, the lecturer contextualizes and personalizes the information to meet their own needs, which may not be appropriate for all learners. In WBL systems, learners experience the information first-hand, which gives them the opportunity to contextualize and personalize the information themselves.

3. Collaborative and cooperative learning should be encouraged to facilitate constructivist learning [82] [89]. Working with other learners gives learners real-life experience of working in a group, and allows them to use their metacognitive skills. Learners will also be able to use the strengths of other learners, and to learn from others. When assigning learners for group work, membership should be based on the expertise level and learning style of individual group members, so that individual team members can benefit from one another's strengths.

4. Learners should be given control of the learning process. There should be a form of guided discovery where learners are allowed to make decision on learning goals, but with some guidance from the instructor.

5. Learners should be given time and opportunity to reflect. When learning online, students need the time to reflect and internalize the information. Embedded questions on the content can be used throughout the lesson to encourage learners to reflect on and process the information in a relevant and meaningful manner; or learners can be asked to generate a learning journal during the learning process to encourage reflection and processing.

6. Learning should be made meaningful for learners. The learning materials should include examples that relate to students, so that they can make sense of the information. Assignments and projects should allow learners to choose meaningful activities to help them apply and personalize the information.
7. Learning should be interactive to promote higher-level learning and social presence, and to help develop personal meaning. According to Heinich [78] learning is the development of new knowledge, skills, and attitudes as the learner interacts with information and the environment. Interaction is also critical to creating a sense of presence and a sense of community for online learners, and to promoting transformational learning [128]. Learners receive the learning materials through the technology, process the information, and then personalize and contextualize the information. In the sharing process, learners interact with the content, with other learners, and with the instructors to test and confirm ideas and to apply what they learn. Garrison [76] claimed that it is the design of the educational experience that includes the transactional nature of the relationship between instructor, learners, and content that is of significance to the learning experience.

By proposing a model and develop a system for WBL, based on educational theory, that shows important learning components that should be used when designing online materials. Neither placing information on the Web nor linking to other digital resources on the Web constitutes WBL. In WBL systems, learning occurs when learners use the Web to go through the sequence of instruction, to complete the learning activities, and to achieve learning outcomes and objectives [6]; [162]. A variety of learning activities should be used to accommodate the different learning styles. Learners will choose the appropriate strategy to meet their learning needs.

Behaviorist, cognitivist, and constructivist theories have contributed in different ways to the design and development of WBL systems, and they will continue to be used to develop learning resources for WBL. Behaviorist strategies can be used to teach the facts (what); cognitivist strategies to teach the principles and processes (how); and constructivist strategies to teach the real-life and personal applications and contextual learning. There is a shift toward constructive learning, in which learners are given the opportunity to construct their own meaning from the information presented during the online sessions. The use of WBL to promote
flexibility and reuse of WBL materials to meet the needs of individual learners will become more common in the future.

Whilst there are claims that the Web can be used to create constructivist learning environments, many argue that in current practice the Web is not being used to its potential [144] [159]. Instead, the web is predominantly being used as a supplement to conventional instructional approaches.

KM is vital in the private sector, and research works into KM practices have found that KM can lead to improvements in the educational sector as well. Potential benefits include better decision-making capabilities for academics, reduced development cycles for curriculum development, improved academic and administrative services as well as reduced costs. In order to explore the role of KM in WBLE, there is a need more research studies on WBL that are to be designed to teach us how the appropriate use of concepts, techniques and tools from KM in WBLE to facilitate better teaching and learning and make WBL more beneficial for more students. The next part of chapter 2 is to discuss about a wide range of activities of KM and how KMs activities can be directly or directly practiced for facilitating KS in the proposed learning environment.

2.3 Knowledge Management

This part of chapter two discusses various concepts relating to KM. Understanding the historic roots of KM and other aspects of knowledge is essential part while people are trying to develop more skills in practising KM. These efforts must be built with a close look at developments in technology and people-centric areas like cognitive sciences [198]. That is why this research endeavours to investigate the adaptability of social computing and to see its potentiality to the KM practice in the context of WBL. Therefore discussing the core issues of KM is of significant importance to explore the key ideas of this dissertation.
2.3.1 Data-Information-Knowledge pyramid

The data-information-knowledge pyramid in Figure 2.1 can provide a starting point to the research discussion. The higher the level, the more symbolic the abstraction. A similar pyramid is proposed by Lengel and Collins [103], but designated as educational pyramid, where the information level is referred to as ideas level and they give a description for their educational pyramid as:

“What education is supposed to do is to get students to see data (facts) in such a way as to inform themselves. The data in their mind are combined into information. Information is then related to other information to produce ideas in the students’ mind – concepts that help explain the world. Some students combine these ideas to produce a wisdom that understands the whys and wherefores of life and truth. The aim of education is to move up the pyramid” [103].

In the lower level, data is considered as the base raw material to represent information. In a more formal definition, data is the representation of facts, concepts, or instructions in a formalised manner suitable for communication, interpretation, or processing by human beings or by automatic means.

![Figure 2.1: Data-Information-Knowledge Pyramid](image)
Information is based on data aggregation and is considered as the material to help and support decision making or other actions. A formal definition is proposed that a human being assigns to data by means of the conventions applied to those data. For information is the product of filtering and then processing raw data into a potentially useful form.

The knowledge level adds context and purpose orientation to the information level. KM is an actual research topic in the Management and Information Systems areas. Knowledge stems from the analysis of information within an expert frame of reference so that it becomes attributed to actual meaning. Barnatt [15] proposes an illustration for the data-information-knowledge progression (Figure 2.2).

![Data-Information-Knowledge Progression](image)

Figure 2.2: Data-Information-Knowledge Progression

At the top of the pyramid in Figure 2.1 a higher level – wisdom – is proposed as the long term material to high order structured models for representing reality. Wisdom is socially constructed and derives its value from being accepted by a group of individuals.

The knowledge which is used in a given problem domain could transform itself into wisdom and become a base to the generation of action activity. Cooley [42] proposes a data to wisdom transformation, based in a signal or noise relation as in Figure 2.3
Data combined gives information. Information, placed in the appropriate context, forms knowledge. And knowledge, combined with experience, judgement and a whole range of other things, gives us wisdom.

**Figure 2.3: Data To Wisdom Transformation**

### 2.3.2 Knowledge Management - Definition

Ideally KM encompasses all processes that identify and locate intellectual assets, create new knowledge for competitive advantage, organising, distributing, and maintaining knowledge within the organisation as well as intra and extra – organisation sharing of best practices and technology that enhances all of the above.

**Figure 2.4: Knowledge Management**
According to research findings [156] there are significant benefits from KM initiatives that are undertaken within companies. These range from better decisions, more flexibility, increased profits, reduced workloads, improved productivity, new business opportunities, reduced costs, best practice exchange, higher market shares, higher stocks prices, improved motivation and retention of employees.

2.3.3 History of Knowledge Management

The historical perspective of current KM shows that it is an old paradigm where knowledge and reasoning had a philosophical grasp from both Western and Eastern philosophers [198]. Much of the earlier efforts were directed toward theoretical and practical understanding of what knowledge is about.

The milestone of practical KM began from a conference held in Boston in 1993 which was devoted to KM [154]. In this conference participants endeavoured to find the meaning of knowledge but were not able to come with an exact meaning of knowledge.

Organisations started recognising the importance of organisational knowledge after their concerns in the increasing of amount of available knowledge and increasingly complex products and processes which led to look at computer technology as part of a solution. For example in 1978 an early hypertext or groupware application capable of interfacing with other applications and systems was introduced as well as a KM System [KMS] which was an open distributed hypermedia tool [14].

The 1980s also saw the development of systems for managing knowledge. The systems mainly were empowered by the work of artificial intelligence [AI] and expert systems that gave rise to the concepts such as “knowledge acquisition”, “knowledge engineering”, “knowledge-based systems and computer-based ontologies” [14].

From 1989 term ‘Knowledge Management’ started appearing in articles in journals as the phrase Knowledge Management got more serious attention and had a
place within dictionaries. Similarly a consortium of US companies started initiatives for managing knowledge assets to provide technological bases for managing knowledge and the first books on organisational learning and KM such as Senge’s The Fifth Discipline and Sakaiya’s The Knowledge Value Revolution were published [14].

The culmination of the published books was the popular and widely read book by Japanese business experts (and KM gurus) Ikujiro Nonaka and Hirotaka Takeuchi The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation [137]. The evolution of Internet and Intranet technology and the advancement of Web technologies brought about significance changes in the ways of managing knowledge.

2.3.4 Knowledge Processes

Understanding knowledge processes is the key thing to know, apply and practice KM. Any KM strategy in one way or another must incorporate at least one knowledge process. Therefore this part endeavours to discuss various knowledge processes.

There is no clear cut definition of knowledge; however many people have attempted to define knowledge. Nonaka and Takeuchi define knowledge in the organisational perspective as a basic unit of analysis to explain firm behaviour [133] [134]. According to Alavi and Leidner [3] knowledge is a justified personal belief that increases an individual’s capacity to take effective action. Action can be described in terms of physical skills and competencies, cognitive/intellectual activity or both.

Davenport also states that knowledge is a fluid mix of relevant experience, values, contextual information, and expert insights that provide a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knower’s [49]. In this research the knowledge that is mainly concerned with is related to experience, personal belief and values which from Nonaka’s point of view is hardly to be captured.
As far as KM is concerned there are different knowledge processes. In the organisational context by knowledge processes the research work means all processes within an appropriate organisational culture that capture, organise, target, transfer and maintain knowledge. Similarly knowledge creation, KS, and knowledge utilisation are essential processes in KM.

The figure 2.5 below shows of KM processes as described by [24].

![Conceptual Framework Of KM Process](image)

**Figure 2.5: Conceptual Framework Of KM Process [24]**

**Knowledge Discovery:** This involves locating or identifying the existing or internal knowledge within an organisation. In this case the organisation may be unaware of its own knowledge assets especially if the organisation is geographically dispersed.

**Knowledge Acquisition:** This involves bringing knowledge from outside to the organisation.

**Knowledge Creation:** Knowledge can be created by integrating the existing internal knowledge, and experiences, or by analysing existing information. Some have argued that in this stage technology is important since it can facilitate the
creation of new knowledge through the synthesis of data and information that have been captured from different sources [141].

**Knowledge Organisation And Storage:** In this case knowledge is gathered and stored in a convenient way and appropriate place or repository. The objective is to make it useful for present and future use.

**Knowledge Sharing:** Knowledge after being gathered and stored must be shared and accessed by people. This involves the transfer of knowledge from one (or more) to another person(s). It is important for organisations to implement different methods that support sharing of different types of knowledge [176]. The focus of most KM is on the sharing of knowledge which seems to be crucial when one employee leaves an organisation and another comes in. The process of KS occurs naturally in a mutually dependent community.

**Knowledge Use Or Application (Knowledge Utilisation):** The KM practice comes to an end when stored and shared knowledge is utilised for the organisational benefit. The KM does not have any value if knowledge created and stored is not utilised to its potential. More knowledge is created as knowledge is applied and utilised.

### 2.3.5 Knowledge Types

Knowledge can be categorised into several types. From the literature it has been observed that authors differ in their views in types or categories of knowledge. However from the Nonaka & Takeuchi [134] point of view there are two categories of knowledge.

**Explicit Knowledge:** The first type is explicit knowledge, which can be expressed in words and numbers and shared in the form of data, scientific formulae, product specifications, manuals, universal principles, etc. This kind of knowledge can be transmitted across individuals formally and systematically. This has been the dominant form of knowledge in the West. Nevertheless the Japanese see this form as
just the tip of the iceberg. They view knowledge as more tacit, something not easily visible and expressible [134].

Tacit Knowledge: The second type is tacit knowledge which is highly personal and hard to formalise, making it difficult to communicate or share with others. Typical tacit knowledge examples are subjective insights, personal belief, intuitions and hunches fall into this category of knowledge. Furthermore, tacit knowledge is deeply rooted in an individual’s action and experience. In more precise ways tacit knowledge itself can be put into two dimensions. The first is the "technical" dimension, which encompasses the kind of informal and hard-to-pin down skills or crafts often captured in the term "know-how". Highly subjective and personal insights, intuitions, hunches and inspirations derived from bodily experience fall into this dimension [134].

Tacit knowledge also contains an important "cognitive" dimension. It consists of beliefs, perceptions, ideals, values, emotions and mental models so ingrained in us that may be taken for granted. Though they cannot be articulated very easily, this dimension of tacit knowledge shapes the way we perceive the world around us [134].

Capturing and sharing of tacit knowledge as discussed in the literature create hurdle to most of the KM initiatives. Several techniques must be employed as well as social interaction is required to create an effective environment for tacit knowledge to be captured and shared. Social interactions among peer groups are necessary for this knowledge to be captured and shared. The differences between tacit and explicit knowledge are shown in table 2.1.
Drawn from experience and is the most powerful form of knowledge  
Can become obsolete quickly

Difficult to articulate formally  
Formal articulation possible and can be processed and stored by automated means, or other media

Difficult to communicate and share  
Easily communicated and shared

Includes privately held insights, feelings culture and values  
Formally articulated and public

Hard to steal or copy  
Can be copied and initiated easily

Shared only when individual are willing to engage in social interaction  
Can be transmitted

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<th>Table 2.1: Tacit Vs Explicit Knowledge</th>
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<td><strong>KM core activities include the creation and integration of knowledge, the accumulation and utilisation of knowledge, and the learning and sharing of knowledge and all these together, comprise KM. Among these, KS, or knowledge flow, or knowledge transfer is a key to the success of KM [71]. The review of the literature reveals that few studies have examined KS issues in WBLEs. The purpose of this study is to develop a greater understanding of the conditions and processes that help promote the sharing or cultivation of tacit knowledge in a formal WBLE.</strong></td>
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<th><strong>2.4 Concept of Knowledge Sharing</strong></th>
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<td>Sharing is a process whereby a resource is given by one party and received by another. For sharing to occur, there must be an exchange. A resource must be passed between a source (provider) and recipient [173]. The term knowledge-sharing implies the giving and receiving of information within a context understood by both the provider and the recipient. As knowledge is directly related to understanding and is gained through the interpretation of information [3], knowledge-sharing is more than passing information from one person to the other. Moreover, there is no guarantee that the knowledge received will be identical to</td>
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what is delivered by the provider, as the process of interpretation is subjective and is framed by the recipient’s knowledge and identity. Different from information sharing, knowledge-sharing fundamentally requires sense making and the generation of knowledge in the recipient. In other words, it involves knowledge creation.

Based on the discussions above, it has been defined in this research that: knowledge-sharing is a dynamic process of the transmission of knowledge resource (information) from a provider to a recipient in a given context. In most KS situations, reciprocal knowledge transmissions occur either naturally or as requested. Characteristics of the knowledge provider or the context influence the amount of knowledge that can be shared from the provider to the recipient.

Beginning with Roger’s [164] investigation of early and late adopters of technological innovations, and more recently with Szulanski’s [182] study of sharing of best practices, many researchers have used communications theory [172] to examine KS.

More recently, organizational learning theories have become a focus in this field, as successful knowledge transfers are increasingly seen as an ongoing process of learning interactions, rather than just a series of communications [182].

2.4.1 Knowledge Sharing in Organizational Learning

Within organizational learning theory, Nonaka [135] explained the knowledge-sharing process as the conversion of knowledge between its tacit and explicit forms. Based on this theory Nonaka [135], the key to knowledge creation lies in the conversion of tacit knowledge.

2.4.2 Social Construction of Knowledge

The “social construction of reality” theory had been used to explain the social construction of knowledge [65] [127]. Knowledge-sharing was seen as knowledge “institutionalisation” on personal and public levels with three phases [18]: “externalisation”, “objectification”, and “internalisation”. In the phase of
externalisation, personal knowledge is exchanged with others. This process involves maintenance, publication and exchange of the personal knowledge. During the phase of objectification, knowledge becomes an “objective reality” [18]. In this phase, new knowledge is created and individual knowledge is shared as public knowledge. In the phase of internalisation and in the course of knowledge socialization, objectified knowledge is widely accepted and used by individuals. This involves knowledge acquisition exchange and retrieval, which enable individuals to learn from either inside or outside of their organizations.

2.4.3 Implications

The organizational learning theory reveals the importance of facilitating the mobilization and conversion of tacit knowledge in knowledge-sharing.

Nevertheless, most IT solutions for knowledge-sharing focus on the sharing of explicit knowledge and apply a codification strategy [73]. Codification strategy depends on sophisticated information technology [IT] to facilitate the acquisition, preservation, distribution, exchange and application of knowledge. Problems have been discovered in this strategy, as knowledge consists of information that is conceptualised and embedded in a “context” such as personal experiences, values and attitudes [10]. This “context” does not always get transmitted with the information for sense-making.

The personalization strategy [73], on the other hand, focuses more on the sharing of tacit knowledge, on people meeting each other, on interpersonal knowledge-sharing, on master-apprenticeship relationship and on communities of practice. People get knowledge through their interaction with other people and their environment, which provide the “context” for sense-making. Compared to the codified strategy, the personalized strategy acknowledges the importance of providing knowledge with its embeddings. However, it can be more complicated in practice as not only information and technological issues need to be considered, but the issues about people and their behaviour as well. The social construction of
knowledge theory reveals that knowledge-sharing is a social process, which involves interactions among people, knowledge and the sharing environment.

### 2.4.4 Knowledge Sharing and Learning

Since the middle of 1990s, as a primary aspect of KM, KS has been widely studied. The pivotal value of KS is that it encourages people to express, exchange, negotiate, and understand tacit knowledge. Potentially, it encourages learning according to Moon’s [126] opinion, Humans do not learn everything from scratch. Knowledge is accumulated in ways that have been largely agreed through social means [199]. Even the means of agreement are learned and socially agreed. On this basis, the notion of meaning resides between the locus of social agreement and the individual’s efforts to understand, for herself, on a personal level. Having understood something, the individual then contributes to the pool of social meanings by adding her perspective when she represents her learning in some form.

KS and learning are not separable; both are highly personal and need specific context [139]. It was suggested that KS is distributing and absorbing knowledge, that is, it is an action requiring learning. Yet, some people questioned that KS is equivalent to learning. Compared to the studies into organisational learning in KM, little was found in the literature on the relationship between KS and WBL [167]. The researcher provides three aspects of the relationship that is found in the literature as follows.

Knowledge is application of data and information that emphasise personal interpreting and understanding. Knowledge answers How and Why questions and is always relevant to a particular context and environmental conditions [16] [62] [97]. Knowledge differs from information in that it has established meaning and belief to those who use it, that is, it is always personal [113]. Up to the transforming of the three concepts, Burton-Jones [30] defined 1960s-1970s as data management era, 1980s-1995 as information management era, and from 1995 to present as a KM era.

Linking to what mentioned in the above paragraph, Al-Hawamdeh [4] regarded knowledge that can be generally codified into information as explicit
knowledge, whereas knowledge that heavily requires different types of trust and ties in the form of social relationships he regarded as tacit-knowledge. Meanwhile, Marchand [113] stresses that although both information and knowledge are context-specific for their meaning, knowledge depends on context for expressing beliefs and commitments, whereas information depends on context for its use or application; the two terms relate to different ways of acting. Therefore, to an extent, sharing information and sharing knowledge have different focuses. As Sharratt and Usoro [173] stated, the sharing of information covers a broad spectrum of exchanges and does not necessarily lead to the creation of new knowledge whereas KS intrinsically implies the generation of knowledge in the person who uses it. This kind of new knowledge generation thus has been seen as learning, which transforms static information into active knowledge. This view is supported by several research study that: Sharing knowledge is not about giving people something, or getting something from them. That is only valid for information sharing. Sharing knowledge occurs when people are genuinely interested in helping one another develop new capacities for action; it is about creating learning processes.

Both learning and KS can be viewed as social action. KS takes place when knowledge is received, processed, and absorbed by people, and in particular, tacit knowledge can be effectively transferred with communication and collaboration between people [4]. KS is an interactive learning process. In this sense, to learn something can mean to come to know or to have knowledge or it can mean that a person is able to do something. Sometimes this is clarified as know that and know how [126] thus far not only means learning from outside teaching or training, but also includes people themselves constructing knowledge by sharing and interaction.

Implicit learning is addressed in analysing the relationship between learning and sharing tacit knowledge. Implicit learning, a factor of cognitive psychology is very much related to individual experiences. As Martz and Shepherd [116] noted, experience is one form of tacit knowledge, and can be transferred in implicit learning processes. Similarly Raelin [155] suggested that implicit learning is individual learning acquired through experience that is the foundation for tacit
knowledge, which can be studied, understood and shared. Experience, in some respects becomes a predominant threshold of linking learning and KS.

Using Rowley's [167] words, knowledge and learning are closely intertwined. Knowledge individually feeds into learning process and learning is embedded in KS activities as well. People learn through receiving and absorbing knowledge by themselves as well as through exchanging and communicating knowledge among people. It can be seen in the recent fifteen years, research into tacit knowledge and KM has added to a growing body of literature in education.

Gerholm [66], for example, has concluded there are five types of tacit knowledge related to students and graduate study programmes. He has pointed out that two forms of them are crucial in academia: one is knowledge that has grown out of long experience in the discipline, and the other is knowledge generated by students themselves to make sense of what they are experiencing in a programme [66]. Rowley [167] has examined KM applicability in the UK HE institutions with four objectives: to create knowledge repositories; to improve knowledge access; to enhance knowledge environment; and to value knowledge. She has pointed out the greater challenge lies in the creation of a knowledge environment and the recognition of knowledge as intellectual capital. Meyer [121] has provided six knowledge-inaction theorems and has argued professional knowledge (e.g., intuition, experience, or tacit knowledge) is less emphasised than technical knowledge for the preparation of education leaders.

More recently, Perkins [147] has categorised five sorts of troublesome knowledge in constructivism learning practice: ritual knowledge; inert knowledge; conceptually difficult knowledge; foreign knowledge; and tacit knowledge, and has urged educators to clear the subtle differences and troublesome dimensions of knowledge in learners articulations of understanding. Moreover, Sallis and Jones [168] have indicated the role of KM in education by observing learning to know what we know. They [168] have addressed the importance of building up learning networks to help share and to make sense of knowledge by writing that, Education may have made people think, but it does not necessarily teach them how to think, or
provide thinking skills. Education has often used too narrow a definition of learning, based on a restrictive model of intelligence, concerned largely with academic ability. Consideration has also been given to the synergy between work, innovation and learning. This narrow model of learning filters out some of the most important intelligences and abilities. It ignores that relationship between work and learning, and the relationship between work and learning and change and creativity.

Clearly, unlike information, referring to the processed data that is given meaning by its context, knowledge is non-static, rich, and ambiguous. In today’s society, people have more and more realised the important role of knowledge. In particular, tacit knowledge to some extent constitutes the major part of the body of knowledge; therefore, to sustain and exploit tacit knowledge at an individual level is drawing more researchers’ attention [178]. Human knowledge is difficult to conceive, as Baumard [16] claims, what we know and what we can express are still crucial in studies into human learning.

2.4.5 Research Issues in Sharing Of Knowledge

KS has issues. As Sallis and Jones [168] mentioned, Knowledge is after all not a tangible product, or a material thing like land, labour and physical capital. Neither is it all of a kind. Some knowledge is very easy to access and cheap to harness, while other knowledge is locked away in people’s minds and harder to use effectively.

According to this statement, the researcher sums up three important facets that raise concerns for sharing knowledge. Firstly, as a crucial form of knowledge, tacit knowledge itself is without a clear foundation. Tacit knowledge has been observed from many perspectives, which result in sharing tacit knowledge is without a clear direction and action. Therefore, when people are asked to knowledge share, they often do not know what requires sharing and that generates little enthusiasm. As Perkins [147] said, different concepts of knowledge used in various disciplines often result in double trouble. KS on the surface is a desirable goal, but in practice often fails due to the troublesome concepts.
Secondly, social barriers such as: language; conflict avoidance; bureaucracy and hierarchy; and incoherent paradigms, are the main barriers from society that affect KS [57]. For example, Graves [70] questioned whether tacit knowledge can make sense through different languages for both rationalists and empiricists. There is no convincing answer yet. Renzl [161] stated that KS is based on the process of interaction between the individuals, and it needs cognitive structures, whereas Haldin-Herrgard [72] argued that knowledge, especially tacit knowledge is held in a non-verbal form so it is hard to provide a useful verbal explanation to another individual. Apparently, knowledge is difficult to share than information because it is about relationships rather than data [97].

Last but not least, individual barriers, such as the revelation, uncertainty, unconsciousness, motivation, and viewing knowledge as personal power. In organisations, people often hoard knowledge due to worrying negative influences on their status and reputation and this makes KS difficult to put into practice [4]. According to Haldin-Herrad [72], knowledge implies cognition, and cognition implies awareness, which is highly dependent on people’s perceptions. Perception, thus, is one of the main difficulties in sharing knowledge. Without doubt, knowledge itself is subjective and experience-based, involving intangible factors such as personal belief, perspective and instinct, which are difficult to express in words, sentences, and formulae [139].

In a nutshell, in KS, at an organisational level, a bulk of research has been undertaken and presents both lessons and successes. To maintain an organisation’s performance and competitive benefits, research into KS at an individual level thus becomes inevitable as well as important. Without exception, in WBLE, to facilitate students learning better, it also requires studies with social computing perspective on how to use knowledge, how to encourage knowledge creation and sharing, how to create knowledge repositories, and how to improve knowledge accessibility in HE settings.
2.5 Social Computing Perspective for Knowledge Sharing

We are entering a new phase of social computing: A new generation of user-centric, open, dynamic Web, with peer production, sharing, collaboration, collective intelligence, distributed content, and decentralized authority in the foreground. Harnessing collective intelligence has become the driving force behind social computing.

This research focuses on how to incorporate the new social computing trends into the WBL process and how to harness and apply social computing perspective to create new learning experiences and learn across communities. In a learning context, social media have become a means to connect people not only to digital knowledge repositories but also to other people, in order to share ideas, collaboratively create new forms of dynamic learning content, get effective support, and learn with and from peers.

2.5.1 Defining Social Computing

Social Computing describes the area of computer science that is concerned with the intersection of social behavior and computational systems. It is any type of computing application in which software serves as an intermediary or a focus for a social relation [170]. The marketing research firm Forrester defines social computing as “A social structure in which technology puts power in communities, not institutions.” [33]. To understand this statement, the emergence of social computing needs to be considered first.

There are two main driving forces that fuel social computing. On one hand, there are the technological factors which provide the tools to enable social computing. On the other hand, social factors bring about a change in user behaviors and how they interact with computers. These two forces work together to create social computing as seen in Figure 2.6.
The term “social computing” can also be broadly defined as “software that supports group interaction” [174], although it is arguable that the internet has always comprised a network of individuals connected through social technologies like e-mail, chat rooms and discussion boards. Current social computing tools not only support social interaction, feedback, conversation and networking [25], but are also endowed with a flexibility and modularity that enables collaborative transformative process in which the information and media organised and shared by individuals can be recombined and built on to create new forms, concepts, ideas, mashups and services.

Many current social software applications straddle the virtual and real social worlds, as they entail both online and offline interactions and visual or verbal connectivity. For example, Flickr and YouTube facilitate the sharing of photos and videos with both “real world” and “virtual” friends; social networking sites like MySpace, Facebook and Friendster allow users to build an online identity by customising their personal profiles with a range of multimedia elements, as well as interacting with existing contacts and establishing new relationships; another social
networking site, Stickam, additionally allows users to interact in real-time using their web cams and microphones.

Mejias [120] observed that “social software can positively impact KS and pedagogy by inculcating a desire to reconnect to the world as whole, not just the social part that exists online”. Mejias also has a much broader definition of social, which encompass both traditional web and social web technologies. For the purposes of the current discussion, the definition adopted here, to link in with the key notion of learner control and choice, is that proposed by Dron [51]: “social software … is [where] control and structure can arise through the process of communication, not as a result of design, but as an emergent feature of group interaction”. With this rich and varied functionality in mind, it is necessary to consider the affordances, limits and potential value adding of social computing concepts and social computing tools for web based learning system.

2.5.2 Social Computing For User-Led Innovation

Increasing importance is being given to user empowerment [158], as it is considered to be a crucial factor for the growth of the digital economy. Approaches like social computing are rapidly expanding in the context of ‘user-led innovation’ and in particular in user-driven service innovation, i.e. where users are involved in the co-creation of services. The adoption rates of media technologies over the past few decades clearly show the benefits of timely user involvement.

Largely steered by users, social computing applications like blogging, podcasting, collaborative content, social networking and on-line gaming exploit internet connectivity to support the networking of people and content. In the history of communication, there are very few examples of such fast growth in such a short time.

2.5.3 The State Of Social Computing

Social computing is more than blogs and wikis. New forms of content have been taken up by the masses, tapping into the ‘wisdom of crowds’ [180]. By 2008,
there were more than 130 million blogs (nearly double the number in 2007). In October 2008, 41% all EU Internet users, and 64% of those aged under 24 had used social computing applications. Also, 32% of European Internet users had created social networking Site profiles. In June 2008, social networking Sites attracted an average of 165 million unique visitors a month; in several OECD countries, more time was spent on social networking and personal blogging sites than on email [131]. More than 1 billion photos and 40 million user-created videos have been uploaded onto photo- or video-sharing sites; tens of billions of objects have been created by users in Second Life; social tagging is on the rise - millions of photos have been tagged in Flickr, and videos in YouTube as shown in the table 2.2.

| **Blogging** | >100M blogs and doubling every 5-7m or the last 2 years  
*Between 20 and 50% Internet users read blogs* | 120,000 new blogs created daily  
Slowing down in the growth of the blogosphere and in the rate of posts created per day since Oct 2006 |
|---|---|---|
| **SNS Multimedia sharing** | Over 250M profiles on-line (Oct 2007)  
>1 billion shared images on-line (Aug 2007)  
~40M shared videos on-line (June 2007)  
*25-50% of Internet users visit SNSs* | Growth in number of profiles in MySpace slowing down  
~1M new images uploaded daily in Flickr (growth levelling off);  
>65,000 videos uploaded daily in YouTube (June 2006); number of videos decreasing since March 2007 |
| **Podcasting** | >100,000 active podcasts worldwide  
<10% of Internet users listening/downloading podcasts. (Statistics vary considerably) | Number of podcasts growing rapidly, up from 10,000 in 2004 (IDATE Aug 2007) |
| **Collaborative content** | 7.5M articles in all combined Wikipedia sites (Oct 2007)  
30% of global Internet users visit Wikipedia | Growth in number of articles in the English version of Wikipedia tailing off since Sep 2006 |
| **Social tagging** | Lots of content tagged  
30% of US Internet users tagging | >1M tags per week in Flickr (2006); 2.6M geotagged photos in Flickr in Aug 2007, up from 1.6M in 2006 |

*Table 2.2: State Of Diffusion Of Social Computing*
Social computing applications have become part of mainstream internet use for at least a quarter of Internet users in Europe. By 2008, blogging, photo- and video-sharing, social networking and on-line gaming had been embraced by half the Internet users worldwide. Some regional patterns seem to emerge: Asian countries are leading the adoption of Social computing, followed by the US and Europe (Figure 2.7). Recent surveys further reveal that the use of social computing is growing as shown in figure 2.8, but at the same time, a process of consolidation is taking place. While social networking sites, blogging and photo-sharing grew in popularity, Internet users appeared to be slightly less engaged with uploading videos to the web. Users are increasingly focusing their digital lives around social networks such as Facebook. They are still taking part in photo sharing and blogging, however they are now doing it via their social networks. At the same time, applications like blogging or photo-sharing have reached saturation level.
Figure 2.8: The Growth Rate Of Social Computing Applications

This may be related to the fact that the novelty of uploading content onto the Internet may have begun to wear off for some consumers, or to the increasing take up of even newer types of social media. In 2008, more personal forms of web publishing than blogs appeared, such as “micro-blogging” (Twitter) and life streaming, which enables users to aggregate and comment on a wide variety of Web media. This may indicate a shift in social computing from “old social media” (e.g. blogs) towards the “new social media”. Another possible reason is what has been called ‘rationalisation’ of social media:

2.5.4 Social Computing for Learning

Lifelong learning plays a crucial role in today’s society with its changing jobs and skills needs. New ways to support value and acknowledge learning are needed in order to provide equitable and high quality learning opportunities, which foster skills for innovation and further learning. This calls for the development of education and training systems, but also for empowerment of learners so that they are able to take responsibility for developing their own competences. Social computing provides resources, connections and new tools for creativity and collaboration, which empower all actors in the educational landscape in new ways, in both structured and unstructured learning settings. Empowered learners are already pressing for change in learning approaches, and new tools and resources
support teachers and institutions in developing these. However, a major challenge for all actors is the need for new skills, especially advanced digital skills beyond basic ICT use. These are required in order to guarantee quality of learning, innovation in learning approaches and safe use of new tools.

An exploratory research conducted by [2] suggested that KS and collaboration using social computing has three key aspects with both economic and social impact:

- Easy access and great diversity of resources
- Connecting through online content
- New tools and models of collaboration.

Later IPTS studies on the role and impacts of social computing in organised education and training [157] and learning in unstructured online community settings [2] support these aspects. However, in the educational sphere, not only the opportunity to share created content with others, but also the enhanced creative and productive processes as such are important sources of learning. Social computing applications play an important role for education and training as:

1. A large share of young students use them in their everyday lives and would also naturally use them in their schoolwork;

2. Adults and workers use these tools as well and need skills for them; and

3. Social computing provides new ways to develop learning opportunities and teaching approaches and provides new empowerment for lifelong learning.

'Empowerment' of learners refers to their ability and opportunities to own their learning as regards what, when and how they learn, and to the possibility to create personal learning paths that suit their needs. Providing this empowerment is a key challenge for making lifelong learning a reality. This calls for availability of
relevant resources, methods and guidance, and also for learners to take responsibility for their continuous personal development and contribution to society.

The role of educators will remain important, but it will shift from knowledge transmission to facilitating learning processes. Furthermore, social computing tools empower teachers to innovate and to develop new learning approaches contributing to their own personal and professional development. Finally, social computing provides new tools to follow, participate and innovate for parents and members of the public outside learning institutions.

**Emerging trends and drivers:** Each one of the three social computing aspects, as defined in this thesis, can promote learning in new ways. Furthermore, Figure 2.9 illustrates how these aspects are interconnected, and, therefore, can accumulate further learning, either for learners themselves or for others. Several examples show that educational institutions have started to experiment with social computing tools [157]. Examples in organised education show knowledge building collaboration and networking with blogs, social networking, wikis and discussion forums.

However, there seem to be somewhat fewer experiments on how to encourage new creativity or how to benefit from the vast amount of diverse learning resources and communities emerging through social computing. For this reason, it is suggested that the scope of the current deployment of social computing in organised education (Figure 2.9) is slightly aligned towards the collaboration' aspect. Informal and unstructured learning can take place in various ways with these tools, benefiting from all aspects of social computing [2]. However, not all social computing usage necessarily leads to learning.

### 2.5.5 Opportunities For Knowledge Sharing

Social computing tools allow easy creation and sharing of a variety of media materials, which enable the development of personal creativity and can give the learner a sense of ownership and responsibility for learning (Figure 2.9). Multimedia opportunities and the diverse availability of resources and connections
can help individuals to imagine and make new connections, ideas and creations through drafting and exploring [111]. Tools for creating blogs or creating and sharing photos, videos, or podcasts, enable users to practice skills in their mother tongue, in a foreign language, and in writing and media production. Furthermore, social computing tools allow teachers to create media-rich learning materials for their learners and share it more easily.

![Diagram](image)

**Figure 2.9: Social Computing For Knowledge Sharing**

**Developing Transversal Skills And Identity:** Blogs, wikis and online writing can enable users to learn important transversal competences such as critical and reflective thinking, active participation, and meta-cognition [11]. Carbonaro [32] suggest that digital storytelling allows students to engage in learning by design, inquiry based lessons, and meaning-making activities.

Participating in a global community with members from different cultures offers new opportunities for becoming aware of, and learning about, cultural expressions and differences. Creation of online profiles and identities provides young people with a new learning tool for identity exploration and development.
Blogs and ePortfolios are also tools for building professional identities and for showing skills and competences acquired via individual learning paths.

**Sharing And Reflection:** Social computing empowers users to develop and share their knowledge with others and for others. For example, the reasons given by US bloggers for blogging were creative expression (77% of respondents), sharing personal experiences (76%), and sharing practical knowledge (64%) [104]. Sharing stories and experiences allows learners to learn through narratives situated in different contexts, and provides new sources for reflection. For example, Park [145] found that 62% of adults participating in online social networking believed that the online profile-related activities led them to learning activities such as reflecting on themselves, sustaining social bonding, acquiring specific knowledge, and cultivating a constructive life.

**New Ways and Reach of Collaboration:** Social computing tools enable wide-reaching collaboration on a large scale, promoting new ways to learn both implicit and explicit knowledge. Learning collaboration can be set up intentionally by educational institutions, but it also emerges informally in the communities that rise up around joint interests.

**Peer Learning and Support:** Social computing tools can be used to provide learners with social networks of peer support and assistance for learning, and for overcoming physical and institutional boundaries. Allan and Lewis [5] found that a virtual learning community provided a safe place for exploring roles and identities, and helped adult learners to widen their professional horizons and even make significant life changes. Students are also using networking facilities outside courses to support their formal learning. For instance, 50% of pupils using social networking tools say that they discuss schoolwork. Specific communities are emerging to support informal peer learning, which puts language learners in touch with each other and with native speakers.

**Communities Mixing Experts and Novices:** Social computing communities are emerging to support different communities of practice, which empower the
professionals to communicate and share knowledge with each other, and let novices learn from their expertise. For example, 75% of IT professionals using IT online communities said that communities of practice help them to do a better job and 68% stated that they benefited personally in their professional development [96]. Cloudworks67 is an example of a social networking site for sharing learning and teaching ideas and connecting educators. There are also online communities for educators on specific teaching tools, such as whiteboards68 or virtual worlds.

Learning Through Collaborative Production: Collaborative work on a joint project facilitated by social computing applications can significantly increase individual and group performance [108]. Wikis and blogs used for collaborative learning in formal education, can furthermore lead to learning material that can be used on a wider scale, as illustrated by the example of Welker’s Wikinomics for secondary education. Social computing enables communities in various areas to support the development of professional skills in, for instance, writing, moviemaking and music making through collaborative work. These tools also allow participants to earn money from the resulting products. Wikiversity is an example of a collaborative community where teachers and anyone who wishes can join to exchange and develop learning materials.

A Great Diversity Of Resources: The affordances of social computing tools for both individual creativity and collaboration provide Internet users with a completely new range of resources, both in terms of access to products and connections to people, which New channels to learning providers. Learning institutions are already experimenting with social computing tools and environments. Searching for ‘university channels’ gave 1,140 results in YouTube in February 2009. Learning providers are also establishing their presence in online social networks73 and the Second Life virtual world. Opening access to course learning materials can benefit users both inside and outside learning institutions. For instance, 49% of the visitors to the MIT OpenCourseWare (OCW) site were selflearners outside formal education, 56% of them wished to enhance their personal knowledge, and 16% to keep up to date in a particular field.
Learning On Demand: Social computing technologies make it possible to find and develop resources for learning when needed. For example, the availability of podcasts on course materials has been shown to be beneficial in revising for exams, providing 15% better results. The large range of different communities makes it possible to find information on almost any topic. In addition to active productive participation, users also learn by observing and following the experts and activities in the communities. Furthermore, global communities make it possible to quickly connect with someone to ask for advice.

Personalising Learning Paths: New availability of different types of multimedia resources enables new types of learning, based on inquiry and exploration, where users are free to select the resources, communities and activities that match their interests and needs. Authentic and situated learning experiences can be supported by virtual 3D environments, such as learning to drive with virtual communities [123], or with serious games where the learning content is blurred with game characteristics [149]. Teachers are empowered to provide a wide range of learning opportunities to suit the needs of their learners. At the same time, as learning materials for degree and other courses are increasingly online, students are better informed when they choose their field of interest and training provider.

The emergent research learning community over the past decade have stimulated research interests by academia and practitioners. Bruckman [28] found that the learning potential of Internet technology can come from the peers and elders. Jin [88] provides a conceptual framework for the development of a prototype system of the virtual community based interactive learning environment. Wachter [192] point out that an enhanced learning environment is possible only if one goes beyond mere on-line course delivery and creates a community of learners and other related resource groups. Wasko and Faraj [196] found that KS has been a motivation for participating in a virtual community.

This research considers KS is a complex cognitive process which requires the cooperation between the collaborators. The famous SECI model [134] has been considered as the basis of knowledge transformation between explicit and tacit
knowledge. SECI model addresses that human knowledge is created and expanded through continuous interactions between explicit and tacit knowledge. Knowledge creation is not confined to individual but to social interaction between individuals, groups and organizations.

There is little doubt that the literature on KS is still controversial about what is meant by tacit knowledge and if it is sharable. According to Baumard [16], two perspectives on tacit knowledge have emerged: one group of researchers [72] [151] [182] [190] support the view that tacit knowledge is sticky, unconscious and ambiguous, and cannot be captured or expressed.

Another group of researchers [116] [136] [178] believe that tacit knowledge is withheld to increase the individuals power, even though it could be transferred. In this study, the researcher takes the second group’s view that tacit knowledge is tacit to the person him or herself; it is hard to convert to explicit knowledge (e.g., formal, systematic language) completely, but it can be converted between people through certain ways (e.g., metaphors, analogies, or images) in certain contexts (e.g., imitation or observation). Relating to the forms of knowledge, the researcher agrees that experience, as a tacit form of knowledge, is possible able to be converted explicitly. This view became an assumptive premise to help the researcher inquire the observed phenomenon, but not a conclusion emerged from the empirical data.

2.6 Summary

The purpose of this chapter was to undertake an extensive literature review regarding three different areas contained in this research. These were WBL, KM and social computing. This chapter has provided a context for the study.

Important theories of teaching and learning were discussed and learning theories reflect the evolution of opinions of human learning, from traditional behavioural theories, an instrumental approach to teaching and learning, through cognitivist theories, providing a variety of ways with human development cognitively, to constructivism, which emphasises knowledge is constructed and learning varies depending on historical and socio-cultural context. It is clearly that
some of these theories could be greatly enhanced using KM activities or process. For instance constructivism which requires students (learners) and teachers to work in a peer-to-peer manner to build students’ knowledge from their pre-existing knowledge could be largely supported by KM services. Students could work together in a collaborative way to share their ideas and construct new knowledge.

Knowledge is intertwined with learning. The cognition of knowledge has a long philosophical root and is full of epistemological debates. The researcher mostly reviewed the discussion in the KM field and studies that demonstrated the troublesome knowledge (particularly, tacit knowledge) in KS and learning. It shows that learning needs KS, but sharing tacit knowledge, such as experience, encounters barriers. The research about KS is increasingly encouraged by promoting organisational learning in KM, whereas in educational studies, it is not addressed as such. In this field, it is mainly presented by studies into understanding meaning due to the opinion that the student is learning and acquiring knowledge in education, and knowledge is shared in this process.

In addition, the review shows that the soaring popularity of social computing tool is specifically remarkable in improving organisational learning as well as assisting teaching and learning in academia. It has distinguishing characteristics such as personal editorship, flexible hyperlinks, colloquial language, feedback and comments which enable an individual to capture, organise and share viewpoints easily. It potentially supports a learning environment; it is an outlet for thoughts and feelings, and it is a form of personal communication and personal learning environment [129]. Also, the literature shows that it provides potential opportunities for students to share their knowledge. It contributes powerfully to expertise promotion. Students can use social computing tools as learning repositories where storage and control of subject-centred or interest-related information. With the advantages of social computing, such as archiving and quick-feedback, students can show their learning processes, discover problems, reduce misunderstanding, learn from each other, and trail their subject development and so on. Meanwhile, social computing offer potential benefits to students by accelerating the learning processes
and making them learn how to learn, learn how to write and learn how to evaluate information online. Replacing face-to-face interaction in the classroom, the flexible communication channels help students become open to criticism and different perspectives as well as promote them to become active learners by self-organised, collaborative and community-based learning. Not only do social computing tools provide effective ways to foster learning, but they also serve as potent collective knowledge-banks which are used to interact, self-discourse, dialogue and exchange thoughts [129].

As Norris [139] said, knowledge, either implicit or tacit, is subjective, experience-based and highly context specific. Researcher widely discuss what is tacit knowledge, sharing and learning, but little literature reveals the relationships between WBL and tacit knowledge sharing. Learning and KS are not stand-alone activities. Learning is embedded in KS and KS is learning processes for acquiring knowledge. According to viewpoints from the literature [60] [142] [189] [200], social computing technology offers a wide range of opportunities for KS in WBLE. Building on the understanding gained from the literature review the next chapter will survey students of several higher learning institutions in Chennai to assess how social computing tools are feasible in enhancing KS of their knowledge, approaches, skills, and experiences during their learning processes.