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CASLA through a social constructivist perspective: WebQuest in project-driven language learning

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Abstract

The basic tenet of constructivism is that learners construct their knowledge on their own by associating new with prior information. The significance of the learner's interaction with his/her social and physical environment is here of great importance; the learner is at the center of the learning process while the tutor is seen as a facilitator, a guide. Considering the paradigm shift in education and language learning, the assumptions of the constructivist philosophy encourage the use of computers in second language acquisition. Computer technology is capable of providing the context for collaboration and social interaction in which learners will construct the knowledge of the target language on their own by being engaged in meaningful activities. Moreover, computers allow learners to interact not only with the learning materials but also with other people. The combination of the social and individual aspect is best expressed by social constructivism. Placing language learning in a socio-cognitive context, we will approach second language acquisition from a social constructivist perspective and indicate the value of such an approach for the design and evaluation of Computer Applications in Second Language Acquisition (CASLA). Firstly, an overview of constructivism as a theory of learning is required in order to make clear the basic assumptions of the constructivist theory. Secondly, the focus is placed on social constructivism which is examined in relation to second language acquisition. This in tandem exploration will lead us to provide a framework which integrates all four language skills in a general theoretical framework of social interaction and shows how social constructivism can promote second language acquisition. Finally, one type of on-line application such as WebQuest, which is best developed in project-driven language learning, will be provided as a potential example of good practice in approaching Computer Applications in Second Language Learning through a social constructivist perspective.

1 Introduction

Over the past decades, language learning theory has seen a paradigm shift in which the learner becomes the centre of learning and is no longer a passive recipient of knowl-

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edge. Consistent with that direction is the well-known theory of constructivism which proposes that individuals construct their knowledge through their interaction with their social and physical environment and by reflecting on their experiences. Principles put forward by constructivism also support the use of computers in second language acquisition as they are capable of providing a context for collaboration and social interaction in which learners will construct the knowledge of the target language on their own by being engaged in meaningful activities. Taking into consideration that computers enable inter-personal interaction and also interaction with the learning materials, the focus is hence here on both the social and cognitive aspects of learning, which are central in social constructivism.

This article is an attempt to show how second language acquisition can be approached from a social constructivist perspective. Considering as a basis the learner's mental operations while constructing the knowledge of the target language, emphasis will be put on the role of social and physical interaction embedded in that process and, as a result, a conceptual framework which explicitly integrates the language learning skills. In addition, the article aims to indicate the potential contribution of such a framework for the design of socio-constructivist CALL (Computer Assisted Language Learning) environments. This is done through expanding on the conditions for successful (language) learning as well as presenting a set of common characteristics to describe the ideal (Computer Assisted Language) learning environment. Finally, this is illustrated through the WebQuest in project-driven language learning, as one possible example of good practice in approaching CASLA (Computer Applications in Second Language Acquisition) through a social constructivist perspective.

2 Constructivism

Starting with an overview on constructivism, we need to refer to its proponents. Going back to ancient Greece, Socrates used a method of assertions and enquiries by means of dialogue to draw out his interlocutor's unconscious knowledge. This method is called the maieutic method. In the first half of the eighteenth century Giambattista Vico believed that human reason can know only what humans themselves have made (von Glasersfeld, 1995). Immanuel Kant further elaborated this idea by saying that "*a priori* knowledge precedes all reasoning" (Jonassen, 1991:10). Constructivism also draws from the work of Jerome Bruner, who believed that the basic element for learning is discovery (Bruner, 1960, 1962), and John Dewey' experiential learning (Dewey, 1938). However, the theories of Jean Piaget and Lev Vygotsky seem to be the most influential for the structure of the constructivist theory.

Jean Piaget dealt with cognitive development and developed a theory of the different cognitive stages whereby children come to know the world. He believed that children construct knowledge based on their experiences through interaction with the social and physical environment. He claimed that mind has mental structures, which he called schemata, by which individuals organize and adapt to the environment. These schemata are used to process and identify information. They change, enlarge and become more sophisticated with mental development through the processes of assimilation and accommodation (Wadsworth, 1989). With Lev Vygotsky, we are moving from the Piagetian individual constructing knowledge through actions on the world to the

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Vygotskian understanding as social in origin (Cole & Wertsch, 1996). The approach Vygotsky takes to cognitive development is sociocultural. He promoted the idea that the individual is inseparable from the social and that thinking develops under particular social and historical conditions. He argued that cognitive operations originate in social interactions and emphasized the role of language and culture in cognitive development as frameworks through which humans experience, communicate and understand reality. He claimed that learned social speech becomes inner speech, "a use of language to regulate internal thought" (Mitchell & Myles, 1998: 148). Thus, speech precedes thought and therefore, thought develops from society. One essential notion in Vygotsky's theory of the social construction of knowledge is that of the 'zone of proximal development' (Vygotsky, 1978) in which learning is fostered with the assistance of somebody else.

Concentrating on the constructivist theory, the term constructivism refers to a well-known theory of learning. Constructivist epistemology (the nature of knowledge) assumes that learners construct their own knowledge through interaction with their social and physical environment. Constructivists believe that, although there is a real world out there, there is no meaning inherent in it but it is imposed by people and cultures. People construct their own understanding and knowledge of the world through experiencing and reflecting on these experiences. Since knowledge construction depends on how humans perceive the world in relation to their social and physical experiences, learning is seen as a result of mental constructions where learners fit new with prior knowledge. In that view, learning is an active constructive process in which the learner is building an internal representation of the world and adjusts his understandings to fit his experiential world. Therefore, in constructivism the focus is on the learner and his mental constructions while learning.

2.1 Social constructivism

There are several types of constructivism but this paper focuses on social constructivism. Social constructivism gives emphasis to the importance of culture and context in forming understanding (McMahon, 1997). Its basic principle is that knowledge is constructed through social interaction and is the result of social processes (Gergen, 1995) and thus it is a shared, rather than an individual, experience (Prawatt & Floden, 1994). Social constructivism is more concerned with meaning than structure since it emphasizes the co-construction of meaning within a social activity. Therefore, the construction of meaning involves intersubjectivity among individuals, i.e. a shared understanding among individuals whose interaction is based on common interests and assumptions that form the ground for their communication (Rogoff, 1990) and is shaped and evolves through negotiation (Prawatt & Floden, 1994).

There is a long debate among world experts about the theories of Piaget and Vygotsky (Tryphon & Vonèche, 1996) concerning whether they are different or complementary. This debate is also extended over cognitive and social constructivism which are based on the work of Piaget and Vygotsky respectively. Dahl (2003) argues that we can create a synthesis of Piaget and Vygotsky on the level of learning theory despite their ontological (having to do with the nature of reality) differences. Regarding the two constructivist perspectives, Felix (2004) suggested that a combination of them can facilitate second language learning. On the other hand, Ernest (1994) claims that there is a lack of con-

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sensus about what is meant by the term social constructivism and distinguishes two types: "One is based on a radical constructivist (Piagetian) theory of mind, and either bolts on aspects of the social, or adds it on as an alternative complementary perspective. The other type is based on the Vygotskian theory of mind, and is more thoroughly social" (Ernest, 1999: electronic version). Based on Ernest's (1999) distinction this paper approaches CALL through a social constructivist perspective meaning that a complementarist position is adopted in which we take into consideration two complementary and interacting but disparate theoretical frameworks because we want to equally emphasize both the cognitive and social aspect of learning.

Consequently, our social constructivist approach consists of one framework that concerns the individual constructing meaning and knowledge, following the radical constructivist model, and the other that concerns social interaction and the negotiation of meaning. More specifically, knowledge is actively built up by the cognizing subject based on his/her experiences and will adapt itself to fit into the individual's experiential world (von Glasersfeld, 1995). Moreover, social interaction is essential in the construction of knowledge as the thinking subject and the realm of the social are interconnected. The subject is shaped in a social context and knowledge constitutes of social and cultural elements. That is because individuals can create meaning through their interactions with each other and their environment and meaningful learning can occur when individuals are engaged in social activities (Prawatt & Floden, 1994). Language is crucial as knowledge is mediated by language. It is a shared code that is used for the expression and transmission of our internal constructions of the real world. Drawing from Vygotsky (1978), the notion of the zone of proximal development is essential, as it is the difference between what a learner can do on his own and what he can do with assistance. Through the process of scaffolding, where the learner is guided in such a way as to reach the level of solving a problem, collaboration is promoted for learners to achieve self-reliance (Wood, Bruner & Ross, 1976; van Lier, 1996).

Based on all the above, we can roughly delineate the primary constructivist principles of learning and teaching. Learning is an active constructive process in which the learner plays the central role while the teacher is seen as a facilitator or a guide. The focus is on the learner's interpretations of the outside world knowledge, and not on the simple transmission of this knowledge to a passive recipient. The learning environment should hence be one that encourages collaboration, negotiation and social interaction while promoting the sharing of multiple perspectives and providing stimuli for the construction of knowledge. Moreover, it should enable and allow learners to make associations with their prior experiences. In that context, learners should be engaged in context-rich and experience-based activities (Jonassen, 1992), which are meaningful to them, and their cognitive experiences should be situated in authentic environments (Brown, Collins & Duguid, 1989). Finally, learners should be encouraged to employ and develop learning strategies that will foster their mental processes and their learning in general.

3 Constructivism and SLA

In an attempt to show the value of applying the constructivist model in CASLA, we will now examine SLA in relation to constructivism. Because both the individual (cognitive) and social aspects are considered central in language learning, a more social construc-

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tivist approach will be followed here. In that context, a combination of cognitive and interactionist approaches to SLA will help us associate constructivism with SLA.

Based on the assumption that learning can be considered a process of information gathering and processing, learners connect new with prior information by combining declarative with procedural knowledge (Rüschoff & Ritter, 2001). In other words, in the process of second language learning the learner is viewed as having internalized knowledge of the second language (L2) which is mentally processed to result in the acquisition and use of the target language. The cognitive processes are activated when new information is available. In order for this new information to be comprehended, it is seen in relation to the learner's prior knowledge. The learner will then employ memory, cognitive and metacognitive strategies and mental procedures to construct or re-construct internal representations to match the target language.

Within that cognitive process, the learner's prior knowledge hence plays a significant role as the L2 is constructed in relation to it. The learner's prior knowledge consists of his mother tongue (L1) and a general knowledge of the world. The L1 provides an insight into how language is structured and therefore it inevitably works as a point of reference in L2 learning. The belief that where two languages are similar, positive transfer will occur, while, where they are different, negative transfer or interference will result, constitutes the so-called Contrastive Analysis Hypothesis (CAH) (Ellis, 1994, Larsen-Freeman & Long, 1991). As language is culturally and socially oriented learners need to rely on their experiences to understand its meaning and use. Thus, the more distinct cultural differences between the two languages are, the more learners have to modify their interpretations to match the target language. Nevertheless, there is the belief that learners create hypotheses about the structure of L2 on the basis of the input they receive and build a 'hypothetical grammar' which is tested internally or when learners produce an output (Corder, 1976). This 'hypothetical grammar' is what Selinker (1972) called interlanguage. Interlanguage is based on personal interpretations which vary from individual to individual. Therefore, the interlanguage each learner builds is unique, showing that individuals construct knowledge on their own by gathering and processing information, which is the basic tenet of constructivism.

However, we cannot disregard the role of interaction in the structure and modification of the learner's internal interpretations of L2. It is through the interaction with others and the learning materials that learners receive input, form and test hypotheses in order to acquire the target language. According to the general theoretical framework developed by Gass (1988), learners receive input in the form of aural and written information in which they notice features due to the saliency of the features themselves or their own prior knowledge. If the perceived input becomes comprehensible, it is associated with the learners' prior knowledge. This input does not become part of the implicit knowledge until it has been fully integrated. The learners' output, oral or written, will allow them to reuse newly integrated hypotheses, check their validity and reform original ones. If the output, which is the overt manifestation of the process of language comprehension, leads to a misunderstanding because it fails to fit the target language, learners will receive feedback or there will be negotiation of meaning.

All these point to a process where input becomes output and output becomes input, and so on and so forth. According to constructivist accounts, with regard to the skills of listening and reading, learners receive input which they process through a variety of cognitive operations in order to construct a representation of the target language which

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they finally verbalize in the form of aural and/or written output, i.e. speaking and writing (Figure 1). In that manner, all four language skills can be integrated in a framework which connects constructivism with SLA promoting social constructivism. The framework, still in progress, looks as follows:

4 Social constructivism and CASLA

At this point, we need to see how the use of computers in second language learning encompasses all the above and brings constructivist theory and especially social constructivism to the foreground. In order to do this, we will re-examine independently the conditions for successful SLA within a CALL context and the conditions for successful learning from a social constructivist perspective. Both sets of conditions will then be juxtaposed so to achieve the description of ideal socio-constructivist conditions for SLA. Subsequently we will describe, again independently, the characteristics of both the ideal CALL environment and the ideal socio-constructivist environment. Again characteristics will be juxtaposed so to achieve the description of an ideal socio-constructivist CALL environment.

4.1 Conditions for successful SLA through a socio-constructivist perspective

The effectiveness of CASLA draws from the conditions for successful SLA made possible in CALL. Based on Chapelle (2001), those conditions are cognitive and socio-affective. Regarding cognitive conditions, learners should be exposed to a range of target structures which are within the learner's grasp, have opportunities to express their meaning in different ways and develop towards the dimensions of fluency, accuracy and complexity, draw their attention to the meaning and structure of the target language and be able to track their progress (Skehan, 1998, in Chapelle, 2001). In addition, the social and affective aspects of learning should be taken into consideration concentrating on the learner's 'willingness to communicate' (MacIntyre, Clément, Dörneyei & Noels, 1998 in Chapelle, 2001). Thus, the activities should encourage social interaction and collaboration in order to provide opportunities for communication.

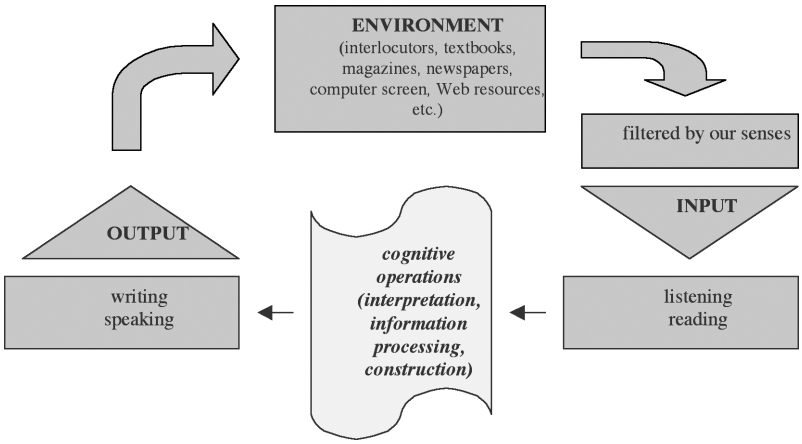


Fig. 1. A socio-constructivist framework of SLA (in progress).

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On constructivist accounts, the emphasis is placed more on the cognitive aspect of learning, because the learner constructs the L2 knowledge on his own based on his experiences and environment. In that context and drawing from Driscoll (1994), the constructivist conditions for learning rely on authenticity in order to enable association of prior with new knowledge, and provide social negotiation and multiple modes of representations so that the learner can see the same content from different perspectives. In that way, the learner becomes aware of his role in his knowledge constructions and is led to a more self-regulatory learning.

By examining the conditions for successful SLA made possible in CALL and the constructivist conditions for learning in parallel, the following conclusions can be drawn. Both perspectives emphasize the variety of materials that learners should be exposed to and promote the role of interaction in collaborative learning. In both cases, the learner is encouraged to be engaged in a self-monitoring process and in that way take control of his learning. However, the constructivist perspective leaves more space for the learners to create their own L2 interpretations which through social interaction and negotiation of meaning will be checked, enlarged or modified to fit the target language. In relation to that, a lot of emphasis is put on the authenticity of learning environments because that will empower reflection upon and correlation to their personal experiences. Finally, computer technology is best deployed for drawing learners' attention to the linguistic form when form-focused tasks are embedded into a scaffolding process. Learners will perform tasks with support until they gradually become more self-reliant.

4.2 Characteristics of the ideal socio-constructivist CALL environment

Considering all the above, we need to see how these conditions can be developed in ideal environments. To begin with, we will concentrate on the characteristics of the ideal CALL environment. In our research, we are focusing on CALL as a type of environment which can promote second language acquisition. According to Chapelle (1998), ideally such an environment provides opportunity for focus on form and meaning and for noticing errors. Moreover, it provides ideal input and output, understood as comprehensible input and output, and allows modified interaction between the learner and the computer.

On the other hand, based on the social constructivist approach, learning is an active constructive process in which the learner is building an internal interpretation of knowledge and meaning is developed on the basis of experience. Taking that into consideration, a socio-constructivist environment facilitates knowledge construction in a variety of ways which are best articulated by Jonassen (1994). By providing multiple representations of reality, representing the natural complexity of the real world, presenting authentic tasks and enabling context and content dependent knowledge construction, learners are allowed to create their own interpretations through the association of prior with new knowledge. According to Bednar, Cunningham, Duffy and Perry (1992), the development of knowledge comes from the sharing of multiple perspectives and the constant change of the learner's interpretation in response to those perspectives. That process can be fostered with the support of collaborative construction of knowledge through social negotiation. Finally, a socio-constructivist environment promotes reflective practice as it helps learners keep track of their progress and know whether their interpretation fits into the target language.

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Because constructivists believe that learning environments should not only facilitate higher-order thinking and metacognition but also promote experiences and contexts that make the student willing and able to learn (Driscoll, 1994), they emphasize situated learning in authentic environments and propose cognitive apprenticeships as an instructional strategy that provides authentic experiences and promotes collaborative learning (Brown, Collins & Duguid, 1989). Therefore, from the socio-constructivist perspective, we have an environment that fosters cognitive apprenticeships, within which we see modeling, scaffolding, coaching, exploration, articulation and reflection (Conway, 1997). It also promotes situated learning or cognition through task-based, project-based and content-based learning (Warschauer & Healey, 1998) and collaborative learning, where learners work together towards a common goal.

By juxtaposing the distinctive features of both the ideal CALL environment and the ideal socio-constructivist environment, we can suggest a definition of the ideal socio-constructivist CALL environment. First of all, it is learner-centered, meaning that the learner is free to make his or her own interpretations. It also promotes authenticity through context-rich and experience-based activities which enables learners to associate new with prior knowledge. Moreover, social interaction is crucial for the sharing of multiple representations, reflection and monitoring and it provides the opportunity for negotiation. Finally, it embeds scaffolding for the manipulation of the learner's attention to form and meaning and for collaboration to achieve the construction of knowledge.

5 WebQuests in project-driven language learning

As said, within the constructivist framework, language learning is an active process in which learners construct representations of the target language based on their prior knowledge and experiences. Learners are engaged in authentic activities that are meaningful to them. Through collaboration and social interaction, they are exposed to multiple representations and exchange interpretations that enhance SLA. Project-based learning can provide the conditions for situated and collaborative learning which are promoted by social-constructivism. Within that perspective, the use of WebQuests appears to be an example of good practice in approaching CASLA through a social-constructivist context. Thus, we need to look towards establishing evaluation criteria for WebQuests in order to find out which fit more closely to our ideal socio-constructivist CALL environment or build WebQuests that meet with these criteria.

As a computer application in which the Web has the potential to engage learners in experiential learning, Felix (2002) classifies WebQuests as an example of the information gap resolution model where social interaction is fostered by collaborating and cooperating in meaningful exchanges through authentic information gaps. It is a model that seeks to achieve maximum connectivity and learner engagement. Furthermore, it involves contextualized language and research tasks and stimulates creative simulations. Yet, a more thorough examination of WebQuests shows that they can enhance second language acquisition through a social constructivist approach.

According to Dodge (1995), the originator of WebQuests, a WebQuest is "an inquiry-oriented activity in which some or all the information that learners interact with comes from the Internet" (Dodge, 1995: ev). Learners have to analyze a body of materials and demonstrate an understanding of them by creating an artifact to which others can

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respond. That complies with the constructionist theory of learning as well, which emphasizes the value of constructing artifacts meaningful to the individual (cf. Papert, 1980) but the constructionist perspective is beyond the scope of this paper. WebQuests typically introduce a task, convergent in nature and ideally of a problem-solving type, which the learners are asked to solve, ideally collaboratively, using a great variety of resources primarily found on the Internet, and scaffold the learning process to prompt higher order thinking (March, 1998). As a starting point, the learners are provided with an original scenario together with some background and support information which are there to help them accomplish the set task. WebQuests contain links that point to websites where students will find all the extra information they need and so they will not wonder meaninglessly on the Web. In other words, students spend their time using the information and not looking for it.

What potentially makes WebQuests examples of good practice is that they put content in context. By creating a situation in which the completion of a task is meaningful to the learners, learning becomes situated in an authentic environment. Moreover, the task usually involves group work, in which learners take on specific roles for its accomplishment, promoting in that way cooperative and collaborative learning. WebQuests also contain motivational elements, such as interesting scenarios or interaction experts online and are highly visual, hence increasing the learners' willingness to participate. They are multimodal as they include photographs, maps, text, charts, sound clips and videos, to name a few. WebQuests promote scaffolding in the sense that the information made available to the learners for each step of the task helps them gradually become self-reliant. WebQuests use scaffolding in order to engage learners in higher level cognition (March, 1998). By breaking the task into smaller pieces and asking students to undertake specific sub-tasks, WebQuests are a learning scaffold allowing different degrees of guidance through their design. Finally, learners are also given the opportunity to reflect on what they have learned and discuss possible extensions and applications of the gained knowledge. Consequently, all these characteristics make WebQuests an ideal socio-constructivist CALL environment.

Taking a closer look at a specific WebQuest we can see how SLA can be enhanced and how some social constructivist principles are embedded in its design. What we need to mention is that there is a wide variety of WebQuests available on the Web. Since they are classroom-based lessons, the selection of a WebQuest is determined by the interests, needs, capabilities and styles of the learners it is aimed at. Even if there is not one suitable for a specific target group, that should not worry teachers who would like to incorporate them in their curriculum because they are easy to create and/or modify accordingly. For the purpose of this paper, we will focus on *Discover London WebQuest* which was designed by Eila Keränen (2002) for intermediate or advanced students of English.

In *Discover London WebQuest* students have to plan a week's student excursion to London. Students have to work in pairs and prepare a two- to three-page brochure of the day-to-day programme of the excursion including information about the places they will visit and present it by using Power Point or Front Page. By presenting their work to the other students in the classroom students have the opportunity to see the different perspectives chosen by each team in approaching the task. As students complete the WebQuest, they will become aware of how their individual work has affected their group's final product. Using the links provided they will also have the chance to dis-

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cover the culture, history and attractions of London and at the same time practise and improve computer and language skills. Searching the Internet for information in order to produce a brochure indicates the connection of discovery with learning-by-doing for effective second language learning. It is important that students can not only improve reading comprehension, summarizing and rewriting but also they can improve computer skills such as word processing, picture manipulation and page design. Furthermore, the tasks allow the employment of cognitive, metacognitive and social strategies such as planning, organizing and processing information, monitoring and cooperating.

Looking more closely at the components of the particular WebQuest, we can see how the social constructivist principles are embedded to enhance SLA. The home page is colourful and full of pictures creating a pleasant and motivational environment. The pictures are used to activate the student's relevant schemata. In the introduction section there is also a quiz for students to check what they already know about London, again activating students' prior knowledge and enabling them to associate new information with it. The task section not only assigns the roles each student has to play and the tasks they have to accomplish but also makes explicit the skills students will improve by being engaged in the activity. That makes students more conscious of their learning process. With the assignment of the roles, each student is responsible for the learning of the other and good cooperation is required for the completion of the tasks. This also allows students to work on their own, develop their different abilities and at the same time share their knowledge with their partners. Collaboration is essential because through social interaction within the team constructive learning can occur. The Resources section provides links that point to websites where students will find all the information they need and the Process section describes each step students have to follow for the completion of the tasks. A planning diagram is also provided for students to organize the information they collect. Thus, there is a kind of scaffolding but this guidance is limited to a certain extent as students are encouraged to work on their own. In the evaluation section there is a rubric for the evaluation of the students' work. The conclusion allows students to reflect on their work and proposes an extension of their research. Finally, the credits section includes references, other resources and cognitive tools students might need, such as, for example, an online dictionary.

6 Conclusion

With the emerging technological development and evolution of technology use in learning, the learners become the centre of the learning process as they can take control of their learning. Because learners construct meaning on their own by associating new with prior knowledge, we should take into consideration the learner's cognitive operations in the language learning process. Moreover, social interaction is also essential for L2 knowledge construction as it enables learners to enlarge, check and modify their interpretations of the target language. Regarding the development of the Internet technology, which promotes human-human interaction (synchronous or asynchronous) in language learning, we are led to adopt a more socio-cognitive approach to CALL, such as social-constructivism.

By examining the conditions for successful second language acquisition through the social constructivist perspective we can conclude that students should be engaged in experiential learning where they play a more active role in language learning and opportunities for social interaction should be provided for multiple representations of the target

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language to be available to the learners. That will allow learners to construct their own interpretations of the target language, interpretations they will then attempt to fit into it. These conditions can be developed in an ideal socio-constructivist CALL environment which is learner-centered and promotes authenticity, interaction and scaffolding.

However, more elaborate research is required into the approach of second language acquisition through social constructivism since a more solid and robust theory of language learning based on constructivism needs to be articulated, and be empirically tested as well. In that direction, our framework, which is still in progress, requires further research. Some experimental data should be collected and analysed in relation to the use of WebQuests as potentially ideal socio-constructivist CALL environments. Nevertheless, due to the constant technological development which favours constructivist principles, new learning approaches, such as social constructivism, which draws upon situated learning and social cognition, will be adopted in CALL in the future.

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