

*Learning and Socio-cultural Theory:  
Exploring Modern Vygotskian  
Perspectives International Workshop  
2007*

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*Volume 1, Issue 1*

2007

*Article 6*

LEARNING AND SOCIO-CULTURAL THEORY: EXPLORING  
MODERN VYGOTSKIAN PERSPECTIVES

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Vygotsky Goes Online: Learning Design from  
a Socio-cultural Perspective

A. Hall\*

\*Sultan Qaboos University

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# Vygotsky Goes Online: Learning Design from a Socio-cultural Perspective

A. Hall

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Student centred online learning courses are often designed according to a socioconstructivist approach. Socio-constructivist approaches are proposed to be a blend of the theories of constructivism as well as those of socio-culturalism. Although this is a commonly held view, Vygotsky proponents believe that the two approaches are fundamentally different. According to Vygotsky environment should be the starting point for learning, and that the student-centred learning should be designed within the Zone of Proximal Development. Vygotsky theories are the basis of problem based learning, cognitive apprenticeships which are frequently used in online courses, but there is very little in the literature that provides practical examples of how fully online courses can be structured based on these sociocultural theories. This paper proposes how this can be done and provides examples from an online course.

# **VYGOTSKY GOES ONLINE: LEARNING DESIGN FROM A SOCIOCULTURAL PERSPECTIVE**

**ANDREA HALL**

Sultan Qaboos University

## **Abstract**

Student centred online learning courses are often designed according to a socio-constructivist approach. Socio-constructivist approaches are proposed to be a blend of the theories of constructivism as well as those of socio-culturalism. Although this is a commonly held view, Vygotsky proponents believe that the two approaches are fundamentally different. According to Vygotsky environment should be the starting point for learning, and that the student-centred learning should be designed within the Zone of Proximal Development. Vygotsky theories are the basis of problem based learning, cognitive apprenticeships which are frequently used in online courses, but there is very little in the literature that provides practical examples of how fully online courses can be structured based on these sociocultural theories. This paper proposes how this can be done and provides examples from an online course.

## **Introduction**

Learning Design principles guide the design of online learning courses. The learning design helps focus the design of the course and helps the teacher or facilitator achieve the course goals. Over recent years, there has been a shift from content –based teaching to skills-based teaching as learning theories propose that learning is an active process, where learners must build knowledge and not be passive recipients of information. This approach provides benefits as it can help develop the skills needed for the workplace, such as problem solving, critical thinking, and independent learning.

The most popular learning design that is used today is based on a socioconstructivist view of learning and teaching. This approach is primarily a constructivist approach that conceptualises learning as a private process within an individual, but then includes aspects of sociocultural theories in recognition of the value of others in the learning process. This can be seen in the following comments: “As an extension of the constructivist view of personal effort in meaning

making, socioconstructivism proposes that the meaningful construction of knowledge occurs when a learner interacts with other learners” (Low, 2003 para 2), or similarly as in this definition of socioconstructivism “knowledge construction based on previous knowledge and interaction with the social environment” (Synteta, Schneider, Morand, Girardin, Frété & Class, 2003). An eclectic approach to course design can be a good approach to take; however this can be done at the risk of missing the key concepts of each approach. This may have happened in the development of socioconstructivist course design, in that the social environment has been added to a constructivist approach, but without the sociocultural explanation of the role of the social environment. This could be the reason why there is little in the literature about sociocultural approaches to online learning design, as Vygotsky’s theories have been commonly included as part of the constructivist or socioconstructivist paradigm, not as a learning theory in their own right.

Therefore, this paper attempts to provide an explanation of Vygotsky’s sociocultural theories as they apply to the design of online learning environments. It then demonstrates the use of this learning design with an example course description.

## **Theoretical Framework**

### **Constructivist Theories**

Although this paper focuses primarily on the use of sociocultural theories for learning design, it is important to know something of the constructivist approach as a comparison.

#### **Key Concepts**

Constructivist learning theories, as proposed by Bruner and others, developed out of Piaget’s theories of cognitive development. Their basic assumption is that the learner is active in the learning process; that learning is the result of interaction with a problem context where the learners construct their own knowledge. The key concepts, as described by Glasersfeld (1992) are that

- Knowledge concerns a student’s “conceptual operations” (p 33)
- Each individual must construct knowledge
- Teaching is a social activity, but learning is “a private activity” (p 33)

Knowledge is not transferred passively, but is personally constructed. Glasersfeld (1992) comments that learning is “on the basis of failures and successes of its own actions” (p 35); learners must first learn and understand before they can share their constructs with others. Glasersfeld holds an extreme view on constructivism, but his definitions have been selected as they show clearly the key concepts of these theories.

## **The Learning Context**

As learning is an active process, the learning context has an important role in the learning process. The context should be designed to help develop critical thinking skills in the learner by using the types of tasks performed in the professional field of practice. Problem solving activities are felt to meet this requirement, as Jonassen (2000 p 63) commented: “problem solving is generally regarded as the most important cognitive activity in everyday and professional contexts”. The best problems are authentic ones, that is are ill-structured problems, as is found in real life (Jonassen, 1998). Cognitive tools are also provided in this environment to aid the learning for example by helping to decrease the cognitive load or help with visualisation. These tools can include computers, concept maps or calculators, for example.

## **Sociocultural Theories**

As with constructivist approaches, sociocultural theories also propose that learning is an active process and that the context has an important role in learning. These theories developed from the work of Vygotsky (1978) who proposed that learning is not just an individual matter, but that it develops within social environment.

## **Mediator Tools in the Social Environment**

Sociocultural theories place the social environment at the very centre of learning, and without which, the “development of the mind is impossible” (Cole & Wertsch, 2001 p 4). This is because learning is mediated. Vygotsky proposed that in the learning process, experts use tools to mediate learning. Cognitive development is not a direct result of activity, but it is indirect; other people must interact with the learner, use mediatory tools to facilitate the learning process, and then cognitive development may occur. These tools are “psychological” (Vygotsky, 1978 p 53) in nature, in that they are used to express thinking, and include language, signs, symbols, texts and mnemonic techniques. The most significant sociocultural tool is language, as it is used to teach tool use and is vital in the process of developing higher psychological functions (Karpov, 2003; Rogoff, 1990; Sutherland, Armstrong, Barnes, Brawn, Breeze, Gall et al, 2004). Mediator tools are first seen externally as the expert teaches the learner how to use the tool, then internally as the learner begins to use the tool in performing other activities. In the internalisation process, the tools modify and transform the learners’ thought processes as they begin to use these new tools to express their thinking. Thus, the impact of the social environment on learning can be seen in that the experts select and teach tool use and this affects the way that the learners express their thinking (Cole & Wertsch, 2001; John-Steiner & Mahn, 1996).

## **Zone of Proximal Development**

As sociocultural theories propose a mediatory function in learning, the role of the teacher can be described in the way they promote learning, and this can be achieved with Vygotsky's concept of the Zone of Proximal Development (ZPD). This concept describes the type of environment that enables the learner to develop cognitively. When faced with a new situation, the learner needs new or more mature psychological tools and mental structures for this particular activity (Chaiklin, 2003). If the learning environment has the right amount of support from others, then the learner can gain maturity in their new tools as they learn to use them in this environment, and the learner is said to be "learning in the ZPD". It is not just the presence of other more mature people that is necessary, but that these people must be able to help the learners develop and enrich the particular psychological tools that are needed, and only when these learners are ready for this next stage of development. If these factors are all present, then the learners' interaction in the social environment can be able to help them achieve success in the learning activity, in a way that they could not have done without the social support (Chaiklin, 2003; Karpov, 2003; Kozulin, 2003).

### **The Context**

The context described in the sociocultural approach is a social one. This is because of the type of tools described in this theory and the necessity of mediators. The context needed for learning is that where the learners can interact with each other and use the new tools. This means that the learning environment must be authentic, that is, it must contain the type of people who would use these types of tools such as concepts, language, symbols in a natural way. The activity that is part of this environment would also need to be an authentic one, as the type of language used by the people in the environment would be determined by the type of tasks they would be doing. Here the learners will be able to learn how to use domain knowledge in the same way practitioners would, as they would discuss and interact using the domain knowledge that learners require competence in (Brown, Collins & Duguid, 1989). Therefore the type of situation that is required for this interaction is tasks or problems that would normally be done by those in the field. These tasks may be simple or complex, depending on the learners' levels, but must be authentic.

## **Using Sociocultural Theories to support Constructivism**

The description of the two theories has shown the core issues in these two theories. This knowledge can be used to make an informed decision of whether the sociocultural theories can be used to enhance constructivism, or whether the core concepts make this not an effective means to teach.

### **Comparing the Theories**

The description of the theoretical basis to these two theories shows that both expect that learning occurs within an active context, where knowledge is built, and where there is some individual learning occurring. However there are many differences between the two, as is shown in Table 1.

Table 1: Concept comparisons for Sociocultural and Constructivist Theories

	Constructivist	Sociocultural
Role of learner	Active	Active
Learning focus	Develop cognitive skills and knowledge	Develop cognitive skills and knowledge
Primary place of Learning	In the individual's mind (the social environment is important as well)	In social practices (individual responsibility is important as well)
How learning is initiated	Working on problem solving activities	Pre-teaching, then providing support to mature learners psychological tools in the ZPD
Role of the activity	Drive learning	Increase competency in tool use.
Basic Unit	Individual	Individual in social interaction
Tools	Cognitive: Express thinking or decrease cognitive load	Psychological: Mediate learning, and change and form the thinking processes
Authentic environment	An ill-structured problem as found in real life	Place where the community uses that knowledge in a problem
Teacher	Ensure the activity is effective and provide another viewpoint	Mediate learning through relationships and analysing tool maturity to identify the ZPD
Role of the social environment	A teaching environment that concerns the teacher more than the learners	To help with learning and cognitive development concerning ZPD and psychological tools

Table 1 shows that the constructivism and sociocultural approaches are not compatible as many of the basic issues are different. Ageyev (2003) commented that Vygotsky's theories 'contradict the core values of Western Culture in individualism' (p 434). As the table shows, the basic unit for constructivism is the individual but for sociocultural individual in social action. For the constructivist approach, the learner acts alone first then interacts with others, for the sociocultural approach it is the reverse. In constructivism, action is proposed to result in learning; sociocultural approach proposes learning first then action, and that action develops competency and cognitive development.

## Using the Sociocultural Theories in Socioconstructivist Approaches

These descriptions of the constructivist and sociocultural theories shows many differences that would prevent them being used together effectively in the same learning environment. It also shows that the sociocultural approach is more than adding social interaction to an individualistic course; rather it concerns the use of the social environment throughout the learning process. It also describes tools and processes that are needed to enhance the learning, such as using the ZPD, and the introduction and development of psychological tools. Therefore if there is the intention to make use of the social environment, this should not be to add them on to a socioconstructivist or constructivist course; courses should be designed based on the principles of the sociocultural theories.

Therefore Vygotsky's theories need to be more widely understood and their applicability to learning design should be exemplified. As these theories explain the role of the social environment, they may help in the design of learning environments that use this environment more effectively.

## **A Social Cultural Design of Learning Environments**

Learning design strategies are used to provide a structure for designing online learning environments. They enable the designer to analyse the purpose of the course, and ensure that it meets the needs of the institution or instructor. The approach used in learning design is determined by the learning theories that underpin it, for example, the original instruction design principles were based in learning theories that assumed that knowledge is transmitted to the learner. The more design approaches, such as constructivist are based in theories that propose that the learner builds knowledge. The sociocultural learning design should be also.

In a sociocultural learning design, Vygotsky's themes of mediation, the social environment, the use of tools, and the development of cognition in the ZPD are all inter-related concepts and these should be applied to the design of Sociocultural learning environments in the following ways.

## **Learning in Community**

The first task of the teacher or designer would be to analyse both the skill-based learning goals and objectives of the course, and then to determine what types of community would naturally be involved in using those skills. This can help decide what skills the learner would need and then which problem activities should be designed to enable that community to work on those skills.

## **The Learning Context**

The learning context is an authentic environment. Learners perform authentic activities, with others, and through this, develop the kinds of cognitive skills necessary to be an effective practitioner in that field. This is because in that environment, the learners use the psychological

tools in their interaction in the way that practitioners do. Therefore the designer selects activities that are genuine practice, which enable learners to function as a community, using the language signs and symbols that are a normal part of that environment.

This concept of the authentic environment is further developed in the Situated Cognition theory of Jean Lave and Etienne Wenger who proposed that learning occurs best in an environment that is authentic; and where authentic activities or practices occur (Brown *et al.*, 1989). Knowledge is part of the environment that it belongs to, that is, in a situated context, and people in that community use the tools of that field in their normal interaction and collaboration. Authentic practice may be simple or complex depending on what the learner is ready for, but it should be embedded in the context and cultural practices of others in that field (Brown *et al.*, 1989).

### **Individual Activities**

Individual activities are part of this learning design. As a mediatory tool is seen “first in the social plane and then in the psychological plane where it is transformed” (Hung & Nichani, 2002 p 173), so learners need individual activities where they may work independently and therefore demonstrate their ability to do these new tasks without the support of others. This would also be expected in a community; here members of the community would take on the culture of the community and begin to use the signs, symbols and language they have internalised in the interaction. Independent activities also show if the learners have internalised the tools they have been learning how to use and therefore can be a way for the teacher to assess student achievement (Doolittle, 1997). Therefore initial activities should be designed in the social environment, but later activities should be designed as independent learning activities.

### **Learner Support**

As Vygotsky’s theories propose that learning is mediated, the course designer should analyse which tools will be needed for the activity and the level of maturity the learner has in those tools, so that the right amount of support will be provided. If tasks are more complex than the learners may be ready for, Riedal, Fitzgerald, Leven and Toenshoff (2003) recommend that instead of making the task simpler, extra support should be provided.

#### **There are two ways that this support may be provided:**

*Use of teaching materials:* These should be used before the activity is accessed as sociocultural theories propose that “learning precedes development” (Artiles *et al.*, 2000 p 81). This means that the first step is the learning of the new signs, symbols and concepts that the learners will use in the new learning context. Thus initial activities should focus in the explication of these tools. Then secondly, as learners begin to use the tools and internalise them in other activities, the internalisation process modifies the thinking processes and so cognitive development occurs. Karpov (2003) described Vygotsky’s concern that this pre-teaching should not be aimed at providing information, but instead to lead and guide development through teaching “scientific knowledge” (p 67). Thus the materials should have a focus on conceptual

knowledge and structural knowledge, showing learners how to use these concepts so they may understand how to use and develop the psychological tools they will need.

*Providing learner support:* Activities should be designed in a course with the right amount of support to help learners gain expertise in using the new concepts and tools. These activities should be at the level where they are challenged without it being too difficult. This means that learning support involves not only the initial work in course design, but it means an active role for the teacher during the implementation of the course in tracking the learners to provide timely and suitable feedback, ensuring learners have the support they need. Dolittle (1997) comments that this is important in ensuring the learners are working on task, and that each student is “both challenged and developing”(p 95) , that is, is working in their ZPD.

Some more recent sociocultural theories provide examples of the ways that learners can be supported, such as the Cognitive Apprenticeship theory developed by Brown et al (1989). In this approach, the teacher, or more experienced peer, models the use of mediatory tools, and provides the scaffolding for learners to practice. Scaffolding is gradually withdrawn as the learner gains expertise. This support is set within the relationships between the learner and the more experienced others, using strategies such as modelling, coaching and fading (Brown *et al.*, 1989; Rogoff, 1990). Modelling concerns providing examples of expert behaviour that include explanations; coaching concerns encouragement, diagnosis and direction; and scaffolding is the provision of structure or prompts in the learning environment. These strategies all provide support both within a course structure and through individual or spontaneous feedback to help learners gain mastery in the use of new tools.

## Summary of features of Sociocultural Learning Design

These sociocultural principles can be summarised in tabular form as is shown in Table 2.

Table 2: Design principles for Courses using a Sociocultural Approach

	Sociocultural course design
Aim of Course	Cognitive development; to learn how to work in the field of practice
Learning Context	Social environment where that knowledge is used in responding to a problem that community may face.
Instructor’s Role	<ul style="list-style-type: none"> <li>• Provide support to help learners work in ZPD</li> <li>• Help learners understand and use new tools.</li> </ul>
Role of peers	Provide the social environment where learners develop competency in tool use.
Initial activity in course (after orientation)	Provide conceptually-based teaching for learners to understand new tools.
Initial context	After formal teaching: the social environment

These key features can be used to design a sociocultural learning design. The main focus is the learning context; based on the course aims and the authentic environment related to the

course aims. The learning design would feature social activities aimed at responding to the problem, using the support provided by peers and the instructor.

### **An example of how a sociocultural learning design may be used**







The following describes a course designed from a sociocultural perspective. There was no empirical research associated concerning the effectiveness of this approach, as the focus is to explain how Vygotsky's theories can inform learning design, and the following course description is a practical example of this application.

The following concepts are taken from an eight week fifty hour online faculty professional development course run at a university. This course is made up of five units, with each unit having a similar format as shown in Figure 1. Participants are encouraged to follow the unit components in order, to achieve maximum learning.

Figure 1: An example of a unit in the Online Course

**Designing an Online Activity 6th to 22nd Nov**

In this unit you will put your learning into practice and design an online student-centred activity for the course you are working on.

-  1. Video Intro to Course
-  2. Teaching Notes
-  3. Unit 4 Tasks
-  4. Brainstorming Chat
-  5. Group support for your activity ideas
-  6. Assignment 3

### **Pre-teaching**

The first task for participants was to read the 'Teaching Notes'. These did not intend to provide content for the learners to understand or remember, but rather focus was on the concepts that were needed by the learners in this unit. These notes aimed to help the learners understand the tools they would use when they doing the activities in the unit. For example, the teaching notes in one unit of the online course explained the concept of 'student-centred learning', and the tasks that followed required that participants would start to use the concept in several tasks

including in the design of the courses. This pre-teaching task followed Vygotsky's concept of the importance of teaching concepts before they are used in activities, and that this should focus on concepts not on content.

## A group Activity

The second task for the participants was an interactive group activity with people from their own faculty or similar background, where they started using the concepts they had been introduced to. The task was on a prescribed topic that helped to provide the scaffold for the learners to begin to deepen their understanding of the concept as they articulated it and interacted with others. The group also had guidance from someone who has some expertise in the area, either the facilitator, or a participant with some expertise in that particular area. For example in seeking to develop and enrich the student-centred learning concept, participants did short individual readings on the topic and then contributed to a group wiki, as shown in Figure 2. This is scaffolded in that it had prescribed topics for each group member's contributions, with a combined description of the concept learners had to work on together to complete the task. The facilitator could edit the contributions, and participants were also encouraged to edit each other's postings. This design of this group activity enabled participants to learn initially in a social environment where there was scaffolding and coaching from the facilitator and others who were more expert, enabling the participants to work in their ZPD.

Figure 2: Using a wiki to develop understanding of a tool

Writer (your name)	Role of	Your comments from reading the articles
S1	Teacher	
S2	Student	Student Roles in student centred learning can be summarised as follow: Student take responsibility for learning Active knowledge seekers construct knowledge and meaning
S3	Peers	
S4	Activities	
S5	Online environment	

## A second Social Activity

The third task in this unit was a chat. This chat enabled the participants to begin to use the tools more competently without facilitator support, but still with the social support of the other group participants and feedback from the facilitator. For example, in one unit, participants chatted about their project, that of designing an online interactive activity for their own university course they were teaching. This exemplifies three features of sociocultural course design; with the

first being the use of the social environment to learn in the ZPD with decreasing scaffolding. The second feature is the use of an authentic problem. Participants in the course were working on materials they would use in their teaching, and discussing it with the community they may have been interacting with in their daily work practice. And finally, the chat was an opportunity to internalise the psychological tools, such as using the concepts of cognitive skill development as shown in Figure 2, in the discussion of the participants' own teaching and learning goals; that is the new concept is now not the focus of discussion but as a new tool in the discussion.

Figure Three: Using Chat to Develop Concept Use

11:03 c:	and there is another one on the next page that is called Development of Navigational elements
11:04 c:	do you think our "to-be-designed" tasks can benefit from that?
11:04 N:	yes
11:05 N:	can you see the progression of tasks from low cognitive to high cognitive >
11:05 c:	is that sort of information or breaking down of the problem-solving applicable to our task design?
11:05 C5:	if the tasks we are designing is a PB one, then yes!

## The Assignment: an Individual Activity

The three main units of the course had an assignment, which made up the final project. The assignments were done as individual work concerning different aspects of online learning as it applied to their own teaching. When the assignments were completed, they were submitted to the facilitator for constructive comments on the work. Participants edited their work and then presented their final project online for assessment. For example, in one unit, participants were asked to examine one unit of one of their courses and analyse it for its student-centredness, and also how this unit could be modified according to student-centred principles. This exemplifies several features of Vygotsky's theories. First it shows the learning was set in an authentic environment. Second it provided the opportunity for individual work and the opportunity for each participant to develop cognitively as they had this further opportunity to use the psychological tools that had been acquired and internalised. It also enabled the facilitator to ensure that the participants were working on the course in their ZPD and were learning. Finally it provided the opportunity, where necessary, to provide further support or mediation in the form of scaffolding or coaching from the facilitator during the course.

This example shows that sociocultural theories can be used to develop a learning design approach that can guide in the design of a course. This design has also shown that the social aspects of learning can be structured into the course to promote learning in a way that is compatible with Vygotsky's sociocultural theories.

## Conclusion

Sociocultural and constructivist theories are often seen as two parts of one theory or that the sociocultural theories provide the social dimension to the problem-based approach of constructivism. However, a closer look at the Vygotsky's theories, as described by Vygotsky and post-Vygotskysts showed that Vygotsky's theories are not a form of constructivism, and that many of the concepts of the theories are different. Therefore courses that propose to use a social environment for learning should use a different learning design. This should be from an informed understanding of sociocultural theories.

A description of the core issues of Vygotsky's theories was used in this paper to propose how learning can be designed from this perspective. An online course that used this approach was then described, showing that this learning design proposed can be applied to learning environments. If designers begin to appreciate the conceptual difference between Vygotsky's theories and constructivism then perhaps better use will be made of the social environment in the learning process and through a sociocultural learning design.

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