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Constructivist approach of Vygotsky for innovative trends in learning and teaching

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Abstract
"The teacher must adopt the role of facilitator not content provider." Lev S. Vygotsky
The goals of education and the objectives of teaching learning process presently have undergone a tremendous change in view of the societal make-over and technological advancements. The focus has now shifted to learner centered strategies from just acquiring the mere knowledge and increasing scores on literacy rate. Learning occurs when the learner constructs his own knowledge mechanisms for learning based on his experiences, aptitude and ability. The work of Lev Vygotsky (1934) has become the foundation of much research and theory in cognitive development over the past several decades, particularly of what has become known as "Social Development Theory". Vygotsky's theories stress the fundamental role of social interaction in the development of cognition, and places its belief strongly that community plays a central role in the process of" making meaning". Vygotsky theory of cognitive development of learners is relevant to instructional concepts such as "scaffolding" and "apprenticeship," in which a teacher or peer helps to structure or arrange a task so that learner can accomplish it wholly. Also, Vygotsky's theories feed into the current interest in collaborative learning, suggesting that group members should have different levels of ability so that more advanced peers can help less advanced members operate within their ZPD. The present paper attempts to examine the psychological basis of innovations in classroom technology in light of Vygotsky's views. And the process of development which can be triggered in learners in any situation with thoughts, intellect, language and observations together to create fundamentally new forms of mental functioning.

Keywords: Learner, knowledge, language, constructivism, zone of proximal development (ZPD), scaffolding, collaborative learning

Introduction
We know different learners, in a class, have different learning needs and the right method depends on the situation. As different learning needs call for different instruction methods, the effective technology integration depends on a well-planned match of needs with resources and instruction strategies, along with classroom conditions that support them. The goals of education keep on changing with changing times. Earlier the focus was on acquiring the knowledge of the 3 R's (Reading, wRiting and aRithmetic), now with technological advancements, the society has different challenges and hence different strategies are required to serve today's educational goals. In order to respond to modern challenges, these changes must reflect in the instruction-learning processes inside as well as outside the classrooms.

In an attempt to understand the intricate (instruction) learning process, different scholars gave different theories which can be crystallized into two different views on instruction and learning, *viz.*, objectivism and constructivism.

(a) Objectivism knowledge has a separate, real existence of its own outside the human mind. Learning happens when this knowledge is transmitted to people and they store it in their minds.

(b) Constructivism humans construct all knowledge in their minds by participating in certain experiences. Learning occurs when one constructs both mechanisms for learning with their unique version of knowledge, colored by background, experiences, and aptitude.

Teaching styles based on constructivism mark a conscious effort to move from 'traditional, objectivist models didactic, memory-oriented transmission models' to a more student-centered approach. Vygotskian thinking indicates that the origin of knowledge construction should not be sought in the mind but in the social interaction co-constructed between a more and a less knowledgeable individual.

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Moreover, the construction of knowledge is a sociocultural mediated process affected by the physical and psychological tools and artifacts. The following assumptions are the core tenets underlying Vygotsky's theory:
1. Learning precedes development.
2. Language is the main vehicle (tool) of thought.
3. Mediation is central to learning.
4. Social interaction is the basis of learning and development.
5. Zone of proximal development (ZPD) is the primary activity space where learning occurs.

Vygotsky and His Theory of Learning

More than any other psychologist, L. S. Vygotsky placed education at the heart of his theory and praxis. Building on the Marxian premise that human beings change history and are themselves changed in the process, his cultural-historical approach assigned a foundational and formative role to sociocultural practices in human development. Of special interest to Vygotsky was the way that, as human beings, we fashion our nature through the mediation of others-through the appropriation of culture and its resources, which change through history (Vygotsky, 1931/1997). From such a perspective, education makes us not only what we are but who we are, and who we could become. Vygotsky's legacy in education is enduring and prolific, influencing educational research and scholarship in areas as far ranging child development, language and literacy development, bilingual education, and learning disabilities to name but a few.

Vygotsky lived and developed his work in a social, cultural, and political context radically different from ours. Vygotsky believed that learning was an active process. He was interested in knowledge construction and believed that cognitive development has to come before learning; the child had to be cognitively ready to learn. He said that learning is subordinated to development and not vice-versa.

So, applications of his work today imply a process of selective appropriation and recontextualization. Although Vygotsky worked as a psychologist for only 10 years, but it was a period of turbulent societal change and intense intellectual activity, resulting from the October Revolution. To Vygotsky the revolution was a call to action, with education a critical area of concern. He wanted to offer a theory of possibilities, a tool for developing new pedagogies for diverse learners. That he could anticipate a short life-because of his tuberculosis-may have motivated his remarkable pace of work.

Classroom Applications

Vygotsky's approach to child development is a form of social constructivism, based on the idea that cognitive functions are the products of social interactions. He emphasized the collaborative nature of learning by the construction of knowledge through social negotiation. He rejected the assumption made by Piaget that it was possible to separate learning from its social context. Vygotsky believed everything is learned on two levels. First, through interaction with others, and then integrated into the individual's mental structure. Therefore every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (neuropsychological) and then inside the child (neuropsychological). This applies equally to voluntary

attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals. (Vygotsky, 1978, p.57.

Applications of Vygotsky's Theory to Education
- **The Zone Of Proximal Development (ZPD)**

The most important application of Vygotsky's theory to education is in his concept of a zone of proximal development. This concept is important because teachers can use it as a guide to a child's development. It allows a teacher to know what a student is able to achieve through the use of a mediator and thus enables the teacher to help the child attain that level by themselves.
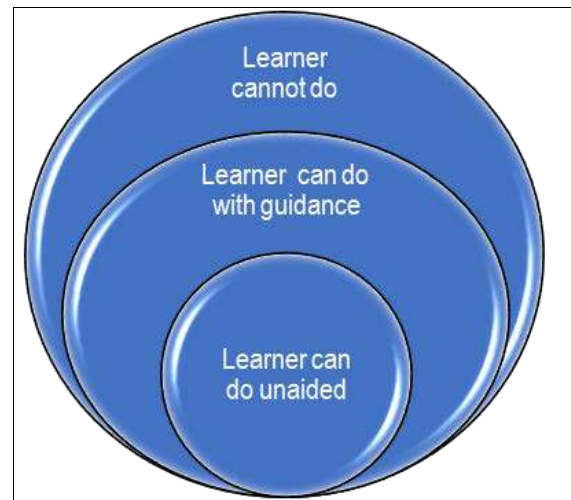

Fig 1: Zones of Learning

- **Role play**

A second important aspect of Vygotsky's theory is the role of play in his theory. According to this perspective teachers need to provide children, especially young children, many opportunities to play. Through play, and imagination a child's conceptual abilities are stretched. Vygotsky argued that play leads to development. "While imitating their elders in culturally patterned activities, children generate opportunities for intellectual development. Initially, their games are recollections and reenactments of real situations; but through the dynamics of their imagination and recognition of implicit rules governing the activities they have reproduced in their games, children achieve an elementary mastery of abstract thought."

- **Language**

In Vygotsky theory, language is the most important symbol system and it is the one that helps to fill the other tools. Language is critical for cognitive development. It provides a means for expressing ideas and asking questions, the categories and concepts for thinking, and the links between the past and the future. When we consider a problem, we generally think in words and partial sentence. Vygotsky thought that human capacity for language enables children to provide for auxiliary tools in the solution of difficult task.

Since language holds a central role in Vygotsky's theory, and is essential to the development of thinking, the school needs to provide many opportunities that allow children to reach the third stage of speech, which is inner speech, since it is this stage which is responsible for all higher levels of functioning.

According to Vygotsky, language plays two critical roles in cognitive development
1. It is the main means by which adults transmit info to children.
2. Language itself becomes a very powerful tool of intellectual adaptation.

Vygotsky sees private speech or talk as a means for children to plan activities and strategies and therefore aid their development. Language is therefore an accelerator to thinking/understanding. Vygotsky believed that language develops from social interactions, for communication purposes. Later language ability becomes internalized as thought and 'inner speech' whereas thought is the result of language.

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Development of Learner
Role of adults and peers: Vygotsky believed that cognitive development occurs through the child conversations and interactions with more capable members of the culture adults or more able peers. These people serve as guides and facilitators, providing the information and support necessary for the child development.

Implications for facilitators: There are at least three ways through which cultural tools can be passed from one individual to another

- *Imitative learning* (where one person tries to imitate the other).
- *Instructed learning* (where learner internalize the instructions of the facilitatorand use these instructions to self-regulate), and
- *Collaborative learning* (where a group of peers strives to understand each other, and learning occurs in the process).

Assisted learning: It means providing strategic help in the initial stages of learning and gradually diminishing as learner gains independence. Assisted learning requires scaffolding-giving information, prompts, reminders, and encouragement at the right time in the right amount.

Scaffolding learning: When adults and other skilled individuals assist children in performing difficult tasks, they often use a technique called scaffolding to support children in their efforts. Exemplar-while erecting a fresh and new building a builder sometimes construct an external structure a scaffold around the building. This scaffold provides support for the worker (a place where they can stand) until the building itself is strong enough to support them. As the building gains stability, the scaffold becomes less necessary and is gradually removed.
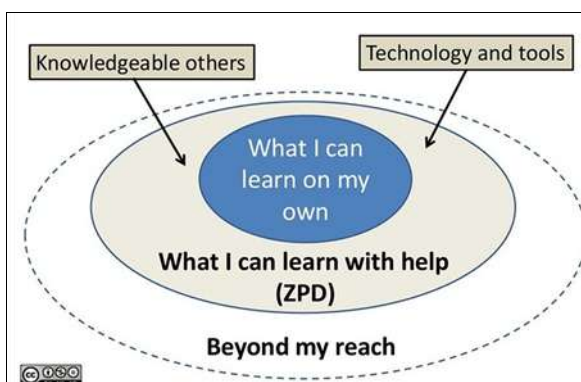

Fig 2: ZPD and Learning through Scaffolding.

Paradigm shift: Zone of Proximal Development
Vygotsky sees the zone of proximal development (ZPD) as the area where the most sensitive instruction or guidance should be given, allowing the child to develop skills which they will use on their own, and developing higher mental functions. He also views interaction with peers as an effective way of developing skills and

strategies. He suggests that facilitators should use cooperative learning exercises where less competent children develop with help from more skillful peers, within ZPD.

This is an area where the child cannot solve a problem alone but can be successful under adult guidance or in collaboration with a more advanced peer. This is the area where instruction can succeed, as real learning is possible. This is an important concept that relates to the difference between what a child can achieve independently and what a child can achieve with guidance and encouragement from a skilled peer. For an instance- the child finds it difficult to solve the jigsaw puzzle by him/her and takes a long time to do so, but is able to solve it following interaction with father and has developed competence at this skill which will be applied in future while solving jigsaw puzzles.

For instance, some children were allowed to play with their mother in a similar situation before they attempted it alone (ZPD) whilst others were allowed to work on this all by themselves. It was found that those who had previously worked with their mother showed greatest improvement compared with the first attempt at the task.This led to the conclusion that Guided learning, within ZPD, leads to greater understanding performance than working alone i.e., discovery learning.

Scaffolding
Scaffolding is a key feature of effective teaching, where the adult continually adjusts the level of his or her help in response to the learner's level of performance. In the classroom, scaffolding can include modeling a skill, providing hints or cues, and adapting material or activity (Copple & Bredekamp, 2009) [2]. Vygotsky views interaction with peers as an effective way of developing skills and strategies. He suggests that teachers use cooperative learning exercises where less competent children develop with help from more skillful peers - within the zone of proximal development. (Silver, 2011) [5].

Scaffolding not only produces immediate results, but also instills the skills necessary for independent problem solving in the future. A contemporary application of Vygotsky's theories is "reciprocal teaching," used to improve students' ability to learn from text. In this method, teacher and students collaborate in learning and practicing four key skills: summarizing, questioning, clarifying, and predicting. The teacher's role in the process is reduced over time.

Role of Social interaction in the cognitive development of learner
Vygotsky's theory stresses the fundamental role of social interaction in the development of cognition, as he believed strongly that community plays a central role in the process of 'making meaning'. Vygotsky's theory highlights three main points.
- Places more emphasis on culture affecting/shaping cognitive development
- Places considerably more emphasis on social factors contributing to cognitive development
- Places more and different emphasis on the role of language in cognitive development.

Vygotsky assumed that every function in a child's cultural development appears twice- first on the social level, (i.e. between the people), and later, on the individual level, (inside the child).
In other words, higher mental process appears first between as they are co-constructed during shared activities. So, for Vygotsky, social interaction was more than an influence it was the origin of higher mental process such as problem solving. Co-constructed process is a social in which people interact and negotiate to create an understanding or to solve a problem. The final product is shaped by all participants. He believed that cultural tools, including real (such as printing presses, abacus-today, we would add PDAs, computers, the internet and symbolic tools (such as numbers and mathematical system, braille and sign language, maps, works of art, signs and codes, and language) play very important roles in cognitive development.

Vygotsky emphasized the tools that the culture provides to support thinking. He believed that all higher-order mental processes such as reasoning and problem solving, are mediated by (accomplished through and with the help of) psychological tools, such as language, signs, and symbols. Adults teach these tools to children during day to day activities and the children internalize them. Then the psychological tools can help learners advance their own development. The process is something like this-- as children engage in activities with adults or more capable peers, they exchange ideas and ways of thinking about or represent spaces concepts drawing maps, for an instance, as a way to represent spaces and places. These co-created ideas are internalized by children. Thus, social sources work at two levels, firstly (a) Individual thinking and secondly (b) Individual learning.

Cultural tools and cognitive development
In this exchange of signs and symbols and exchange of planation, children begin to develop a 'cultural tool kit' to make sense of their world. The kit is filled with physical tools such as pencils or paint brushes directed toward the external world and psychological tools such as problem-solving or memory strategies for acting mentally.
According to Vygotsky, infants are born with the basic materials/abilities for intellectual development. Vygotsky refers to elementary mental functions -
- Attention
- Sensation
- Perception
- Memory

Eventually, through interaction within the socio-cultural environment, these are developed into more sophisticated and effective mental processes/strategies which he refers to as higher mental functions, e.g. memory. In young children this is limited by biological factors. However, culture determines the kind of memory strategy we develop. E.g., in our culture we learn note-taking to aid memory, but in pre-literate societies other strategies must be developed, such as tying knots in string to remember, or carrying pebbles, or repetition of the names of ancestors until large numbers can be repeated. Vygotsky also refers to tools of intellectual adaptation-these allow children to use the basic mental functions more effectively/adaptively, and these are culturally determined (eg. memory mnemonics, mind maps).
Vygotsky therefore sees cognitive functions, even those carried out alone, as affected by the beliefs, values and tools of intellectual adaptation of the culture in which a person develops and therefore socio-culturally determined. The tools of intellectual adaptation therefore vary from culture to culture - as in the memory exemplar.

Social influence on cognitive development
It means we are socializing with others. In other words, we can say that we are guided by others. Vygotsky says that this is a cultural setting and cannot be understood apart from this setting. These social interactions are more than simple influence on cognitive development. In fact, Vygotsky conceptualized development as the transfer of socially shared activities into an internalized process.
Vygotsky believes that young children are curious and actively involved in their own learning and the discovery and development of fresh and new understandings / schema. Hence, he places more emphasis on social contributions to the process of development.
According to Vygotsky, much important learning by the child occurs through social interaction with a skillful tutor. The tutor may model behaviors and/or provide verbal instructions for the child. This is referred as co-operative or collaborative dialogue. The child seeks to understand the actions or instructions provided by the tutor (often the parent or facilitator) then internalizes the information, using it to guide or regulate their own performance.
For an instance, a young girl, who is given her first jigsaw; alone, she performs poorly in attempting to solve the puzzle. The father then sits with her and describes or demonstrates some basic strategies, such as finding all the corner/edge pieces and provides a couple of pieces for the child to put together herself and provides encouragement when she does so. As the child becomes more

competent, the father allows the child to work more independently. According to Vygotsky, this kind of social interaction involving cooperative or collaborative dialogue promotes cognitive development.

Reciprocal Instruction
A contemporary educational application of Vygotsky's theory is "reciprocal teaching," used to improve students' ability to learn from text. In this method, teachers and students collaborate in learning and practicing four key skills: summarizing, questioning, clarifying, and predicting. The teacher's role in the process is reduced over time.
Psychologists recognize that the child's culture shapes his cognitive development by determining what and how the child will learn about the world. It used to improve learners' ability to learn from text. In this method, facilitator and learners collaborate in learning and practicing four key skills.
a. Summarizingb. Questioningc. Clarifyingd. Predicting.
The facilitator's role in the process is reduced over time with various kinds of learning like apprenticeship, where a facilitator or more advanced peer helps to structure or arrange a task so that all can work on it successfully, assisted learning and scaffolding learning.

Conclusion
The main concept rooted in Vygotsky's sociocultural theory was the ZPD, an idea that explained the learning process and developmental changes in children. It seems possible to extend Vygotsky's concept of ZPD from the school settings to the adults to gain professionalism. Finally, the important feature of Vygotsky's sociocultural theory takes into consideration almost all the relevant factors essential for development of learner including cognitive, affective, social, and contextual.
ZPD should be used where instruction should begin towards the zone's upper limit, in which the learner is able to reach the goal only through close collaboration with the instructor. With continued instruction and practice, the learner organizes and masters the behavioral sequences required for performing the target skill. Once the goal is achieved, it can become the foundation for the development of a fresh and new ZPD.
To improvise learner's skill and knowledge, use scaffolding with self-initiated learning activities and scaffolding to help learner move to a higher level. Provide just enough assistance or observe the learner intentions and attempts, smoothly providing support when needed. When the learner hesitates, provide encouragement. Encourage the learner to practice the skill.
Vygotsky believed that only adults are not important in helping learner but also the support and guidance from more-skilled person. Hence more-skilled peers can assist as facilitators for learning which is being emphasized in classroom learning now.
Both children and adult engage in learning activities in a collaborative way. Peers, facilitators, parents and other adults work together in a community of learner rather than the child learning as in isolated individual. Collaborative learning should be encouraged and recognized that involves a community of learners.

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