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Learning Science and Mathematics

SOCIAL CONSTRUCTIVISM APPROACH

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The essence of constructivism

The premises of constructivism as an epistemology are:-

- Knowledge is constructed
- Prior knowledge impacts the learning process
- Initial understanding is local, not global
- Building useful knowledge structures requires effortful and purposeful activity

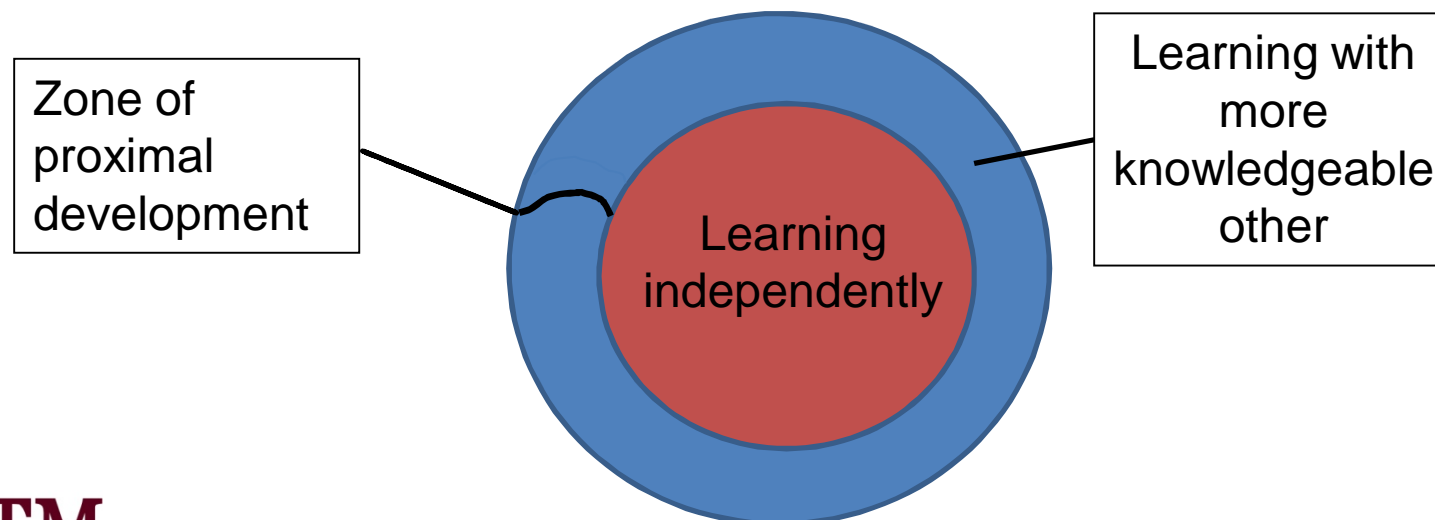
(University of Massachusetts Physics Education Group, 2001)

- *“ Learning is an active process occurring within and influenced by the learner as much as by the instructor and the school. From this perspective, learning outcomes do not depend on what the teacher presents. Rather, they are an interactive result of what information is encountered and how the student processes it based on perceived knowledge. All learning is dependent upon language and communication”.*

Robert E Yager (1991)

Social constructivism

- Zone of Proximal Development: the gap between what a learner can achieve with assistance from a more knowledgeable other with his achievement if he learnt on his own.



Assumptions of social constructivism

- **Reality:** Social constructivists believe that reality is constructed through human activity.
- **Learning:** Social constructivists view learning as a social process. It does not take place only within an individual, nor is it a passive development of behaviors that are shaped by external forces

- **Knowledge:** To social constructivists, knowledge is also a human product, and is socially and culturally constructed. Individuals create meaning through their interactions with each other and with the environment they live in.

CHARACTERISTICS OF CONSTRUCTIVIST TEACHING

- Teacher will always evaluate students' prior knowledge at the beginning of a lesson
- Teacher will guide students to restructure their existing ideas
- Teacher gives opportunities for students to apply their ideas
- Teacher will guide students to make reflections

Learning activities fall under three levels

1. Activities already familiar to students so they can work independently to practise skills
2. Activities within the ZPD zone, so scaffolding from the teacher or more capable peer is required
3. Activities that are too hard and lead to off-task behaviour and discipline problems

Cooperative learning

- Social constructivism stress the need for collaboration among students and practitioners
- For younger students, cooperative learning is more suitable

Cooperative learning

- For cooperative learning to be effective, the following factors must be present:
- ***Mutual dependence or positive interdependence:***
- Group members perceive they need each other to accomplish a task

Cooperative learning

1. Individual accountability:

- each member is responsible for completing the assigned tasks, mastering the material and explaining the work to the class

2. Face to face interaction:

- group members sit together to discuss and teach what they know to other members

3. Interpersonal and group skills:

- students need to develop listening, respecting others, sharing responsibility