Constructivism

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Educational Psychology
Chapter 9
Constructivist View of Learning
Neuroscience and Education

Education and Neuroscience Survey

Point/Counterpoint

Development

Learning/Memory

Executive Functions

Emotion/Social Interaction

Learning Disabilities/Brain Disorders
Constructivist Views of Learning

• Constructivism is a broad term used by philosophers, curriculum designers, psychologists, educators, and others.

• Most constructivists share two main ideas
  1. Learners are active in constructing their own knowledge
  2. Social interactions are important to knowledge construction

• Constructivism views learning as more than receiving and processing information transmitted by teachers or texts.
Constructivism

- 1. Learning involves pursuing meaningful goals.
- 2. Learners link new material with existing and future-oriented material.
- 3. Higher-order thinking facilitates creative and critical thinking.
- 4. Teaching should support child’s natural curiosity.
# Constructivist Classrooms vs. Traditional Classrooms

<table>
<thead>
<tr>
<th>Constructivist Classrooms</th>
<th>Traditional Classrooms</th>
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<tbody>
<tr>
<td>Curriculum emphasizes big concepts, beginning with the whole and expanding to include the parts.</td>
<td>Curriculum begins with the parts of the whole. Emphasizes basic skills.</td>
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<tr>
<td>Pursuit of student questions and interests is valued.</td>
<td>Strict adherence to fixed curriculum is highly valued.</td>
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<tr>
<td>Materials include primary sources of material and manipulative materials.</td>
<td>Materials are primarily textbooks and workbooks.</td>
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<tr>
<td>Learning is interactive, building on what the student already knows.</td>
<td>Learning is based on repetition.</td>
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<tr>
<td>Teachers have a dialogue with students, helping students construct their own knowledge.</td>
<td>Teachers disseminate information to students; students are recipients of knowledge.</td>
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## Constructivist Classrooms vs. Traditional Classrooms continued...

<table>
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<tr>
<td>Teacher’s role is interactive, rooted in negotiation.</td>
<td>Teacher’s role is directive, rooted in authority.</td>
</tr>
<tr>
<td>Assessment includes student works, observations, and points of view, as well as tests. Process is as important as product.</td>
<td>Assessment is through testing, correct answers.</td>
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<tr>
<td>Knowledge is seen as dynamic, ever changing with our experiences.</td>
<td>Knowledge is seen as inert.</td>
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<tr>
<td>Students work primarily in groups.</td>
<td>Students work primarily alone.</td>
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Modern Education

• How important is remembering facts/concepts in today’s society?

• What use is knowledge that you won’t use in your field to you?

• Should all education be experiential?

• How well do you as a student know what’s best for what you want?
Psychological/Individual Constructivism

• Concerned with how individuals build up certain elements of their cognitive or emotional apparatus (Phillips, 1997)

• Interested in individual knowledge, beliefs, self-concept, or identity

• Called individual constructivists or cognitive constructivist
  – “first wave constructivism”

• Focus on the inner psychological life of people.
First Wave Constructivism

- Piaget’s psychological (cognitive) constructivist perspective

- Piaget proposed a sequence of cognitive stages that all humans develop through.

- Piaget’s special concern was with logic and the construction of universal knowledge that cannot be learned directly from the environment.
  - Individuals’ thinking becomes less tied to concrete events

- It emphasizes on individual meaning-making.
Radical constructivism

- This perspective holds that there is no reality or truth in the world
- Only the individual’s perceptions and beliefs
- Each of us constructs meaning from our own experiences, but we have no way of understanding or “knowing” the reality of others.
  - Does “teaching all sides” play a role here
Second wave Constructivism

- Vygotsky’s Social Constructivism

- Does not focus on individual learning

- Vygotsky believed that social interaction, cultural tools, and activity shape individual development and learning.

- One advantage of his theory of learning is that it gives us a way to consider both the psychological and the social

- Appropriation
Vygotsky’s Social Constructivism

• Vygotsky’s concept of the zone of proximal development.

• Culture creates cognition when the adult uses tools and practices from the culture to steer the child toward goals the culture values.

• One way of integrating individual and social constructivism is to think of knowledge as individually constructed and socially mediated.
Learning Styles

• What topic do you perform best in?

• How do you study/learn in that topic?

• What topic do you perform worst in?

• How do you study/learn in that topic?
How Is Knowledge Constructed

• The realities and truths of the external world direct knowledge construction.

• Internal processes such as Piaget’s organization, assimilation and accommodation direct knowledge
  – Piaget

• Both external and internal factors direct knowledge construction.
  – Vygotsky
Knowledge: Situated or General?

• Vygotsky’s notion that learning is inherently social and embedded in a particular cultural setting.

• Learning in the “real world” is not like learning in school
  – Apprenticeship

• Situated learning is often described as “enculturation”, or adopting the norms, behaviors, skills, beliefs, language, and attitudes of a particular community.
How does situated learning differ from transfer?

• **Situated Learning**: the idea that skills and knowledge are tied to the situation in which they were learned and difficult to apply in new settings.

• **Transfer**: influence of previously learned material on new material.
Common Elements of Constructivist Perspectives

• Knowing develops as learners try to make sense of their experiences.

• These learners construct mental models or schemas and continue to revise them to make better sense of their experiences.

• They negotiate and co-construct meanings.
Many constructivist approaches recommend five conditions for learning

1. Embed learning in complex, realistic, and relevant learning environments.

2. Provide for social negotiation and shared responsibility as a part of learning.


4. Nurture self-awareness and an understanding that knowledge is constructed.

5. Encourage ownership in learning.
Chapter 9: Applying Constructivist Perspectives

THE TRUE PURPOSE OF EDUCATION IS TO MAKE MINDS, NOT CAREERS.
—WILLIAM DERMERIEWICZ
Constructivist Learning

- Elicit student experiences in relation to topics
- Engage in meaningful activities
- Variety of information resources and tools to mediate learning
- Work collaboratively
- Make thinking process explicit, encourage the same
- Reflective thinking
- Variety of assessment to understand evolution
Inquiry Learning

• John Dewey described the basic inquiry learning format in 1910

• Teacher presents a puzzling event or problem.
  1. Students formulate hypotheses to explain the event or problem.
  2. Students collect data to test the hypotheses
  3. Students draw conclusions based on their data.
  4. Students reflect on the original event/problem and on the thinking skills used in explaining/solving it.

• Examples?
Problem-Based Learning

• Learning is driven by challenging, open-ended problems.

• Students work in small collaborative groups.

• Teachers take on the role as "facilitators" of learning.

• Can you design a class (e.g. social study, math) for an eighth grade class in that is based on problem-based learning?
The Teacher’s Role in Problem-Based Learning

1. Orient students to the problem

2. Organize students for study

3. Assist independent and group investigation

4. Develop and present artifacts and exhibits

5. Analyze and evaluate the problem-solving process
Research on Inquiry and Problem-Based Learning

• Problems?

• Must be carefully planned and organized

• Ineffective and even detrimental for lower-ability students

• Teacher: Student ratio

• Time limit

• Students learning through problem-based instruction were better at clinical skills such as problem formation and reasoning, but they were worse in their basic knowledge of science and felt less prepared in science (Albanese & Mitchell, 1993).
Dialogue and Instructional Conversations

• One implication of Vygotsky’s theory of cognitive development is that important learning and understanding require interaction and conversation.

• Allows teacher to help students with problems within their zone of proximal development and to provide scaffolding when necessary.
Dialogue and Instructional Conversations

• Have you had a class that involves a lot instructional conversation?

• What are instructional conversations and how do they differ from a lecture?

• How comfortable are you when you are not fed the material?
Cognitive Apprenticeships

- Over the centuries, apprenticeships have proved to be an effective form of education.

- Knowledgeable guides provide models, demonstrations, and corrections, as well as personal bond that is motivating.
Cognitive Apprenticeships

1. Students watch the model
2. Receive tutoring or coaching
3. Receive scaffolding
4. Articulate their knowledge
5. Reflect on progress
6. Explore new ways to apply what they have learned
Cooperative Learning

**Collaboration** – how to relate to others

Deal with people that respects differences, shares authority, and builds on knowledge

**Group Work** – several students working together

**Cooperation** – working with others to attain a shared goal
Cooperative Learning

Situations in which:

Elaboration
Interpretation
Explanation
Argumentation

Elements of true cooperative learning

• Face to Face Interaction

• Positive Interdependence – need each other for support, explanations and guidance

• Individual Accountability – held accountable for learning
Group learning: What can go wrong?

• Students may value procedures over the learning. Speed and finishing early can take precedence over thoughtfulness and learning.

• Rather than challenging and correcting misinterpretations, students support and reinforce misunderstandings.

• Socializing and interpersonal relationships take precedence over learning.

• Students may shift from teacher to the expert in the group – learning is still passive and can be wrong.

• Status differences may increase – some see the group will still succeed without their input, others become convinced they are unable to understand without the group.
Possible Student Roles

• Encourager - encourages reluctant or shy students to participate
• Praisier/Cheerleader - shows appreciation of other’s contributions and recognizes accomplishments
• Gate Keeper - equalizes participation and makes sure no one dominates
• Coach - helps with academic content, explains concepts
• Question Commander - Makes sure all students’ questions are asked and answered
• Checker - checks the groups’ understanding
• Taskmaster - keeps the group on track
• Recorder - writes down ideas, decisions, plans
• Reflector – keeps the group aware of progress
• Quiet Captain - monitors noise level
• Materials Monitor - picks up and returns material
Jigsaw Classroom

- Is a learning process in which each student is part of a group and each group member is assigned a part of the material to be learned by the whole group. Students become an “expert” on their piece and then teach it to the others in the group.
Dilemmas of Constructivist Practice

• The first is conceptual: How do I make sense of cognitive versus social conceptions of constructivism and reconcile these different perspectives with my practice?

• The second dilemma is pedagogical: How do I teach in truly constructivist ways that both honor my students’ attempts to think for themselves, but still insure that they learn the academic material?
Dilemmas of Constructivist Practice

• Third are cultural dilemmas: What activities, cultural knowledge, and ways of talking will build a community in a diverse classroom?

• Finally, there are political dilemmas. How can I teach for deep understanding and critical thinking, but still satisfy the accountability demands of parents and the requirement of *No Child Left Behind*?
Memory, Mind, Body and Experience
Social/Personal Learning

[Graphs showing time and number of words over trials for Amnesic and Comparison groups.]
Cognition

- What is it?
- Minimal mechanisms of cognition?
  - Molecule (neurotransmitters)
  - Organelle (synapses)
  - Cell (neuron)
  - Tissue (nervous tissue)
  - Organ (brain)
Embodied Cognition

• Mind is determined by the form of the body
  – Motor system/perceptual system influence our thought
    • Just as our mind influences our motor and perceptual systems

• Through co-experience we come to understand concepts in terms of our body experiences with them

• This process can be understood as metaphor
Embodied Cognition
Embodied Cognition and Education

- Movement and Simulation over reading, writing, reciting
- Movement enhances memory