Constructionism, Supporting Learners

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Today

• Constructionism, another learning theory
• Supporting learners
  – Zone of Proximal Development
  – Scaffolding
  – Learning Strategy
Constructionism: Critical Elements beyond Constructivism

• Project-based learning
  • Creation of artifacts
  • Public viewing of the completed artifact
  • Self-directed
Constructionism:
Not Constructionism:
“Gears” experience defined

• Self directed out of their own desire (not school related) but then helps them later in school
“Gears” experience

- Applied to a lot of different things – how you think about it rather than that context
- Paradigm or framework for understanding more complicated ideas
- Entirely passionate and driven by the person
- Nothing to do with school
- No external motivation or rewards
Guided Reciprocal Peer Questioning

• Share with your neighbor your **motivations** for your learning in your academic learning (gears or in school): 8 min

• Identify **similarities** and **differences** between your group members’ learning motivations, record in Gradescope (individually if possible): 4 min
Constructionist Strengths

- Motivation is more built in
  - More active learning because it’s hands on
  - Validation from peers
  - The structure built in can be considered scaffolding
- They finish to a higher level of completeness
Constructionist Strengths

- Builds Identity
- Ability to create artifacts leads to self expression
- Flexible to student passions – some students go all in!
Constructionist Challenges

• Resource-heavy to implement at scale
  - Difficult to provide individual guidance and resources
  - Even more complicated over time
  - Public sharing can be stressful (magnifies anxiety and self consciousness), feeds into social dynamics
  - Not everyone may hit the same learning goals
Constructionist Challenges

• Holes in student knowledge
  – If project didn’t need it, they didn’t learn it

• Choosing project of appropriate difficulty
  – Often choose projects far too hard

• They may build it but not understand it
  – They could get help from others, “remix” code from a website, etc.
Downsides of Constructionism

• Students with anxiety
  – Adjust “public” sharing – smaller groups
  – Find out what level of sharing would be motivating
  – Create a positive, not competitive, environment

• Students not motivated through the task
  – Make projects about themselves

• Parents may step in
  – Scaffolding so students can do it
  – Provide plenty of work time in class to get it done (discourage doing it at home)
Zone of Proximal Development

What I can’t do

What I can do with help

What I can do

Zone of proximal Development – ZPD.
What needs to be done to take the learner where he needs to be.

Zone of achieved Development – ZAD
Where the learner is right now
Scaffolding
Scaffolding

• What are the elements necessary to be considered scaffolding?
  – Temporary
  – Helps with the activity
  – Specific learning goal
Zone of Proximal Development / Scaffolding Relationship

- Frustration occurs with tasks of this difficulty
- Learning occurs with tasks of this difficulty
- Scaffolding moves tasks from frustrating to learning
Metacognitive Learning Strategies

• Some cognitive processes lead to learning
• Make explicit the cognitive processes successful learners use
scratch.mit.edu: Constructionism in action
Programming language, environment, community
Scratch Activity

• Where was the Constructivism?
• Where was the Scaffolding?
Scratch Activity

• Where was the Constructivism?
  – Building on your existing programming knowledge

• Where was the Scaffolding?
  – Worksheet to
    • Familiarize you with environment
    • Show steps to navigating an existing codebase
  – Simpler environment before going to Java
Switch to Games

Let’s explore what motivates us to play / keep playing games!!
What are different game genres?

• First / Third person shooter
  • Platformers (mario bros)
  • rhythm games
• City building / simulation games
• Strategy
• Sandbox games - e.g. minecraft
• board games
• role-playing games - final fantasy
• puzzle games
• Horror action games
Small Group Discussions (10 min)

• Break up by favorite genre
• What do you like about that genre compared to other genres?
  – Be as specific as possible.
• What are your favorite games within the genre?
  – Be as specific as possible. We want to figure out not *what the game did well* as much as *what aspect you like about games*
Scratch as a First Language

• Where was the Constructivism?
• Where was the Scaffolding?