

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:

Name _____ Date _____

MULTIPLICATION COLOR BY NUMBER

63 light blue 18 pink 54 brown 0 yellow 27 gray
 36 light brown 45 light brown 81 blue 72 green 9 red

Multiply. Then, use the color code to complete the picture.

$9 \times 0 =$ $9 \times 9 =$ $9 \times 8 =$ $9 \times 7 =$ $9 \times 6 =$
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“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

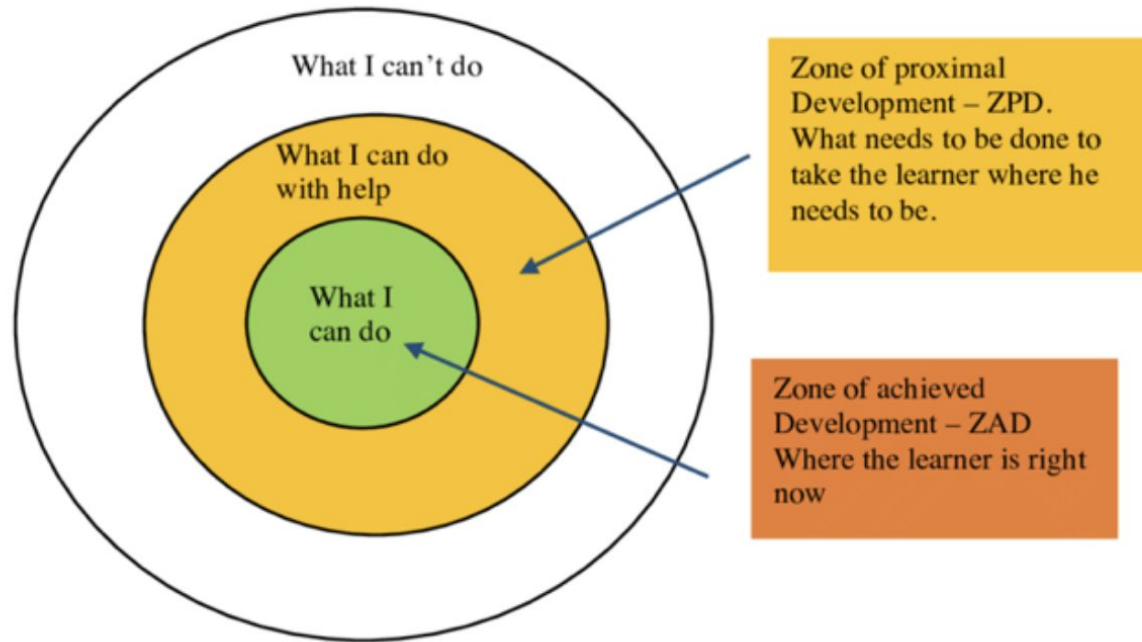
Constructionist Challenges

- 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



zone of proximal development diagram

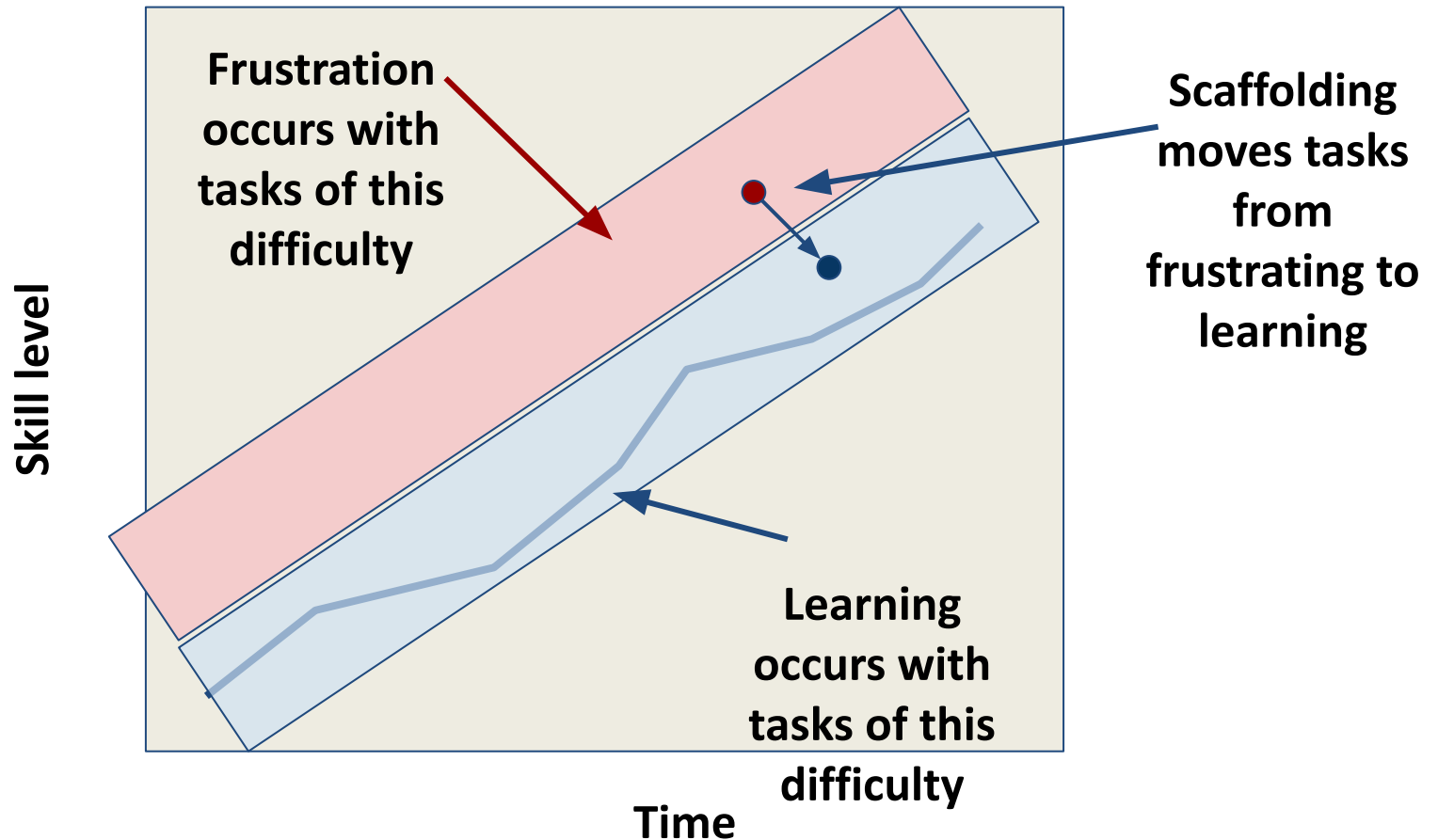
Scaffolding



Scaffolding

- What are the elements necessary to be considered scaffolding?
 - Temporary
 - Helps with the activity
 - Specific learning goal

Zone of Proximal Development / Scaffolding Relationship

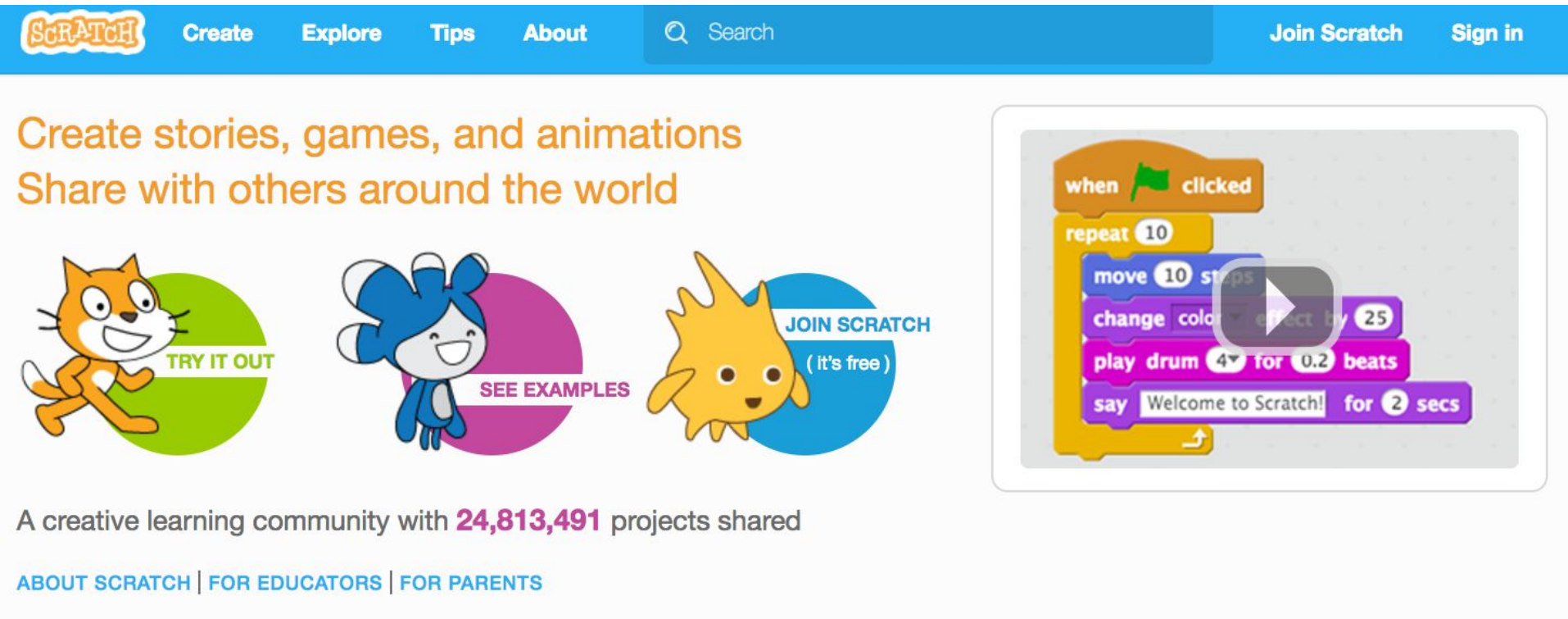


Metacognitive Learning Strategies

- Some cognitive processes lead to learning
- Make explicit the cognitive processes successful learners use

scratch.mit.edu: Constructionism in action

Programming language, environment, community



The image shows the Scratch website interface. At the top is a blue navigation bar with the Scratch logo, links for 'Create', 'Explore', 'Tips', and 'About', a search bar, and links for 'Join Scratch' and 'Sign in'. Below the navigation bar, the main content area features the text 'Create stories, games, and animations' and 'Share with others around the world'. Three circular icons represent different actions: 'TRY IT OUT' with the Scratch cat, 'SEE EXAMPLES' with a blue character, and 'JOIN SCRATCH (It's free)' with a yellow character. To the right, a code block is shown with a play button overlay, containing the following code: 'when green flag clicked', 'repeat 10', 'move 10 steps', 'change color effect by 25', 'play drum 4 for 0.2 beats', and 'say Welcome to Scratch! for 2 secs'.

Scratch

Create Explore Tips About

Search

Join Scratch Sign in

Create stories, games, and animations
Share with others around the world

TRY IT OUT

SEE EXAMPLES

JOIN SCRATCH
(It's free)

```
when green flag clicked
repeat 10
  move 10 steps
  change color effect by 25
  play drum 4 for 0.2 beats
  say Welcome to Scratch! for 2 secs
```

A creative learning community with **24,813,491** projects shared

[ABOUT SCRATCH](#) | [FOR EDUCATORS](#) | [FOR PARENTS](#)

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?