

Unit 1 – Pedagogy Strand

Constructivism vs. Constructionism and Differences between Problem- and Project- Based Learning

While these terms are likely familiar to teachers of all subjects, the level of personal experience with these approaches is bound to differ among teachers, most likely due to the vastly different nature of the subjects they teach. What follows is a very brief overview of four approaches to teaching.

Constructivism

Jean Piaget presented the theory of constructivism, asserting that knowledge is not simply transmitted from teacher to student, but actively constructed in the mind of the learner. Learners don't receive ideas; rather they create them from their own base of knowledge. Some characteristics of constructivist learning are that it:

- fosters critical thinking
- creates motivated and independent learners
- has lessons that include guided discovery, whereby the teachers acts as a guide to the learner, helping to point out inconsistencies in students' thinking. Students build their understanding by resolving these conflicts.
- includes a minimal amount of direct instruction

Constructionism

Building from the idea of constructivism, Seymour Papert presented his theory of constructionism which suggests that new ideas are most likely to be created when learners are actively engaged in building some type of external artifact that they can reflect upon and share with others. Elements of a constructionist learning environment include:

- a teacher who acts as a facilitator
- learners who investigate, create, and solve problems
- learner collaboration
- learners engaging in authentic tasks
- opportunity for feedback and multiple opportunities for revision

Problem-Based Learning*

Problem-based learning is one type of constructivist learning theory that can be applied in a classroom setting. It is a method which allows students to learn about a subject by exposing them to multiple problems, so they will be able to construct their understanding of the subject through these problems. Problem-based learning typically:

- begins with problem for students to solve or learn about
- includes problems that are somewhat ambiguous to mirror the complexity of real life
- uses an inquiry model
- requires students to present a conclusion of the problem solving process, but does not necessarily require them to create a product as a result
- is driven by defined problems

Project-Based Learning*

Project-based learning encompasses Papert's theory of constructionism where students build an artifact as part of the learning process. Project-based learning typically:

- begins with an end product in mind
- includes production of an artifact, which typically raises one or more problems for students to solve
- asks students to use or present the product they have created
- is driven by the end product
- stresses that content knowledge and skills acquired during the production process are critical to success

*From Comparing and Contrasting the Problem-Based and Project-Based Approaches to Learning, <http://www.coe.uga.edu/epltt/images/pbl.gif>

Readings

<http://www.papert.org/articles/SituatingConstructionism.html>

Reflection Questions

Think about the following:

- 1) An activity you give (or would like to give) your students that is based on the constructivist model.
- 2) An activity you give (or would like to give) your students that is based on the constructionist model.
- 3) Which is more common in your classroom: tasks centered around problem -based or project based learning.
- 4) A highlight of one of the activities/projects you reflected upon above.
- 5) A challenge of one of the activities/project you reflected upon above.

One final note: If your experience with any of the approaches described above is limited, it is only natural to feel like you are in an unfamiliar territory. We see your role as a co-learner, whereby you are learning the material along with the students, while also acting as a facilitator throughout the process. It is okay not to know the answers to questions about App Inventor. And there is no need to hide that from the students! You have a wealth of knowledge that is going to be invaluable in this process, so rely on your amazing problem solving and research skills to help students look up the answers, post in the forum, and look for video tutorials.