Constructivism & the Cognitive Apprenticeship Model:
The PM Mentoring Constructivist Learning Environment – A Prototype

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Abstract

This paper will examine constructivism and its implications for teaching and learning. It includes justification as to why the web-based prototype learning environment I have developed is based on constructivist principles. The PM Mentoring constructivist learning environment has theoretical grounding in the cognitive apprenticeship pedagogical model. It was developed for project management professionals – experts and novices. Paired in mentor-mentee teams, both experts and novices learn from one another by engaging in learning activities and real-world experiences. The PM Mentoring program currently exist as a pilot program in the Washington, DC Chapter of the Project Management Institute (PMI). The PM Mentoring program coordinator oversees the mentoring program and monitors the progress of the mentors and mentees. The mentors and mentees currently meet in a face-to-face setting. A description is provided on how the prototype PM Mentoring constructivist learning environment can be expanded into other learner populations and content areas.
**Introduction to Constructivism**

In life, we approach new learning experiences armed with the knowledge we have gained from previous learning experiences. Our prior knowledge has a direct influence on what new knowledge is constructed. This theory is known as constructivism. The main idea of constructivism is that new knowledge is constructed from a learner’s prior knowledge. “In constructivist theory, the learner is viewed as an active participant in the instructional experience, developing knowledge through a process of perception and meaning making” (Dabbagh and Bannan-Ritland, 2005. p.167). This learning is active, rather than passive, as we confront our understanding of the learning experience. As we recognize inconsistencies in our understanding of an experience, we modify our understanding to accommodate the new experience. This results in newly constructed knowledge. This constructivist approach to learning emphasizes authentic learning experiences. In an authentic learning environment, learners monitor and direct their own learning. When learners work collaboratively, multiple perspectives are generated. With multiple perspectives, learners can harness the collective knowledge to construct new meaning.

Constructivism has tremendous implications for teaching and learning. There are many learner populations that would thrive in a constructivist learning environment. For the learners, experiences would be richer and imaginations would soar. D. Jonassen (2007) describes a constructivist environment as an active environment where learners can construct their own meaning as they work toward achieving a cognitive goal. Working in groups, they engage in social negotiation and become part of knowledge building communities. Learners articulate and reflect on their learning process and engage in meaningful tasks that are
situated in real world contexts. Learners also engage in solving ill-structured and complex problems that have multiple perspectives.

In K-12 and higher education school systems; however, teaching has traditionally been objectivist with the transmission of knowledge from the teacher to the student. In order for a constructivist learning environment to be effective in a school system, the administrators would need to: 1) implement a curriculum plan that ensures the students all have the required prior knowledge to succeed; and 2) the teacher would need to take on the role of a facilitator and provide students with the ability to be active participants in the learning process.

Because it is a great challenge for school systems to transition from an objectivist to a constructivist environment, it is more practical to create an objectivist learning environment that incorporates constructivist principles. There are many Web 2.0 software tools in the marketplace today that make it simple for school systems to incorporate content areas and learning activities based on constructivist principles. Examples are blogs, wikis, and social networking software.

The Cognitive Apprenticeship Pedagogical Model

The cognitive apprenticeship pedagogical model is grounded in constructivism. It provides learning activities that focus on one-on-one coaching to mentees who want to develop specific project management career skills. Mentors and mentees are paired based on areas of interest. A cognitive apprenticeship can be designed as either a one-on-one experience or a collective experience. In both designs, well-defined learning objectives can be met. The collective design provides the best learning experience because it is inline with
the idea of a “shared mind.” Learners in the collective design will participate in more enriching learning experiences. Our class readings support the idea that cognitive apprenticeship is theoretically grounded in situated cognition. There are currently two views of cognitive apprenticeships. Duffy and Cunningham explain that they agree with “the focus on authentic cognitive activity” in the development of the concept of cognitive apprenticeship (p.184). They explain that there has been a focus in cognitive apprenticeship on the master-apprenticeship relationship in which there is reciprocal teaching and mentoring. This view is more inline with the mind as a computer and mind as a brain models which focus on individual cognitive activity.

Lave and Wenger’s view of cognitive apprenticeship is more inline with the mind as a rhizome model which focuses on the cognitive activity of many minds “distributed in social, cultural, historical, and institutional contexts” (Duffy and Cunningham, p.177). There are similarities between Lave and Wenger’s view of cognitive apprenticeships and communities of practice. Both involve a collection of individuals sharing mutually defined practices and beliefs. However, the difference is that cognitive apprenticeships are focused on a novice gaining new knowledge and communities of practice are focused on experienced practitioners gaining new knowledge and sharing knowledge.

The PM Mentoring Constructivist Learning Environment

PM Mentoring is a prototype of a web-based constructivist learning environment based on the cognitive apprenticeship pedagogical model. It was developed using the social networking platform Ning. I chose to develop my prototype in Ning because it allows me to showcase a functional web-based application and demonstrate many of the collaborative features necessary for an online mentor program.
In development, I analyzed the content area and developed learning outcomes for the mentees as well as the mentors. I then thoroughly reviewed the characteristics of a cognitive apprenticeship and began to map the instructional strategies to the learning activities. The learning environment promotes coaching and scaffolding to help the learner relate concepts to existing knowledge and practice. Articulation and reflection are provided through learning activities that require the use of cognitive skills. Also incorporated in the learning environment are modeling and explaining, multiple perspectives, exploration, role-playing, self-directed learning, collaboration and social negotiation, and authentic learning activities.

Coaching takes place when the instructor observes or monitors “student performance when students are completing a task and providing guidance and help when appropriate” (Dabbagh and Bannan-Ritland, 2005, p. 221). This is achieved through the in-depth discussions initiated between mentors and mentees on current project management issues via phone, chat, threaded discussion areas, and in-person. This support will not only help the learner construct meaning, but encourage them to “monitor, evaluate, and update” those meaning constructions (Ertmer & Newby, 1993, p. 66). The focus here is on mentoring between novice learners and expert practitioners.

Modeling and explaining is when the instructor provides examples of the desired performance by focusing on the expert’s performance (Dabbagh and Bannan-Ritland, 2005, p. 219). This is achieved when mentors share details of their current projects, status, and steps toward resolving problems. Mentees are able to learn from the mentors as they observe how they handle everyday tasks as well as problems and resolutions.

Scaffolding takes place when the instructor supports “novice learners by limiting the complexities of the context and gradually removing these limits (a concept known as fading)
as learners gain the knowledge, skills, and confidence they need to cope with the full complexity of the context” (Dabbagh and Bannan-Ritland, 2005, p. 222). This is achieved as the mentors provide the appropriate level of supporting assistance, resources, and tools to the mentors during the year long program. The learning environment incorporates six months of learning activities with the remaining six planned for a gradual fading of support. The mentors and mentees communicate via collaborative tools which are listed under Resources in the Forum.

Multiple perspectives are created by “exposing students to multiple points of view with regard to understanding or judging things or events, [which] allows learners to rearrange information to construct new knowledge and acquire flexible and meaningful knowledge structures” (Dabbagh and Bannan-Ritland, 2005, p. 218). This is achieved through on-the-job experience with the mentor and volunteering at project management events, meetings, and conferences.

Exploration is when the instructor “provides limited instruction and guidance and the emphasis is on student-generated learning through exploring and discovering information” (Dabbagh and Bannan-Ritland, 2005, p. 211). This is achieved through the mentees’ access to resource links: project plans, case studies, best practices, lessons learned, and video clips of role-playing scenarios.

Role-playing is when the instructor “allows learners to assume practitioner and professional roles…and act out situations that these professionals face in the real world” (Dabbagh and Bannan-Ritland, 2005, p. 213). There is a focus on performance mastery. This is achieved when the mentors and mentees participate in virtual and in-person role-playing scenarios that focus on common project management issues.
Self-directed learning is when the instructor encourages learners to use “self-discipline, self-monitoring, self-initiative, and self-management, which are components of self-regulated or self-directed learning” (Dabbagh and Bannan-Ritland, 2005, p. 38). This is achieved when the mentors learn the basic principles of project management and then narrow their focus to specific areas of interest where complex issues are discussed. Issues addressed increase in complexity in order to provide the mentees with a richer experience.

Collaboration and social negotiation is when the instructor encourages “joint construction of knowledge, joint negotiation of alternatives through argumentation and debate, and other means, student reliance on both other students and teachers as learning resources” (Dabbagh and Bannan-Ritland, 2005, p. 217). This is achieved through the following collaborative tools: calendar of meetings, events, and conferences; mind mapping software in order to chart organizational, team, and personal goals; project management software to manage time, labor, materials, and budgets on team projects; and bookmarking software for bookmarking and sharing web resources.

Articulation is when the instructor provides opportunities for learners to “articulate their knowledge or understanding of something, thus explaining to others what they know” (Dabbagh and Bannan-Ritland, 2005, p. 214). This is achieved when the mentees and mentors participate in threaded discussions on project management issues.

Reflection takes place when the instructor “asks the students to review what they have done, analyze their performance, and compare it with that of experts and peers” (Dabbagh and Bannan-Ritland, 2005, p. 215). This is achieved through the weekly blogs the mentees maintain on their personal page under the My Page Tab.
Authentic learning activities “are learning tasks anchored in a realistic setting in which the focus is on solving a problem rather than learning a body of content.” (Dabbagh and Bannan-Ritland, 2005, p. 205). There is a focus on the enculturation of students into authentic practices. This is achieved the following ways: 1) mentors use the learning activities in the online environment to provide one-on-one coaching to mentees in order to develop specific career skills; 2) mentees implement the project management techniques learned in their current projects and document best practices and lessons learned; and 3) mentees share their performance evaluations (from supervisors and subordinates) with their mentors.

The learning environment includes an assessment of the learning outcomes for both the mentee and the mentor. The mentees complete a pre-assessment in order determine their current project management knowledge-level. The mentees will be accessed on their ability to apply the concepts learned to their current project management issues. They will also be assessed on their participation in the learning activities, the in-depth analysis of their entries in the discussion area, and blog reflections that demonstrate cognitive processing of the knowledge learned. Mentors will be accessed on their ability to provide scaffolding and fading during the learning activities, and feedback given to the mentees in the discussion area and blog.

**Expansion of the PM Mentoring Cognitive Apprenticeship Model**

There is an opportunity to use the PM Mentoring Cognitive Apprenticeship Model in training other student populations and in developing other content areas. Developed using the social networking platform Ning, it can be very easy to replicate. The open source platform is growing in popularity and includes many collaborative features. It brings with it
many educational affordances. Ning will allow an instructional designer to easily create an authentic learning environment for all types of content areas. There are currently many K-12 educators using the Ning platform and university professors are currently conducting tests.

The navigation, layout, features, and activities that make up the learning environment help to create an authentic experience for content areas that focus on social interaction. The graphical interface and multimedia elements help to hold the attention of the learner. Learners who are familiar with social networking websites, like MySpace and Facebook, will be familiar with the features and will feel comfortable and be engaged in the learning environment.
References


