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Reaction Paper:

Systematic Design and Constructivism

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Abstract

Designing instruction takes many forms, from detailed flowcharts to general models such as ADDIE, allowing educators the freedom to choose the best instructional environments for their students. When comparing systematic design and constructivism, significant differences emerge. Richard Gagne's nine instructional events focus more on mastery, separating it from more liberal constructivist viewpoints. The way educational environments and learning opportunities are designed contributes to the dissimilar focus of these two theories. They also emphasize different levels of cognition and participation in order to ensure life-long learning. Although systematic design and constructivism have distinctive and disparate features, educators can design effective instructional opportunities using both theories as long as they consider their students' objectives and determine which methods best match those goals.

Systematic Design and Constructivism

Introduction

Learning Theory

Learning theories allow instructors to solidify their pedagogical beliefs and determine their preferred methods of defining learning and designing instruction. Constructivist and behaviorist/information processing learning theories fall toward opposite ends of the broad learning theory continuum, with very different ideas about best practices for educating learners. Although their differences are varied and significant, these learning theories also contain a few similarities regarding learners.

According to Page (2001), Gagne's work reflects both behaviorist and information processing influences. Through his nine events of instruction, Gagne showed his preference for scaffolded learning that builds systematically. Gagne supported this hierarchical approach to learning with mastery being accomplished only as the result of completing a series of sequential components (Zemke, 1999). Each level of learning could be concretely observed or measured, following behaviorist tenets. Additionally, Gagne's nine events of instruction focused on metacognition, a component of information processing theory, with students actively processing information in order to acquire their different outcomes.

Gagne's focus on mastery, however, is significantly different than that of Kafai and Resnik's constructivist perspective. Constructivist followers believe that the learner must actively build knowledge (Shaw, 1996). There are no specific components students must master in a prescribed lesson; knowledge is embedded within the context of students' authentic exploration. Brooks and Brooks (1999) believe constructivist teaching practices help learners "transform new information" as they create meaning from their learning (p.15). Behaviorist and

based on several learning theories and tries to describe the conditions that a teacher, trainer or instructional designer can arrange for learning of a specific outcome. Gagne's military experience may have influenced his theory; some wonder if he had been working with elementary school student would his model have been so systematic.

There are three parts to Gagne's instructional theory. One is the theory is based on a taxonomy of learning outcome. Next, the theory states the necessity of internal and external conditions in order to achieve the learning outcome. Finally, the nine events of instruction serve as a model for the development of a module of instruction. In Gagne's theory, a learning hierarchy is constructed to help obtain the requirements for the learning objectives.

Gagne's earlier work reflects behaviorist where his focus is on the outcome or behavior that is the results of training. He was considered an experimental psychologist concerned with learning and instruction ( ).

Constructivism is not an instructional approach. It is a learning theory that believes learners construct their own knowledge based on interaction with their environment. There are four assumptions that are considered in constructivist learning. They are knowledge is: physically constructed by learners involved in active learning, symbolically constructed by learners who make their own representations of action, socially constructed by learners who convey their meaning making to others and theoretically constructed by learners who try to explain what they don't completely understand ( ).

There are a few instructional strategies that Gagne uses. He breaks down the organization into micro levels and deals with the arrangement of lessons. He is concerned with the way in which information is delivered to students. He helps the learner interact with the activities designed for learning. Constructivism uses other strategies. It places the learner at the center of

instruction. The learner in their own way constructs knowledge rather than be lead to the knowledge. They use prior experience, mental structure and their own beliefs to interpret objects and events. Both of these approaches to learning should be used to enable students to gain knowledge that will help them to solve problems and reach conclusions

( ).

Cognition

Reigeluth adds on to Bloom's definition of the cognitive domain as "the domain that deals with the recall or recognition of knowledge and the development of understandings and intellectual abilities and skills"(Reigeluth, 49). This affects instructional design. A wise facilitator of learning will want to design environments that encourage the cognitive process in his or her student. How students categorize their learning is also important to learning theorists. An effective learning theorist will take into consideration how the brain processes knowledge.

Gagne had defined learning as being cognitive, affective, and motor (Reigeluth, 49). Bloom took this idea of cognitive learning and created a taxonomy to organize the depth and type of cognitive learning. Gagne's nine levels of instruction, at first glance, focuses on the mastery of the knowledge, comprehension, and application domains of cognition. Information is presented, learners are asked to recall related information, and learners are expected to connect the two. With the emphasis on mastery, some facilitators may not move instruction farther up the hierarchy. But, with the use of scaffolding, facilitators can move from rote learning to meaningful learning. Using scaffolding to build upon what the learners already know as well modeling how to connect concepts in a "nonarbitrary, substantive fashion" allows for that meaningful learning. This applies to the learning of verbal information, intellectual skills, and cognitive strategies. Students can use metacognition to think about better ways to memorize the information.

Kafai and Resnick's theories on constructivism focus on exploring the curriculum. Students must analyze the concepts and "break down the material into its parts"(Reigeluth, p. 49). This process of exploring the material leads well into students being able to evaluate the material and its worth. Students must be able to develop critical thinking skills in order to succeed in this freedom within restrictions. Rote memorization cannot be achieved through constructivism. "Isolated entities" go against the building of relationships in the material. Constructivism also has an emphasis on developing the learner with skills to help in the attainment of understanding. Kafai and Resnick's ideas are useful also with general cognitive skills that are cross-curricular. When a student knows how to learn, there is more likelihood that the student will continue with lifelong learning.

Considerations

Gagne's progression of instructional steps provides a good foundation for teachers to apply theory in their classrooms. His steps would be especially useful to new teachers who are just starting to develop their classroom management style. These steps resemble a traditional flow of a good classroom and students may be used to this layout and adjust naturally. It is useful for conveying expectations, especially with learning objectives being explained to the students. Mentor teachers and instructional specialists could provide outlines of these steps for lesson plans and have new teachers fill in the blanks when they are stressed with first year worries. It might also be a good reminder as to what goes in to effective classroom structures in a traditional setting for veteran teachers.

Kafai and Resnick's constructivist theories might be misinterpreted by new teachers and result in overwhelming freedom. With a focus on building connections and developing meaning, new teachers following these theories may neglect some objectives. A good teacher will use items like meaningful artifacts to help students build those connections between the curriculum,

the state standards, and the lives of the students. Students must also be given certain boundaries with the freedom in constructivism. Too much freedom and students will get lost in the flood of opportunities and may also become more easily off-task. Adding certain boundaries adds a degree of focus and efficiency. A delicate balance must be weighed so that students remain focused but have enough freedom to "buy into" the lesson.

Conclusion

References

Brooks, J. G., & Brooks, M. G. (1999). *In search of understanding: the case for constructivist classrooms.* Alexandria, Virginia: Association for Supervision and Curriculum Development.

Joyce, B., Weil, M., & Calhoun, E. (2004). *Models of teaching. 7th edition.* Boston, MA: Pearson Education, Inc.

Page, N. (2001). *Robert Gagne*. Retrieved September 9, 2002, from Masschusetts School of Professional Psychology, The Psi Cafe: A Psychology Resource Site:

Shaw, A. (1996). Social constructionism and the inner city: designing environments for social development and urban renewal. In Y.Kafai & M.Resnick (Eds.), *Constructionism in practice: designing, thinking and learning in a digital world* (pp.175-204). New Jersey: Lawrence Erlbaum Associates.

Zemke, R. (1999). Toward a science of training. Robert M. Gagne's contributions to instructional theory. [Electronic version]. *Training (Minneapolis, Minn.), 3,* 32-34. Retrieved February 5, 2006, from the InfoTrac database.