Observations of constructivist teaching: A comparison of methods used in introductory and advanced instruction.

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Abstract

Constructivist theorists believe students improve their critical thinking and problem solving skills when they construct new knowledge based on background experiences and multiple resources. Teachers in the constructivist classroom act as facilitators who coach learners toward meaningful goals, are an integral part of the learning process, and combine their understanding of how students learn with expert knowledge of a particular discipline.

Although constructivist methods can be used to increase the knowledge and understanding of students, a base of information must be present to build upon. As a test of this hypothesis observations were made in two courses offered in the College of Fine Arts, Ball State University. The use of constructivist techniques in lecture time differed greatly between the two courses (p = 0.005). Time spent in the upper division class using constructivist methods was obviously disproportionate to the lower division course at the time of observation. The evidence presented in this study may support the hypothesis, but more data is needed.

Introduction

Although the main philosophy behind Constructivist theory is credited to Jean Piaget (1896-1980), the construction of knowledge through active learning, has roots in the lessons of scholars over twenty-two hundred years ago. Socrates, Plato, and Aristotle (470-320 B.C.) repeatedly spoke of the formation of knowledge (Crowther 1997). History reveals many examples of constructivism, Saint Augustine (300's A.D.), John Locke (17th and 18th centuries) and Kant (18th and 19th centuries) all tout sensory experience as a source of new knowledge (Crowther 1997). Still, Piaget remains the father of constructivism, and has provided the foundation for modern Constructivist theory.

Piaget believed that intelligence consists of two interrelated processes, organization and adaptation. People organize their thoughts so that they make sense, separating ones that are important from ones that are not, as well as connecting multiple ideas together. Simultaneously, people adapt their thinking to include knew ideas, as new experiences provide additional information. According to Piaget, adaptation has two pathways, through assimilation and
accommodation. In the former, new information is added to the existing cognitive organization. In the latter, the intellectual organization has to change to adjust for new information (Berger 1978).

Constructivism is a familiar word to most members of the science education community (Caine et al. 2002, Campbell 1998, Illman 1998). Constructivist theorists believe students improve their critical thinking and problem solving skills when they construct new knowledge based on background experiences and multiple resources (Price 1997). Students construct knowledge independently or as part of a social unit. They think critically when they combine background knowledge, independent research and classroom presentations to build their existing schema, and expand the foundation of their knowledge (Maypole and Davies 2001). Constructivists see learning as a process of actively exploring information and constructing meaning by linking it to previous knowledge and experience (Alesandrini and Larson 2002).

In the constructivist paradigm, the teacher’s role is not to lecture or provide structured activities that guide students to mastery of some teacher-imposed goal. Teachers in the constructivist classroom act as facilitators who coach learners toward meaningful goals (Alesandrini and Larson 2002). Teachers are an integral part of the learning process. They combine their understanding of how students learn with expert knowledge of a particular discipline. Teachers encourage students to respond to texts and to one another enabling students to think in increasingly complex ways about multiple possible perspectives (Chrenka 2001).

Constructivism or Constructivist theory puts the students, their interests, and previous experiences and knowledge as paramount parts of understanding in designing curriculum (Stofflett 1998). This has a particular impact when exploring the implications of pedagogy and teacher training. It is my contention that although constructivist methods can be used to increase the knowledge and understanding of students, a base of information must be present to build upon. As a test of this hypothesis observations were made in two courses offered in the College of Fine Arts, Ball State University. One course was introductory (100) offered to non-majors. The other an upper-division course (319) offered to majors who met prerequisite requirements.
If the above hypothesis is valid, more examples of the Constructivist Learning Method should be observed in the upper-level course than in the introductory one.

**Methods**

Data were collected through direct observation in each class for an equal period of time (300min/course) between 4/7 and 4/18/03. Both courses met for 50 minutes per day on Monday, Wednesday and Friday (Appendix A and B). Prior to data collection, the observer passed the Human Participants Protection Education for Research Teams course (Appendix C). Time spent using constructivist methods in class was recorded and assessed as a proportion relative to the total time observed (50 min./day, or 300min/course). Constructivist theory applied to course materials other than those used during the 50-minute course time were assessed qualitatively and will be considered in the interpretation of the results.

Wilcoxon signed rank test was used to test for differences in means between class observations. This non-parametric procedure tests the hypothesis that the frequency distributions for the two groups are identical.

**Results**

The use of constructivist techniques in lecture time differed greatly between the two courses (p = 0.005). In the upper division course (319) constructivist methods were observed 78 percent of the time. Only 30 percent of the time was spent in constructivist activities in the lower division course (100) (Figure 1). Variation in course time use was higher in the lower division course (figure 2).
Discussion

Time spent in the upper division class using constructivist methods was obviously disproportionate to the lower division course at the time of observation. Aubusson (2002) warns that transitions between advanced and introductory information could result in reverting to previous techniques. The Structure of the two courses differs significantly due to the abilities of the students. One such difference exists between the classes in the way the students are held accountable for their preparation. Students in the majors’ course were quizzed prior to discussion, and open-ended questions intentionally fueled discussion during the next meeting. On the other hand the introductory students were assessed traditionally, after the material was presented. The advanced class participated in discussions during class facilitated by the instructor, while introductory students were engaged in activities associated with materials covered in lecture. Introductory students are exposed to materials (e.g., a video) followed by lecture material over subjects relative to the presentation. One instance likened the history of the subject covered to modern examples relative to the students’ lives, giving them reference material for subject matter recollection. Links between such divisions in techniques have been described previously (MacKinnon et al. 2002, Yore 2001), and few suggestions have been put forward to correct for them.

With the exception of the dichotomy associated with the quiz material, assignments outside of class were all directed toward constructivist theory. Group activities outlined for students in both classes incorporate multiple aspects of the material presented to the class. These
projects appear to give students presenting information a facilitator’s role. The advanced students researched socio-political climates associated with the time of their subject and were required to incorporate it into a dramatic representation. Introductory students performed a skit with characters associated with multiple course topics.

Conclusion

Although the evidence presented in this study may support my hypothesis the time spent collecting data does not yield enough information to say anything more than a relationship exists between the use of Constructivist Learning Methods and course level. As a self-proclaimed constructivist I take this information as a challenge in my use of techniques in introductory courses. As with all of our endeavors, teaching philosophies evolve. The idea that a relationship may exist between constructivist teaching and previous knowledge does not mean that we have to accept an inability to use these methods. Simply put, if the relationship exists we must adapt our curriculum to overcome this “obstacle”.
References Cited


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Appendix A: Journal upper division course.

Day 1 Monday 4/7/03

Initial discussion included personal banter between the instructor and students. Class began with a discussion of a reading assignment. The instructor acted as a facilitator fuel the students’ conversation on the topic and answering direct questions only. This continued for the entire class period.

Day 2 Wednesday 4/9/03

Class met at the university theater for a 20-minute presentation. It was a group project.

Day 3 Friday 4/11/03

Students responsible for Wednesday’s presentation began by presenting the research of their topic. There were seven students in the group each had their own research assignment relative to the topic. This was followed by the joint defense of Wednesday’s presentation. Students in the class asked questions for a portion of the remaining time, followed by the instructors questions.

Day 4 Monday 4/14/03

The class discussed the outcome of their quiz. All assessments are taken through InQuisit, and one of the question responses required a defense to their answers. This took the entire period.

Day 5 Wednesday 4/16/03

Class discussion of readings. 1st breakdown story, next the characters, followed by the dissection of the materials. This took the entire class meeting. It was noted that throughout my observation period only a few students actually started discussions, but all participated once they began.

Day 6 Friday 4/18/03

Continued discussion from Wednesday.
Appendix B: Journal introductory course

Day 1 Monday 4/7/03
Finished watching film

Day 2 Wednesday 4/9/03
Lecture over course material

Day 3 Friday 4/11/03
Lecture over course material

Day 4 Monday 4/14/03
Lecture over course material

Day 5 Wednesday 4/16/03
Presentation of group projects

Day 6 Friday 4/18/03
Final project presentations
Appendix C:

Completion Certificate

This is to certify that

**Thomas Sobat**

has completed the *Human Participants Protection Education for Research Teams* online course, sponsored by the National Institutes of Health (NIH), on 01/28/2003.

This course included the following:

- key historical events and current issues that impact guidelines and legislation on human participant protection in research.
- ethical principles and guidelines that should assist in resolving the ethical issues inherent in the conduct of research with human participants.
- the use of key ethical principles and federal regulations to protect human participants at various stages in the research process.
- a description of guidelines for the protection of special populations in research.
- a definition of informed consent and components necessary for a valid consent.
- a description of the role of the IRB in the research process.
- the roles, responsibilities, and interactions of federal agencies, institutions, and researchers in conducting research with human participants.

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