Constructivist Learning Design

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This paper represents a collaborative effort of two teacher educators to articulate a constructivist approach to "designing for learning" rather than planning for teaching. See our **Constructivist Learning Design Notes** for a simplified version. Ongoing collaborative research with teachers is presented in our **Constructivist Learning Design Study**. We believe this focus on learning is needed if teachers are to implement a constructive approach to thinking about day-to-day learning by the students. Conventional lesson planning focuses on what the teacher will do. If learning is teacher directed, then the focus of the lesson plan is on what the teacher does. When designing a learning experience for students, teachers focus on what students will do. Our language encourages teachers to focus on thinking about how to organize what learners will do rather than plan their teaching behaviors.

Teachers and teacher educators make different meanings of constructivist learning theory. At a recent retreat with facilitators of learning communities for teachers who were studying in a Masters of Education program, we were talking about our common reading of The Case for Constructivist Classrooms (Brooks & Brooks, 1993). We asked the ten facilitators to answer this question, "What is constructivism?" The results were interesting because all of their definitions were quite different and reflected their own understanding of the term and the text. This was a clear demonstration that what we read does not produce a single meaning but that understanding is constructed by the readers who bring prior knowledge and experience to the text and make their own meaning as they interact with the author's words. The following interpretation of constructivist learning reflects our understanding of and beliefs about constructivism.

Constructivist Learning

Constructivist learning has emerged as a prominent approach to teaching during this past decade. The work of Dewey, Montessori, Piaget, Bruner, and Vygotsky among others provide historical precedents for constructivist learning theory. Constructivism represents a paradigm shift from education based on behaviorism to education based on cognitive theory. Fosnot (1996) has provided a recent summary of these theories and describes constructivist teaching practice. Behaviorist epistemology focuses on intelligence, domains of objectives, levels of knowledge, and reinforcement. Constructivist epistemology assumes that learners construct their own knowledge on the basis of interaction with their environment. Four epistemological assumptions are at the heart of what we refer to as "constructivist learning."

1. Knowledge is physically constructed by learners who are involved in active learning.

2. Knowledge is symbolically constructed by learners who are making their own representations of action;

3. Knowledge is socially constructed by learners who convey their meaning making to others;

4. Knowledge is theoretically constructed by learners who try to explain things they don't completely understand.

With these common assumptions, teacher planning according to the Tyler or Hunter models is no longer adequate. Research indicates that few classroom teachers plan using these models anyway (Morine-Dershimer, 1979; Zahorik, 1975) and usually because of administrative pressure if they do

(McCutcheon, 1982) However, few approaches are available for working with prospective teachers or new teachers to organize for learning. Simon (1995) and Steffe & Ambrosio (1995) describe their processes of planning for constructivist learning and constructivist teaching respectively, but these methods are complex and represent the thinking of experienced teachers.

We are proposing a new approach for planning using a "Constructivist Learning Design" that honors the common assumptions of constructivism and focuses on the development of situations as a way of thinking about the constructive activities of the learner rather than the demonstrative behavior of the teacher. Most conventional teacher planning models are based on verbal explanations or visual demonstrations of a procedure or skill by the teacher which are then combined with practice of this method or skill by the student. Much of this approach seems consistent with the description of classroom activities reported in a major research study titled *A place called school* conducted ten years ago by Goodlad (1984). He found that most of the time, most of the teachers talk to the kids. Students explained that physical education, fine arts, or industrial arts were their most interesting classes because they actually got to do something. They were active participants in learning rather than passive recipients of information. This is the primary message of constructivism; students who are engaged in active learning are making their own meaning and constructing their own knowledge in the process.

Constructivist Learning Design

The "Constructive Learning Design" we are using now has been through a variety of revisions in the past seven years and now emphasizes these six important elements: **Situation**, **Groupings**, **Bridge**, **Questions**, **Exhibit**, and **Reflections**. These elements are designed to provoke teacher planning and reflection about the process of student learning. Teachers develop the **situation** for students to explain, select a process for **groupings** of materials and students, build a **bridge** between what students already know and what they want them to learn, anticipate **questions** to ask and answer without giving away an explanation, encourage students to **exhibit** a record of their thinking by sharing it with others, and solicit students' **reflections** about their learning. We now longer refer to objectives, outcomes, or results since we expect that teachers have that determined by the district curriculum or the textbook they are using in their classroom and need to think more about accomplishing it than about writing it again.

This brief overview above indicates how each of these six elements integrate and work as a whole, but all need further explanation:

1. Situation: What situation are you going to arrange for students to explain? Give this situation a title and describe a process of solving problems, answering questions, creating metaphors, making decisions, drawing conclusions, or setting goals. This situation should include what you expect the students to do and how students will make their own meaning.

2. Groupings: There are two categories of groupings:
A. How are you going to make groupings of students; as a whole class, individuals, in collaborative thinking teams of two, three, four, five, six or more, and what process will you use to group them; counting off, chosing a color or piece of fruit, or similar clothing? This depends upon the situation you design and the materials you have available to you.

B. How are you going to arrange groupings of materials that students will use to explain the situation by physical modeling, graphically representing, numerically describing, or individually writing about their collective experience. How many sets of materials you have will often determine the numbers of student groups you will form.

3. Bridge: This is an initial activity intended to determine students' prior knowledge and to build a "bridge" between what they already know and what they might learn by explaining the situation. This might involve such things as giving them a simple problem to solve, having a whole class discussion, playing a game, or making lists. Sometimes this is best done before students are in groups and sometimes after they are grouped. You need to think about what is appropriate.

4. Questions: Questions could take place during each element of the Learning Design. What guiding questions will you use to introduce the situation, to arrange the groupings, to set up the bridge, to keep active learning going, to prompt exhibits, and to encourage reflections? You also need to anticipate questions from students and frame other questions to encourage them to explain their thinking and to support them in continuing to think for themselves.

5. Exhibit: This involves having students make an exhibit for others of whatever record they made to record their thinking as they were explaining the situation. This could include writing a description on cards and giving a verbal presentation, making a graph, chart, or other visual representation, acting out or role playing their impressions, constructing a physical representation with models, and making a video tape, photographs, or audio tape for display.

6. Reflections: These are the students' reflections of what they thought about while explaining the situation and then saw the exhibits from others. They would include what students remember from their thought process about feelings in their spirit, images in their imagination, and languages in their internal dialogue. What attitudes, skills, and concepts will students take out the door? What did students learn today that they won't forget tomorrow? What did they know before; what did they want to know; and what did they learn?

Educational Precedents

Each of these six elements of our constructivist learning design has educational precedents. The following overview provides brief references to theoretical ancestors which support including these elements in organizing for learning:

- **Situations** : The work of Duckworth (1987) describes situations to engage students in having their own wonderful ideas about science, Steffe and Ambrosio (1995) use situations for students to explain in math, and Fosnot (1996) provides similar examples from writing and art.
- **Groupings**: Schmuck and Schmuck (1988) introduced group process dynamics to classrooms, and heterogeneous groupings are common to the cooperative learning work of Johnson and Johnson (1975) or Slavin (1980a). The materials category is often included in lesson plans.
- **Bridge**: This has some grounding in the set induction described by Gagne (1970), the anticipatory set of Madeline Hunter (1982) and the advanced organizer of Ausubel (1978).
- **Questions**: There is precedence in Bloom's (1956) taxonomy of educational objectives in the cognitive domain which led to higher level thinking questions, Sanders' (1966) work on kinds of classroom questions, and Flanders' (1970) work describing classroom questioning strategies.
- **Exhibit**: The work of Theodore Sizer (1973) and the coalition for essential schools includes an exhibition as part of the learning process. The passages of the Jefferson County Open School in Colorado and the validations of the St. Paul Open School in Minnesota put into practice authentic assessment approaches from a variety of sources including Wiggins (1995).

Documentation from Engel (1994), portfolios from Carini (1986), and alternative assessment from the North Dakota Study Group on Evaluation led by Perrone (1988) encouraged teachers to move from testing memorization of information to demonstration of student learning.

- **Reflections**: We see earlier work in Hunter's (1982) description of "transfer," the work of Schon (1987) about reflective practice of teachers, which also applies to student learning, reflection about learning through journaling as described by Cooper (1991), and Brookfield's (1986) work on critical reflection. These precedents provide a theoretical framework for a constructivist learning design.

Assessment

Assessment becomes an integral part of every step in this learning design. Teachers design the **situation** based on their assessment of students' learning approaches, interests, and needs. Teachers design a process for **groupings** based on their assessment of materials of available and desired mixture of students. Teachers design a simple assessment of what students already know as a **bridge** to what they want students to learn. Teachers design **questions** to assess student understanding of the concepts, skills, or attitudes they are trying to learn. Teachers arrange an **exhibit** for students to record what they thought and submit it to others for assessment. Teachers arrange for **reflections** about what students' have learned and their internal process of representations as a context for self-assessment of individual learning.

Applications

The planning approach we are proposing is based on actively engaging students in situations that involve collaboratively considering their own explanations for phenomena, resolutions to problems, or formulation of questions. Students are asked to actively construct their own knowledge by making meaning out of the situation by themselves with support and guidance from the teacher. Teachers organize the situation and then provide encouragement and questions to groups of students who are trying to construct and to display their own explanations. For example, composition teachers might ask students to construct the simplest sentences and compare structures, literature teachers might ask students to explain the motives of a character, social studies teachers might ask students to assume the roles of two adversaries in a meeting, science teachers might demonstrate a phenomenon and ask students to explain what was observed, math teachers might ask students to find examples of sloping lines in the world around them and then introduce grids to determine equations, language teachers might engage students in conversational immersion without resorting to English translations, art teachers might ask students to transform clay with their hands without looking at it, music teachers might ask students to identify rhythms in a piece of music using their own annotations. The constructivist approach can be adapted to any subject area or curriculum by involving students as active participants in making meaning instead of passive recipients of information given to them by the teacher. This approach can be incorporated into 45 or 50 minute class periods to teach a particular concept, skill, or attitude.

When referring to student learning we deliberately use the phrase "concepts, skills, and attitudes" to convey different dimensions of knowledge. The accepted educational language described by current NCATE accreditation standards is "knowledge, skills, and attitudes." This implies that skills and attitudes are something different than knowledge or that knowledge is merely a collection of facts or information. Perhaps some of the confusion derives from Bloom's (1956) taxonomy of objectives starting with knowledge and proceeding through comprehension,

application, analysis, synthesis, and evaluation. Again, this language is accepted as a standard in the education curriculum. Bloom later classified objectives in the affective domain and the psychomotor domain as well as in the cognitive domain. This left us with the legacy of knowledge as separate from what we can do with it or how we feel about it. We would argue that what Bloom has labeled knowledge is really information and that the other levels are different ways that learners construct knowledge for themselves and may not be discreet and hierarchical as Bloom suggests. However, these classifications can serve as an important guidelines for moving beyond recitation of information as the goal of education. We contend that an understanding of education should begin with epistemology rather than relegating it to the province of philosophy as an academic pursuit. Constructivist learning implies an initial concern with what knowledge is and how knowledge is actively constructed by the learner. Advocates of constructivism agree that acquiring knowledge or knowing is an active process of constructing understanding rather than the passive receipt of information.

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For a simplified version of our Constructivist Learning Design follow this link:

Constructivist Learning Design Notes

For a description of our Constructivist Learning Design research follow this link:

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