Applying a Constructivist Pedagogy to Design Studio Education

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Introduction

This paper will apply a constructivist philosophical framework to teaching and learning in the landscape architecture studio. First, the paper provides some meanings associated with constructivism followed by the changes in the worldview that affected constructivism. The paper next discusses constructivism in education and defines two variations of it, radical constructivism and social constructivism. Finally, 10 pedagogical principals suggested by constructivists are listed and related to the design studio.

The main goal of this paper is to help in the reassessment and redesign of the construction process inherent in teachers, learners, and the studio system. Often, actions of educators are not necessarily guided by an overt knowledge of the reasoning behind these actions. Intuition, successful experiences, and observations: these factors play an important role in influencing the behavior of teachers and, no doubt, often dictate their practice (Murphy 1997). Educators often adopt and utilize a particular approach or method without necessarily having purposely considered the theory or philosophy that underpins it. This paper is important because it helps to guide the development of a philosophical framework unconsciously employed by many design teachers already. This paper reiterates von Glaserfeld's (1995) comments: "constructivism does not claim to have made earth-shaking inventions in the area of education; it merely claims to provide a solid conceptual basis for some of the things that, until now, inspired teachers had to do without theoretical foundation" (p. 3).

Shifting Epistemologies and Constructivism

Knowledge, its nature and how we come to know, are essential considerations for constructivists. Beliefs about knowledge, inform, justify, and sustain our practices of education. (Gergen 1995). If we believe that learners gain knowledge by passive reception of information then priority in instruction will be on knowledge transmission. However, if we believe that learners actively construct knowledge in their attempts to make sense of their world, then learning will likely emphasize the development of meaning and understanding (Murphy 1997).

Early theories emphasized knowledge acquisition as the awareness of objects that exist independent of any subject. According to this objectivist view, objects have intrinsic meaning, and knowledge is a reflection of a correspondence to reality. In other words, knowledge represents a real world that is thought of as existing, separate and independent of the knower; and this knowledge should be considered true only if it correctly reflects the independent world. Beliefs such as passive transmission of knowledge continue to dominate most pedagogy today in the form of direct lecturing, memorization, and passive learning activities.

However, constructivists prefer to reject the idealized view of truth inherited from the ancients and modernists by replacing it with a dynamic, changing truth bounded by time, space, and perspective (Wilson 1997). The educational constructivist view argues that knowledge and reality does not have an object or absolute value, at the least, we have no way of knowing this reality. Von Glasersfeld (1995) indicates the concept of reality as "made up of the network of things and relationships that we rely on in our living, and on which, we believe, others rely on too" (p. 7). The knower interprets and constructs a reality based on his experiences and interactions with his environment. Constructivists generally claim that knowledge is not discovered but actively made and the ideas teachers teach do not correspond to an objective reality.

The next two sections will focus on radical and social constructivism. It is important to note that within education, constructivism has several theoretical forms but this paper will focus on radical and social constructivism because of their more widespread acceptance and applicability.

Radical Constructivism

Radical constructivism maintains that within the growth of knowledge, making is more important than finding. The idea of making as relating to a

subjective construction while the notion of finding can be akin to an objective revelation. Ernst von Glasersfeld, a leading proponent of radical constructivism, suggests "to know" actually should be understood "to know how to make" (Von Glasersfeld 1989). Von Glasersfeld continues by writing that the human knower, unlike God, can know only that which the human knower has constructed or made. Radical constructivists oppose the idea of a completely external world and reality separate from the human knower. Radical constructivism replaces this observer-independent model of knowledge with the idea that knowledge is comprised of conceptual structures created by individuals in a fashion congruent with their experience and perspective.

Jean Piaget, a psychologist and contributor to radical constructivist ideology, provides one explanation for the construction of knowledge. Piaget's central thesis holds that knowledge is built through human change and adaptation and will survive in so long as that knowledge remains useful. Further, adaptation, similar to its evolutionary meaning, refers to the ability of an individual to create coherent conceptual frameworks of the world as it is experienced and sustain these frameworks until they are no longer viable (von Glasersfeld 1995). Adaptation directly refers to change. Change through adaptation, according to radical constructivists, is how we begin to build knowledge. Knowledge is then maintained or disregarded through the process of adaptation as new and old concepts loose their poignancy or viability. In this sense, an idea that doesn't seem to "fit" into an individual's ontology will loose its viability. This causes the individual to adapt to this change and set in motion the creation of new knowledge. To the constructivist, viability, which is changeable, replaces universal truths, which are static.

An example of radical constructivist ideology in the design studio is seen in the methods for evaluating student work. There is almost certainly no absolute right or true way to evaluate student work independent from the individuals involved in the evaluation. In other words, no standardized or normalized method of evaluation can exist because it could not be applicable in all situations for all times. Instead, teachers evaluate student work using a method that seems viable to them given the particular goals and context of the students and work being evaluated. This method may, for example, tend to be qualitative or quantitative depending on a variety of factors the teacher has considered important. The teacher utilizes their adopted evaluative method until it does not seem viable or effective any longer. At this point, the need to adapt should force the teacher to construct a new method for evaluating student work based upon their particular perspective of the current situation.

Social Constructivism

Social constructivism encompasses a variety of views. Some views claim knowledge is the product of our social practices and institutions. While others views stress social interactions and negotiations between relevant social groups. Defenders of social constructivism insist that the world is accessible to us only through our shared interpretations, and the idea of an independent reality is at best an irrelevant abstraction and at worst incoherent. (Gasper 1999, p. 855). Social constructivism differs vastly from radical constructivism in general epistemology and ontology. For example, radical constructivism holds that knowledge is subjectively created through personal experiences within the context of the individual. In contrast, social constructivism holds that knowledge is created and determined viable through functional and pragmatic social interaction. Social constructivism sees consensus between different subjects as the ultimate criterion to judge knowledge. "'Truth' or 'reality' will be accorded only to those constructions on which people of a social group agree" (Heylighen 1993, p. 2)

Social constructivists see language as a key to understanding reality since meaning of the world is linked to specific meanings of words shared by groups of people. Language provides the shared structure necessary for communicating meaningful ideas and thoughts. Since meaning is derived from language and language is interdependent between two or more persons, it follows that socio-cultural processes of negotiation, cooperation, conflict,

rhetoric, ritual, roles, social scenarios, and the like are crucial factors in the development of meaning and reality.

An example of social constructivist ideology in the design studio can again be shown in relationship to the methods for evaluating student work. A method of evaluation is effective and useful if it is determined to be so by a particular group. This group may be students, teachers, professional organizations, or any other interactive culture or group. The group prescribes and utilizes an agreed upon evaluative method until it is held by the group as unusable or ineffective. At this point, the need to adapt should force the group to construct a new method for evaluating student work based upon their collective perspective of the current situation.

Educational Constructivism's Combined Learning Principals

The process in which knowledge is conceived and acquired, the types of knowledge, skills and activities emphasized, the role of learner and teacher, how goals are established: all of these factors are articulated differently within the various constructivist perspectives (Murphy 1997). These differences amongst constructivists, do however, provide an increased diversity and applicability to studio education when synthesized.

The following sections will provide 7 principals for applying constructivist ideology to the design studio. With each principal, an example of how the principal can be applied to studio is given. The 7 principals are based upon the work of many radical and social constructivist authors in conjunction with the experience of the author as both student and teacher. Most of the principals have recently proved fruitful in studio trials while a few are in need of corroboration. Regardless, the 7 principals represent a challenge to current pedagogy and will provide needed discourse.

The following authors were utilized in the creation of the 7 principals: Borich and Tombari (1997), Brooks and Brooks (1993), Driscoll (1994), Driver, Aasoko, Leach, Mortimer, and Scott (1994), Eggen and Kauchak (1997), Gergen (1995), Honebein (1996), Jonassen (1991), Lee (1999), Mitchell (1989), Savery And Duffy (1995), Stanbridge (1990), von Glasersfeld (1996), Wagner and McCombs (1995), Wilson (1995), Wilson and Cole (1991), Zimmerman (1989).

1) Establish Prior Constructions of Knowledge.

Constructivism suggests that any form of learning should be personally relevant to the learner. Providing relevant situations helps students to perceive learning as purposive and not view the task as merely an assignment to be undertaken. For a constructivist, the determination of relevance comes from assessing the learner's previous knowledge constructions, beliefs and attitudes. Acknowledging the importance of prior learning also helps teachers understand their student's points of view and conceptions so that new ideas can be taught in the context of current understandings. Prior knowledge is the initial building blocks from which teacher and learner must begin construction. For example, a studio instructor could establish prior constructions of student knowledge by talking to the student's previous teacher or interviewing the students.

2) Formative Assessment and Evaluation

Assessment should be authentic and interwoven with teaching. Assessing a learner's knowledge acquisition during the lesson provides a glimpse into the construction process a particular student employs. The pursuit of student questions is highly valued as a method of assessing and helping diagnose the student's process for structuring problems. However, assessment should not be reserved for the student alone. Periodic assessment should also serve as a self-analysis tool for the teacher because teachers knowledge, like students, is open to construction and reconstruction (von Glasersfeld 1996). A teacher's current knowledge and beliefs are expressed in the way they plan, design, teach, make decisions, and evaluate their studio and students. Problems or surprises encountered within the studio provide opportunities for reorganization of knowledge and beliefs. For a constructivist, assessment is used to elicit and describe the student's construction processes with the notion that understanding processing will allow for successful intervention and advancement of knowledge construction. One example of using

formative assessment within the studio is having students assess each other during pin-ups by answering certain focused questions on note cards and then returning them for review.

3) Students Negotiate Goals

Goals and objectives should be derived by the student or in negotiation with the teacher and studio. Providing an environment that encourages social negotiation as an integral part of learning will accustom students to using thoughtful discourse and other means of negotiation for achieving their needs. For a constructivist, students must be able to plan and set their own goals, reflect and assess their progress as well as determine how to proceed. If students are to be expected work with all their intellect and emotion then it is important that they be empowered. Empowering students however needs to be complemented by self-regulation. In the studio, a teacher could allow students to propose the product they will submit for a particular project based upon their starting level of understanding. Students and teacher could also negotiate deadlines with respect to what they propose to produce.

4) Create Authentic Problems

In the constructivist studio there is provision for ambiguity and uncertainty. Again, the embedding of learning within relevant contexts is important. The studio should create learning situations, environments, skills, content and tasks that are realistic, authentic, and represent the natural complexities of the 'real world'. A means to providing personal relevance is by simulating authentic problems without lowering the degree of cognitive complexity. Since these problems are similar to the challenges students will face in their real world, tasks requiring problem solving become more engaging, as the students want to know what the possible outcomes may be. For example, a studio teacher may use juries composed of people outside design to review projects and submit comments that are similar to those a potential client group may provide.

5) Emphasize Big Concepts and Interconnectedness

For a constructivist, problem-solving, higher-order thinking skills and deep understanding are emphasized. Knowledge complexity is reflected in an emphasis on conceptual inter-relatedness and interdisciplinary learning. By placing emphasis on big concepts the learner does not focus on details that tend to change more rapidly than the structures upon which they rest. In a studio, the teacher may choose to focus on a bigger concept such as graphic representation rather than focusing on a particular method for rendering plans.

6) Encourage Multiple Representations

For a constructivist, multiple representations of concepts and content are presented and encouraged. However, the overriding importance is on knowledge construction and not merely representation, particularly if presented as the sole final reflection of the 'real world.' Providing access to multiple modes of representation such as a numerous example work helps to stress conceptual inter-relatedness and multiplicity. The notion that the world is getting smaller and more multicultural suggests that teachers provide tools and environments to help learners interpret and appreciate multiple perspectives of the world. According to constructivists, not only should the teacher provide multiple representations but also learners need to have the opportunity to present their work and ideas in a variety of ways. In the studio, teacher and learners should utilize constructive discourse consisting of verbal, written, and graphic languages. A studio teacher might, for example, using video or role playing to both present case studies.

7) Errors are Opportunities

In a constructivist studio, errors provide the opportunity for insight into students' previous knowledge construction. The use of errors as a mechanism to provide feedback on learners' understanding is a key component to constructivism. Desk critiques and pin ups of in-progress work will expose many ill-structured constructions to the

teacher and other learners. Allowing students to find problems in their own work and the work of others exposes different perspectives and processes. To a constructivist, process takes precedent over product because a truly final thing-in-itself can never be achieved. Therefore no error is final and confusion can always be cleared if the teacher and learners take the time and effort to examine their constructions.

Teacher and Learner Roles

In von Glasersfeld's (1995) conception of learning, the teacher plays the role of "midwife in the birth of understanding" as opposed to "mechanics of knowledge transfer". Teacher's roles are not dispensing of knowledge but to provide students with opportunities and incentives to build it up. To a constructivist, teachers serve in the role of guides, monitors, coaches, tutors, and facilitators and essentially teach learners how to learn. In a constructivist system, emphasis shifts from teachers' problem solving power alone to teachers and students joint fallibility and problem solving potential. Constructivist teachers view learning as a joint cognitive venture and encourage ownership and voice in the learning process.

To a constructivist, students are viewed as thinkers with emerging views and theories of the world. The student plays a central role in mediating and controlling learning. Therefore students should assume responsibility for their own learning and take measures to achieve its success. Teachers need to trust students to solve problems and students need to trust teachers to respect their efforts. Students need to depend on a teacher, and other students, to be supportive of their ideas, rather than to react disparagingly to seemingly incorrect views. Students desire to trust a teacher to deal eventually with most issues of concern, and students need to believe that confusion or unease is temporary only, as construction can take time and resolution will occur eventually. In a studio, for example, students should be shown how to assess their own designs and then allowed the opportunity to act accordingly.

Implications for Studio Pedagogy

Constructivism implies that teachers and learners within the studio are busily constructing knowledge and the recognition of their constructions can lead to positive intervention in the process resulting in the advancement of effective and efficient growth. Responsibility in the learning process should be shared and negotiated amongst teachers and learners. An enriched studio environment with a multiplicity of informational sources and representations will help students and teachers reflect upon their prior knowledge. The studio is an excellent place for the outgrowth of constructivism. The nature of design with its uncertainty and irregularities are congruent with the epistemology and ontology of constructivist pedagogy. The inclusion of constructivist ideology within current curriculums and studio courses will help add theoretical credibility to existing studio teaching practices and most importantly increase learning and advance constructions of knowledge.

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