

Effective Constructivist Teaching Learning in the Classroom

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Abstract

Constructivism has been a very powerful model for explaining how knowledge is produced in the world as well as how students learn. Moreover, constructivist teaching practices are becoming more prevalent in teacher education programs, while demonstrating significant success in promoting student learning. In this paper, the author takes a serious look at constructivist teaching practices highlighting both the promises and potential problems of these practices. The author argues that constructivist teaching has often been misinterpreted and misused, resulting in learning practices that neither challenge students nor address their needs. He outlines some of the ways in which constructivism has been misconstrued and analyzes several ways in which constructivist teaching has been misused. The author also presents two examples that illustrate the effective use of constructivist teaching and explains what makes them successful.

Keywords: constructivism, teaching, learning, misuse, effective use.

An individual's own learning experience shapes his unique perspective about process of education which in turn influences his/her decisions as an administrator, a manager or a police maker. For instance, teachers often treat their students in the same manner as they had been treated their teachers and others in their childhood. Meaning thereby that a person's approach towards education determine his/her performance and practice inside or outside the classroom. Conversely, it is also possible to help the teachers and other interested persons to look into perspective of other's if they are able to understand the background of psychological and pedagogical thought in which the new ideas emerge. This is particularly important for facilitating desirable changes in teaching process.

The purpose of the paper is to present a comparative description of traditional and constructivist approaches to education.

Vignette-1

Four years old Nish came weeping- “Mom I don't want to go to school”

Mother: “My child but why?”

(The mother got worried. Because she had thought that her child will adjust nicely in that well established school, leaving behind the confines of their flat on the third floor. She had seen, Nisha running to the swing at the far end of the field and even talking to some of the children there, on the very first day she was admitted to the school).

The mother decided to meet the principles.

Mother: Today my daughter refused to come to school.

Principal: And you come to make a complaint with me?

Mother: No principal.....but.....

Principal: Please listen to me. Your daughter is very naughty. I always find her moving in the classroom. She cannot repeat ABCD with the whole class. She cannot learn numbers and does not like to write.

Mother: I have an idea principal. Please allow Nisha to spend some time in the open field for some days.

Principal:and break the discipline of the whole class. Then who do you think will take down her class work and home.

Mother: "I have another idea principal Take the whole class to that ground"

Principal: (Now looked annoyed) And brake the discipline of the whole school? Madam listen. Rules, discipline and hard work is the motto of our school. (then resumed her professional calm). Don't worry. Your daughter will soon be able to learn.

An analysis of the above vignette with academic interest reveals different perspectives of the parents and teachers / principals. Nisha's mother could understand her daughter's interests, performances, and maturity level and believes that her child could learn in the open field also and perhaps better but needs proper guidance of the teacher. But the principal's perspective reflected in classroom practices is influenced by management centric approach based on industrial model. This perspective place importance to outcome based pedagogy.

Vignette-II

In dhangadhi, well educated and enlighten parents of a brilliant scientist family daughter, opened a school, after the untimely demise of their daughter, on profit and no loss basis. The lady, a retired lecturer in her own right, knew that the school should not become a synonym of jail for the children. About fifteen students, aged 3-4 years were admitted in the first session. The organizers were satisfied. They will raise these children as they had brought up their own daughter-they thought. Following are some excerpts of their talk.

Parents: About two months have been passed Madam. And my daughter cannot write a single letter yet.

Principal: We feel that children find writing very cumbersome in the beginning. Therefore we are concentrating on no oral skills and good habits first. You must have noticed that your daughter can clearly

and fluently recite many rhymes which she has been learnt so fast.

Parents I: All Nepali poetry and that's all.

Parents II: My son also says that he likes to sing and recite poetry in Nepali.

Principal: we give same weightage to both the languages but never force a child to specific one. Then we have also exhibited the sketches-all drawn out by the children themselves. We also wish to inform you that children are taking great interest in the activities of Eco-Club which we have opened recently.

Parent III: But the children have to compare with the students from other schools. In this way they will never English at all.....

The above conversation reveals that the objections made by the parents due to their anxiousness over slight deviations in the established structure of education which again reflects their belief in rigid management centric approach which focuses upon part to whole learning, quantitative measurement and extrinsic motivation. The classrooms are considered a work place and listening to the instructions is a thought of as the traditional perspective because it has had a profound effect on schools in the last one hundred years.

The opposing idea, Progressivism led by Dewey has also influenced the schools and society throughout the last century. His school of thought advocated child centered and experiential approach to teaching and learning. This approach laid emphasis on discovery and dialectical approach to constructing knowledge. Dewey convinced American to Unbolt School Desks from the floor. His perception about the classroom was a learning place. Dewey saw connections with democracy and pedagogy. Democracy was not the subject to be studied rather a value to be lived. He believed that the theory and practice of democracy should be nourished by power of pedagogy. Dewey's legacy is seen in holistic learning, reflective assessment and intrinsic motivation. This approach eventually resulted in other perspectives known as cognitivism, socialcognitivism, interactionism, and transformative education.

Vignette-III

One day five years old Sangita, was very much excited- "Papa I have seen a thing in the garden which was changing its colour. I saw it on the tree. It was dirty! dirty! Then it went on the leaves it become green. After a while its head become red!."

"It was a chameleon." Her father said. "Really Papa! Have you also seen it." Sangita was very happy as she started repeating its name.

After a while she saying "C for catC for Coat and C for " The father had an opportunity to tell her the spelling also which Sangita could differentiate easily and could remember very fast.

Sangita's play becomes more enriched.

Giving a pause to her continuous repetition, the mother added, ".....and C for camel also." Sangita stopped. "But I have never seen a camel!"

"O.K. when we will go to zoo we will show a camel to you."

"And when you will come to my school I will show you the chameleon...."

Then noticing surprise on mother's face Sangita said "Chameleon is my friend. It will come to meet me again."

Suddenly she realized "F for fan and F for friend also." And she resumed her play now speaking more letters with words she know. Her parents also got more opportunity to enrich her game as well as knowledge in interesting manner.

Sangita's mother was satisfied with the progress her daughter was exhibiting in her performance. But she knew that ultimately they had to depend upon the school. While sharing her experiences with Diby's mother both of them agreed that children learn in their knowledge gets enriched through interaction with more knowledgeable peers and adults. Diby's mother also added "My Diby is now more than 7 years old. He makes all different sounds through her same manner and will say "Look I am a car. Then she will correct herself if the sound and the movement do not correspond." The mother was laughing "the other day she came running to me "Mom now I know what it means to fly! I have seen a butterfly sitting on the flower.....then flying to other.....then to another. And you know? I can also fly-she showed through his actions and movements -only my feet

touch the ground." In the evening the mother saw her daughter a banana peel on a stick and running in a circle with that stick "Look this is my jet and I am flying it."

In the above explanation, assimilation of new ideas in the children's existing mental structure are explicit. Both Sangita and Diby's experiences and actions may be explained on the basis of the theory of intellectual development which focuses on cognitive constructions of the growing children. Constructivism is an epistemology that presents explanation of the nature and acquisition of knowledge among human beings. The constructivist theory posits that knowledge is constructed by learners as they attempts to make sense of their experiences. Learners, therefore, are not empty vessels to be filled but active organisms seeking meaning (Driscoll, 1994).

Traditional and Constructivist Instructional Approaches

The traditional classes are usually dominated by direct and unilateral instruction. Traditional approach followers assume that there is a fixed body of knowledge that the student must come to know. Students are expected to blindly accept the information they are given without questioning the instructor (Stofflett, 1998). The teacher seeks to transfer thoughts and meanings to the passive student leaving little room for student-initiated questions, independent thought or interaction between students (VAST, 1998). Even the in activities based subjects, although activities are done in a group but do not encourage discussion or exploration of the concepts involved. This tends to overlook the critical thinking and unifying concepts essential to true science literacy and appreciation (Yore, 2001). This teacher centered method of teaching also assumes that all students have the same level of background knowledge in the subject matter and are able to absorb the material at the same pace (Lord, 1999).

In contrast, constructivist or student centered learning poses a question to the students, who then work together in small groups to discover one or more solutions (Yager, 1991). Students play an active role in carrying out experiments and reaching their own conclusions. Teachers assist the students

in developing new insights and connecting them with previous knowledge, but leave the discovery and discussion to the student groups (VAST, 1998). Questions are posed to the class and student teams work together to discuss and reach agreement on their answers, which are then shared with the entire class. Students are able to develop their own understanding of the subject matter based on previous knowledge, and can correct any misconceptions they have. Both teaching styles can lead to successful learning but it has been shown that students in the constructivist environment demonstrated more enthusiasm and interest in the subject matter. In fact, repeated research has found that teacher-centered lessons can be less or non-productive, and in some cases, detrimental to the students' learning process (Zoller, 2000). Many teachers are hesitant to try the constructivist model, because it requires additional planning and a relaxation of the traditional rules of the classroom (Scheurman, 1998).

Teachers often feel as though they aren't doing their job if the students are working together and actively discussing the material instead of busily taking notes (Sprague and Dede, 1999). Since any new idea is likely to be rejected unless teachers examine their own theoretical framework and develop their own justification for the change, it was suggested that additional quantitative evidence in support of constructivism might encourage more teachers to embrace this teaching style (Shymansky, 1992). Numerous studies have been completed to compare students' learning in traditional and constructivist classrooms. These studies generally based their conclusions on test or quiz scores and student comments or evaluations (Lord, 1997; Lord, 1999). The use of a quantitative analysis based on videotapes of the labs, which takes into account the actions of both students and teacher, should provide a new outlook on these teaching styles, as well as offering another means of objectively comparing the results.

Traditional teaching approach (lecture method) is very common in the field of education. Traditional method ignores the students consequently the mental level of interest of the students. It involves coverage of the context and rote memorization on the part of the students. It did not involve students in creative

thinking and participation in the creative part of activities. Most of the time, during teaching learning process, instruction remain unilateral which is and consider to be orthodox activity. The up-and-coming trends changed the present scenario and adopted the constructivist approach which is moral and more focus on innovative activities and knowledge acquisition. Constructivism is a paradigm that hypothesizes learning as an active, contextualized, or constructive process. Constructivism is a reaction to teaching approaches such as behaviorism and programmed instruction. The learner acts as an information constructor. Learners construct knowledge based on their personal experiences and hypotheses of the environment. Learners actively construct or create their own subjective or objective reality. Learners, through social negotiation, continuously test their hypotheses and create new knowledge, correct previous knowledge, or confirm present knowledge. Learner linked new knowledge to prior knowledge. Constructivists argued that learner is not a blank slate (*tabula rasa*) but brings past experiences and cultural factors to a construct new knowledge in given situation.

Therefore each learner has a different interpretation and constructions of knowledge process based on mental representations (Learning Theories Knowledgebase, 2008). Constructivism activates the student's inborn curiosity about the real world to observe how things work. A common misunderstanding regarding constructivism, due to confusion of theory of pedagogy (teaching) with a theory of knowing, is that instructors should never tell students anything directly but, instead, should always allow them to construct knowledge for themselves. Constructivism assumes that all knowledge is constructed from the learner's previous knowledge, regardless of how one is taught. Thus, even listening to a lecture involves active attempts to construct new knowledge. In the classroom, the constructivist view of learning can point towards a number of different teaching practices. In the most general sense, it usually means encouraging students to use active techniques (experiments, real-world problem solving) to create more knowledge and then to reflect on and talk about what they are doing and how their understanding is changing. The

teacher makes sure that he understands the students' preexisting conceptions, and guides the activity to address them and then build on them. Constructivism modifies role of teacher that he facilitate and help students to construct knowledge rather than to reproduce a series of facts.

The constructivist teacher help the students through problem-solving and inquiry-based learning activities with which students formulate and test their ideas, draw conclusions and inferences, and pool and convey their knowledge in a collaborative learning environment. Constructivism transforms the student from a passive recipient of information to an active participant in the learning process. Always guided by the teacher, students construct their knowledge actively rather than just mechanically ingesting knowledge from the teacher or the textbook. The task of the instructor is to translate information to be learned into a format appropriate to the learner's current state of understanding. Curriculum should be organized in a spiral manner so that the student continually builds upon what they have already learned. Bruner (1966) states that a constructivists or theory of instruction should address four major aspects: predisposition towards learning, the ways in which a body of knowledge can be structured so that it can be most readily grasped by the learner, the most effective sequences in which to present material, and the nature and pacing of rewards and punishments.

Defining Constructivism

In the past few decades, a constructivist approach has emerged as a very powerful model for explaining how knowledge is produced in the world as well as how students learn. For constructivists like Joe Kincheloe and Barbara Thayer-Bacon, knowledge about the world does not simply exist out there, waiting to be discovered, but is rather constructed by human beings in their interaction with the world: The angle from which an entity is seen, the values of the researcher that shape the questions he or she asks about it, and what the researcher considers important are all factors in the construction of knowledge about the phenomenon in question. (Kincheloe, 2000, p. 342)

Thayer-Bacon (1999) invokes a quilting bee

metaphor to highlight the fact that knowledge is constructed by people who are socially and culturally embedded rather than isolated individuals or detached minds. To assert that knowledge is constructed rather than discovered implies that it is neither independent of human knowing nor value free. Indeed, constructivists believe that what is deemed knowledge is always informed by a particular perspective and shaped by various implicit value judgments. Informed by the insights of theorists such as Piaget, Vygotsky, and Freire constructivism has helped to shift the way in which knowledge is understood and assessed. Piaget believed that to understand the nature of knowledge, 'we must study its formation rather than examining only the end product' (Kamii & Ewing, 1996, p. 260). His developmental theory demonstrates that the way one arrives at knowledge is equally, if not more, important than the final result. Vygotsky's (1978) concept of the 'Zone of Proximal Development' enables us to realize that human learning, development, and knowledge are all embedded in a particular social and cultural context in which people exist and grow:

Since mental activity, he maintained, takes place in a social and cultural context, thought will operate differently in diverse historical situations. Cognition thus is shaped by the interactions among social actors, the contexts in which they act, and the form their activities assume. (Kincheloe, 1999, p. 9)

Freire (1994) insists that knowledge is not a gift or a possession that some individuals have and others lack. On the contrary, knowledge is attained when people come together to exchange ideas, articulate their problems from their own perspectives, and construct meanings that makes sense to them. It is a process of inquiry and creation, an active and restless process that human beings undertake in order to make sense of themselves, the world, and the relationships between the two.

In light of the insights of Piaget, Vygotsky, and Freire, a constructivist approach to education is one in which learners actively create, interpret, and reorganize knowledge in individual ways. According to Windschitl (1999), 'these fluid intellectual transformations occur when students reconcile formal instructional experiences with their existing

knowledge, with the cultural and social contexts in which ideas occur, and with a host of other influences that serve to mediate understanding' (p. 752). In this view, teaching should promote experiences that require students to become active, scholarly participators in the learning process. Windschitl goes on to note that 'such experiences include problem-based learning, inquiry activities, dialogues with peers and teachers that encourage making sense of the subject matter, exposure to multiple sources of information, and opportunities for students to demonstrate their understanding in diverse ways' (p. 752).

To be sure, such pedagogical recommendations make a great deal of sense. In fact, constructivist teaching practices are becoming more prevalent in teacher education programs and public schools across the nation, while demonstrating significant success in promoting student learning (e.g., Baines & Stanley, 2000; Davis & Sumara, 2002; Fang & Ashley, 2004; Gordon & O'Brien, 2007; Marlowe & Page, 2005; Oxford, 1997; Richardson, 1997). Still, Van Huizen, Van Oers, and Wubbels (2005) are probably correct in asserting that, as with other paradigms, the impact of constructivism has remained limited, and that, 'rather than being reformed by them, teacher education has absorbed elements of these paradigms' (p. 268). One noteworthy problem is that constructivist teaching has often been misinterpreted and misused, resulting in learning practices that neither challenge students nor address their needs.

Wilson (1996) defines constructivist learning environments as 'a place where learners may work together and support each other as they use a variety of tools and information resources in the guided pursuit of learning goals and problem-solving activities' (p.5). He suggests analysis that focuses on the constituent parts or key components of typical learning environments. Marlowe and Page (1998) identify core components of constructivist classrooms. They include the language you use in the classroom and the classroom communication system, student and teacher roles, classroom management, the physical environment, student choice, how students interact with content, and assessing student learning. They suggest a continuum of practice within each of these components. Winstichl (1999)

suggests we view constructivist classrooms as a culture, 'a set of beliefs, norms and practices that constitute the fabric of school life' (p.752). This culture, in turn, influences interactions, relationships and experiences. DeVries & Zan (1994) also provide an indepth discussion of constructivist classrooms based on 'their research in kindergarten classrooms. They argue that implementing constructivist education involves more than activities, materials and classroom organization and suggest that a socio-moral atmosphere ('the network of interpersonal relations that make up a child's experience of school,' p.22) supports and promotes children's development. They describe constructivist classrooms in terms of a) the organization, including meeting children's needs, encouraging peer interaction and facilitating children taking responsibility; b) activities, including engaging children's interest, encouraging active experimentation, and fostering cooperation; and c) the teacher's roles and relationships with children, including facilitating children's constructions, fostering cooperation and interpersonal understanding, and promoting moral values.

Piaget has expounded that a child is not just a miniature adult but his distinctive mental structure is qualitatively different from those of adults. The children at different stages of development view the world from their unique perspectives and they are different from adults in their use of language. Piaget viewed that the children learn best from concrete activity but physical experiences and concrete manipulation are not only ways in which the child learns. His social experiences and interaction with others, be they peers or adults, lead, to their understanding about the world around them. Thus the teachers must make special efforts to understand the unique properties of the child's experiences and his ways of thinking. In piagetian curriculum teaching is always a two step process of diagnosis followed presenting the materials which require cognitive adaption. Piaget believed that single global diagnosis for each child, that, is preoperational, transitional concrete operational is not sufficient. For any given child the current stage of classificatory development and both may be different from the current stage of spatial development. Once the stage her been defined in a given area the teacher can orchestrate

the instructional material accordingly.

Another strand of constructivist idea, social constructivism has been identified in the work of Vygotsky who believed that culture and social interactions are essential features in shaping knowledge. For Vygotsky interaction with caregivers, peers, teachers and material world is the basis of intellectual development. He believed that potential for Cognitive Development depends upon Zone of Proximal Development (ZPD). Therefore the settings of cooperative learning, arrangement among groups of students with differing levels of ability, tutoring by more competent peers can be effective in promoting growth within ZPD. Other constructivist methods include reciprocal teaching, scaffolding and discovery learning etc. Vygotsky theory does not mean that anything can be taught to any child. But instructions can be planned to provide practice within ZPD for individual children or for a group of children. According to him the basic purpose of instruction is not to add one piece of knowledge to another but to stimulate cognitive development. Central to his approach is a view of mind which extends beyond the skills, which does not stimulate the thinking in the confined spaces of the individual brain or mind. Instead he proposes a sustained dynamic between other humans both present and past, book, the rest of our material and nonmaterial culture and the individual engaged in symbolic activity.

Constructivism Misconstrued

One of the most common ways in which educational theorists have misunderstood constructivism is to equate it with student-centered teaching approaches. Baines and Stanley (2000) write that 'textbooks tell us that constructivism is student-centered and is on the opposite side of the continuum from subject-centered or teacher-centered instruction' (p. 327). However, constructivism should not be confused with the various child-centered teaching models that have emerged in different versions over the last couple of centuries. The latter are indebted to theorists like Rousseau who asserted in the *Emile* that the educator should intervene as little as possible with the 'natural' development of children. In contrast, a constructivist

classroom is one in which there is a balance between teacher- and student-directed learning and requires teachers to take an active role in the learning process, including formal teaching. Dewey (1956), who was one of the pioneers of modern constructivism, taught us long ago that in education extremes are dangerous and that we should avoid approaches that either marginalize the needs, experiences, and interests of children or focus entirely on these factors.

Another widespread misconception regarding constructivist teaching is the view that there is no body of knowledge associated with it and that, therefore, teachers do not need to be experts in a particular content area. As Baines and Stanley (2000) assert, 'with constructivism, the teacher is supposed to set up the learning environment, know student preferences, guide student investigations, and then get out of the way' (p. 330). However, theorists, such as Virginia Richardson and Mark Windschitl, correctly insist that constructivist teaching places great demands on a teacher's subject matter understanding. Richardson (2003) maintains that 'research within the last several years has indicated the importance of deep and strong subject matter knowledge in a constructivist classroom' (p. 1631). Windschitl (1999) adds that in these classrooms 'the teacher must not only be familiar with the principles underlying a topic of study but must also be prepared for the variety of ways these principles can be explored' (p. 753). For instance, teachers who are covering the concept of density in a science class must be able to support the understanding of those students who approach this concept in an abstract manner using equations and graphs as well as those that need more concrete illustrations and real-life applications of density.

The notion that constructivist teaching does not require content expertise is based in part on a misreading of Paulo Freire's concept of problem-posing education. While Freire (1994) distinguished his notion of problem-posing education from banking education by emphasizing that in the latter the teacher is in total control of the construction and dissemination of knowledge, he never claimed that problem-posing educators need not have content knowledge expertise. In fact, Freire has stated quite bluntly that educators who have nothing to teach

their students should look for a different profession. The main difference between banking education and Freire's pedagogical approach does not hinge on the expertise of the teacher but rather on the way in which students are taught and interact with the teacher. In the former, teachers make 'deposits' of information into a passive group of students, while in the latter teachers and students engage in dialogue with and teach each other.

Hence, the authority of knowledge in constructivist classrooms still rests heavily on the teachers' own knowledge and experience. Maughn Rollins Gregory (2002) echoes this point when she writes that:

Since an autonomous community of uninitiated students may construct understandings and values at odds with disciplinary standards, and verify those understandings to themselves with utter conviction, there must always be an ineradicable element of authority in the practice of even constructivist pedagogy. Although the constructivist account of oneself in practice, the intelligibility of an idea to myself, as Peirce argued against Descartes, is no epistemological warrant of its truth. (p. 400)

The misguided notions about constructivism mentioned above have contributed to the misuse of constructivist teaching in various schools across the USA. For example, a high school Spanish teacher in an exclusive private school has reported that her supervisor insists that each lesson should start with a few minutes of warm-up games in order to immediately grab the students' attention. This supervisor also recommends that each lesson include at least five different activities for the students. This teacher described how some of the other teachers in the department spend virtually the entire lesson engaging their advanced Spanish students in word games and other 'fun activities', rewarding them with candy for correct answers. The main idea in these lessons is to keep adolescents, whose attention span is supposedly short, entertained throughout the 50-minute lesson. In this way, learning is reduced to a form of entertainment in which the main goal is to keep students amused. While getting students to enjoy the lesson may increase their motivation and attention, when learning becomes

purely entertainment, academic rigor and in-depth exploration of the subject matter suffer. In short, many constructivist teachers who want to prevent their students from becoming bored at all cost are compromising their ability to gain a broader and deeper understanding of the content.

Another misuse of constructivist teaching is when teachers essentially require their students to teach themselves. Teacher candidates in our program spoke about professors who, after the first class meeting, divided the students into small groups and devoted the rest of the semester to having each group present to the class one or more chapters from the textbook. These teacher candidates reported that 'they had learned nothing in this class' or that 'the professor had a very hands-off approach and did not really teach us very much'. To be sure, these students may be exaggerating when they claim that they didn't learn anything in the course. Still, it seems to me that there is a serious problem with the expectation that students teach themselves. While the constructivist notion that students should be encouraged to create their own interpretations of the text is a sound idea, this is not the same as leaving students to their own devices and requiring them to teach themselves. As Dewey (1956) warned us over a 100 years ago:

Nothing can be developed from nothing; nothing but the crude can be developed out of the crude – and this is what surely happens when we throw the child back upon his achieved self as a finality, and invite him to spin new truths of nature or of conduct out of that. It is certainly as futile to expect a child to evolve a universe out of his own mind as it is for a philosopher to attempt that task. (p. 18)

A final misuse of constructivist teaching worth mentioning happens when teachers communicate to students the message that there are no incorrect answers and that knowledge is in the eye of the beholder. MacKinnon and Scarff-Seatter (1997) provide a quote from an elementary science methods student that illustrates this problem :

I am very anxious to return to my classroom and teach science. Constructivism has taught me [that] I do not need to know any science in order to teach it. I will simply allow students to figure things out for themselves, for I know that there is

no right answer. (p. 53)

Similarly, Holt-Reynolds (2000) describes a situation in which a prospective English teacher internalized the notion that constructivist teaching meant that she had to encourage her students to construct their own interpretations of the story and affirm each interpretation regardless of its accuracy or fidelity to the text. The point, illustrated by these two examples, is that constructivist teaching has sometimes been used to justify the misguided notion that knowledge is only relative and that students do not need to be held to rigorous academic standards. When constructivist teaching is portrayed in such a tentative way, it opens itself to the charge that it is a kind of ‘anything goes’ relativist model of teaching. In contrast, I will argue that effective constructivist teaching not only includes a number of specific criteria, but that it actually raises the bar and demands far more from students than many teacher-centered models of learning.

Effective Constructivist Teaching and Learning: Aboard Experiences

One example of effective constructivist teaching and learning is taken from Bill Peterson’s fifth grade class and their study of the American Revolution and the creation of the Constitution of United States. Unlike the traditional way in which this topic has been taught through sterile lectures, boring textbook readings, and rote memorization of factoids, Peterson decided to have the students in his class reenact through role play the Constitutional Convention of 1787. Only this particular convention included a twist in that they decided to invite many groups of people who were excluded from the original one in Philadelphia (e.g., indentured servants, African American slaves, white women, and Native Americans). As Peterson (2001) describes this project:

The basic components of the role play are the dividing of the class into seven distinct social groups, having them focus on the key issues of slavery and suffrage, negotiate among themselves to get other groups to support their positions, and then have debate and a final vote at a mock Constitutional Convention. (pp. 63–64)

In preparation for the mock convention, Peterson

posed several questions to his students, such as: Who benefited most and least from the American Revolution? Who benefited most and least from the Constitution? And, how have people struggled to expand the democratic spirit of the American Revolution after the Constitution was ratified? To help his students prepare for the role play activity, Peterson also showed them a picture of a painting depicting the original Constitutional Convention (which includes only wealthy white men), introduced them to some important vocabulary they will need to use, and gave them mini-lectures on each of the seven groups that have been invited to the convention. Once the students were divided into the groups, they began to get ready for the convention, brainstorming a list of arguments they can use in their role play. Throughout the entire process of preparing for and conducting the mock convention, Peterson played an active role in every step of the process by providing his students some background knowledge on this event, informing them on the position of each group, and helping them construct their arguments for the role play.

Peterson’s experience of conducting this mock convention and role play for a number of years indicates that ‘it brings the above questions to life, energizes the class, and helps me assess my students’ knowledge and skills’ (p. 63). Through this exciting project, Peterson’s students learned firsthand that, historically, many oppressed groups of people were excluded from participating in the democratic process and how those groups fought to secure their freedom and equality. In this way, they gained a deep understanding of the background, content, and implications of this major historical event, unlike the surface knowledge that comes from a cursory reading of history in a text book. Participating in the role play also enables Peterson’s students to hone their critical thinking skills and come to appreciate the value that dissent and resistance have in bringing about social change in a democratic society.

Another example of successful constructivist teaching and learning from a different context is taken from Rosemary Dusing’s teaching of ninth-grade math. Following the same pedagogical method that she experienced when she was a student, Dusing initially taught math in the traditional exposition

model in which the teacher is in complete control of the creation and dissemination of knowledge. Ignoring her own memories of how she struggled with math when she was a student and the boredom she often felt, Dusting preferred to stick to the only method she was familiar with:

I suppressed memories about how certain teachers made me feel idiotic if I ventured a response that was incorrect, or how others barely even noticed whether there were any students in the class, rarely leaving their chair or putting down the chalk as they ploughed on through sets of notes they'd been using for the past x years. (Loughran, Mitchell, & Mitchell, 2002, p. 174)

Over time, however, Dusting began to notice that the traditional way of teaching math was not effective for many students whose interest and engagement were not aroused. Other students did not understand the concepts and therefore turned off instead of admitting that they were struggling with comprehension. Students in Dusting's class had very few opportunities to experience and practice math thinking skills. Ultimately, she concluded that her problems getting students to understand math stemmed from two factors: 'the inherent weaknesses of the chalk and talk transmissive model; and the fact that it was the only style I was using' (Loughran et al., 2002, p. 176).

In the late 1990s, Dusting began to implement changes in her teaching of math by focusing on teaching for understanding and implementing many constructivist principles of learning into her lessons. For instance, instead of writing formulae on the board and demonstrating how to solve them, she sometimes asked students to try to study a new concept in the book on their own and then come up to the board and offer an explanation of this concept to the rest of the class. Moreover, when introducing a new topic, Dusting began to rely on brainstorming techniques, which required students to tap into their prior knowledge, helped them make connections to other topics, and got everyone involved in the lesson. On other occasions, after class discussions or other activities, Dusting asked them to write down their understanding of a math concept, identify the use of an algorithm, or write in their own words the steps used to solve a problem. Her experience with

implementing these changes suggests that:

Once the students were familiar with the expectations of these approaches, they (generally) became quite accepting of the tasks. They quickly got down to the process which involved writing; they listened attentively as others read out their versions; and they checked and altered their own writing as a result of what they heard and now thought. (Loughran et al., 2002, p. 180)

Still, Dusting was unsure whether or not her new teaching approach, based on constructivist principles, was actually resulting in better quality learning for her students. She felt a need to find out more about her students' views on the way they were being taught and were asked to learn. Therefore, in 1999, Dusting decided to survey her entire tenth-grade class, some of which were her ninth-grade students the year before as well as her current ninth-grade students. The results of these surveys indicated that the students' views on Dusting's teaching approach were mixed. Some students appreciated the opportunity to work independently or in groups on solving math problems and think for themselves. Others acknowledged the chance to take responsibility for their own learning but noted that they were often confused and did not receive adequate explanations of some concepts. Finally, there was a group of students who did not appreciate Dusting's constructivist teaching approach and complained that they did not learn much because 'she did not explain well and do her job properly'. Based on her students' survey responses, Dusting concluded that her constructivist teaching approach had not been successful for a significant number of her students, especially those who were not able to make the connections between the different concepts themselves:

I certainly recognize that, in teaching, it is not sufficient to 'throw' out some ideas, wait, then allow time for discussion and exploration if the overall big picture, the purpose underpinning the approach, is not made clear. It seems to me that I had not done this well enough for some of my students. (Loughran et al., 2002, p. 191)

Analyzing this experience, Dusting realized that in order to reduce her students' confusions and

misunderstandings, she had to use her professional knowledge to respond to contextual factors and to step in and clarify questions as they arise. As a result of this insight, in 1999 Dusting decided to tone down her teaching approach and balance her desire for students to construct their own understandings of math concepts with the need to respond to students questions and provide them with good explanations. Not surprisingly, when she surveyed this new cohort of students about their experiences learning math, the vast majority of students had positive reactions to Dusting's teaching approach. She, therefore, learned how important it is to not only attend to her own agenda as a teacher, but to be equally mindful of the students' needs and experiences.

Reflections

First of all, genuine learning requires students to be active, not passive, and to construct their own interpretations of the subject matters. For both Peterson and Dusting, it is clear that learning is not about accumulating random information, memorizing it, and then repeating it on some exam; learning is about understanding and applying concepts, constructing meaning, and thinking about ideas. At the same time, effective constructivist teaching does not mean that the teacher takes a back seat and forces students to learn the concepts of the lesson on their own. Both Peterson and Dusting assumed an active role in their classes and facilitated their students learning through explanations, mini-lectures, and guiding their research. That is, they created a community of learners in their classrooms in which they were an integral and dynamic part. Both did not shy away from using their content expertise to answer student questions or correct their misconceptions about a particular issue that they were trying to figure out.

Secondly, the examples of Peterson and Dusting illustrate that effective constructivist teaching has to be challenging for students: that they have to be able to demonstrate an in-depth understanding of the subject matter and be held to rigorous standards of performance. This means that students need to be held to much higher standards than the normal technical standards, measured by one's performance on standardized tests, which merely ask students to

show that they have learned a set of predetermined skills, facts, or formula in different disciplines. Joe Kincheloe argues correctly that such technical standards are grossly inadequate in that they remove the crucial meaning making process from students' learning. 'Meaning in this context has already been determined by the curriculum makers and is simply imposed on students as a done deal-there is no room for negotiation about the interpretation of information' (Kincheloe, 2001, p. 4). Kincheloe's point is not that teachers and students should disregard the information that has been generated by others. It is that schools should place less emphasis on the simple acquisition of a set of predigested facts and much more on the ability to interpret and make sense of ideas and experiences that students encounter. The two examples of effective constructivist teaching illustrate this point. Peterson challenged his students to interpret the Constitutional Convention of 1787 and consider this event from multiple perspectives, thereby helping them arrive at a deeper understanding of American history and the democratic process in the USA. And Dusting helped her students make sense of complex math concepts by encouraging them to develop their own definitions of these concepts, explain them to other students, and ask her questions about them.

Finally, is the notion that good constructivist teaching ought to be flexible and attend first and foremost to the actual needs of students and not just to the teacher's perceptions of those needs. Much like Dusting, who adjusted her teaching approach when she realized that it was not working well for some of her students, constructivist educators are successful to the extent that they constantly monitor how their students are responding to their pedagogical approaches and how well they are actually learning.

Conclusion

The growing reliance on constructivist teaching in teacher education programs and public schools across the nation is a mixed blessing. On the one hand, the increase use of constructivist pedagogies is good since it indicates that more and more teachers and schools are finally moving away from traditional models of teaching, which often did not challenge learners to construct their own understandings of the

content and did not meet the needs of many students. Many teachers like Peterson and Dusting who rely on constructivist teaching strategies have been able to get their students to become more engaged in the learning process and attain a deeper knowledge of the subject matter. On the other hand, the prevalence of constructivist teaching practices suggests that educators need to become much more vigilant both about what we mean by constructivism and how we apply constructivist teaching. We need to be careful not to confuse constructivism with student-centered teaching or to assume that teachers who espouse this approach have no content expertise. Moreover, teachers who rely on constructivist pedagogical practices need to be mindful to avoid some of the pitfalls discussed above such as reducing learning to entertainment or requiring students to teach themselves. Above all, teachers, educational theorists, and educators in general should remember that as with any effective model of teaching and learning, constructivism is not a panacea that can cure us of all of our educational woes. As evidenced by the examples of Peterson and Dustings, constructivist teaching can produce tremendous results when used correctly and judiciously; it can also lead to poor results and ineffective learning when it is misconstrued or misused.

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