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ABSTRACT

Constructivists view thinking and learning differently from other learning theorists: they believe that learners do not acquire knowledge that is transmitted to them; rather, learners construct knowledge through intellectual activity. Sharp contrasts exist between a "transmission" model of instruction and the constructivist perspective. The transmission model is teacher directed, ignores prior knowledge, depends on external motivation, and involves isolated skill teaching. The constructivist perspective offers student directed learning, uses prior knowledge of students, generates knowledge, offers students intrinsic motivation, and capitalizes on context. Tenets of a constructivist perspective include: (1) learners come to school with a wealth of prior knowledge; (2) learners make meaning of their world by logically linking pieces of knowledge, communication, and experiences; (3) these belief systems are often incomplete explanations or misconceptions; (4) learners hold to their belief systems and are resistant to change; (5) direct instruction is unlikely to change belief systems; (6) learning takes place when confrontation with new experience yields dissonance; (7) a social context facilitates these processes; and (8) learning takes place best in a meaningful context. From the constructivist perspective, the role of the teacher becomes one of facilitating, guiding, and coaching. (A figure representing an "objectivist" lesson plan, and a figure contrasting the constructivist and transmission models are included. (Contains 22 references.) (RS)

THE CONSTRUCTION OF MEANING FROM EXPERIENCE

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INTRODUCTORY SCENARIO

Students bustle about as they assemble for class A group clusters around Michael, the teacher, as he arranges some materials for the class. They are eager to discover what new inquiry is in store for them. Michael signals the class that it is time to begin and holds up a shoe box. "What do you think might be inside my special household storage box?" The students offer many suggestions about the possible contents. Michael lifts the lid and begins to show the class things that he has collected around the house over the past few weeks--rubber bands, popsicle sticks, plastic bags, cardboard tubes. "What could I do with all these things I have saved?" Students are asked to record in their journals ideas about the materials in the box. They write: "I would throw them away. They're useless." "My mom uses the plastic bags for trash. The other stuff, I don't know." "You could shoot the rubber bands at somebody"

Michael now asks the class to move in a tight circle around him as he brings out a picture book titled *Galimoto* (Williams, 1990). "What do you think this book is about?" Michael asks, as he shows the cover of the book. Students speculate about the title *Galimoto* and wonder about what it means. They talk about the boy on the cover and suggest that the setting might be in Africa or perhaps the Caribbean. They are curious about what the boy is doing with the wires.

Michael then reads the book interactively with the children. "Kondi opened an old shoe box and looked inside. These were this things. They belonged to him. Inside the box there was a ball made of many old plastic bags, tightly wrapped with string. There was a knife Kondi had made from a piece of tin can and a dancing man he had made from dried cornstalks. I n Kondi's box there were also some scraps of wire. He had been saving the wires for something special. Now he took them and the knife from his box. 'I shall make a galimoto,' Kondi told his brother, Ufulu." (Williams, 1990, unpaged). As the story unfolds, Kondi finds, trades, begs and borrows wires for his galimoto.

While Michael reads the story and shows the pictures to the class, he invites the children to respond by asking questions such as, "What do you think Kondi is going to do next? Why do you think that? Do you see anything in this picture that you have a question about? Is there anything you would like to know more about?" Students speculate, question and predict about the nature of Kondi's galimoto, the characters, and the action of the story. They ask questions about where this place is, why there are shoe boxes and no one seems to wear shoes, what kind of chant they were singing, and what kind of people they were. As the story closes, students discover that Kondi's galimoto is a wire model of a truck. Other children in the village had constructed their own galimotos. Cars, trucks, boats, wheels--all were galimotos.

Michael returns to the shoe box of materials. "I wonder if we might be like Kondi. Could you make something out of these materials?" Michael distributes popsicle sticks, plastic bags, rubber bands and cardboard rolls to the class and tells them, "If your group needs any more of a particular kind of material you can try to trade with another group. When you finish your invention I want you to give it a special name--a word you invent for your creation. When everyone is finished each group will show the class your invention, tell what it does and give its name." Students experiment with the materials, trade with others for certain items, sketch their creation and take notes in their journals.

Students share their creations: cars, paddle boats, parachutes, bag trees, a catapult shooting game, merry-go-rounds, and a host of other inventions and models. As the students demonstrate their craft, Michael asks them to think about the materials in the shoe box once again. He asks them to write about what uses they have found for simple household items. "Look back to your first writing in your journal. Have you found out anything different from your first thoughts about popsicle sticks and plastic bags?" Some report: "I didn't think these things had any value, but with a little imagination one can make a toy." "Things we throw away might be recycled into something useful." "Other cultures like Kondi's make better use of their environment and resources. We ought to do the same."

Michael guides the class as they start to ask further questions about how materials can be reused and what they could invent collectively if they saved more of these things.

HOW WE CONSTRUCT MEANING

The introductory scenario offers us a backdrop for discussion of learning--to ask ourselves a fundamental question: "How do we learn best?"

Curriculum designers often skip over this most fundamental question perhaps because it appears too theoretical and nebulous. Yet, we believe that to base curriculum on an idea of how humans learn is not only appropriate but critical. To skip to planning curriculum without some agreement about how we learn is akin to selecting an automobile without regard to the energy system it employs. You might be very impressed by the style, appointments and comfort of the car only to realize that it runs on an exotic fuel or perhaps doesn't even have an engine! Thinking about learning is a fundamental requisite of curriculum development because it fuels our thinking in making curriculum choices.

The introductory lesson sequence is based upon some very important tenets about how we learn best. These tenets are:

> 1. Knowledge consists of past constructions.
> 2. Constructions come about through assimilation and accommodation.
> 3. Learning is an organic process of invention, rather than a mechanical process of accumulation.
> 4. Meaningful learning occurs through reflection and resolution of cognitive conflict and thus serves to negate earlier, incomplete levels of understanding. (Fosnot, 1989, p. 19-20))

By choosing these tenets to describe learning, we have aligned ourselves with a constructivist perspective. Constructivists view thinking and learning very differently from other learning theorists.

> The learner is actively constructing knowledge rather than passively taking in information. Learners come to the educational setting with many different experiences, ideas, and approaches to learning. Learners do not *acquire* knowledge that is transmitted to them; rather, they *construct* knowledge through their intellectual activity and make it their own (Chaille & Britain, 1991, p. 11).

Take a moment to return to the *Galimoto* lesson to analyze how it employed the constructivist perspective of learning. In it, we honored what learners knew about common objects and what might be done with them. We encouraged students to make meaning of the experiences and to personalize their findings. We provided an experience that offered an opportunity to put the learner in cognitive dissonance. As planners of this lesson we had adopted a paradigm of belief about how people learn before we crafted our curriculum. Each decision that we made about how to arrange activities, how to structure assessment, and how to facilitate learning was fueled by these general tenets about learning.

CONSTRUCTIVIST CONTRASTED TO TRANSMISSION MODEL

The constructivist perspective is a departure from what educators have commonly practiced. To bring that difference to light, examine how we might have structured some of the same content and activities based on, what might be called, a transmission model of learning (See **Figure 1**).

Figure 1: *Galimoto:* Objectivist Lesson Plan

TLWDAT: (The Learner Will Demonstrate the Ability To:)

1) listen interpretively
2) list materials that are normally thrown away but which may have utility
3) make an accurate model

ANTICIPATORY SET:

Read *Galimoto* aloud to the class

LESSON:

Give Objective of Lesson: "Today children we are going to be like Kondi. He made a toy from scraps of wire--using materials that would have been thrown away. You too will make a toy from wire(pipe cleaners) that I have prepared for you."

Give Model: "Here is one that I have made as a model. See how I have bent the wires to make a wheel?"

Check for Understanding: "Now children, what will we be doing today? " (Students respond.)

Guided Practice: Give students time to build their galimoto. Teacher monitors as individuals shape cars, trucks, helicopters, wagons from pipe cleaners.

ASSESSMENT:

Examine student models to determine how closely they match the models in the book.

Written Quiz:

1) What are some uses of discarded materials?
2) What is a galimoto?
3) How did Kondi get materials for his galimoto?

This sort of lesson design assumes a very different philosophic, psychological and epistemological basis. In **Figure 2** we have listed some sharp contrasts between this form of instruction and the constructivist perspective. The transmission model assumes that the learner is the recipient and benefactor of the teacher's or the textbook writer's experience and knowledge. The lesson and its supportive strategies are methods to transmit that knowledge to the learner. Metaphorically, the learner is a sponge or receptacle which we fill up with the collected wisdom of the common culture.

Figure 2: Galimoto, Constructivist vs. Transmission Model Contrasts

Transmission Model	Constructivist Perspective
• Close-ended instruction	• Open-ended instruction
• Teacher directed learning	• Student directed learning
• Ignores prior knowledge	• Utilizes prior knowledge
• Transmits knowledge	• Generates knowledge
• Externally motivated	• Intrinsically motivated
• Isolated skill teaching	• Capitalizes on context

Because the transmission model starts with the premise that the learner needs to know a certain piece of knowledge or skill, prior knowledge becomes tangential and unimportant. Instruction is closed and assessment must measure whether the objective has been met. Learning outside this structure is superfluous and plays little role.

Since the objectives are set down by the teacher or curriculum, motivation for learning is external. Students make galimotos because they are directed to do so and are evaluated based on their skill to copy the model.

TENETS OF A CONSTRUCTIVIST PERSPECTIVE

To hone our understanding of the way humans learn, let's return to the basic principles of constructivism. Callison (1991) summarized the research by listing characteristics of constructive learning:

- •Learners come to school with a wealth of prior knowledge
- •Learners make meaning of their world by logically linking pieces of knowledge, communications and experiences.
- •These belief systems are often incomplete explanations or misconceptions.
- Learners hold to their belief systems and are resistant to change
- Direct instruction is unlikely to change belief systems
- Learning takes place when confrontation with new experience yields dissonance
- A social context facilitates these processes
- Learning takes place best in a meaningful context

Each of the principles represents a significant idea about how learning takes place. In the following section, we have stated these principles in the way that we understand them. We will provide you with an illustrative vignette and a discussion of the tenet.

•Learners come to school with a wealth of prior knowledge

Vignette: Adult learners, including elementary teachers, are asked about electricity and electrocution. "What kinds of things can shock you?" Learners report such things as household current, lightning, car batteries, and the batteries used in toys, flashlights, and other common items. Given a 1.5 volt "D" cell, individuals are asked to touch each side of the battery with one hand. Many approach the task with trepidation for fear that they may be shocked. Most of the learners observe that there is no discernible shock. When wires are added to the ends of the cell, many of those that saw no hazard in holding a battery now demonstrate new caution. Prior knowledge and experience of electrical shock either facilitates or interferes in the adult's observation and participation with these batteries.

A body of research and literature supports the premise that learners arrive at school with a wealth of information and experience. Knowing what children know is a most important beginning for teaching and learning (Ausubel, 1968). Prior knowledge is important in constructing new ideas and frameworks and forms the bridge or barrier to further conceptual change (Pines & West, 1986). Learners accommodate new concepts by generating links to the existing knowledge (Driver & Bell, 1986). By assessing prior knowledge and organizing new experiences that complement and challenge

the learner, effective learning is achieved (Finley, 1981).

•Learners make meaning of their world by logically linking pieces of knowledge, communications and experiences.

Vignette: As part of a book response activity adults had to predict how long different kinds of candles might burn. There were birthday cake candles, votive candles and short multipurpose types. To our surprise, one adult learner was convinced that one kind of candle, because it was in a metal cup, would never burn out. It was logical for this learner to link his prior knowledge and observations to form a logical explanation of the candle. From his point of reference, wax did not burn but simply melted and dripped off candles. A metal container should corral the dripping and therefore the candle would never burn out!

All of us make sense of our world through individual and often, non-conventional, or non-science, ways. Children make sense of their world by employing causal explanations and generalizations to impose some order on the experiences of the experienced universe (Hewson,1986). These 'alternative frameworks" (Driver & Easley, 1978) are ways in which learners make sense of the natural phenomena around them. Alternative frameworks are often counter to conventions of science. It is common, for example, for people to think that the reason it is warm in the summer is because that is when the sun is closest to the earth, that one can be shocked from a common D cell, or that we see more in a mirror if we stand back. Researchers have cataloged a plethora of misconceptions in the sciences (Shymansky and Kyle, 1988).

•Belief systems are often incomplete explanations or misconceptions and are held until they are modified or replaced by a more satisfactory explanation.

Fossils. Carol's mother lives in the north central Nebraska very near a fossil find. Although she had lived near the site for her whole life she never had seen any of the remains. One summer, Carol's family returned to Nebraska and arranged an expedition to see the fossil digs. Walking up to a road cut in the sand hills of Nebraska, Carol's mother viewed a bright white layer of sea shells. "You know, I have been told all my life that this area was once an inland sea but I never truly believed it until this moment."

Alternative frameworks are not replaced easily. Learners will find ways to adjust their old ideas before assimilating new ones. (Watson & Konicek, 1990). Children and adults often hold to their belief systems until they are directly confronted by some new phenomena. Learners are often unwilling to give up on their personal frameworks even in the face of observable phenomena that are in conflict with their explanation (Feher & Rice, 1988).

This resistance to change is a significant aspect of understanding learning. If learners are in fact recalcitrant to leave self-constructed explanations of the world, then how can those frameworks be challenged and replaced with more conventional constructs? The answer to this question rests in first acknowledging that conceptual change is gradual, effort-taking and often threatening. To learn means, in Piagetian terms, to accommodate new constructs into older structures. To affect conceptual change, learners need an environment of new experiences and communications that confront their conceptions. Posner, et. al. (1982) assert that people will resist change unless they are confronted with something different and become dissatisfied with the former. Learning is characterized by a process of interaction between the student's mind and the stimuli providing the new information. Such a learning environment enables students to modify their existing cognitive structures (Kyle & Shymansky, 1989). Finley (1985) found that direct experience with the phenomena in the form of hands-on experimentation was an effective way of confronting naive conceptions.

• What the learner knows is constructed meaning which did not exist before the learner created it.

Vignette: Children's language yields many examples of constructions that are original. Nathan was two at the time of his first wilderness canoe trip. His favorite word at the time was "juice." On encountering his first river rapids, he promptly named them "whee-juice", a meaning constructed by him that was an apt description of his experience. Five-year-old Lydia states that "The cat 'hood' under the bed when she saw me coming" and six-year-old Claire uses the verb "hided" in a similar sentence. They refer to the carport as the car house, strawberries have hats that must be removed before we eat them, and trees' trunks are their legs. A mama cat has "nibbles" that she uses to nurse her baby kittens. Children make similar inventions in their writing. Phillip, a kindergartner, draws a picture of a car and labels it "labrgne" and seven-year-old Debbie writes "I wish for high-hill-s hoes but my mother things I'm to young but who kers." Both in speech and in writing children are creating meanings and inventing structures that are unique and which do not exist prior to the child's creating them.

We know that children construct knowledge because they possess so many ideas that adults do not teach them (DeVries and Kohlberg, 1989). This is true of adults as well--they have many ideas which no one has taught or told them. A primary tenet of constructivist theory is that knowledge is the result of individual constructions of reality. "Meaning is not conveyed but evoked" (Wheatley, 1991, p. 11). "Learning involves organizing self experiences in a way that makes sense" (Driver & Bell, 1986, p. 453)" ...through the continual creation of rules and hypotheses to explain what is observed" (Brooks, 1990, p. 68). Each individual invents the truth. Wells

(1986, p. 89) advises teachers to "recognize that their perspective cannot be transmitted directly, but must be constructed by children for themselves, through a process of building on what they already know and gradually elaborating the framework within which they know it."

• Conceptual meaning cannot be transmitted from a more knowledgeable person.

Vignette: For a moment think about getting ready for work in the morning. You brush your teeth and face the bathroom mirror above the sink. After you check your face for left over toothpaste, you decide that you would like to see how the rest of your body looks. What should you do to see more of yourself? We have asked this question of child and adult learners alike and generally receive the response, "Back up and you can see more of yourself."

We next ask that groups of learners take mirrors and perform some kind of experiment to corroborate their assumptions. When asked to report findings, some say they can indeed see more of themselves by getting farther from the mirror, an observation consistent with their initial assumptions. Some groups report that there is no or little change in what can be seen. These divergent findings cause some learners to dispute observations different from their own.

Finally, we mount a large mirror on the wall and ask several volunteers to make observations in front of the group. Most learners, when they are confronted by this controlled circumstance, make the observation that there is no change in the amount of the body that they can see as they move farther from the mirror. Amazingly, however, there are some that will maintain their initial position even though what they see offers no corroboration. One student that we had asked to do this experiment repeatedly reported that she saw more as she moved back. After others continued to report differently, she flushed with embarrassment because she realized that she didn't want to believe what she saw!

It takes more than a transmission model to change the conceptual structures that people invent for themselves. Michael was unable to convince anyone about the mirrors. No amount of "telling" adequately reforms anyone's thought patterns. In order to change, learners must actively hypothesis, check and change their ideas (Driver & Bell, 1986). The accommodation occurs gradually, with each new adjustment laying groundwork for further adjustments. Learners require "coherent, internally stable set of explanatory structures that account for the individual's experience and that resolve as many apparent anomalies as possible" (Hewson, 1986). Problem-centered curricula, in which students engage in meaning making, provides an environment for conceptual change (Wheatley, 1991). Such a learning environment enables students to modify

their existing cognitive structures.

Of course we recognize that there are some kinds of knowledge that can be transmitted from authority to recipient. Facts, dates, and numbers are pieces of information that are easily transmitted from teacher, text or media to learners. Caine and Caine (1991) refer to this kind of information as route learning. We can learn the route to our destination by learning to walk three blocks north, turn right, walk two blocks east and stop at the yellow house. We have only step by step instruction on how to proceed.

Although there is important utility for learning routes, we choose not to dwell in this kind of learning. Our discussions about human learning focuses upon conceptual, or map, knowledge. This kind of knowledge is broader than route learning because it provides the learner with the schema of the problem instead of an algorithm for solution. By having a concept of town, the skills of using a compass, a map and an address, learners armed with a broader understanding of where the destination might lie can invent their own routes. This kind of learning involves learners in understanding the whole as opposed to the part.

To illustrate the difference between these two perspectives consider the example of a rain forest unit taught by one of our students. To engage the children in discussions and inquiry about the rain forest and to interest them in learning all they could about man's impact on the environment, the teacher initiated the unit by reading *The Great Kapok Tree* (Cherry, 1990). The conceptual underpinnings of this sort of inquiry were rich and virtually limitless. As they read, students asked "What's a Kapok tree?" Although they were dealing with the larger issue of man's impact on the rain forest, the specific question required specific information. The children looked up the kapok tree in the encyclopedia and a piece of information which was meaningful within the context was transmitted to the learners.

Broad concepts, language learning, problem solving, invention, and storytelling all demand map learning. It is this sort of learning that cannot be simply transmitted from one person to another by telling. When a learner has formed a concept or schema, bits of information that fit that schema can easily be transmitted to them.

- **Learning is facilitated by social interaction with teacher and peers.**

Vignette: A group of third graders have decided to focus their book discussion on the topic of grandparents. Following the conclusion of their discussion group, the children made the following reflections.

> Ben continued, "This group has changed my way of thinking. I used to go to my Grandma's house and not think anything about it. Now I go and I see her as a special person. I value her more. She seems so caring and funny. I notice more when I go to her house. She has become more interesting. It is

like starting over and getting to know a new friend."

Luke hesitated, 'I was really afraid to go over to my Grandparents'. I knew I had changed and I was afraid they would be the same. I was wrong. I noticed how much they loved life. I started listening to them more. I wanted to learn from them. I don't really think they changed, but I changed and now I look at them differently."

Carl nodded his head in agreement and said, "I always felt my grandparents were special. I wasn't necessarily changed in my thinking about them but I changed a lot in my thinking about school. This group made me think. I can't wait to read other books and discuss their meanings." (Kauffman and Yoder, 1990)

In addition to a rich environment of new experiences and opportunities for confronting and articulating new meaning, a social context is important. Observations of peers, shared insights, and collaborative constructions are powerful tools in the process of c conceptual change. Learners are supple to the leading of other learners and will often modify or adopt a new construct invented as a collective effort more readily than if offered as a distant truth. "Knowledge is not something people possess in their heads , but rather something people do together"(Gergen, 1982, p. 270). The community of learners in this process is a context for reflecting on the conflict and developing a new mindedness.

• Learning takes place best in a context which facilitates invention

Vignette· A group of our pre-service teachers had asked us to conference with them before they were to teach a unit on Native Americans. As we listened to their lesson ideas we recognized that they were organized in an objectivist, or transmission, mode.

"First we are going to show the children pictures and examples of the kinds of dwellings that Indians lived in. We are going to give them pictures of hogans, wigwams, tipis, and then have the students assemble models of each."

We asked the students to describe the parts of the lesson and they dutifully identified the anticipatory set, the objective, the lesson, practice and assessment. We asked them to consider how the children were learning in this mode. Was it a constructive opportunity or was it merely a wrinkle of the the transmission model? After considerable brainstorming and discussion, the students redesigned the lesson:

"We decided that we will show the students pictures of the habitats in which the Indians lived. We will have pictures of deserts, forests, and grasslands. We will ask students to brainstorm things that they thought the Indians might have been able to gather from these environments to build shelters. We hope to challenge students to think about how they might make a shelter from the items suggested and then supply the materials for them to experiment. After they have made a shelter we will ask then to comment about how they put it together and what features it has."

Several days later we watched children debate with one another in groups about the possible design of their shelters. They experimented with the materials and built and rebuilt their structures. As they reported to the rest of the class what they had created we noticed a high degree of invention of language and meaning in the solving of this problem.

This lesson sequence was a context that allowed students to construct their own meaning. The curriculum was open-ended allowing students to construct a variety of possibilities. The teacher offered the lesson as a question to be answered by an array of possibility. If our students had instructed the first lesson sequence, students would have dutifully complied and would have made Indian shelters, but the endpoint would not be in question. The tipi would either look like the picture or it would not. The constructivist lesson is marked by a question mark, not by a period.

A Differentiation Between Discovery and Constructivism

It is important that we take a few paragraphs to make clear a distinction between discovery and the constructivist model. Although some suggest that constructivist learning theory is discovery, we would disagree. In a pure discovery lesson strategy the teacher sets up the experience and circumstances so that when we allow that first domino to fall, all the rest fall in a very predictable pattern. We discover certain algorithmic principles of nature. As speed increases, momentum increases; as supply goes up, price goes down; as man manipulates variables in the environment, the system becomes unbalanced. Discovery lessons are designed so that learners can only arrive at one possibility(if they do the experiment correctly). The teacher directing a discovery lesson would expect that all of the students would arrive at the predicted endpoint at the conclusion of the lesson.

The constructivist point of view is broader in scope than discovery. Learners invent their own realities instead of discovering the teachers reality. We might say that Columbus discovered America, but Jefferson invented the republic. America was already a continent when Columbus discovered it. He found what was already there. Jefferson invented a concept. He created a

vision that had never been seen before. The teacher directing a constructivist lesson would expect that as learners make meaning about experiences that they will invent--visions never seen before.

Summary

Each of these tenets and vignette examples characterizes learners that come to the classroom with an array of prior knowledge. Both child and adult have experienced the natural world on a daily basis and have observed common events and special phenomena through the senses. Mirrors are see daily, candles drip, sparks jump from electrical equipment, Nebraska plains look very dry and unsea like. In very natural ways these inputs are arranged in meaningful ways to the learner and satisfy or explain the way things are. It seems logical that we should see more as we move back from a mirror. Since there is no ash and there are wax drips, then it makes sense that the wax isn't consumed. Electricity is to be held suspect. Nebraska is a long way from the ocean. Once those explanations are embedded, learners are reluctant to let go. Whatever the mechanism is for holding on to these ideas, humans have a propensity to defend and protect their perspectives. Even confronted with conflicting or challenging observations, learners often hold tenaciously to their beliefs.

No amount of teacher talk facilitates conceptual change. Even after expert testimony, candles that do not drip are still never consumed, batteries can still shock, one can see more if the mirror is pulled away. Carol's mother, even though taught about the geologic history of her home still remained skeptical. The social aspect of the learning cannot be underestimated in each of these instances. For example, Carol's mother might not even have had the experience if it had not been for the family choosing to walk those road cuts and to collectively view them. Belinda goes home after the mirror experiment and asks her husband what he sees in the bathroom mirror! What was needed in each of these learning situations was opportunity for the learner to experience new observations or information and to incorporate the new with the old creating a new structure. Coupled with others in social settings, learners are enabled to make new meanings of their world. Given a rich context the constructive perspective allows for open-endedness: Questions beget new experimentation and observation which begets yet new questions for exploration. Knowing becomes a generative process of building meaning through new experiences.

The common theoretical ground for all learning impacts on both teaching and curriculum. The role of teachers becomes one of facilitating, guiding, coaching, providing an environment and context for learning, and evaluating the learner's current state of knowing. The goals of curriculum are not a set of disarticulated behavioral objectives, but rather a broader

learner empowerment. The teacher shifts from imparting a body of knowledge to helping children enrich and understand their personal lived-through experience. Knowledge becomes not something that sits on a shelf but the dynamic interaction of people. Teachers grounded in a constructivist view have a different attitude toward their students--a respect and understanding of their students' knowledge and ability to learn (Jaeger & Lauritzen, 1992).

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