

Reconceptualizing processes and agents of learning in an environmental perspective

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Abstract

This paper focuses on learning as a systemic phenomenon in an environmental context. In this view, it is argued that learning can and must be studied as it occurs in learners, teachers, and the learning environments teachers create as they make adjustments to better accommodate to students' needs. In today's emphasis on student-centered instruction, teachers pay little attention to their own learning. They generally do not think of themselves as learners nor do they systematically undertake a learning agenda that will better prepare them to solve problems facing them in the classroom. In the same vein, instructional designers tend to treat learning as a static process. They design instruction for desired learning outcomes without much regard for how learners' needs change in making progress towards achieving those outcomes. In this presentation, two technology-based learning environments will be discussed as cases for how learning might be viewed more systemically. In one, the distinction between preservice teacher preparation and inservice teacher development is collapsed as members of both groups are brought together in an intentional learning community. In the other, design features built into the environment enable the teacher and students to learn about their own learning and make adjustments accordingly.

INTRODUCTION

The impetus for this paper is something I have been thinking about for a long time. I say a long time because it seems as though modern debates in education about teacher-centered versus learner-centered approaches to instruction have been going on for 20 years or more. Arguments proffered in favor of learner-centered approaches cite factors such as learner diversity, the impact of prior knowledge on new learning, and personal relevance of instruction as important reasons to focus on the learner in designing curricula and instruction. Arguments for teacher-centered approaches, much less popular these days, make mention of factors such as instructional efficiency and assurance that all students are being taught a common curriculum.

As someone who is always suspicious of “either-or” choices, I have been increasingly bothered by this dichotomy and the escalating value judgments being placed on these competing perspectives. Student-centered instruction is “good,” whereas teacher-centered instruction is “bad.” Student-centered instruction is consistent with constructivist principles, and constructivism, as the educational theory “du jour,” is good. Teacher-centered instruction, on the other hand, comes out of a behavioral tradition and, tarred with a positivist brush in this postmodern world, that’s bad.

However, when one looks beyond the labels, the distinctions between teacher- and learner-centered views are perhaps not quite as clear or dichotomous as people think they are. For example, Hill (1997)¹ contrasts three types of curricula that he calls (after Habermas, 1971) ‘control’, ‘adaptive’, and ‘personal’. He describes the control curriculum as being based in behavioral theory, providing a predetermined and essentialist approach to instruction, and casting the roles of teacher and student as authority and recipient, respectively. In this type of curriculum, lecture is common, and the voices heard dominating in the classroom belong to teachers. While I do not argue that such teacher-centered, control classrooms exist, I believe it is a mistake to equate teacher-centered with the psychological theory of behaviorism.

According to B.F. Skinner, on whose views modern behavioral theory is founded, the learning organism is active and modifies its behavior by acting on the environment and experiencing the consequences of that behavior. Certainly, a teacher can arrange behavioral contingencies in such a way as to promote changes in the behavior of a learner and, in this way, can be said to direct instruction. However, so can learners control behavioral contingencies to modify their own behavior and thus direct and manage their own learning. Why this is such a difficult aspect of behavioral theory to grasp, I do not know, but students in my own courses on learning theory continue to express

¹ This is recent example, but the view Hill expresses is commonplace. Many of the new instructional development paradigms presented in Dills and Romiszowski (1997), for example, represent learner-centered approaches and are contrasted by their authors to teacher-centered approaches they are meant to supplant.

their beliefs at the end of the term that behaviorism means the learner is a passive recipient of instruction.

The problem with viewing instruction from either a teacher-centered or a student-centered lens is that both perspectives are myopic. That is, in defining learning, both focus on only one agent or actor in the learning environment and ignore all the other agents or actors. I believe this a mistake, and for the remainder of this paper, I attempt to articulate an alternate, more systemic perspective--a learning-centered view of teaching and learning.

A LEARNING-CENTERED APPROACH TO TEACHING AND LEARNING

What constitutes a learning-centered approach to teaching and learning, and how is it different from teacher-centered and student-centered approaches? We can begin to answer this question by considering dimensions of teaching and learning, such as what learning means, whose learning is the focus of curriculum design, who makes design decisions, and so forth (see Table 1, page 4).

What is learning? Who is learning?

Teacher-centered and student-centered views put primacy on the learning of the student, and all other aspects of the learning environment and instruction are planned from that initial standpoint. For example, learning is defined as the acquisition of knowledge, skills, and attitudes by the student (teacher-centered approach) or the construction of knowledge within the learner (student-centered approach). See Table 1. One can see the cognitive vs. constructivist influences in these definitions, as well as the objectivist (“reality exists independent of the knower”) vs. relativist (“reality is constructed by the knower”) philosophical traditions.

By contrast, a learning-centered approach puts learning into a broader context and implies that learning is something that goes on in an environment in which different actors operate, involving themselves in a variety of processes of interaction among themselves and other agents in the environment. In this view, the learning of students certainly matters, but so does the learning of teachers and of instructional systems created to meet the needs of students.

In the current focus on student-centered instruction, teachers pay little attention to their own learning. They generally do not think of themselves as learners nor do they systematically undertake to learn things that will help them solve problems in the classroom. Preservice teachers are no better off. They view themselves as learners only insofar as doing what they have to do to earn a particular grade in their college classes. When asked what they believe about teaching and learning, most respond with blank looks and the statement, “I’ve never thought about that.”

Table 1

A comparison of teacher-centered, learner-centered and learning-centered views of instruction.

Questions/Dimensions	Teacher-Centered	Learner-Centered	Learning-Centered
Who is learning?	learner	learner	learner, teacher, and other agents in the learning environment
What is learning?	acquisition of knowledge, skills, and attitudes by the learner	construction of knowledge within the learner	something that goes on in an environment, in which different actors operate, involving themselves in a variety of processes of interaction among themselves and with the environment
Who determines and manages <ul style="list-style-type: none"> • instructional goals? • instructional strategies? • conditions of learning? 	instructional or curriculum designer (who could also be a teacher)	learner (in the most radical view)	all agents in the learning environment, who assume primary responsibility and control at different times
When are design decisions made?	generally in advance of instruction	macro decisions in advance and micro decisions during instruction	some in advance and others during instruction, with continual “just-in-time” adaptation
Who/what establishes the reason (or context) for learning?	an assessment of learner needs, taking into account organizational or societal goals	learner	the “work” of the learning community as defined by the actors within it

In the same vein, instructional designers tend to treat learning as a static process. They design instruction for desired learning outcomes without much regard for how learners' needs change in making progress towards achieving those outcomes. Merrill (1997) questioned whether learner-oriented instruction is the same as learning-oriented instruction and argued for the latter, but his emphasis is teacher-centered in the sense that the learner is the recipient of the instruction. By contrast, recent constructivist approaches to instructional design (e.g., Wilson, 1996) are student-centered in their emphasis on personal knowledge construction by the learner. These approaches tend to result in open-ended learning environments where there is considerable latitude in both what to learn and how to learn. Nonetheless both design approaches, whether student-centered or teacher-centered, focus exclusively on learning by the student.

In his 1997 paper, Merrill does address the ability of instructional systems to adapt to learners as they interact with the system, stating that "an adaptive system is a learning-oriented system that is not only able to change the nature of the interactions with the student, but it is able to determine both micro and macro sequence automatically" (p. 55). Constructivist instructional designers would also argue that their systems are adaptive to learner needs in that strategies are available to help learners find, sort, organize, and synthesize information, for example. Yet, I venture to say that adaptations in both systems are learner-specific and do not result in "learning" by the system itself. That is, anytime a new learner logs on, the system is set to its beginning state, ready to keep separate and independent track of this learner's progress.² Although the learner may "act upon" the environment, especially in the case of the open-ended learning environment in which they may manipulate information to suit their own desires, these actions do not result in program changes that would be experienced by the next learner.

A learning-centered instructional system, however, should be capable of self-improvement. That is, not only should the system adapt to an individual learner's changing needs as learning proceeds, it should be able to learn from these interactions to become more effective for other learners as well. I attempt to develop this concept more fully in the examples I describe toward the end of the paper.

Who makes design decisions?

Learning-centered approaches differ from teacher- and student-centered approaches in their locus of control and authority, or in who decides and manages aspects of learning environments such as goals, instructional strategies, and conditions of learning. In teacher-centered approaches, it is

² I have not actually seen Merrill's ID Expert™ firsthand, so I may be erroneous in my assumption of how it works. I would expect, however, that learners interact independently with the system, which keeps track of their individual progress.

typically the teacher or instructional designer who has this control and makes these decisions (recognizing, of course, that there are many influences on the decisions, such as external standards or the desires of a client). This is what Hill (1997) refers to as the control curriculum, whose efforts are to “engineer a learning program that will be generally good for almost all learners,” specifying and delineating “what learners should know to be successful and productive in society” (p. 146).

This is not to say that teachers and instructional designers do not involve learners as they make decisions and build learning environments. Quite the contrary. Instructional design models specifically call for learner analysis at the front end and formative evaluation at the back end, both of which provide valuable information to enhance the effectiveness of the designer’s decisions and resulting instructional design. But neither of these procedures shifts the balance of power between designer and learner.

A learner-centered approach, on the other hand, puts control and decision making squarely in the hands of the learner. Students determine for themselves what goals they wish to achieve and how they will go about attaining that achievement. In this approach, learners’ ability to self-regulate is critical for their success, and many learning environments are designed with this in mind. Strategies are embedded to help students who do not possess good regulatory skills or to help them develop or at least improve such skills as they interact with the environment. Certainly, a very active area of research these days is investigating just how learners can be supported in open-ended environments where they have control over their own learning.

Hill (1997) comments that control curricula taken to an extreme become indoctrination, but “Schooling emphasizing only personal curriculum or adaptive learning would also eventually self-destruct. The downside of the personal curriculum is libertarianism drifting into anarchic or hedonist ends. The downside of the adaptive curriculum is persons repeating endless errors with no notion of the lessons of history or culture” (p. 147). Thus, overemphasizing personal aspects such as personal goal-setting and total control of instruction would contribute to the libertarianism Hill speaks of, while overemphasizing the constructivist nature of learning would have students rediscovering for themselves knowledge they should be using and building upon in the pursuit of new knowledge. (Gruender, 199x, makes a similar argument about the pitfalls of constructivist theory informing educational pedagogy.)

In a learning-oriented environment, then, all agents in the environment assume primary responsibility at different times for contributing to the decisions that shape and manage the teaching and learning that goes on in the environment. Control and authority are shared but not always equally or all the time. For example, **need to develop a good example in teaching or instructional design here-**

-cite Ann Brown's work showing the shift in power from teacher as authority to teacher as learning partner.

When are design decisions made? How is the context for learning established?

The work of most instructional designers is accomplished well in advance of instruction. In other words, they determine goals, conduct front-end analysis, develop assessment instruments, design an instructional strategy, select media, and develop the instructional system before the targeted learners are ever engaged in the instruction.³ Likewise, teachers generally have selected textbooks and other instructional materials, as well as determined their general instructional plan, before they ever set foot in the classroom. Both teachers and designers will have considered, to varying extent, the motivation of their learners and have attempted to establish relevance of the instruction for the intended learners.

Approaches that are more learner-centered, by contrast, require some decisions to be made in advance of instruction and others to be made during instruction. A technology-based open-ended learning environment, for example, must be produced in much the same way any other instructional design product is done. Certain content must be selected and included, certain strategies for interacting with the content must be designed and programmed, and so on. These macro decisions have to be made just to develop the product, but micro decisions - what the learner chooses to study and how the learner will use tools available in the software - are made by learners as they engage in the instruction. In the most radical student-centered approaches, the learner establishes the context or reason for learning in deciding what it is he or she wants to learn. Typical of many OELEs I have seen, however, is the embedding of a theme or problem context that students find engaging and that draws them into the learning environment.

Learning-centered approaches resemble learner-centered approaches in that instructional decisions take place both before and during instruction. What I believe is unique about the learning-centered perspective is its conscious and systematic attention to the learning of all agents within the instructional system. Consider the teacher in the classroom, for example. As teacher-centered or learner-centered, she will have designed certain activities to occur in her class and arranged for certain resources to be available and used by her students. In this respect, she has taken their learning into consideration. During the process of instruction, she also adapts on the fly to changing

³ I am aware of rapid prototyping as an attempt to involve the target audience in an iterative process of design and development. While this approaches my notions of learning-centered design, it still does not capture the dynamic nature of the instructional system as I am conceptualizing it.

conditions. Students may not have learned as she anticipated, so she spends more time on a particular topic or alters her instructional approach.

When she becomes learning-centered, she will consider her own learning and reflect upon the instruction and her adjustment to it to understand why various strategies were effective or not. She establishes a learning agenda driven by the situated problems she continues to face in her classroom and seeks to learn those things that will help her solve these problems as well as contribute to her developing expertise in teaching. The context for learning, then, is established partly by her conception of her profession and her work in the classroom. It is also determined in part by her students' conceptions of their roles in her classroom. To the extent that the teacher adopts a learning-centered perspective, the context for learning becomes dynamic and mutually defined by teacher and students.

TWO EXAMPLES OF LEARNING-CENTERED ENVIRONMENTS

As a means of further developing and illustrating the ideas I have attempted to articulate in the previous section, let me describe two examples of technology-based learning environments that I believe embody, at least in part, characteristics of a learning-centered perspective.

Alternate Views of Teaching and Learning

I teach a course, nicknamed *Altviews*, that has become something of a laboratory for implementing emerging and alternate views of teaching and learning. The overall goal of the course is for students to become familiar with new and emerging theories of teaching and learning, solve authentic instructional problems using these theories, and articulate a perspective of their own on teaching and learning. My philosophy in teaching the course is that students must experience these theories to fully appreciate their implications. In keeping with this philosophy, therefore, I attempt each semester to model the theories students are engaged in studying in as integrative a way as possible.

In the most recent iteration of the course (see Wager & Driscoll, 1999, for a more complete description), we focused on the concept of a learning community (e.g., Scardamalia & Bereiter, 1996). The course was web-based in that assignments and readings were posted on line, students published all their work on the course website, and all members of the class interacted around the ever-building knowledge base on the website.

The course could be described as learner-centered in the aspect that students selected from a database articles they wanted to study (after all students read the same 5 articles in the first three weeks of class to provide everyone with the same foundation from which to start). Students also

completed work more or less at their own pace, and they determined the nature of the project that was the capstone for the course. Two features of the course, however, made it more learning-centered.

First, discussions during class were routinely self-reflective. It was as if we held a mirror up to ourselves as a class and let our reflection shine back on us so that we could study it and ask questions about it. Were we truly a learning community? Were we doing what it took to become a learning community? What should we do differently to become a better exemplar of our collective understanding of a learning community? We examined and critiqued the instructional strategies designed into the course from the perspective of the literature we were studying.

Our self-examination suggested ways in which the course may be improved. For example, one assignment called for students to react online to articles they read by responding to four general questions: (a) What is their 'gut reaction' to the article? (b) What are the 'big ideas' in the article? (c) What are implications for teaching and learning? and (d) What nagging questions still remain after reading the article? During class discussion over a two week period, students raised the question of what it meant to describe 'big ideas' from a published article. One student, in the true, knowledge-building spirit of the course, was reading what other students wrote in their reactions, and he detected a dichotomy in answers to this question. Some of his classmates appeared to be summarizing main ideas from an article, whereas others described their perceptions of what ideas were most important or insightful.

I, too, had detected the same difference in students' reactions to articles, and I confess it surprised me. To me, the abstract of an article summarizes its main points, so there is no reason for a reader of the article to do the same. Rather, I was expecting students to discuss what, from their personal perspective, was worthwhile or important to take away from an article, what contributed in some important way to their own thinking about a topic. Why, then, did most students not describe 'big ideas' in the way I expected? Two possible answers were that they did not know how, or they did not choose to do so.

In our discussions during class, it seemed that both answers were true in some way. The few students who seemed to know what I meant by 'big ideas' weren't sure that it was acceptable practice to describe their own opinions rather than what they took to be 'really there' in the article. Most, however, weren't sure of how to read an article, think about it in relation to things they already knew, and render some sort of judgment about its worth or value in furthering their understanding of a topic. How, then, can students learn to do this sort of thinking? One solution, I believe, is through modeling by the instructor.

A shortcoming of our learning community is that I had read all the articles that comprised the database, and so, in one respect, I wasn't gaining anything new as a learner in the community. I was

the leader, the teacher, the coach. However, if I was to seek out new articles for the database and write my own reading reactions, then I would not only be expanding my own knowledge, I would be contributing to the knowledge of the community and serving to model the kinds of thinking I wanted my students to learn. I had only a limited opportunity to try out this strategy during that semester, but the response from students was such that I am convinced it bears additional, systematic investigation.

The second feature of Altviews that facilitates its “learning-centeredness” is the confidential report, an assignment that students submitted three times during the semester in which they reported on their own learning, the learning of their group, the learning of the community (class), and any suggestions they have for improving the course. Students submitted their confidential reports via email directly to me, and I responded to them only unless they specifically indicated they had an issue to be shared with the entire class. The information students provided not only reflected their own goals and intentions as learners, it served as a valuable source of formative feedback that I would use to make mid-course revisions.

In one of the confidential reports, for example, an international student described her struggles to understand class discussion, particularly when it went far afield of the original topic for the day. She suggested that I post weekly summaries of class discussions on the course homepage. This seemed a reasonable idea and so I created a space on the homepage where such summaries could be posted. Soon after I posted the first summary, I heard from other students (particularly the four who were taking the course as distance students) who reported finding the feature helpful. Their learning was facilitated as well as the student who made the suggestion. In this case, the system became more adaptive to all the learners engaged in it, not just the one whose learning need precipitated the adaptation.

Although I did not set out originally to design a learning-centered instructional system, I believe I succeeded in identifying two critical features of such systems: 1) everyone in the system is a learner, albeit at different levels and with different skills, intentions, and needs; and 2) the system must be dynamic and self-improving based on feedback from the learners that interact within it.

Teaching as Intentional Learning

In 1996, McCown, Driscoll, and Roop published the second edition of an educational psychology textbook intended for use with preservice teachers. The theme of the book was: learning is the measure of teaching. By this we meant that learning and teaching are integrated processes. Teachers are deemed effective when their students are demonstrably learning. More than that, however, we wanted to emphasize that teachers are also learners. To the extent that teachers are

intentional learners, deliberately seeking new knowledge and reflecting on their current practices, they will develop increasing expertise in teaching.

This notion of teaching as intentional learning (TIL) served as the foundation for an action research seminar created by McCown and his colleague, Connie Moss, who is a clinical professor of education. They developed a website and a problem-solving process to bring together education students and practicing teachers in research teams as part of an intentional learning community (McCown & Moss, 1998). The practicing teachers came with “areas of concern,” problems they were experiencing in their classrooms, schools, or districts. The aspiring teachers came with freshly acquired knowledge about educational and psychological theories and principles. Working in teams, the aspiring and practicing teachers identified the problem underlying the area of concern and sought possible solutions through the application of educational and psychological theories and principles. The website provided the means for individuals and teams to communicate with one another and publish their work for others to critique and use.

As the seminar instructors, Moss and McCown used the feedback from the participants in the learning community to improve the instructional strategies designed into the course and website in much the same way that I used the information from confidential reports to improve Altviews. I was privileged to join the Moss-McCown collaboration in 1998 at a conceptual level, and we struggled with questions of how this intentional learning community should work to achieve what we had in mind. This semester, three of my doctoral students are participating as members of TIL along with Pittsburgh teachers, Duquesne University students, and a student-professor team from Indiana University. Moss is discussing some of these efforts later in this conference (Moss, McCown, & Driscoll, 1999).

How is TIL learning-centered? To begin with, all participants enter the community as learners with intentional learning goals. Practicing teachers develop a learning agenda related to the problems they wish to solve in their classrooms or schools. Aspiring teachers develop learning agendas related to the application of theory to practice; this is their opportunity to see how the theories they are studying apply to real problems in real classrooms. The instructors and other professors develop learning agendas related to research questions such as What learning conditions are necessary in a web-based environment to create an intentional learning community? How do the problems and quality of solutions identified by the teacher-student teams relate to who works together with whom? and What is the effect of intentionality to learn on the types of problems proposed and

researched by the teams? The graduate students develop learning agendas that range, depending on their interests, from problem-oriented (like the teachers) to research-oriented (like the professors).⁴

The TIL website design is also learning-centered in the aspect of being dynamic and evolving. Participants have the ability to add links to other resources, thus expanding the potential of all members of the community to learn. As we ourselves learn from the experiences of the others within the community, we will demand more from the technology that serves us. The current web design is, according to Moss (personal communication), like the trailer we live in while we build our dream home. Yet, this metaphor is incomplete in the sense that a truly learning-centered environment is never finished; it must continue to evolve as the actors within it come and go, learn and change.

CONCLUSION

I am not ready to write a conclusion to this paper. As part of a symposium, I think it should make links in some way to the other papers presented here, but as of this writing, I have not read my colleagues' contributions. I also find myself reflecting on other, related areas of literature such as situated cognition and self-regulation and would like to explore the implications of the views I have presented here in the context of those theories. So let this stand as my opening contribution to an ongoing discussion, one that I will look forward to learning as much from as I contribute to it.

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⁴ The development of these types of learning agendas are what we expect to occur on a theoretical level. Given our current stage of implementation, only the teachers and students have identified their learning agendas in any formal way.

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