Where's the Content? The Role of Content in Constructivist Teacher Education

by Sam Hausfather

Constructivism has become the reigning paradigm in teacher education in America today. More and more teacher education programs portray themselves as following a constructivist approach (Richardson, 1997), but there remains limited understanding among teachers and the public of the meaning of constructivism. Recently constructivism has come under attack from conservative elements who view it as too focused on empowerment, and from educators who view it as soft on content (Baines and Stanley, 2000). A deeper understanding of constructivism and the role of content in constructivist teaching is needed by both teacher educators and K–12 teachers in order to fulfill the constructivist promise of improved student learning.

What Is Constructivism?

One aspect of constructivism that challenges easy understanding is the fact that there is not just one constructivist theory but a multiplicity of them (see, e.g., Fosnot, 1996; Phillips, 1995; Prawat, 1996). Steffe and Gale (1995) note six different constructivist paradigms: social constructivism, radical constructivism; social constructionism; information-processing constructivism; cybernetic systems; and sociocultural approaches to mediated action. Constructivism is often used as an umbrella term (Larochelle, Bednarz, and Garrison, 1998, p. vii) for a range of theories that offer various alternatives to the empiricist view that knowledge comes to us from the world "out there" and to the nativist view that knowledge is inborn.

In contrast with both empiricism and nativism, constructivism proposes that knowledge emerges from human activity as people interact with each other and with the physical world, using their minds and bodies as well as the material and symbolic tools made available to them by their cultures (Newman, Griffin, and Cole, 1989). Thus we actively construct our knowledge and do not passively receive it from experience or heredity. To be sure, experience and heredity make important contributions, but they do not constitute our knowledge in and of themselves. What is missing from such accounts is the crucial role of our *activity*, both as individuals and with others. Our own activity transforms what comes from within and from without; it results in the construction of something that cannot be reduced to either (Staver, 1998). What we construct at one time may later be reconstructed, and then reconstructed again, in the light of future experience and (sometimes) maturation. Most important, though, it is what we have already constructed that gives us a basis for using the resources given by nature and experience in the further construction of knowledge.

Constructivist Approaches to Learning Content

Constructivism is based on a firm knowledge base of learning theory derived from cognitive psychology. Research in cognitive science has supported constructivist theory and progressed to the point that clear implications are apparent in educational practice. Gaea Leinhardt (1992) has synthesized the cognitive research that supports constructivism and summarized the implications around three fundamental aspects: multiple forms of knowledge, the role of prior knowledge, and the social nature of knowledge and its acquisition.

Multiple Forms of Knowledge

Research on learning has led to the understanding that there are both different types and

Sam Hausfather, Ph.D., is dean of the School of Professional Studies, East Stroudsburg University of Pennsylvania.

amounts of knowledge. Declarative knowledge of content concepts and principles becomes powerful for students when it is connected with procedural knowledge of actions and skills (Best, 1995). Knowledge varies as we examine the different arrangements of facts, notations, and reasoning that are used in different subject areas. Documentation, arguments, and explanations are structured in distinctive ways in different disciplines. In addition, metaknowledge—knowing what and how well one knows—is seen as a powerful factor in developing understanding (Schoenfeld, 1987).

These multiple forms of knowledge highlight the complexity of learning. Knowledge is seen not just as information, but as an active process, retained when embedded in some organizing structure (Bereiter, 1985). When students interact with information, using it in solving problems, answering questions, or discussing interpretations, the information becomes their knowledge, tied to their unique understandings. This points toward teaching that integrates knowing content with using content, dissolving the line between content and process (Leinhardt, 1992). An active, problem-solving approach should be an element of any content approach taken. Because knowledge also does not exist in isolation, it must be connected to student prior knowledge and larger contexts in order to be incorporated into deep understanding. Interdisciplinary approaches can connect the richness of separate disciplines while acknowledging their interrelationships and modes of inquiry (Martinello and Cook, 2000).

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The separation of schools of education from schools of arts and sciences within the university often disconnects content courses from courses on teaching methods and learning (NCTAF, 1996). Although teacher education has sought more integration of content with process, the content prospective teachers learn in their arts and sciences courses is generally left separate and inactive through the teacher education sequence. Teacher education students often take 50 percent to 85 percent of their course work in the arts and sciences (Gollnick, 1996).

Many large arts and sciences courses seldom challenge students' prior knowledge and often reinforce a transmission view of knowledge. A compilation of broad knowledge is emphasized over in-depth study that would challenge student misconceptions. Teacher education faculty should work closely with arts and sciences faculty to plan and implement courses linking strong disciplinary preparation with the methods and content of pedagogical studies. Brooklyn College of the City University of New York has developed a teacher education program in which students take several three-course sequences made up of a liberal arts course, an education "bridging" course, and a pedagogy course (Grumet, 1992). The mixed faculty teaching these courses plans syllabi, readings, and discussions together. All teacher education programs should closely examine their own curricula to determine the extent to which they model interdisciplinary integration of content and pedagogy.

Role of prior knowledge

Learning involves continually connecting prior knowledge with new information (Leinhardt, 1992). This prior knowledge can facilitate, inhibit, or transform learning. In reading, comprehension has been shown to depend on what one already knows or wants to know (Smith, 1988). Research into the nature of "children's science," the ideas and experiences students bring into class with them (Driver, Guesne, and Tiberghien, 1985; West and Pines, 1985), shows students hold tenaciously to their prior ideas. These alternative conceptions or misconceptions, which grow out of students' prior experiences, can interfere considerably with attempts to foster learning. In mathematics, students come to class with effective but alternative routes to mathematics processes that are often confounded by teaching (Carpenter et al., 1989). Research on history reveals students' tendency to see historical events in terms of individuals' intentions and interactions and to ignore the role of societal institutions (Barton, 1997).

Teacher educators are caught in the bind of informing teacher candidates about the importance of prior experiences and misconceptions while also having to deal with these candidates' own prior experiences and misconceptions. The "apprenticeship of observation" (Lortie, 1975) through lengthy personal experience with schooling prevents preservice teachers from

searching beyond what they already know and from questioning the practices they see (Feiman-Nemser and Buchmann, 1987). On the other hand, some teacher education programs promote conceptual change in their students toward viewing schools as they could be, not merely as they are. Experiences that challenge student conceptions of schooling include provocative readings and discussion (such as Kozol, 1991, etc.), simulations, and experiences in experimental schools that can provide different visions of education. In their content studies, preservice teachers' misconceptions can also be challenged. Teacher education programs that work with faculty in arts and sciences to understand student preconceptions can promote approaches that will challenge these preconceptions. Through having their own conceptions challenged and through learning about the prior knowledge of their students, teacher candidates will be better prepared to provide their students content knowledge linked with student prior knowledge.

Social nature of knowledge

Finally, the social aspect of knowledge provides clear implications in practice. As outlined above, learning is an active process of knowledge construction and sense making. Beyond that, knowledge is understood as a cultural artifact. It is created and transformed by each individual and by groups of people (Vygotsky, 1978). As a result, learning should involve talk, public reasoning, and shared problem solving. Too often the social environment of schools is counterproductive to learning (Hausfather, 1996). Instead of a focus on individual achievement, learning should involve social interaction that supports thinking, brings prior knowledge to the surface, and allows skills to be used in the context of content knowledge. Participating in communities of discourse allows students to clarify, defend, elaborate, evaluate, and argue over the knowledge constructed (Brown, 1994). Many teachers use cooperative learning as a powerful route to building communities of discourse in their classrooms and to improving learning outcomes (Slavin, 1996).

Teacher education has a clear role in focusing a vision of a social environment supportive of learning. Preservice methods courses can model collaboration between and among the teacher and students. College teaching has traditionally stressed individual processes over social processes in learning. Teacher education needs to pro-vide opportunities in which college students learn within cooperative or discourse groups while analyzing their own experiences, as a guide to their teaching. Instructional conversations can occur within the classic Socratic seminar, where instructor and students together explore problems as a small community of learners. Pairing students for field experience placements in schools helps foster deeper understandings of classroom situations (Hausfather, Outlaw, and Strehle, 1996). Pairing allows preservice teachers to see the value of collegial reflection in contrast to the individuality prevalent in schools.

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Pedagogical content knowledge

Research in teaching has identified the linking of content with the process of teaching; such links occur as the teacher continually restructures subject matter knowledge (Cochran, DeRuiter, and King, 1993). Termed "pedagogical content knowledge" (PCK)—"the ways of representing and formulating the subject that make it comprehensible to others" (Shulman, 1986, p. 9)—this concept connects research on teaching with research on learning, helping determine constructivist approaches to learning content for teaching. This goes beyond knowledge of the content *per se* to include issues of teaching, including curricular choices, powerful ideas, common learning difficulties, and student conceptions. Teachers derive PCK from their understandings of content, their teaching practice, and their own school experience (Shulman, 1987). Although scholars have different conceptualizations of PCK, all agree it differs considerably from content knowledge, and that it is developed through an integrative process during classroom practice (Van Driel, Verloop, and De Vos, 1998). Cochran, DeRuiter, and King (1993) renamed PCK as pedagogical content *knowing* (PCKg), based on constructivist views. Their model includes subject matter content and specific pedagogical knowledge but adds teachers' understanding of students and environment. Understanding students includes student abilities and learning strategies, developmental levels, attitudes, motivations, and prior conceptions. Context includes teachers' understandings of the social, political, cultural, and physical environment.

Research in PCK reinforces cognitive science (Cochran, DeRuiter, and King, 1993) and many of the implications listed above (Ashton, 1990). Programs can enhance the development of PCK in candidates by modeling and sharing teaching decisions and strategies with students, both by education and content-area faculty. Faculty should have opportunities to demonstrate and reflect on how they use PCK in their own teaching (Cochran, DeRuiter, and King, 1993). Contexts that promote active simultaneous learning about the many components of teaching within the content area promote the development of PCK. These contexts should be similar to classroom environments, which suggests the incorporation of multiple field-based opportunities. Early, continued, and authentic field experiences include real teaching, much contact with experienced teachers, reflection, and feedback (Hausfather, Outlaw, and Strehle, 1996).

It appears that a thorough and coherent understanding of content is necessary for effective PCK (Van Driel, Verloop, and De Vos, 1998). Teacher education programs can help preservice teachers construct a deep understanding of disciplinary content from a teaching perspective so it can be used to help specific students understand specific concepts (Cochran, DeRuiter, and King, 1993). This involves working closely with arts and sciences faculty to understand pedagogical perspectives and integrating methods courses with or alongside content courses.

Teacher education needs to provide opportunities in which college students learn within cooperative or discourse groups while analyzing their own experiences, as a guide to their teaching.

A teacher education program that balances attention to the process of learning with the content of what is being learned can help teachers to better understand both their content and the learning of their students. Too often content is taught without any attention to process, or process is taught without a deep understanding of content. Constructivist approaches seek to balance the process with the content. Content does not disappear but in fact is deepened!

Where's the Content?

Educators early in their career, and especially teacher education students, tend to focus on the hands-on aspect of teaching. Constructivism is often interpreted as making learning fun and active. Sometimes activity is misunderstood as physical activity only. Either through a desire to find alternatives to schooling as it exists or through less-than-complete presentations of constructivist theory from teacher educators, too many teachers are learning misinterpretations of constructivism. Teacher educators should continually emphasize the minds-on aspect of constructivist approaches to teaching. Mental activity is of primary importance, and, depending on developmental level, physical activity merely leads us to that end. The content and concepts that students must learn have to be at the center of constructivist teaching. Content, however, does not come first. Students' experiences, ideas, and prior knowledge come first. Content knowledge is then built upon student knowledge through the active involvement of students. The goal of our teaching must always be building an understanding of the current accepted knowledge within a particular discipline in ways that impact student understanding.

Constructivism is not a method. It is a theory of knowledge and learning that should inform practice but not prescribe practice. By its very nature, constructivism emphasizes the importance of the teaching context, student prior knowledge, and active interaction between the learner and the content to be learned. There is no teaching technique that should be prescribed or forbidden based solely on its constructivist "fit." Some teacher educators view lecturing solely as transmission of information. Yet there are effective ways to lecture that make use of constructivist principles. Lecturers can begin from a group's prior experiences and concerns. They can use stories to set and create contexts for understandings. They can make us think! The key is to move a mentally active audience toward deeper understandings of a particular content. Constructivism should be able to explain all instances of learning.

Conclusions

Constructivist approaches to teacher education must acknowledge the vital link between content and its acquisition. Constructivism challenges some basic understandings of content knowledge. Research supporting constructivist

approaches can bring to teacher education practice insights that make for more powerful teaching, as long as student understanding of content remains paramount. An understanding of the nature of pedagogical content knowledge should lead teacher educators to work more closely with arts and sciences faculty.

Teacher education provides a multiplier effect. Teacher educators must first model approaches that lead their students to understand content deeply and to view content and process as inseparable aspects of knowledge construction. These new teachers then gain the perspectives and abilities to move their own students to deeper understandings of content. A constructivist approach shows us that content and process are not dichotomous.

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