Thinking of the Other: Constructivist Discourse and Cultural Difference in the Field of Educational Technology

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ABSTRACT: Learning in a technologically enhanced constructivist classroom is a practice of acculturation into a western culture of power and traditions of reasoning. For children positioned outside this culture historical practices of inclusion and exclusion erase cultural differences that make a difference in their educational lives. While constructivism may be understood by some in the field of Educational Technology as a rallying cry for the reform of schooling, it is experienced by others as an ethical crisis in the relation of the self to the other. Even as we pursue equity through the integration of technology in constructivist learning practices, we need to pause and consider how these pursuits may actually contribute to disparities between the technological haves and have-nots. The solution is not to abandon constructivism. Instead, we need to shift our constructivist practices to address the cultural, racial and gendered complexities inherent in schooling yet historically inconsistent with constructivist theory and practice.

RÉSUMÉ: Apprendre dans une classe constructiviste supportée par la technologie est un phénomène culturel occidental où le pouvoir et les habitudes deraisonnement en sont les mots clés. Pour les enfants qui ne sont absolument pas baignés dans ce contexte culturel historique, l'inclusion et l'exclusion effacent les différences culturelles leur créant ainsi, une vie scolaire distincte. Dans le domaine de la technologie éducative, alors que certains peuvent interpréter le constructivisme comme un point de ralliement dans la réforme de l'enseignement, d'autres le ressentent comme une crise ethnique les concernant face aux autres. Au moment même où nous sommes à la recherche de l'équité à travers l'adoption de la technologie dans le constructivisme comme outil éducatif, nous avons besoin de marquer un temps d'arrêt pour réfléchir sur les conséquences qui contribuent à creuser le fossé entre ceux qui possèdent la technologie et ceux qui ne la possèdent pas. Abandonner le constructivisme n'est pas la solution! Il vaut

Journal of Educational Thought
Vol. 38, No. 1, 2004, 67-93.

> mieux changer de fusil d'épaule et se tourner vers les difficultés générées par les diversités raciales et culturelles dans un milieu scolaire encore trop jeune historiquement pour adopter l'usage et la théorie du constructivisme

Equitable access to computers in K-12 classrooms in the United States is a formidable problem. Since the emergence of desktop computers in the early 1980s, access to computer hardware and software in general by minority and working-class students can be distinguished from access by white and middle-class students (Gomez, 1991; Lynn, 1995). While there are fewer computers available to minority and working-class students, there is also an important distinction to be made between how computers are used by these students. As Kleiman distinguishes, "Students in underserved communities are more likely to use computers for drill-and-practice and integrated-learning systems lessons, while students in other communities are more likely to use computers to support inquiry-based, project-based, and collaborative learning" (2000, p. 13). In many classrooms, not only are the computers obsolete, but computer use primarily supports direct instruction in basic skills and/or preparation for proficiency testing (Healy, 1999; McAdoo, 2000; Sheingold, Martin, & Endreweit, 1987). A limited number of privileged schools, however, emphasize a current reform initiative to integrate technologically enhanced constructivist learning strategies into classroom practice. These strategies conceive of learning as an active process to construct knowledge.

The President's Committee of advisors on science and technology reported to the President of the United States, in March 1997, that such distinctions persist into the late1990s. As the report discusses, school administrators rationalize the continued use of drill-and-practice and other methods of direct instruction by claiming their use improves outcomes on standardized tests (Damarin, 1998; Gomez, 1991; Lynn, 1995; President's Committee, 1997; Striebel, 1991). As the report contrasts, the integration of technology in constructivist learning environments is emerging as a central element of reform in more privileged schools. The 1997 report to the President expresses much confidence in the pedagogic potential associated with constructivist thought. With tremendous federal support, this confidence echoes across the field of Educational Technology from elementary classrooms to the International Society for Technology in Education (ISTE), from pre-

service teacher education programs to doctoral programs in Educational Technology, from the Milken Family Foundation to the Center for Technology in Learning at SRI.

In this essay, I analyze the discourse on constructivism in the field of Educational Technology. This analysis continues my analyses of the deployment of technology in the field of Education (Shutkin, 1997, 1998, 2001, in press). The concept of deployment emerges in the writings of Foucault (1972, 1979, 1980a, 1980b) as he analyzes the productivity of power. He writes, power "produces things, it induces pleasure, forms knowledge, produces discourse. It needs to be considered as a productive network which runs through the whole social body" (Foucault, 1980a, p. 119). The deployment of technology in the field of Education is organized by and productive of a multiplicity of interrelated elements including a corpus of knowledge, discourses and social practices across a multiplicity of institutions such as the discipline of psychology, private business, higher education and state government. Far from acting autonomously, these institutions mutually condition each other as they condition the integration of technology in the field of Education.

The discourse on constructivism in the field of Educational Technology forms an element of this deployment of technology. Through this analysis I assume that for children in technologically enhanced constructivist classrooms the experience of learning is also a practice of acculturation into a western culture of power and traditions of reasoning. For children positioned outside this culture of power, western practices of inclusion and exclusion may erase cultural differences that make a difference in their educational lives. I implicitly challenge a popular assumption that constructivist approaches to technology integration, as instances of best practices, can be used to ameliorate issues of inequity associated with the digital divide (Bolt & Crawford, 2000; Kleiman, 2000; McAddo, 2000; Vadeboncoeur, 1997; Zevenbergen,1996). As constructivist discourse emerges from traditions of western intellectual thought, this assumption may no more represent a solution to the digital divide than an element contributing to the divide.

As a teacher educator, I express concerns in this article that echo across the broad field of Education. However, as a technologist I focus on constructivist discourse in the intersecting field of Educational Technology. This field forms an instance of the problematic, not to be generalized but rather to be compared and contrasted with other sites across the broader field of Education. While constructivist discourse is

often theorized and debated across the social sciences as social epistemology (Popkewitz, 1998), what distinguishes constructivist discourse in the field of Educational Technology is its status as an applied theory concerned with the nature of the learner and the augmentation of processes of learning with technology.

At this historical juncture, this discourse is formed, in part, through an expansive literature which I reference throughout this analysis. Taking various forms, depending on criteria such as stated purpose and intended audience, this literature formalizes the discourse on constructivism in the field of Educational Technology. As this discourse cannot be characterized by a single, unified social origin in the field, neither can it be represented from a unified intellectual perspective. While Bruner (1986) traces constructivist thought in the field of Education to Kant, and von Glasersfeld (1995) traces it to Vico and Kant, Popkewitz (1998) traces constructivist thought in the field of Education to Vygotsky and Dewey. Indeed, no discourse is once and for all; the boundaries cannot be fixed and this constructivist discourse is no exception. While I explicitly challenge the orthodox boundaries of this discourse in the field of Educational Technology, there are other challenges which effectively broaden the sociocultural and political boundaries of constructivist discourse in this field (c.f. Goldman-Segall, 1998).

There are a multiplicity of perspectives such as cognitive constructivism and sociocultural constructivism, to name two. While related, these perspectives emerge from and trace to historically distinct social practices and traditions in western intellectual thought. The discourse on constructivism in the field of Educational Technology is marked simultaneously by practical strategies, which blend these constructivist perspectives and apply them to the integration of technology in classroom learning, and by more academic strategies, which maintain distinctions between perspectives.

While I broadly consider constructivist practices, I situate these practices within the context of specific perspectives of constructivist discourse. Immediately following this introduction, I consider sociocultural constructivism and discuss learning in a technologically enhanced constructivist classroom as an historical practice of acculturation into the western culture of power. As a practice of acculturation, constructivist discourse in the field of Educational Technology excludes references to racial, cultural or social differences necessary for the effective design of technologically enhanced learning

environments. The effect of these exclusions is the tacit assumption that racial and cultural differences are insignificant.

I then explore a relationship between this discursive practice of exclusion and a central assumption of cognitive constructivism that learning is a practice of constructing new knowledge in relation to previous knowledge and beliefs. As a special instance of this assumption, I consider the practice of learning about other people (i.e. learning about the other). It follows that the learner's knowledge of the other cannot be independent of the learner's prior knowledge and beliefs. The other is assimilated or accommodated to the learner's prior knowledge and beliefs; the other cannot be known by the learner as the other might be "in himself."

Levinas (1998) refers to this practice as "the reduction of the other to the self." Following Levinas, I conclude that through constructivist discourse, learning with technology is a western cultural practice to assimilate and erase difference. To better address the cultural, racial and gendered complexities inherent in schooling yet historically absent from constructivist research, design and practice, we need to conceptualize the potential of learning environments that are culturally relevant and technologically enhanced.

Acculturation and Sociocultural Constructivism

While cognitivist and radical constructivists situate learning within the mind of the individual learner, sociocultural constructivists shift the emphasis from the mind to the historically specific and culturally situated context of learning. Sociocultural constructivism posits culture as the context placing constraints on what it is viable for the individual learner to know.[1] Here, as Duffy and Cunningham (1996) explain in the *Handbook of Research on Educational Communications and Technology*, learning is understood as a practice of acculturation in established communities of practice:

> Culture ... impacts our lives by determining what is important and what is not, what makes sense and what does not. The culture then makes these constructions available to the young and to new initiates for appropriation and use in transforming their participation in that culture. Learning, then, becomes a matter of changes in one's relation to the culture(s) to which one is connected. (p. 178)

The culture of schooling, in which constructivist practices are used, is one such established community of practice. In his discussion of

constructivism in the journal *Educational Technology*, Perkins (1991) offers an instance of this practice of acculturation in the culture of schooling and the community of science. Perkins explains explicitly that for sociocultural constructivism, learning or acculturation involves replacing the learner's naïve model of physical properties of the natural world with a more sophisticated model, "students are likely to have prior 'naïve' models of the phenomena in question (e.g., Aristotelian concepts of motion) that the learning experience tries to replace with better models (e.g., Newtonian concepts of motion)" (p. 19). Through practices of learning, the individual learner not only interprets events or constructs knowledge from her or his experiences as expected of constructivist thought. In addition, that learner is being initiated or acculturated in a constructivist community of practice.

As constructivist practices to integrate technology are designed across the field of Education and implemented in schools, they emerge as practices placing constraints on what is viable for the individual learner to know and through what cultural practices the learner will come to know. This sociocultural emphasis on context and acculturation is implicit in the technology integration scenarios described by the International Society for Technology in Education (ISTE). Scenario one for grades 3-5 describes the integration of technology and constructivist pedagogy in Ms. Smith's fifth grade science class. As described in the ISTE scenario, Ms. Smith has integrated into her science class on-line resources such as Global Learning and Observations for a Better Environment.[2]

Recently, her students used GLOBE and other electronic resources to research a hot local issue. The community was debating whether to allow a biotechnology firm to locate nearby. Her students chose to analyze this issue very carefully. Students working in groups engaged in collecting and analyzing data about the proposed plant. Ms. Smith set forums in the class so the students could present their findings and engage in debate. Students then created web pages to present their findings and arguments to the community. She reports that because of the authenticity and relevance of the issue, her students were even more engaged as they used technology in researching the issues (ISTE NETS for Students, 2003a).

Implicit in the discourse on constructivism in the field of Educational Technology, classroom learning environments, like Ms. Smith's, are designed to acculturate students in an emergent 21st century world of digital technologies. The Harvard-based educational technologist, Chris

Dede writes, "as educators, our task is to prepare our children to function in a future civilization created by the biggest leaps in technology since the Industrial Revolution two centuries ago" (1998, p. VI). Through this discourse, it is commonly assumed that children will not adequately be prepared for meaningful participation in this future civilization through traditional educational practices. Technologically enhanced learning environments, combined with constructivist educational practices, are thus being designed to acculturate children to function in a future civilization. As I proceed in this discourse analysis, a significant question becomes, "whose future civilization?"

Acculturation and the Culture of Power

To refocus this discussion, it is instructive to briefly consider the writings of Delpit (1995) about acculturation and the education of African-American children. Broadly, the practices of education are part of what Delpit (1995) describes as a European culture of power. From school-reform initiatives to implement process-oriented constructivist pedagogies and digital technologies, to compulsory objectivist-based proficiency testing and subsequent drill-and-practice technologies, Delpit argues there is a culture of power that is evident in classrooms every day. Further, Delpit identifies specific linguistic rules and communicative strategies that students must learn if they are to successfully acculturate to this culture of power. These rules and strategies, she explains, are simultaneously pedagogic and cultural. There are "...ways of talking, ways of writing, ways of dressing, and ways of interacting" (p. 25). Such rules and strategies and, therefore, success in school and beyond, Delpit maintains, reflect those who are in positions of power:

> The upper and middle classes send their children to school with all the accouterments of the culture of power; children from other kinds of families operate within perfectly wonderful and viable cultures but not cultures that carry the codes or rules of power. (Delpit, 1995, p. 25)

While there is more to success in the culture of power than effective pedagogy, effective pedagogy is a cultural practice. Delpit thus concludes that acculturation in the culture of power, and therefore success in school, is best facilitated through explicit and direct instruction in the rules and strategies of this culture of power. Implicit in Depilt's (1995) writing, liberal educators (and here I would include most educational technologists) need to make explicit the rules and strategies of

technologically enhanced constructivist classrooms for African-American and for other children marginalized and excluded from direct access to the culture of power. In their book, *Integrating Educational Technology into Teaching,* Roblyer and Edwards (2000) implicitly suggest culturally specific rules for constructivist learning environments, "constructivist goals focus on students' ability to solve real-life, practical problems, and its methods call for students to construct knowledge themselves rather than simply receiving it from knowledgeable teachers" (p. 67). Similarly, a list of constructivist learning strategies, presented by the International Society for Technology in Education (ISTE), offers learning environments that are: student centered, multisensory, multipath, collaborative, authentic, active, and critical (ISTE NETS for Students (2003b).

Following sociocultural constructivist theorists, learning in technologically enhanced constructivist classrooms, with their unique rules and strategies, is an historically specific practice of acculturation in the culture of schooling and the broader culture of power. Explicitly informing people positioned outside the culture of power of the rules and strategies of constructivism, or neglecting to do so, are both practices of acculturation in constructivist communities of practice. Made explicit or not, constructivism does not reside somewhere beyond or outside the boundaries of its own assumptions. Yet, Delpit cautions, explicitly communicating to peoples of other cultures the cultural and pedagogic rules and strategies of the culture of power is often less than fully successful and does not necessarily lead to success in school. As I discuss in the next section, for children in technologically enhanced constructivist classrooms positioned outside this culture of power, categories of inclusion and exclusion erase cultural differences that make a difference in their educational lives.

Constructivist Discourse Without Difference

As a practice of acculturation into the culture of power, constructivist discourse focuses on individual learners' development of higher-order-thinking skills. Absent from this discourse are explicit references to significant social and cultural differences, such as race, class, ethnicity, or gender. Following Delpit, these differences should be considered in the design of technologically enhanced constructivist learning environments. In this section, I begin an historical accounting of this absence by introducing a constellation of antecedent discourses from 17th century Enlightenment thought that trace to the formation of constructivist

discourse in the field of Educational Technology. These antecedent discourses have historically contributed to the exclusion of the poor, women, and people of color from equitable participation in institutions of western cultural life such as the legal system and schooling.

Absent Signifiers and the Subject of Educational Technology

Introduced previously, the 1997 report to the President on the use of technology to strengthen K-12 education emphasizes equitable and universal access to Educational Technology by all students regardless of socioeconomic status, race, ethnicity, gender, or geography. This report explains that distinctions between majority white and majority non-white schools reflect an explicit instance of institutionalized inequity and injustice in the education system. Such distinctions, the report concludes, mirror distinctions between constructivist learning strategies and traditional strategies of direct instruction.[3]

Focusing on the semantic structure of this report to the President, there is an abrupt and significant shift from a discussion of equitable access to technology to a discussion of constructivism. While this report includes sections on both constructivism and equitable access, a boundary is formed that separates and distinguishes the psychologies of constructivism from the sociocultural context of the integration of technology into classroom practice. Indeed, within constructivist discourse these interrelated aspects of Educational Technology are not addressed at the same time.[4]

With few notable exceptions (i.e., Goldman-Segall, 1998), constructivist discourse in the field of Educational Technology refers only to the learner, the teacher, the technologist, and so forth. Issues of inequity, race, and class are not discussed in constructivist discourse as the discourse focuses on the individual learner and the development of higher-order-thinking skills. All signifiers – racial, cultural or social – that otherwise could be used to refer to the subject are absent. In her cultural critique of Educational Technology, Henderson (1996) describes this practice as deracialization. She argues that the learning theory that informs Educational Technology, whether it be direct instruction or constructivist, constructs a subject which has no identity other than the learner. While Henderson's observation is technically accurate, in this section I emphasize instead that the subject of constructivist discourse in the field of Educational Technology is tacitly assumed to be a white, European male of significant economic means. In a frequently cited article about constructivism and educational technology, Jonassen (1991)

places the subject of constructivism in the field of Educational Technology exclusively within a western cultural tradition:

> Our western cultural belief system accepts the existence of a real world .... If our learning theory assumes that we construct meaning for objects and events by interpreting our perceptions of them in terms of our past experiences, beliefs, and biases, then each of us mentally represents our own personal reality. (p. 7)

The references in the above quote that relate constructivism to western cultural tradition are historically and theoretically accurate. However, overt references to specific cultural beliefs are unique and uncharacteristic of the discourse. Following Henderson (1996), in most instances explicit racial, ethnic, or gendered signifiers are absent from the discourse. This absence is also recognized by Damarin (1998) and by Voithofer and Foley (2002) who call for an interweaving of constructivism with multiculturalism in the field of Educational Technology. Educational technologists, however, have not found this interweaving to be easily accomplished. This can be explained, at least partially, by exploring aspects of the historical formation of this discourse.

Cultural and Historical Precedents to Constructivist Discourse

> In matters of race, silence and evasion have historically ruled literary discourse. (Morrison, 1992, p. 9)

In poststructural thought, the formation of discourse is an historical process. This process is neither linear nor cyclical. Rather, the historical formation of discourse is described as genealogical (Foucault, 1979). Aspects of a discourse, such as descriptions and objectifications of people (subjects), or places and things (objects) may endure through history. Other aspects seem to disappear altogether. Still other aspects remain historically dormant only to suddenly re-emerge at some later time in combination with aspects from other discourses with different histories. In this way, discourses are historically formed. Aspects of discourses, in this case subjectivity, can be traced to antecedent discourses and these antecedent discourses can be said to resemble current discourses. Bourdieu (1984) discusses that this structural resemblance is attributable to common history.

The subject of a sentence that reads: "I am a learner in a constructivist classroom," is "I." While this is grammatically obvious, as a cultural formation it is less obvious. Through what culturally and historically specific set of discursive practices does this subject come to

speak those words and to think of themself in these culturally specific terms? While the student or the learner, as the subject of constructivist discourse, combines a multiplicity of discursive aspects, the formation of this subject traces, in part, to 17th century Europe.[5] Referring historically and exclusively to the European male, the rational individual subject of 17th century western cultural thought combines the abstract juridical subject of rights and individualism with the liberal humanist subject of reason (Venn, 1984; Walkerdine, 1988). This uniquely western subject resembles the subject of constructivist discourse in the field of Educational Technology.

Across the field of Educational Technology, teachers learn to value and are invited to design technology-enhanced constructivist learning environments that primarily foster in their students a similar capacity to reason. This capacity is often described as higher-order-thinking or critical thinking (Bowens, 2000; Harvey, 1998; Honey, Culp, & Spielvogel, 1999; Kafai, Franke, Shih, & Ching, 1998; Lajoie, Lavigne, Guerrera, & Munsie, 2001; Milbury & Silva, 1998; Nowicki, 1999; Oliver & Hannafin, 2000). In an on-line essay about constructivism, technology and student achievement, Means, et al. (1993) write in an illustrative fashion, "evidence indicates that when used effectively, technology applications can support higher-order thinking by engaging students in authentic, complex tasks." By placing emphasis on the mastery of reasoning skills (i.e., higher order thinking) constructivist discourse incorporates a significant aspect of 17th century discourse.

As I trace the formation of constructivist discourse, my intention is not to reject reason or to question the value of higher-order-thinking in education.[6] Rather, the historical and cultural significance of the mastery of reason emerges when this aspect of constructivist discourse is considered in relation to discursive practices that remove sociocultural differences.

As a subject of rights protected by the law the liberal humanist subject of reason appears in the writings of 17th century English philosopher John Locke. However, as an exemplary instance of this discourse, in Locke's writing women, the poor, and people of color are excluded from the protection of law and contracts on the basis of their supposed inability to reason. As only white, European males of financial means were assumed to possess the capacity to develop reason, only they were recognized as subjects to be protected by the law. At the same time, without this recognition or legal protection, women, the poor, and people

of color were excluded even further from participation in the Enlightenment discourse on reason (Venn, 1984).

As current exclusions of women, the poor, and people of color from the legal system and from schooling take uniquely 21st century forms, their conspicuous absence from constructivist discourse in the field of Educational Technology is not without precedent.[7] It is through the combining of this sociocultural exclusion with the emphasis on the development of cognitive reasoning skills that today's subject of constructivist discourse traces to Locke and the 17th century juridical subject. It is this combining which establishes a significant historical precedent for the absence or erasure of explicit racial, ethnic, or gendered signifiers that could identify the subject of constructivist discourse in the field of Educational Technology.[8] Though not identical to its historical antecedent, current constructivist discourse traces to this 17th century discourse.

Writing about the relation of race and the formation of subjectivity, Pinar (1993) discusses that curriculum debates in the United States are not only about knowledge and what children should learn in school. They are also about the cultural formation of identity and what and who is excluded or marginalized as different in western thought. Referring to Pinar, Popkewitz (1997) explains that curriculum research should attempt, " to understand how the systems of reasoning and categories of inclusion have erased the 'other' except as different from what is perceived and classified as the 'normal'" (p. 26). These historically specific systems of reasoning and categories of exclusion that erase the other form subtle practices of acculturation. Education, including constructivist discourse in Educational Technology, participates in these practices. The absence of consideration of women, the economically disadvantaged, and people of color from constructivist thought and practice in the field of Educational Technology suggests a disregard of significant differences that make a difference. It is as if sociocultural differences across race, class, and gender were irrelevant to the design of technologically enhanced constructivist learning experiences.

Cognitive Constructivism in the Field of Educational Technology

> The Kantian rational/logical mind is that of a White man. (DeVaney, 1998, p. 75)

Constructivist discourse in the field of Educational Technology traces to a 17th century combining of the subject of reason with the subject of law. With its emphasis on the development of higher-order-thinking skills, this discourse also traces to an Enlightenment discourse on representation and the nature of knowledge. As I develop below, this discourse has expression in the writings of Immanuel Kant (Jonassen, 1991). In this section, I consider the discourse on cognitivist / radical constructivism associated with Piagetian psychology and the neo-Kantian writings of von Glasersfeld. Broadly, this constructivism is associated with a counter-intuitive assumption that practices of representation construct their objects and thus precede these objects. As Woolgar confirms, "we somehow feel that representation can only follow from objects, not the other way around" (1998, p. 65).

In constructivist discourse in the field of Educational Technology, learning is an active process of representation and the construction of knowledge. Cognitive and radical constructivists focus on the individual learner's development of higher-order-thinking skills such as the interpretation of events and objects, the formation of perspectives and the construction of knowledge. Learning is not a practice of depositing or transferring knowledge directly into the mind of the learner (Ertmer & Newby, 1993). What is or can be known about the world is constructed from interpretations of experience in relation to prior knowledge and beliefs. In general, this constructivism forms a psychological epistemology based on the prior knowledge, beliefs, experiences, sensory perceptions, and mental activity of the learner as an individual subject (Jonassen, 1991). Technology is integrated into the classroom in support of this constructivism as Niederhauser and Stoddart (2001) write:

> Computer software based on constructivist principles provides students with experiences that allow them to discover or re-invent concepts. Students are given access to a variety of open-ended applications that they use to help construct more complex understandings. (p. 18)

Given the near absence of references to culture, race, or gender in this constructivist discourse in the field of Educational Technology, in this section I consider how the predominantly European male subject of this

discourse constructs knowledge and understanding of people who are unlike him – his cultural or racial *other*. I first trace this discourse from the European tradition of continental thought to the field of Educational Technology.

Tracing Kant to Constuctivism in the Field of Educational Technology

Writing to a thoughtful and reflective audience, yet to an audience who at the time was deeply committed to traditional assumptions of direct instruction inherent in practices of educational technology, Jonassen (1991) referred to the work of the celebrated educational psychologist Jerome Bruner. Seeking an opportunity to engage the mindful curiosities of this audience, Jonassen discussed Bruner's (1986) claim that constructivism began with Kant.[9] Bruner discussed that the significance of constructivism is that it posits that there is no objective world that exists prior to, or independently of, language and the activity of the mind. The world is produced; it is constructed through practices of the mind. Bruner traces to the work of Kant this central assumption of constructivist thought: what exists to the individual is a product of thought, a construction of the mind, not things as they are materially or objectively in themselves (c.f. Jonassen, 1991).

In his intellectual history of constructivist thought, von Glasersfeld (1995) also explicitly references Kant's transcendental philosophy as a rational analysis of human understanding and cognition constitutive of constructivist thought. He writes, "Kant's transcendental philosophy, however, is a purely rational analysis of human understanding and provides a model that is in many ways fundamental to the constructivist orientation" (p. 39). Von Glasersfeld establishes his claim through a series of references to Kant's *Critique of Pure Reason* and to later Kantian texts. Discussing Kant's attempt to account for earlier failures to understand reason or human cognition, von Glasersfeld quotes from the *Critique*: "Until now one assumed that all cognition had to conform to objects .... Henceforth one might try to find out whether we do not get further ... *if we assume that objects have to conform to our cognition* (p. 39, Italics added).

Von Glasersfeld (1995) explains that Kant furthers this explication of reason or cognition 11 years later in 1798 when he published *The Conflict of the Faculties.* Kant writes:

> The things to which presentations and concepts refer cannot be what our mind presents to itself; because the mind can create only presentations of its own objects and not of real things, that is, through these presentations and concepts, things cannot possibly be known as they might be in-themselves. (pp. 39-40)

What are the kinds of things or objects to which Kant and later constructivists refer? What kinds of objects or subjects cannot possibly be known as they might be in-themselves but rather must conform to our cognition? Are there no boundaries to delimit this epistemology, no object or subject excluded from this formulation?

Constructivist Discourse and the Reduction of the Other to the Knowing Subject

The relationship between knowing about the world and the prior experiences and knowledge of the individual subject is central to constructivism in the field of Educational Technology. As discussed previously, it is assumed that new knowledge must conform to cognition. In other words, the construction of new knowledge by the individual is based on the person's prior experiences and knowledge. However, to question its boundaries and to suggest limits to this constructivist discourse, I want to explore a special instance of this assumption. Namely, consistent with constructivist discourse, it would have to be assumed that the practice of learning about other people (i.e., the other) is based on the individual's previous knowledge. The individual learner could never know the other as that other knows himself; rather the individual learner can know the other only in terms relative to himself. Knowledge of the other cannot be independent of the subject's prior knowledge and beliefs.

While this assumption has expression in the field of Educational Technology, it is inherent across constructivist discourse. In fact, it is explicitly discussed by von Glasersfeld (1995) with direct references again to Kant. In his exploration of the self and others as constructing agents, von Glasersfeld explains that how we construct others is an extension of Kant's *Critique of Pure Reason*. Von Glasersfeld quotes again from Kant, "it is clear: If one conceives of another thinking subject, one necessarily imputes to that other the properties and capabilities by which one characterizes oneself as subject" (p.119).

Examples used to explicate this seem to conform so innocently to common sense. In one instance, von Glasersfeld (1995) explains that when a child wants to catch a frog, he soon learns to sneak up behind the

frog ever so quietly as he realizes that, like himself, the frog can both hear and see.

However, does it continue to conform to common sense when this other is neither a frog nor even your little brother but rather an other of another race, culture, sexual preference, or nation? Duffy and Cunningham (1996) describe a cross-cultural exchange of hypercard stacks where children from the United States and Ireland are invited to see the world from the perspective of the other. It becomes evident however, with the instances that they discuss of sectarian violence in Ireland and person-on-person violence in the United States, that the other can be known only in relation to the prior knowledge and experience of the learner, not as the other knows himself nor as the other might actually be in himself.[10] Duffy and Cunningham make plain that the children of Ireland come to know violence in the United States and hence the experience of violence by children in the United States relative to the sectarian violence that they experience in Ireland. They cannot know violence in the United States in any other way.

Indeed, in constructivist discourse it is explained that prior knowledge precedes all reasoning: "It is what we know ... which is what we perceive from our environment" (Jonassen, 1991, p. 10). In constructivist discourse, learning about the unknown other is a practice of coming to know or to understand the other in terms of the self and what is already known. It is a practice of assuming the other relative to the self, of assimilating the unknown other. This assimilating is strikingly evident in the design of some collaborative distance learning projects such as the World Bank's World Links for Development (WorLD) program. This program links students and teachers in developing (southern) nations with students and teachers in postindustrial (northern) nations via the Internet for collaborative distance learning projects on topics of sustainable development (Carlson & Hawkins, 1998).

Students participating in the WorLD program represent themselves on-line and form understandings about their on-line other. In the parlance of constructivist discourse, the program enables the assimilation (or accommodation) of the cultural experiences they have with students from other nations to their previous knowledge and beliefs.[11] Indeed, following Kant, Bruner, and Jonassen, learning about the unknown other through the WorLD program is a practice of coming to know the other in terms of the self and what is already known about technology, sustainable development, and cultural differences.

The sociocultural significance of this practice of assuming the other is like the self becomes more evident when I shift my emphasis from the students' experiences to the educational design of this WorLD program. Constructed into the design of this program is the assumption of the universality of its objectives which are to serve the educational needs of northern and southern students alike. This assumption of universality forms a practice of assimilating or accommodating what is unknown to the educational technologists (southern students) to what they previously know (northern students). The WorLD program objectives are to "improve educational opportunities, develop information technology skills, facilitate cultural understanding, and promote broad-based support for economic development" (Carlson & Hawkins, 1998, p. 58). From the perspective of educational technologists working in the postindustrial north, these objectives are perhaps laudable. These objectives might even receive praise from the privileged minority of students and teachers from southern nations who participate in the WorLD program. Indeed, those fortunate to participate in the WorLD program have opportunities to develop technological skills while advancing their practical knowledge of sustainable development.

However, the curriculum of the WorLD program assumes a neocolonial perspective on sustainable development and technology infusion that benefits northern nations at the expense of southern nations (Davison, 2001). This is evidenced by the on-line textbook in use, *Beyond Economic Growth: Meeting the Challenges of Global Development* (The World Bank Group, n.d.). This is further evidenced by the exclusion of millions of students and their teachers living in southern nations such as Ghana and Brazil from participating in the WorLD program. While the program is to address inequities in access to technology and the Internet and to provide educational opportunities for more students worldwide, a consequence of the WorLD program is the diminished educational opportunities for those students it excludes. Lacking in even the most basic educational resources, like pencils and textbooks, these students reap no benefit from this technology-intensive program. Furthermore, finances for the WorLD program are from World Bank loans that must be paid back (Oxfam International, n.d.). Current receiver (southern) nations are defaulting on these and other loans because of their huge debt burdens. The World Bank's response has actually been to impose extreme economic policies which force these nations to further reduce allocations for education (Borucke & Weinrib, 2002).

Through the design and objectives of the WorLD program, incorporating a neocolonial perspective on sustainable development and technological progress that historically advantage northern nations, the predominantly European male subject expresses the educational needs of his cultural and racial *other* in terms of himself. This design expresses knowledge and understanding of the other in terms of the self; it is "a reduction of the other to the self" (Levinas, 1998). In short, this practice of knowing can be described as an assimilating of the unknown other to the individual knowing subject (Peperzak, Critchley, & Bernasconi, 1996). In constructivist discourse, it is possible to erase economic, racial, and cultural differences, to dismiss these differences as irrelevant because of the tacit assumption that learning, following Locke, is a rational act of cognition. The objectives and the design of the WorLD program are instances of this practice of erasure and assumption about learning.

Conclusion: An Ethical Crisis in the Relation of the Self to the Other

As it traces to Locke, Kant, Hegel, and others, learning in a technologically enhanced constructivist classroom must be recognized as a practice of acculturation into a western culture of power. Following Barton (1998), for children positioned outside this culture, their failure to succeed in school is often reduced to psychological reasons of cognitive development. Learning in a constructivist classroom, however, is also an experience of acculturation into western traditions of reasoning and categories of inclusion and exclusion. Therefore, as we pursue equity through our efforts to integrate technology into schooling, we need to pause and consider whether constructivist practices offer equitable strategies for technology integration. In actuality, the integration of technology in constructivist learning practices may further institutionalize inequities across an increasingly global digital divide. In the field of Educational Technology, these practices erase cultural differences that make a difference in the educational lives of children. To paraphrase Duffy and Cunningham (1996), I conclude that learning in a technologically enhanced constructivist classroom becomes a matter of the culture(s) to which one is connected.

The cultural and theoretical discussion that I have presented challenges the central assumption of constructivist learning theory and constructivist practices across the field of Educational Technology.

Forged through the discourse on constructivism in this field is an intersection, a discursive combining of western cultural thought, constructivist psychology, and classroom practices that position the learner as the rational, European individual subject. As Levinas testifies, this subject furthers his comprehension and understanding by equating and subsequently by reducing external reality to his experiences and understandings. It is a practice to assimilate all otherness.

That the infinite complexities of the other can be understood only from the perspective of the individual raises profound questions regarding the daily practices of western institutional life, including constructivist practices to integrate technology. Levinas (1998) emphasizes that within western thought, the relation of the knowing subject to the other is an incorporation or assimilation of the other. Similarly, Gasché (1986) writes, "Western philosophy is in essence the attempt to domesticate Otherness, since what we understand by thought is nothing but such a project" (p. 101). The other can be understood only in terms and from the perspective of the knowing subject, as Critichley (1992) writes, "in seeking to think the other, its otherness is reduced or appropriated to our understanding" (p. 29). The implications of this limitation extend far beyond constructivist discourse in the field of Educational Technology to what Davis (1996) describes as the ontological imperialism of western thought. Critchley (1992) writes emphatically that western thought insists upon "the reduction of the other to the Same, where the other is assimilated like so much food or drink – 'O digestive philosophy!' as Sartre exclaimed against French neo-Kantianism" (p. 6).

Indeed, Levinas and his colleagues express deep concerns about the assumption that the individual subject constructs meaning of the other only by interpreting knowledge, perceptions, and experiences of the other in relation to that individual subject's prior knowledge, beliefs, and experiences. Yet Levinas would never have questioned the veracity of constructivist theory or practice. Instead, recognized as a condition of western thought, this constructivism would deeply trouble him. What may be a rallying cry for the reform of schooling for many across the field of Educational Technology is recognized by others as an ethical crisis in the relation of the self to the other.

While the research, design, and implementation of technologically enhanced constructivist learning environments consider individual differences such as learning styles, they fail to consider sociocultural

differences. These differences make a profound difference. By not engaging the cultural, racial, and gendered differences inherent in schooling, we reduce the other to the knowing subject. Extending Levinas' (1985; 1998) writings on ethical responsibility for the other, we need to deepen our constructivist practices.

The ethnographic scholarship of Goldman-Segall (1998) forms a unique instance. While there are numerous scholars in the field of Educational Technology pursuing critical, poststructural, and feminist research questions, Goldman-Segall is working within the field to extend the limits of constructivist discourse beyond its applied psychologism.[12] Writing about the construction of knowledge and relations of self to other from a feminist point of view, Goldman-Segall situates the learning experiences of adolescent girls within a sociocultural context.

> Self-consciousness seems to be a relatively common experience for teenage girls, who are continually targeted (by the media and by adult culture in general) as the epitome of perfection because they are not fully developed, physically or intellectually. Living up to the expectations of others can become increasingly difficult for girls in their early teens. (Goldman-Segall, 1998, p. 214)

Culturally relevant pedagogies (Ladson-Billings, 1995) and postcolonial classroom practices (McCarthy, 1998) create further possibilities for extending constructivist discourse beyond the limits of its psychologism. Culturally relevant pedagogies combine cultural integrity with academic success and critical consciousness. Cultural integrity honors the infinite differences of the other through self-reflective practices that interrupt western tendencies to reduce the other to the same (Joldersma, 2001). Beyond multiple perspectives, postcolonial researchers recognize relations of power and promote subaltern (i.e., dominated) perspectives. Postcolonial thought refuses notions of discrete cultures or races such as those suggested by references to the "west and the rest." In its place is the recognition that cultures, from east to west and north to south, are radically hybrid, mutually conditioning, and refusing of anything but the blurriest of boundaries to distinguish them. In the classroom, postcolonial educators introduce pedagogic strategies such as reading literature contrapuntally. Not inconsistent with constructivist practices, contrapuntal readings promote parallel readings of subaltern texts with western canonical texts. These subaltern texts question, respond to, and challenge the sovereign independence of their western canonical counterparts (McCarthy, 1998). Research and design in the field of

Educational Technology should be as bold as postcolonial thought and combine its constructivist psychology with social and cultural thought.

ACKNOWLEDGMENT

I want to thank Jason Earle, Charles Hersch, Thomas Kelly, Matthew Weinstein, and Leslie Yenkin for helpful criticisms on earlier drafts.

NOTES

1. There is discussion across constructivist discourse and in the field of Educational Technology about whether sociocultural, cognitivist and radical constructivism can be reconciled. From the perspective of Cobb (1994) writes, "I will argue that mathematical learning should be viewed as both a process of active individual construction and a process of enculturation into the mathematical practices of the wider society" (p. 13).
2. The Globe Program, http://globe.gov/globe_flash.html, 3 June 2003.
3. There are additional discussions of this in the literature on the digital divide. For instance see Bolt and Crawford, 2000; McAdoo, 2000.
4. C.F. Henderson (1996) and Damarin (1998). The semantic structure of Brunner and Tally's (1999) discussion mirrors that of the presidential report in its construction of a boundary in its treatment of constructivism and equity in relation to technology. See chapter 2 in Brunner and Tally (1999). This structure is evident in Goldman-Segall (1998), especially chapter 2. Yet there are instances in her writing that take a truly hybrid form, establishing a precedent for merging post-structural and feminist thought with political economy and constructivist theory. See chapter 8. I develop this in the conclusion.
5. The significant formed, produced, and constructed are nearly synonymous as used in this essay. The concept of the subject or subjectivity, as I use it, hails from poststructural thought. For an excellent discussion see De Vaney (1998); Scott (1992); and Popkewitz (1997). Benveniste (1971) demonstrates how the speaking subject tacitly recognizes her position as a subject in language through her use of the first person pronoun, "I."
6. For a related discussion of the question of reason see Foucault (1982).
7. There is significant research on females and computing. However, like the issue of equity, this research is not incorporated into constructivist discourse. See for example Maxwell (2000), Hanor (1998), and Bryson and de Castell (1998).
8. Another precedent for this practice of erasure is found in American literary theory as discussed by Toni Morrison (1992). Morrison explains that historically there have been elaborate strategies in the field of literary criticism in the United States to erase what she refers to as the Africanist presence in American literature.

9. To substantiate this claim, Bruner (1986) carefully replaces Kant's consideration of noumenal and a priori knowledge with a relativist perspective consistent with constructivist thought. In Kant's philosophical system, a noumenon refers to a "thing-in-itself." It is opposed to the thing that appears to use i.e. a phenomenon. A noumenon is the basic reality behind sensory experience. According to Kant, a noumenon is not knowable because it cannot be perceived. (Source: *The Columbia Encyclopedia*, 2001, 6th Edition. Columbia University Press; also see Goodman (1978, 1984).

10. In this instance, my focus is on knowing the other in constructivist discourse, not on the mediating effect of hypercard technology on this experience of knowing.

11. While my focus is on the practice of assimilation, a similar argument can be made about the constructivist practice of accommodation. Though accommodation traces to the Hegelian dialectic, its effect in relations between the self and the other is similar to assimilation. Davis explains "in the workings of the Hegelian dialectic, the characteristic gesture of philosophy is to acknowledge the Other in order to incorporate it within the expanding circles of the Same (Davis, 1996, p. 40). For discussion of accommodation in the field of Educational Technology please see Cobb, 1996; Duffy and Cunningham, 1996; Spiro, et al., 1999.

12. For examples of critical, poststructural and feminist research in the field of Educational Technology, please see: Damarin, S. 1998; De Vaney, A., 1998; Muffoletto, R., 2001; Rose, E., 2002.

REFERENCES

Ball, D. (1993). With an eye on the mathematical horizon: Dilemmas of teaching elementary school mathematics. *Elementary School Journal, 93*, 373-397.

Barton, A. (1998). Reframing science for all through the politics of poverty. *Educational Policy, 12*(5), 525-541.

Belsey, C. (1980). *Critical practice.* New York: Methuen.

Benveniste, E. (1971). *Problems in general linguistics.* Coral Gables, FL: University of Miami Press.

Bolt, D., & Crawford, R. (2000). *Digital divide: Computers & our children's future.* New York: TV Books.

Borucke, M., & Weinrib, O. (2002). The graduation message we won't hear. *The Boston Globe.* June 4.

Bourdieu, P. (1984). *Distinction: A social critique of the judgment of taste.* Cambridge, MA: The President and Fellows of Harvard College.

Bowens, E. (2000). Research, analysis, communication: Meeting standards with technology. *Learning & Leading with Technology, 27*(8), 6-9,17.

Bruner, J. (1986). *Actual minds, possible worlds.* Cambridge, MA: Harvard University Press.

Brunner, C., & Tally, W. (1999). *The new media literacy handbook: An educator's guide to bringing new media into the classroom.* New York: Anchor Books.

Bryson, M., & de Castell, S. (1998). New technologies and the cultural ecology of primary schooling: Imagining teachers as Luddites in/deed. *Educational Policy, 12*(5), 542-567.

Carlson, S., & Hawkins, R. (1998). Linking students around the world: The World Bank's new educational technology program. *Educational Technology, 38*(5), 57-60.

Cobb, P. (1994). Where is the mind? Constructivist and sociocultural perspectives on mathematical development. *Educational Researcher, 23*(7), 13-20.

Cobb, P. (1996). Constructivism and learning. In T. Plomp & D. Ely (Eds.), *International encyclopedia of educational technology* (pp. 56-58). Oxford, UK: Pergamon.

Critchley, S. (1992). *The ethics of deconstruction: Derrida & Levinas.* Cambridge, MA: Blackwell Publishers.

Damarin, S. (1998). Technology and multicultural education: The question of convergence. *Theory Into Practice, 37*(1), 11-19.

Davis, C. (1996). *Levinas: An introduction.* Notre Dame, IN: University of Notre Dame Press.

Davison, A. (2001). *Technology and the contested meanings of sustainability.* Albany, NY : State University of New York Press.

De Vaney, A. (1998). Can and need educational technology become a postmodern enterprise? *Theory Into Practice, 37*(1), 72-80.

Dede, C. (1998). *Learning with technology.* Alexandria, VA : Association for Supervision and Curriculum Development.

Delpit, L. (1995). *Other people's children: Cultural conflict in the classroom.* New York: The New Press.

Duffy, T., & Cunningham, D. (1996). Constructivism: Implications for the design and delivery of instruction. In D. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 170-198). New York: Macmillan Library Reference.

Ertmer, P., & Newby, T. (1993). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly, 6*(4), 50-72.

Foucault, M. (1972). *The archaeology of knowledge* (A.M. Sheridan Smith, Trans.). New York: Pantheon.

Foucault, M. (1979). *Discipline & punish: The birth of the prison.* New York: Vintage Books.

Foucault, M. (1980a). *The history of sexuality* (R. Hurley, Trans.). New York: Vintage Books.

Foucault, M. (1980b). *Power/knowledge selected interviews and other writings 1972-1977*. New York: Pantheon Books.

Foucault, M. (1982). The subject and power. In H. Dreyfus & P. Rabinow (Eds.), *Michel Foucault: Beyond structuralism and hermeneutics* (pp. 208-226). Chicago: University of Chicago Press.

Gasché, R. (1986). *The tain of the mirror*. Cambridge, MA: Harvard University Press.

Glasersfeld, E., von. (1995). *Radical constructivism: A Way of knowing and learning*. London, UK: Falmer Press.

Goldman-Segall, R. (1998). *Points of viewing children's thinking: A digital ethnographer's journey*. Mahwah, NJ: L. Erlbaum.

Gomez, M. (1991). The equitable teaching of composition with computers: A case for change. In G. Hawisher & C. Selfe (Eds.), *Evolving perspectives on computers and composition studies: Questions for the 1990's* (pp. 318-335) Urbana, IL: NCTE.

Goodman, N. (1978). *Ways of worldmaking*. Indianapolis: Hackett Pub. Co.

Goodman, N. (1984). *Of mind and other matters*. Cambridge, MA: Harvard University Press.

Hanor, J.(1998). Concepts and strategies learned from girl's interactions with computers. *Theory into practice, 37*(1), 64-71.

Harvey, B. (1998). Reasoning with computers: Inference vs. Backtracking. *International Journal of Computers for Mathematical Learning, 3*(1), 81-92.

Healy, J. (1999). *Failure to connect*. New York: Simon & Schuster.

Henderson, L. (1996). Instructional Design of Interactive Multimedia: A cultural Critique, *Educational Technology Research and Development, 44*(4), 85-104.

Honey, M., Culp, K., & Spielvogel, R. (1999). *Using technology to improve student achievement*. Retrieved May 15, 2002, from The North Central Regional Educational Laboratory Web site: http://www.ncrel.org/sdrs/areas/issues/methods/technlgy/te800.htm.

ISTE NETS for Students. (2003a). *Curriculum Examples and Scenarios*. (n.d.). Retrieved June 4, 2003, from http://cnets.iste.org/students/s_example-35.html

ISTE NETS for Students. (2003b). *Essential conditions to make IT happen*. Retrieved June 4, 2003, from http://cnets.iste.org/students/s_esscond.html

Joldersma, C. (2001). The tension between justice and freedom in Paulo Freire's epistemology. *Journal of Educational Thought, 35*(2), 129-148.

Jonassen, D. (1991). Objectivism versus constructivism – Do we need a new philosophical paradigm? *Educational Technology Research and Development, 39*(3), 5-14.

Kafai, Y., Franke, M., Shih, J., & Ching, C. (1998). Game design as an interactive learning environment for fostering students' and teachers' mathematical inquiry. *International Journal of Computers for Mathematical Learning, 3*(2), 149-84.

Kleiman, G. (2000). Myths and realities about technology in K-12 schools. In D.T. Gordon (Ed.), *The digital classroom* (pp. 7-18). Cambridge, MA: Harvard Education Letter.

Ladson-Billings, G. (1995). But that's just good teaching! The case for culturally relevant pedagogy. *Theory into Practice, 34*(3), 159-65.

Lajoie, S., Lavigne, Nancy C., Guerrera, C., & Munsie, S. (2001). Constructing knowledge in the context of BioWorld. *Instructional Science, 29*(2), 155-86.

Levinas, E. (1985). *Ethics and infinity, Conversations with Philippe Nemo.* Pittsburgh: Duquesne University Press.

Levinas, E. (1998). *Totality and infinity*. Pittsburgh: Duquesne University Press.

Lynn, L. (1995). Computers and equity. *Rethinking Schools, 9*(4), 16-17.

Maxwell, D. (2000). Technology and inequality within the United States School Systems. *Journal of Educational Thought, 34*(1), 43-57.

McAdoo, M. (2000). The real digital divide: Quality not Quantity. In D. T. Gordon (Ed.), *The digital classroom* (pp. 143-150). Cambridge, MA: Harvard Education Letter.

McCarthy, C. (1998) *The uses of culture: Education and the limits of ethnic affiliation*. New York: Routledge.

Means, B., Blando, J., Olson, K., Middleton, T., Morocco, C., Remz, A., & Zorfass, J. (1993). *Using technology to support education reform.* Retrieved May 15, 2002, from The U.S. Department of Education Web site: http://www.ed.gov/pubs/EdReformStudies/TechReforms/

Milbury, P., & Silva, B. (1998). Problem-based learning, primary sources, and information literacy. *MultiMedia Schools, 5*(4), 40-44.

Morrison, T. (1992) *Playing in the dark: Whiteness and the literary imagination*. New York: Vintage Books.

Muffoletto, R. (2001). *Education and technology: Critical and reflective practices.* Cresskill, NJ: Hampton Press.

Niederhauser, D., & Stoddart, T. (2001). Teacher's instructional perspectives and use of educational software. *Teaching and Teacher Education, 17*(1), 15-31.

Nowicki, S. (1999). Information literacy and critical thinking in the electronic environment. *Journal of Instruction Delivery Systems, 13*(1), 25-28.

Oliver, K., & Hannafin, M. (2000). Student management of Web-based hypermedia resources during open-ended problem solving. *Journal of Educational Research 94*(2), 75-92.

Oxfam International (n.d.). *Debt relief for Tanzania: An opportunity for a better future.* Retrieved May 14, 2002, from Web site: Oxfam International http://www.caa.org.au/oxfam/advocacy/tanzdebt/index.html

Peperzak, A., Critchley, S., & Bernasconi, R. (1996). *Emmanuel Levinas basic philosophical writing.* Bloomington, IN: Indiana University Press.

Perkins, D. (1991). What constructivism demands of the learner. *Educational Technology, 31*(9), 19-21.

Pinar, W. (1993). Notes on understanding curriculum as a racial text. In C. McCarthy & W. Crichlow (Eds.), *Race, identity and representation in education* (pp. 60-70). New York: Routledge.

Popkewitz, T. (1997). A changing terrain of knowledge and power: A social epistemology of educational research. *Educational Researcher, 26*(9), 18-29.

Popkewitz, T. (1998). Dewey, Vygotsky, and the social administration of the individual: Constructivist pedagogy as systems of ideas in historical spaces. *American Educational Research Journal, 35*(4), 535-570.

President's Committee of Advisors on Science and Technology, Panel on Educational Technology (1997). *Report to the President on the use of technology to strengthen k-12 education in the United States.* Retrieved February 13, 1999, from The United States Government Office of the President, Washington, DC Web site: http://www1.whitehouse.gov/WH/EOP/OSTP/NSTC/PCAST/k-12ed.html

Roblyer, M., & Edwards, J. (2000). *Integrating educational technology into teaching.* Columbus, OH.: Merrill.

Rose, E. (2002). Boundary talk: A cultural study of the relationship between instructional design and education. *Educational Technology, 42*(6), 14-22.

Scott, J. (1992). Experience. In J. Butler & J. Scott (Eds.), *Feminists theorize the political* (pp. 22-40). New York: Routledge.

Sheingold, K., Martin, L., & Endreweit, M. (1987). Preparing urban teachers for the technological future. In R. Pea & K. Sheingold (Eds.), *Mirrors of mind: Patterns of experience in educational computing* (pp. 67-85). Norwood, NJ: Ablex Publishing.

Shutkin, D. (1997). Schooling in an age of information: Governmental rationality & the care of the child. *Quarterly Journal of Ideology, 20*(3 & 4), 99-166.

Shutkin, D. (1998). The deployment of information technology & the augmentation of the child. In T. Popkewitz & M. Brennan (Eds.), *Foucault's challenge: Discourse, knowledge and power in education* (pp. 205-229). New York: Cresskill, NJ: Hampton Press.

Shutkin, D. (2001). Technology, the pleasures of the interface & the psychology of motivation. In R. Muffoletto (Ed.), *Technology: Reflective practices* (pp. 259-284). Cresskill, NJ: Hampton Press.

Shutkin, D. (In Press). Virtual community and ethical difference in the field of education. *JCT: The Journal of Curriculum Theorizing.*

Spiro, R., Feltovich, P., Jacobson, M., & Coulson, R. (1991). Cognitive flexibility, constructivism, and hypertext. *Educational Technology, 31*(5), 24-33.

Striebel, M. (1991). A critical analysis of the use of computers in education. In D. Hlynka & J. Belland (Eds.), *Paradigms regained: The uses of illuminative, semiotic, and post-modern criticism as modes of inquiry in educational technology: A book of readings* (pp. 283-333). Englewood Cliffs, NJ: Educational Technology Publications.

The World Bank Group (n.d.). *Beyond economic growth: Meeting the challenges of global development.* Retrieved May14, 2002, from The World Bank Group Web site: http://www.worldbank.org/depweb/beyond/beyond.htm.

Vadeboncoeur, J. (1997). Child development and the purpose of education: A historical context for constructivism in teacher education. In V. Richardson (Ed.), *Constructivist teacher education* (pp. 15-37). Washington, DC: The Falmer Press.

Venn, C. (1984). The subject of psychology. In J. Henriques, W. Hollway, C. Urwin, C. Venn, & V. Walkerdine (Eds.), *Changing the subject: Psychology, social regulation and subjectivity* (pp. 119-152). New York: Methuen.

Voithofer, R. & Foley, A. (2002). Post-IT: Putting postmodern perspectives to use in instructional technology – A response to Solomon's "Towards a Post-Modern Agenda in Instructional Technology." *Educational Technology Research and Development, 50*(1), 5-14.

Walkerdine, V. (1988). *The mastery of reason: Cognitive development and the production of rationality.* New York: Routledge.

Woolgar, S. (1988). *Science: The very idea.* New York: Methuen.

Zevenbergen, R. (1996). Constructivism as liberal bourgeois discourse. *Educational Studies in Mathematics, 31*(1-2), 95-113.

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