2016-09-01

Learner Agency and Responsibility in Educational Technology

Michael Thomas Matthews
Brigham Young University

Learner Agency and Responsibility in Educational Technology

Michael Thomas Matthews

A dissertation submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Stephen C. Yanchar, Chair
David D. Williams
Richard E. West
Royce M. Kimmons
Jonathan S. Spackman

Department of Instructional Psychology and Technology

Brigham Young University

ABSTRACT

Learner Agency and Responsibility in Educational Technology

Michael Thomas Matthews
Department of Instructional Psychology and Technology, BYU
Doctor of Philosophy

Though the topic of learner agency has received relatively little discussion in the literature of educational technology, it is nevertheless a significant and actually omnipresent concern of both scholars and practitioners. Through the journal-ready articles contained herein, I show how theories of learning and certain practices of instructional designers reflect implicit positions on the agency of learners. I also discuss agency in more concrete terms as the responsibility for learning that is shared with learners in instructional design contexts. In addition, I provide practical suggestions to help designers keep the learner at the forefront of their design thinking. Through this research, I hope to make the broad philosophical concept of agency more accessible and practical, and to outline some initial directions for further inquiry and practical application in the field of educational technology.

Keywords: agency, assumptions, cooperation, design practices, instructional design, learners, learning, responsibility, technology

ACKNOWLEDGEMENTS

I'd like to thank my committee members, for their help in polishing this rough-hewn work. Thank you to Dr. Yanchar, whose vision and understanding has been a continual source of inspiration and guidance. Thank you to my wife, Katherine, for helping me see the value of getting practical about philosophical issues, and for supporting me through my many years of schooling. Finally, thanks be to God for supporting me "under trials and troubles of every kind" (Alma 36:27), "for it was given unto as many as called upon God to write by the spirit of inspiration" (Moses 6:5).

TABLE OF CONTENTS

LIST OF TABLES

DISSERTATION DOCUMENT INTRODUCTION

A recent sketch of the field of educational technology showed that the new millennium has seen an increased focus on learner participation, experience, and engagement (Wilson, 2012). This broad trend can be seen through the emergence and heightening of several schools of thought within the educational technology literature that emphasize the role of the learner in the teaching and learning enterprise. The foundational works of John Dewey (1916) and David Kolb (1984) have inspired the experiential learning movement, whose adherents advocate for learners to be treated as self-directed active participants (Lindsey & Berger, 2009). Constructivists have defined the learner as an active meaning-maker who constructs knowledge through participation in authentic experiences (Jonassen, 1991; Lebow, 1993; Wilson, 2012). And recent interest among instructional designers concerning the aesthetic dimension of learning experiences indicates an emphasis on the value of learner engagement (Parrish, 2009; Wilson, & Parrish, 2011). These approaches within the field of educational technology all seem to emphasize the agency of learners, in one way or another, and heighten the learner's responsibility for learning.

One of the oldest philosophical questions known to mankind concerns the nature and origin of human action: is an individual the cause of his or her own actions, or are those actions the result of some other power or set of forces? In the field of educational technology, this question can be restated as follows: are learners the cause of their own learning, or is learning the effect of some other cause? How we respond to this question will be profound in depth and sweeping in its implications, as any answer to this question is a philosophical commentary on the nature of human action that would have implications for teaching and designing.

As I argue in this dissertation, the field of educational technology stands to benefit tremendously from increased awareness of, and critical reflection on, issues related to learner

agency (or lack thereof). Scholars within educational technology could increase critical examination of, and innovative generation of, theories of learning that harmonize with agentic or deterministic accounts of learners; practitioners could develop professionally by reflecting on their own assumptions about learners and learning itself, in order to critically examine and constructively synthesize new approaches to designing instruction for learners, including approaches that emphasize and heighten the learner's responsibility for learning.

This document contains publication-ready versions of three articles, each written as part of an overall program of research dedicated to making the concept of agency more accessible and applicable within the field of educational technology. Article 1 was prepared for publication in *Educational Technology and Society*, Article 2 for *Educational Technology, Research & Development*, and Article 3 for *TechTrends*. The formatting of each article below represents conformity with the author guidelines for publication in each of these journals. (Note: Tables are numbered at the overall dissertation level for ease of reference.)

ARTICLE 1: Learner Agency in Educational Technology Learning Theories

Learner Agency in Educational Technology Learning Theories

Michael T. Matthews*, Stephen C. Yanchar
Instructional Psychology and Technology, Brigham Young University //
mthomasmatthews@gmail.com // stephen_yanchar@byu.edu
*Corresponding author

ABSTRACT

Theories of human learning are based on underlying assumptions, including those that have to do with human agency. However, these assumptions are not typically articulated, contextualized, and evaluated within the literature of educational technology. This paper offers a review of three prominent learning theories within the field—self-regulated learning, situated learning, and constructivism—to examine their assumptions regarding learner agency or determinism. Potential benefits for further disciplinary discussion about learner agency and determinism are also outlined. It is argued that more focused attention on the topic of human agency is important because an understanding of what humans are (e.g., agents or determined beings) logically shapes positions on subsequent issues such as how humans learn and how they should be instructed.

Keywords
Agency; Free Will; Learning; Critical Thinking; Assumptions

Introduction

In 1991, Lave and Wenger wrote that "All theories of learning are based on fundamental assumptions about the person, the world, and their relations" (p. 47). Without at least some awareness of the basic assumptions and implications of learning theories, scholars and practitioners in educational technology risk committing the kind of error that Wenger (1998) warned about:

If we proceed without reflecting on our fundamental assumptions about the nature of learning, we run an increasing risk that our conceptions will have misleading ramifications . . . it is our *conception* of learning that needs urgent attention when we choose to meddle with it on the scale on which we do today. . . . The farther you aim, the more an initial error matters (p. 9; italics in original).

In light of this concern, Wenger recommended that designers in education "become reflective with regard to [their] own discourses of learning and to their effects on the ways [they] design for learning" (p. 9). We second Wenger's call for careful consideration of various conceptions of learning and propose that the issue of learner agency (or free will) is of primary importance in this pursuit of more reflective practice. We suggest that assumptions about learner agency inform theories about human learning, and have implications for practical matters such as instruction, design, and technology. Thus, this article represents a call for more disciplinary awareness, discussion, and critical analysis of the implicit assumptions underlying learning theories in the field of educational technology.

Writers within educational psychology have produced works that discuss the issue of learner agency directly, especially in connection with self-regulated learning (Martin, 2004; McCombs & Marzano, 1990; Stefanou, Perencevich, DiCinto, & Turner, 2004). In educational technology, however, many articles have included only brief and unclarified references to some notion of learner agency that is assumed to be real (Lebow, 1993; Song, Wong, & Looi, 2012; Wilson & Parrish, 2011; see also Lindgren & McDaniel, 2012, for one exception to this finding). Some have referred to a learner's ability to construct knowledge as epistemic or epistemological agency (Cacciamani, Cesareni, Martini, Ferrini, & Fujita, 2012; Hyslop-Margison, 2004; Scardamalia & Bereiter, 1991), or have written about learner autonomy in selecting and completing academic tasks (see Dlaska, 2002; Rienties, Giesbers, Tempelaar, Lygo-Baker, Segers, & Gijselaers, 2012). Other writers have discussed the agency of the instructional designer in effecting change (Campbell, Schwier, & Kenny, 2005 and 2009; Ellaway, Begg, Dewhurst & Macleod, 2006), or agency generally as "the human element in our designs" (Wilson, 2013 p. 42). This paper, on the other hand, represents an initial effort to review conceptions of agency as a basic aspect of human intention and action. Thus, in response to the recent call for a more careful and coherent theoretical foundation for the field (Evans, 2011), we suggest that the issue of learner agency and responsibility for learning should be made a matter of critical analysis.

We will briefly describe the importance of the agency and determinism debate, then examine how scholars have addressed (or failed to address) agency in three prominent learning theories, and finally, make suggestions regarding how the field can deal more productively with this aspect of learning.

The agency and determinism debate

Philosophers (Kane, 2005; Griffith, 2013) and psychologists (Martin, Sugarman, & Thompson, 2003; Sappington, 1990) have historically acknowledged three positions in this debate: hard determinism, libertarianism (or agency), and soft determinism, each with its own variations. While there are other positions as well (Guignon, 2002; Williams, 1992; Yanchar, 2011), these three have been predominant throughout the history of this debate. A hard determinist position is taken by those who argue that human intentions and actions are caused by forces of nature other than the acting human per se. Thus, a hard determinist would claim that forces other than the acting human (whether external or internal to the human) are ultimately responsible for the intentions and actions of an individual (for further description and examples of this kind of thinking, see Sappington, 1990, and Skinner, 1947 and 1974, respectively).

Libertarian positions take root in the opposite notion that people are the originating causes of their own intentions and actions, and are thus ultimately responsible for their own intentions and actions. In this view, humans are self-determining in some sense, and thus the assumption of human agency is incompatible with the assumption that other forces such as natural laws fully govern human intention and action. Finally, in between the two extremes of hard determinism and libertarianism lies a third alternative, frequently referred to as soft determinism. As Sappington (1990, p. 20) summarized, "This view says that people do make conscious choices between different courses of action, and that these choices do affect their lives. However, according to this view, the choices themselves are determined by other factors." Adherents to this position are referred to as *compatibilists* because they claim that human choice is compatible with determining forces acting on the individual. A common libertarian objection is that if "free" human action is still ultimately determined by other causes, then the real originative source of human action remains something other than the individual, and the position remains essentially deterministic (Kane, 2005). But because it includes human choice (as the last link) in the overall chain of causation leading to human actions, it is seen as a softer view of determinism.

The difficulty of the debate

The well-known philosopher and psychologist William James concluded that the debate between agency (or free will) and determinism cannot be solved by an appeal to facts, because it pivots on the question of whether or not it is possible for an action or event to have occurred otherwise than it actually did:

Only facts can be proved by other facts. With things that are possibilities and not facts, facts have no concern. If we have no other evidence than the evidence of existing facts, the possibility-question must remain a mystery never to be cleared up (1897/1954, p. 152).

According to James, facts alone are insufficient as evidence in matters of possibility. He claimed that the position one takes on this debate would, at bottom, be composed of prior philosophical commitments regarding the nature of human action. Despite declaring the debate scientifically unsolvable at the time, James felt that there was value in considering the issues involved—as philosophical as they were (and still are)—because one's position in this regard will make a difference in one's stand on very practical matters such as attributing responsibility to people for their intentions and actions.

Nearly one hundred years later, Sappington (1990) expressed a similar sentiment concerning the philosophical nature of the debate, referring to various positions as "meta-assumptions" that can guide theoretical and practical work:

It should not be supposed that, because meta-assumptions are not meant to be tested, they have no importance. Theories based on a meta-assumption of free will may be more likely to examine constructs such as purpose or conscious choice than theories based on a meta-assumption of determinism. … Thus, meta-assumptions such as free will, although not verifiable themselves, can guide the gathering of data (p. 27).

If this is the case, then, it seems that one's assumptions regarding agency and determinism would be relevant to the work of scholars and practitioners, for example, in how they conceive of, and design for, learning.

Relevance for educational technology

Over many decades, a debate has been carried on within the discourse of educational technology concerning this same basic issue of agency and determinism. Some have suggested that the work of instructional design is akin to engineering instruction based upon scientific principles of learning. These take some form of determinism as their meta-assumption. Such persons advocate for a stronger focus on empirically-derived principles of learning (e.g., Clark, 2009), findings from evidence-based practice (e.g., Clark & Mayer, 2011), or on "the evidence from learning science" (Saxberg, 2015, p. 1). Speaking hypothetically, if a learner's learning, intentions, and actions are ultimately caused by the operations of factors other than the learner, then instructional designers who know how to design in accordance with those factors would be able to guarantee that learning will occur. Such a designer could guarantee high learner motivation (intention) and high learner engagement (action) for the same reasons. And ultimately, such designers would have to assume responsibility for ensuring that learning would occur, because of the underlying assumption that learning can be engineered (for an example of this, see Saxberg, 2015). A hypothetical instructional designer proceeding on the meta-assumption of learning as deterministic would likely lean toward the design of learning environments that seek to shape the learning process and ultimately the learning itself. From this perspective, the human learner would essentially be a natural object to be molded in ways that minimize learning failure and optimize success. That learner would be carefully guided through a very structured curriculum in which outcomes are well predicted and controlled, perhaps in a fashion quite similar to what was seen in behaviorist-derived programmed instruction (McDonald, Yanchar, & Osguthorpe, 2005).

Meanwhile, other voices within educational technology say that instruction and learning are uncertain and nondeterministic enterprises. Objections include arguments that scientific research isn't as objective as it claims to be (Jonassen et al., 1997), that instructional designers are human instruments whose actual design work doesn't match prescribed processes (Tracey & Boling, 2014), and that instruction and learning are inherently nondeterministic phenomena (Jonassen et al., 1997). They take some form of human agency as their meta-assumption, which guides their work. These individuals focus on the human qualities of instructional design, the unpredictability of learning situations, and even the aesthetic qualities of learning experiences as nondeterministic (Boling et al., 2004; Parrish, Wilson, & Dunlap, 2011). Again speaking hypothetically, if a learner's intentions, actions, and learning are caused by the learner, as an agent enacting her own free will, then instructional designers assuming as much would not be able to guarantee learning, high learner motivation, or engagement, because of the learner's free will. An instructional designer operating under the meta-assumption of learners as agents may seek to emphasize learner choice regarding crucial aspects of the learning experience, creative problem solving in order to explore course content, and the meaning of course subject matter. From this perspective, an overriding concern might be to allow agent-learners to be self-directed through much of the learning experience because the learners are, fundamentally, the kinds of beings that operate according to their own purposes.

Learning theories

We suggest that learning theories espoused in the field of educational technology are a fruitful starting place to search for meta-assumptions of learner agency or determinism. To begin such an examination of theoretical assumptions concerning learners and learning, we reviewed three prominent theories of learning that seem to lean towards some understanding of learners as agents. Agency-oriented positions in the field are typically associated with learner choice, intention, purposive exploration, and active creation of knowledge. In this sense, many theories of learning in the field seem to be dealing with the philosophical issue of human agency by offering learners choices. However, as we will suggest, the conceptions of agency underlying these positions have not been articulated, theoretically developed, or subjected to critical scrutiny. And while space permits an examination of only a few learning theories in the scholarly literature and our recommendations for future critical examination, we will also briefly suggest some ways instructional design practitioners can reflect on and examine their own informal and unarticulated positions on the nature of learning.

Methods for reviewing the literature

We examined formal theoretical perspectives that seemed to explore human agency as part of their conception of learning. Especially significant were prominent theories that seemed to provide some commentary, even if only implied, on the nature of learners as agents. We considered *self-regulated learning*, according to which learners are capable of regulating their own learning processes; the *situated learning* perspective, in which learners are described as legitimate peripheral participants in communities of practice; and *constructivism*, in which learners are theoretically conceived of as reality- or knowledge-constructors, and in practice are frequently given a high degree of freedom and choice concerning their learning activities. Having chosen these theories for analysis, we sought literature that either (a) connected these learning theories to human agency explicitly, or (b) entailed the most representative works on the theory of learning in question, hoping to find clues about the authors' positions on learner agency or determinism in their theoretical accounts.

We determined representativeness of works by examining Google Scholar for a combination of earliest-dated works, high citation counts, original authors, and sources that would be familiar and accessible to instructional designers. For instance, the most widely cited work on constructivism was found to be a math education book by Ernst von Glasersfeld on radical constructivism published in 1995. While this book was the most widely cited in our search, we selected an earlier article by David Jonassen (1991) as the single most representative work for traditional (not radical) constructivism, on the basis that it was an early article, still widely-cited, and published in a journal likely to be familiar to instructional designers. In our attempt to address broad theoretical perspectives, we included additional writings that were similarly representative and helped offer a more thorough description of the learning theory in question. Thus, we attempted to review the literature that is most representative of the field's engagement with the issue of learner agency as it relates to the theories of learning we selected for analysis.

Findings

For each major learning theory listed above, we describe how we selected the literature to be reviewed, offer a brief description of the contents of the works reviewed, and provide an analysis of their treatment of the issue of learner agency.

Self-regulated learning

Martin (2004) offered a detailed exposition of the form of agency undergirding self-regulated learning in an article titled "Self-Regulated Learning, Social Cognitive Theory, and Agency." According to Martin, Bandura's social cognitive perspective provides a theoretical basis for claims that self-regulated learning is fundamentally agentic in nature, which Martin described as containing "genuine elements of both constructivist and socioculturalist perspectives" (p. 136). He first oriented the reader to the major concepts within the centuries-long debate over agency and determinism. He pointed out that, in the discipline of psychology at least, scientists and practitioners advocating some version of human agency must articulate

a kind of self-determination that is both determined and determining. . . . [T]his psychological Holy Grail must be both demonstrably determined by physical, biological, and sociocultural factors and conditions, yet must somehow be taken over by persons themselves and used with intention to move them toward their goals (p. 137).

Martin then quoted Bandura (2001), who described his proposed origin of human agency by contending that "social cognitive theory subscribes to a model of emergent interactive agency" (p. 4). The concept of emergence refers to a process wherein something of greater complexity arises out of, but is unable to be reduced to, something simpler and more fundamental. Martin explains that Bandura's emergent interactive agency depends on the interaction of thought processes (as emergent brain states) within the social context of the agent, and that any resulting ability to choose is fundamentally different enough from the brain states and social context alone to be an entirely new kind of phenomenon. Bandura described his own position on learner agency as compatibilist (or soft-determinist) in nature: "Because self-influence is an interacting part of the determining conditions, human agency is *not incompatible* with the principle of regulative causality" (2006, p. 165; emphasis added).

For its depth and technical precision, Martin's (2004) article is impressive. He, along with Bandura, appear to be some of the few scholars who offer a clear description of how self-regulated learning theory is informed by a view

of agency in the philosophical language of the original debate. Indeed, we found no other articles within educational psychology or educational technology that explicitly discussed the nature of agency underlying views of self-regulated learning. While it is important that scholars like Bandura and Martin articulate their positions, and even offer implications for educational practice, useful insights can be gained from critically examining the underlying assumptions and implications of these positions in more depth than we have done here. For example, concepts of emergence similar to Bandura's have been described as "radical kind emergence," (van Gulick, 2001), or as "strong emergence" (Bedau, 1997; Chalmers, 2006). Both terms denote something roughly equivalent—a higher-order phenomenon that is determined (by emerging from lower-order phenomena) and determining (exerting forces on the lower-order phenomena), and is yet incapable of being reduced to or explained in terms only of the lower-order phenomena. Martin (2004) referred to this kind of emergence as a "Holy Grail" (p. 137), while others have criticized the plausibility of such a notion (Bedau, 1997; Gantt & Williams, 2013). Thus, a more careful look at Bandura's concept of emergence as it relates to the development of human agency would reveal the strengths and weaknesses of this concept as an aspect of agentic theorizing.

Situated learning

Works from the situated learning perspective describe learners as apprentices participating in sociocultural contexts. For example, Brown, Collins, and Duguid (1989) stated that "[t]o learn to use tools as practitioners use them, a student, like an apprentice, must enter that community and its culture. Thus, in a significant way, learning is, we believe, a process of enculturation" (p. 32). Their emphasis was on students learning to use the tools of, and participate in the culture and practices of, real-world practitioners. In another article, Collins, Brown, and Holum (1991) provided recommendations for how to facilitate this process of enculturation in ways that align with "the basic notion of apprenticeship: showing the apprentice how to do a task and helping the apprentice to do it" (p. 8), "aimed at encouraging *learner autonomy*, not only in carrying out expert problem-solving processes but also in defining or formulating the problems to be solved" (p. 43; emphasis added). These early contributions in the area of situated learning describe learners as apprentices becoming capable of independent autonomous action within the cultural context of a given practice.

Without additional theoretical elaboration, this perspective on learning seemed to offer only glimmers of some form of learner agency, which could be seen in its emphasis on active learner participation in cultural activities. But in 1991, Lave and Wenger published what may be the most representative work on situated learning. They emphasized the social and relational over the individual in their account of learning: "the relational interdependence of agent and world, activity, meaning, cognition, learning, and knowing" (p. 50). In their view, "agent, activity, and the world mutually constitute each other" (p. 33). However, Lave and Wenger made no clear attempt to explicate or defend their specific position on the nature of learner agency. They briefly referenced Giddens' (1979) structuration theory as one possible way of overcoming the traditional dichotomy between agency and social forces, but their overall emphasis in the book remained on the social and relational, rather than returning to a discussion of individual agents. They seemed to suggest that the more fundamental phenomenon behind learning was the learner's enculturation into the community of practice: "[T]he process of becoming a full participant in a sociocultural practice … includes, indeed it subsumes, the learning of knowledgeable skills" (p. 29). This claim seems to grant considerable power to social forces and leaves unanswered the question of what kind of agency, if any, can plausibly exist within or alongside such social structures.

In a later work, Wenger (1998) clarified the preeminence of the social in situated learning, indicating that he was not proposing an extreme theory of social structure in which individuals have no agency; yet his work also lacked specificity concerning the agency of individuals, or the connection between an individual's agency and learning. Wenger's clearest references to the agency of individuals were made in his efforts to avoid being misunderstood. He described his interpretation of situated learning as somewhere in the middle between theories of social structure and theories of situated experience, and between theories of collectivity and theories of subjectivity. In avoiding traditional distinctions of agency versus structure, and collectivity versus subjectivity, Wenger sought to define learning in a new way. His new terminology, however, offered no clear statement about the nature of learner agency itself. Moreover, per our review, subsequent works from the situated learning perspective have not directly addressed this basic question regarding the status of humans as learners.

Constructivism

As described above, we selected Jonassen's (1991) article, "Objectivism versus Constructivism: Do We Need a New Philosophical Paradigm?" as the most representative single article of the constructivist position for instructional designers. In it, Jonassen compared the philosophical paradigm of constructivism with the more entrenched paradigm of objectivism. After describing the historical shift in instructional design and technology from behaviorism to cognitivism, Jonassen surmised, "Perhaps IST has not accommodated or even adequately conceptualized the mind in its theories of learning because the psychological revolution [from behaviorism to cognitivism] did not include a commensurate philosophical revolution in the field to adequately accommodate the mind" (p. 6). Jonassen then described fundamental philosophical commitments underlying the objectivism implicit in behaviorism and cognitivism, and suggested that change toward constructivism needed to be made at this philosophical level. After describing constructivism more explicitly, in philosophical and practical terms, Jonassen proposed several practical changes that would result from a disciplinary move toward a constructivist philosophy.

Because Jonassen (1991) provided no definitive statement in his description of constructivism regarding learner agency, we could only examine how he described learners' construction of knowledge for clues to his position on this issue. Jonassen's use of active verbs such as construct, interpret, create, and produce, all as part of mental activity, could suggest a learner who is an agent in some fashion—active and involved in his or her own learning.

However, other statements from Jonassen in the same article (1991) raise questions about the role of the mind in learning. For example, he asserted that in constructivism, one's "world is created by the mind" (p. 10); "what we know as individuals is what the mind produces" (p. 10); and "how one constructs knowledge is a function of the prior experiences, mental structures, and beliefs that one uses to interpret objects and events" (p. 10). Jonassen claimed that constructivism began with Immanuel Kant, the philosopher who posited that a priori mental structures enable knowledge construction. What remained to be explained by Jonassen, in interpreting constructivist learning for instructional designers, was the nature of these mental structures: are they determined by biological or cognitive mechanisms, or are they the result of the originative efforts of an agent-learner? And what argumentation can be marshaled to support either position?

Other constructivist writers have placed similar emphasis on the primacy of mental structures in learning, but also without explaining their either agentic or determined nature. Following Piaget, Rieber (1996) stated: "Learning is defined as the construction of new knowledge resulting from the resolution to the [epistemic] conflict" that arises when one is confronted by some aspect of "an ever-changing environment" which is eventually "resolved as fitting an established mental structure (i.e., assimilation), or a new structure is formed (i.e., accommodation)" (p. 47). Additionally, Rieber (1992) described an "equilibrium process" (p. 101) within learners as "the heart of constructivism . . . the idea that learning involves individual constructions of knowledge and is accomplished through the process of *equilibration*" (p. 94; emphasis in original). Rieber explicitly cited Piaget as another source for the constructivist notion of knowledge structures, but again, without explaining either the determinant or agentic nature of those structures.

Rieber did, however, describe the operations of the mind in constructing knowledge: "Assimilation and accommodation are the two well-known enabling *mechanisms* of equilibration. They operate on the *natural tension* caused by an individual's need for an organized and ordered world while constantly being confronted by the need to adapt" (1992, p. 94; emphasis added). By describing learning in terms of a process driven by mechanisms that operate on this natural tension, Rieber's account of constructivist learning as an internal mechanistic process could be read as a deterministic position on learner agency; but this is only one possible interpretation, since he did not clarify the nature of the mental processes at work. A more detailed exposition of these processes and mechanisms would clarify the assumptions underlying this approach and suggest further implications of those assumptions for instruction.

Moving forward

Although the learning theories we reviewed might entail elements of human agency, sometimes in their most representative works, we found that their positions on the matter were difficult to ascertain. And as noted earlier, the debate over agency and determinism has much to offer the field of educational technology, in terms of both theory and practice. Analysis of theories about human learning, and efforts to design instruction in accordance with such

theories, reveal what they implicitly assume regarding humans generally and learners specifically. For this reason, we invite discussion within the field that examines learning theories in light of agency. As we will now suggest, this perspective offers the field both a critical thinking tool with which to analyze existing learning theories and accompanying practices, as well as a resource for creating new theories and practices rooted in some conception of agency, compatibilism, or determinism.

Analysis

We recommend critical analysis of the underlying assumptions within learning theories regarding agency and determinism, and of what those assumptions imply for the design of learning environments. Similar to the affordances and constraints of technological tools discussed in our field (Gibson, 1979; Ryder & Wilson, 1996), conceptual tools such as theories and models of learning create certain possibilities for design and foreclose on others. Understanding the conceptual affordances of learning theories, especially as they relate to the issue of learner agency, will enable individual practitioners to better utilize, modify, or reject theories and practices available in the field. As we mentioned previously, clarifying the nature of learning theories would be profitable in a practical sense, given that what one assumes about learning will inform instruction in some manner.

Following the pattern offered by our review of theories in this work, one example of this kind of critical examination could be to revisit the work of Jean Piaget (or other prominent figures associated with learning theories) and critically analyze where he seems to have positioned himself in the agency and determinism debate. Related examinations could potentially include reading the works of Vygotsky, to analyze his writings for elements of either agentic or deterministic thought. Since Piaget and Vygotsky are frequently named in discussions of constructivist learning, a close look at the works of both individuals would be illuminating for the constructivist movement in the field. Such in-depth examination of theories would help scholars and practitioners better understand the ideas in question and articulate their own positions in the debate—possibly including variations of the positions they examine. Additionally, these critical examinations could be undertaken from a variety of analytical perspectives. For example, what would a post-structuralist, feminist, or social justice analysis of extant learning theories conclude?

This kind of critical thinking can also include analysis of models of instruction and instructional design, especially regarding their assumptions about learner agency. This would be useful regardless of whether a model of instruction claims alignment with a particular theory of learning. For example, what kind of learner agency (if any) is presumed in Merrill's (2002) first principles of instruction, and the kinds of learning activities recommended therein? Or do certain models for designing instruction, such as van Merriënboer's 4C/ID model (2003), necessitate deterministic views of phenomena such as automaticity?

Additionally, theories of learning and models of design could be analyzed for their support for, or control of, learner behavior. The tendency toward control of learner behavior has been documented in both past and present endeavors within educational technology (McDonald, Yanchar, & Osguthorpe, 2005). One possible avenue for critical examination could include consideration of how learner behavior and choices are either supported or controlled under certain theories of learning and models of instruction. These pursuits and many like them can be undertaken in an effort to better understand the conceptual resources available in the field of educational technology.

Synthesis

We suggest that one aspect of best (or better) practices in any profession involves awareness of one's own assumptions as unacknowledged guiding influences (for a thorough example of this kind of reflexivity and explication in the field of psychology, see Slife, 1998; Slife & Williams, 1995; Yanchar, Slife, & Warne, 2008). For practitioners in the field, such critical examinations of one's own assumptions in light of available theories can yield practical insight and the development of more workable concepts to guide design work. This would occur as theories are considered in light of a practitioner's own emerging views regarding issues such as learner agency. For example, a designer may critically examine (or read a critical examination of) a theory she commonly draws from in her work and find that she disagrees, at some level, with some of its precepts. As part of that designer's professional development, she now has an opportunity to more fully articulate her own position on learner agency, and potentially re-construe or repurpose certain aspects of that learning theory (or others) in a way that resonates more fully with her own emerging position.

While eclecticism is certainly an option, the approach we describe here can allow practitioners to have a position that is flexible and capable of incorporating other ideas even if they have to be reworked in some way to fit with one's view of learner agency. This kind of flexibility has been advocated as a way of engaging the theoretical work of our scholars that leads to flexible and effective, yet critically examined and evolving design practices, and represents one way in which practicing designers can make use of theoretical knowledge relevant to their work (Yanchar & Gabbitas, 2011).

Beyond the repurposing of already-existing theories, educational technology scholars and practitioners who are at least somewhat familiar with the debate over agency may be able to synthesize entirely new instructional theories or models that align with a position in the debate. A more thorough understanding of positions on learner agency represented in the field can help individuals better orient themselves among the conceptual possibilities, and will enable scholars and designers, as they seek to articulate their positions, to generate innovative positions to help inform the design of instruction. Thus, an understanding of these positions can lead to more creativity within the field, not just in the large domains of learning, instruction, and design, but also in relevant sub-domains such as motivation, learner engagement, instruction in particular settings, and general design principles that cohere with an agency-oriented view of learning.

As an example of such a synthesis, we note that none of the learning theories we reviewed seemed to include elements of genuine libertarianism. What might an explicitly libertarian theory of learning look like? And what would be the key features of instruction designed in accordance with that theory? Alternatively, what might a more contemporary, non-behaviorist yet hard-determinist theory of learning look like? And what might an instructional environment designed to align with such a theory entail? And if a theory of learning or a model for designing instruction were intended to support learner choice instead of controlling it, of what might that theory or model consist? New approaches to instruction and its design could be generated that would incorporate an interdependency between learner and instructor (and even designer) that would acknowledge the agency of learners in contributing to the overall educational endeavor. A wide array of possibilities awaits instructional design practitioners and scholars who seek to innovate new understandings of learning, instruction, and design, from either agentic or deterministic points of view.

Conclusion

In conclusion, we suggest that greater attention be paid to learner agency in our disciplinary discourse. It is time to clarify and reevaluate the field's conceptions of learning by critically examining what common theories and models assume about agency. In making this call for increased discussion, we do not advocate a specific position on agency or determinism; we simply wish to raise awareness of the importance of this topic and foster a critical dialogue regarding the various positions involved. Whichever way one may lean in this debate, there is value in being aware of what one assumes and how those assumptions inform practice.

References

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*, 1–26.

Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science*, *1*(2), 164–180.

Bedau, M. A. (1997). Weak emergence. *Noûs, 31,* 375–399.

Boling, E., Eccarius, M., Smith, K., Frick, T. (2004). Instructional illustrations: Intended meanings and learner interpretations. *Journal of Visual Literacy, 24*(2), 185–204.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition the culture of learning. *Educational Researcher*, *18*(1), 32–42.

Cacciamani, S., Cesareni, D., Martini, F., Ferrini, T., & Fujita, N. (2012). Influence of participation, facilitator styles, and metacognitive reflection on knowledge building in online university courses. *Computers and Education*, *58*(3), 874–884. doi:10.1016/j.compedu.2011.10.019

Campbell, K., Schwier, R. A., & Kenny, R. F. (2005). Agency of the instructional designer: Moral coherence and transformative social practice. *Australasian Journal of Educational Technology*, *21*(2), 242–262.

Campbell, K., Schwier, R. A., & Kenny, R. F. (2009). The critical, relational practice of instructional design in higher education: An emerging model of change agency. *Educational Technology Research and Development*, *57*(5), 645–663.

Chalmers, D. J. (2006). Strong and weak emergence. In P. Clayton & P. Davies (Eds.), *Re-emergence of emergence: The emergentist hypothesis from science to religion* (pp. 244–254). Oxford, UK: Oxford University Press.

Clark, R. E. (2009). Translating research into new instructional technologies for higher education: the active ingredient process. *Journal of Computing in Higher Education*, *21*(1), 4–18. doi:10.1007/s12528-009-9013-8

Clark, R. C., & Mayer, R. E. (2011). *e-learning and the science of instruction* (3rd ed.). San Francisco, CA: Pfeiffer.

Collins, A., Brown, J. S., & Holum, A. (1991). Cognitive apprenticeship: Making thinking visible. *American Educator*, *15*(3), 6–11, 38–46.

Dlaska, A. (2002). Sites of construction: language learning, multimedia, and the international engineer. *Computers and Education*, *39*(2), 129–143. doi:10.1016/S0360-1315(02)00031-3

Ellaway, R., Begg, M., Dewhurst, D., & Macleod, H. (2006). In a glass darkly: Identity, agency and the role of the learning technologist in shaping the learning environment. *E-Learning*, *3*(1), 75–87. doi:10.2304/elea.2006.3.1.75

Evans, M. A. (2011). A critical-realist response to the postmodern agenda in instructional design and technology: A way forward. *Educational Technology Research and Development*, *59*(6), 799–815. doi:10.1007/s11423-011-9194-5

Gantt, E. E., & Williams, R. N. (2013). Psychology and the legacy of Newtonianism: Motivation, intentionality, and the ontological gap. *Journal of Theoretical and Philosophical Psychology*. doi:10.1037/a0031587

Gibson, J. (1979). *The ecological approach to visual perception.* Boston, MA: Houghton Mifflin.

Giddens, A. (1979). *Central problems in social theory: Action, structure and contradiction in social analysis.* London, UK: Macmillan.

Griffith, M. (2013). *Free will: The basics.* New York, NY: Routledge.

Guignon, C. (2002). Ontological presuppositions of the determinism-free will debate. In H. Atmanspacher & R. Bishop (Eds.), *Between chance and choice: Interdisciplinary perspectives on determinism* (pp. 321–337). Charlottesville, VA: Imprint Academic.

Hyslop-Margison, E. J. (2004). Technology, human agency and Dewey's constructivism: Opening democratic spaces in virtual classrooms. *Australasian Journal of Educational Technology, 20*(2), 137–148.

James, W. (1897/1956). The dilemma of determinism. In *The will to believe and other essays in modern philosophy* (pp. 145–183). New York, NY: Dover Publications.

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

Jonassen, D. H., Hennon, R. J., Ondrusek, A., Samouilova, M., Spaulding, K. L., Yueh, H.-P., Li, T., Nouri, V., DiRocco, M., Birdwell, D. (1997). Certainty, determinism, and predictability in theories of instructional design: Lessons from science. *Educational Technology*, *37*(1), 27–34. Retrieved from http://www.eric.ed.gov/ERICWebPortal/detail?accno=EJ537923

Kane, R. (2005). *A contemporary introduction to free will.* New York, NY: Oxford University Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.

Lebow, D. (1993). Constructivist values for instructional systems design: Five principles toward a new mindset. *Educational Technology Research and Development*, *41*(3), 4–16.

Lindgren, R., & McDaniel, R. (2012). Transforming online learning through narrative and student agency. *Educational Technology & Society, 15*(4), 344–355.

Martin, J. (2004). Self-regulated learning, social cognitive theory, and agency. *Educational Psychologist*, *39*(2), 135–145.

Martin, J., Sugarman, J., & Thompson, J. (2003). *Psychology and the question of agency.* Albany, NY: SUNY Press.

McCombs, B. L., & Marzano, R. J. (1990). Putting the self in self-regulated learning: The self as agent in integrating will and skill. *Educational Psychologist, 25, 51–69*. doi:10.1207/s15326985ep2501_5

McDonald, J. K., Yanchar, S. C., & Osguthorpe, R. T. (2005). Learning from programmed instruction: Examining implications for modern instructional technology. *Educational Technology, Research and Development*, *53*(2), 84–98.

Merrill, M. D. (2002). First principles of instruction. *Educational Technology Research and Development*, *50*(3), 43–59.

Parrish, P. E., Wilson, B. G., & Dunlap, J. C. (2011). Learning experience as transaction: A framework for instructional design. *Educational Technology*, *51*(2), 15–22.

Rieber, L. P. (1992). Computer-based microworlds: A bridge between constructivism and direct instruction. *Educational Technology Research and Development*, *40*(1), 93–106.

Rieber, L. P. (1996). Seriously considering play: Designing interactive learning environments based on the blending of microworlds, simulations, and games. *Educational Technology Research and Development*, *44*(2), 43–58.

Rienties, B., Giesbers, B., Tempelaar, D., Lygo-Baker, S., Segers, M., & Gijselaers, W. (2012). The role of scaffolding and motivation in CSCL. *Computers and Education*, *59*(3), 893–906. doi:10.1016/j.compedu.2012.04.010

Ryder, M., and Wilson, B. (1996, February). *Affordances and constraints of the Internet for learning and instruction.* Paper presented at the meeting of the Association for Educational Communications Technology, Indianapolis, Indiana.

Sappington, A. A. (1990). Recent psychological approaches to the free will versus determinism issue. *Psychological Bulletin*, *108*(1), 19–29. doi:10.1037//0033-2909.108.1.19

Saxberg, B. (2015). Why we need learning engineers. *The Chronicle of Higher Education*. Retrieved from http://chronicle.com/article/Why-We-Need-Learning-Engineers/229391/

Scardamalia, M., & Bereiter, C. (1991). Higher levels of agency for children in knowledge building: A challenge for the design of new knowledge media. *The Journal of the Learning Sciences, 1*(1), 37–68.

Skinner, B. F. (1947). Experimental psychology. In W. Dennis (Ed.), *Current trends in psychology* (pp. 16–49). Pittsburgh, PA: University of Pittsburgh Press.

Skinner, B. F. (1974). *About behaviorism.* New York, NY: Knopf.

Slife, B. D. (1998). Raising the consciousness of researchers: Hidden assumptions in the behavioral sciences. *Adapted Physical Activity Quarterly, 15*, 208–221.

Slife, B. D., & Williams, R. N. (1995). *What's behind the research? Discovering hidden assumptions in the behavioral sciences*. Sage Publications.

Song, Y., Wong, L.-H., & Looi, C.-K. (2012). Fostering personalized learning in science inquiry supported by mobile technologies. *Educational Technology Research and Development*, *60*(4), 679–701. doi:10.1007/s11423-012-9245-6

Stefanou, C. R., Perencevich, K. C., DiCintio, M., & Turner, J. C. (2004). Supporting autonomy in the classroom: Ways teachers encourage student decision making and ownership. *Educational Psychologist*, *39*(2), 97–110.

Tracey, M. W., & Boling, E. (2014). Preparing instructional designers: Traditional and emerging perspectives. *Handbook of Research on Educational Communications and Technology*, 653–660. doi:10.1007/978-1-4614-3185-5

van Gulick, R. (2001). Reduction, emergence, and other recent options on the mind/body problem: A philosophic overview. *Journal of Consciousness Studies*, *8*(9–10), 1–34.

van Merriënboer, J. J. G., Kirschner, P. A., & Kester, L. (2003). Taking the load off a learner's mind: Instructional design for complex learning. *Educational Psychologist*, *38*(1), 5–13.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity.* New York, NY: Cambridge University Press.

Williams, R. N. (1992). The human context of agency. *American Psychologist*, *47*(6), 752–760

Wilson, B. G. (2013). A practice-centered approach to instructional design. In J. M. Spector, B. Lockee, Barbara, S. E. Smaldino, & M. C. Herring (Eds.), *Learning, Problem Solving, and Mindtools: Essays in Honor of David H. Jonassen* (pp. 35–54). New York, NY: Taylor & Francis.

Wilson, B. G., & Parrish, P. E. (2011). Transformative learning experience: Aim higher, gain more. *Educational Technology*, *51*(2), 10–15.

Yanchar, S. C. (2011). Participational agency. *Review of General Psychology*, *15*(3), 277–287. doi:10.1037/a0024872

Yanchar, S. C., & Gabbitas, B. W. (2011). Between eclecticism and orthodoxy in instructional design. *Educational Technology Research and Development*, *59*(3), 383–398. doi:10.1007/s11423-010-9180-3

Yanchar, S. C., Slife, B. D., & Warne, R. (2008). Critical thinking as disciplinary practice. *Review of General Psychology, 12*(3), 265–281.

ARTICLE 2: Responsibility for Learning in Instructional Design Practice

Responsibility for Learning in Instructional Design Practice

Michael T. Matthews and Stephen C. Yanchar

Brigham Young University

Abstract

This study employed a qualitative research design to investigate instructional designers' underlying views of learner responsibility for their own learning, and how those views informed design practice. Prior research has examined how instructional designers spend their time, make decisions, use theory, and solve problems—but have not explored views of learner responsibility that inform design work. Based on intensive interviews of practitioners in the field, this study produced seven themes concerning how instructional designers balance their own and their learners' responsibility for learning. Overall, these results suggest that designers feel largely responsible for learning to take place, but are seeking ways of sharing that responsibility with their learners. Other conclusions are discussed and future directions for research are offered.

Keywords: assumptions, engagement, instructional design practice, learning, responsibility.

Introduction

The literature within educational technology contains several calls for a clearer understanding of the practices of instructional designers (Kerr, 1983; Rowland, 1992; Smith & Boling, 2009; Wedman & Tessmer, 1993). Given the near-ubiquity of process models such as ADDIE in the instructional design literature, it comes as no surprise to find that most studies of instructional designer practices focus on the degree of designers' adherence to such models (see Christensen & Osguthorpe, 2004; Kenny, Zhang, Schwier, & Campbell, 2005; Visscher-Voerman & Gustafson, 2004), and literature that provides understanding of instructional designers' working practices in other ways has remained relatively small in comparison (Christensen & Osguthorpe, 2004; Cox & Osguthorpe, 2003; Ertmer et al., 2008; Nelson, Magliaro & Sherman, 1988; Williams, South, Yanchar, Wilson & Allen, 2011). Some efforts have been made to understand instructional designers' use of formalized theories in their design work (Christensen & Osguthorpe, 2004; Yanchar & Hawkley, 2014; Yanchar, South, Williams, Allen & Wilson, 2010), and we recognize the value of such studies in helping to potentially bridge the oft-noted split between theory and practice in the field of instructional design (see Dick, 1997; Reigeluth, 1999; Seels, 1997; Yanchar & South, 2009). But, as has been discussed elsewhere, instructional design work (and design generally) involves more than simple theory-application to solve tidy design problems—practical wisdom, intuition, creativity, and a host of other personal factors are at play in the design work of such professionals (Bichelmeyer, Boling & Gibbons, 2006; Clinton & Hokanson, 2012; Lawson & Dorst, 2009; Nelson & Stolterman, 2012; Rowland, 1993; Smith & Boling, 2009; Schön, 1983).

One way in which instructional designers' practices are influenced is by their own assumptions or beliefs about learning and learning-related phenomena. In discussing educational

researchers, Driscoll wrote: "Research decisions such as [which variables to examine] fundamentally stem from disciplinary assumptions, or beliefs, that investigators have about the phenomena they intend to study" (2000, p. 8). We suggest that the same is true for instructional designers, that they are influenced by underlying assumptions or beliefs about, for example, the nature of learning and instruction, and their assumptions affect the nature and kind of instructional materials and programs they design. Gray (2015) wrote that instructional designers' assumptions about the learners for whom they are designing shape "the ways instructional materials are designed, as the designer inscribes their . . . standpoint into the designs they create" (p. 203). We see instructional designers' beliefs or assumptions as an important influence on their practice. Within the literature of educational technology, examination of underlying assumptions has been recommended, but usually in reference to the assumptions of theoretical paradigms—such as postmodernism (Solomon, 2000, 2002; Voithofer & Foley, 2002), behaviorism (McDonald, Yanchar & Osguthorpe, 2005), constructivism (Jonassen, 1991; Osguthorpe & Osguthorpe, 2007; Spector, 2001), or comparisons of these paradigms (Dick, 1996; Hannafin & Rieber, 1991; Rieber, 1992). Yet according to Yanchar and Gabbitas (2011), little attention has been paid to examining assumptions in the work of practicing instructional designers.

Responsibility for Learning

In this study, we inquired into the nature and significance of instructional designers' assumptions regarding who bears the responsibility for learning in instructional design contexts. Barr and Tagg (1995) described increased learner responsibility as part of the learning paradigm they promoted. In this paradigm, "responsibility is a win-win game wherein two agents take responsibility for the same outcome even though neither is in complete control of all the

variables" (p. 15). The opposing and more ubiquitous paradigm, called the instruction paradigm, and its configuration of responsibility has been described as one in which "most students come to see themselves as powerless in their own education and see professors as having a majority of responsibility to educate and to produce learning" (Abdelmalak & Trespalacios, 2013, p. 324; see also Manor et al., 2010). In the literature on educational technology, Jonassen (1991) indirectly addressed the issue of responsibility for learning when he described the contrast between constructivism and objectivism. He said that under objectivist-guided programs of instruction, "Students are not encouraged to make their own interpretations of what they perceive; it is the role of the teacher or the instruction to interpret events for them" (p. 10), which suggests that a high responsibility for ensuring learning rests with the teacher (or the designed instructional materials). Also, implicit in his statement is the suggestion that under constructivism, learners have more responsibility for their own learning. Beyond Jonassen's theoretical argument about paradigms, concerns about dropout and attrition in online education (Angelino et al., 2007; Lee, Pate, & Cozart, 2015), for example, highlight the practical significance of understanding the responsibility for learning in traditional instructional design contexts. If the responsibility for learning rests largely with designers, then the solution to the attrition problem is for designers to do better. However, if the responsibility for learning also rests with learners, then they would be part of the solution as well.

Limited research has examined responsibility for learning in instructional design contexts—mostly through case studies on courses in higher education that have been redesigned to increase student responsibility (Abdelmalak & Trespalacios, 2013; Fishman, 2014; Nelson & Bianco, 2013). Thus, we focused our study on what practicing instructional designers assume or believe about the responsibility for learning and how those beliefs manifest in their design

practices. We framed our research questions for this study as follows: (a) What do instructional designers assume or believe about who bears responsibility for learning? (b) How do their beliefs manifest in their work practices and products?

Method

For this study, we adapted an approach that has been used in previous studies of designer practice (Williams et al., 2011; Yanchar & Hawkley, 2014; Yanchar et al., 2010) that included elements of hermeneutic inquiry activities (Fleming, Gaidys, & Robb, 2003; Kvale & Brinkmann, 2009; Stigliano, 1989; Westerman, 2004). Our procedure was intended to aid both researchers and participants in a joint interpretation of the meaning of the data collected (Kvale & Brinkmann, 2009), leading to a set of themes and insights concerning designer practice that would be transferable to many areas of instructional design research and practice, including the training of instructional designers, evaluation in instructional design settings, and project management by instructional designers. Thick description of participant activities and stories was employed to facilitate transferability.

Participants

Following Patton's (2014) quota sampling strategy, to ensure that "certain categories are included in a study regardless of their size and distribution in the population" (p. 285), we interviewed instructional designers employed in different settings with diverse organizational cultures—for example, in higher education, government, military, corporate-contracted, and in-house corporate settings. We also selected participants in order to achieve diversity in gender, educational background, and degree of experience in instructional design, as summarized in Table 1 below. This strategy enabled us to become familiar with designers' views and practices in major segments of the field.

Table 1

Participant Information

Name	Gender	Experience	Position / Industry	Highest Degree
Brody	Male	4 years	Instructional Designer / In-house Corporate	MS
Brook	Female	19 years	Instructional Designer / Higher Education	MS, Ph.D. coursework
Dan	Male	11 years	On-Demand Training Production Manager / In-house Corporate	MS
Donna	Female	7 years	Education Specialist / Government	Ph.D.
Sierra	Female	12 years	Language Instructor / Military	AS, Honorary Ph.D.
Terri	Female	17 years	Senior Instructional Designer / Higher Ed Publishing	MS, Ph.D. coursework

Interview Procedure

These interviews were conducted as part of a larger study of design practices that focused on designers' views of learners and learning. We employed video conferencing technology to interview participants from a distance. In order to maintain a focus on the actual practices of these instructional designers, we requested artifacts from their actual design work—completed designs, blueprints, design briefs, and so on—in addition to the interviews, which allowed us to focus our interview questions around the details of those artifacts to better ground their answers in the context of their work and understand more concretely the nature of their design practices.

We followed Seidman's (2013) three-interview protocol in conducting in-depth, semi-structured interviews with the participants. Following Seidman's approach, the first interview consisted of getting to know the designer, coming to understand his or her work context and routines, and obtaining a general sense of their design practices. The second interview focused more on "the concrete details of the participants' present lived experience in the topic area of

study" (p. 18). In this interview we asked designers about their work and work artifacts, querying them about their design decisions and related work experiences. The goal was to have a critical dialogue with these designers to help explicate their assumptions regarding the issue of responsibility for learning. The third interview focused on clarifying content from past interviews, clarification of potential themes derived from the data thus far, and pursuit of any questions that had not yet been addressed. We spaced our interviews with participants to have one week of time for transcription and analysis between each one, although in some cases more time was needed for a sufficiently thorough analysis of the data.

Data Analysis

For each participant, interview 1 was transcribed and analyzed prior to interview 2, and so on, for all three interviews. After data analysis was completed, we gave each participant an opportunity to review our results to ensure that we accurately quoted and portrayed their views. Through our analysis of the transcripts, we sought to draw out key insights into the assumptions of these practicing designers concerning learner responsibility. Initially we examined the interview transcripts for a variety of themes and topics discussed, whether relevant to our research questions or not. After diverging to discover multiple possible themes, we then converged on topics and themes that provided significant insight or commentary on relevant issues from the literature on instructional design practice and responsibility for learning. We formulated preliminary themes, which were then used to reexamine the data for additional instances of those themes. Our analysis efforts overlapped with the interviews, so our preliminary findings informed the questions we asked in subsequent interviews.

More specifically, our data collection procedure entailed the following steps: (1) gaining a sense of the whole by reading transcripts and divergently identifying preliminary themes; (2)

refining these into more precise themes by convergently combining, editing, and removing existing themes; (3) deepening these themes by comparing and contrasting data against other data, which will likely include further refinement of the themes; (4) grouping these refined themes into broader meta-themes while continuing to refine; (5) selecting participant quotes from the transcripts that illustrate the refined themes; (6) considering the whole in light of each theme, and each theme in light of the whole, all while continuing to refine the themes; and (7) refining the overall thematic structure of our interpretations of the data. We began our tentative thematic structure by examining statements from our participants concerning their perspectives on responsibility for learning, and then we expanded outward to see what other topics may have some relation to the larger topic of learner responsibility.

Trustworthiness

We sought to produce trustworthy results in accordance with well-accepted standards for qualitative inquiry (Lincoln & Guba, 1985). By interviewing our participants three times each, on a variety of subjects related to responsibility for learning, and sharing their answers with the other participants, we maintained prolonged engagement, persistent inquiry on several topics, and triangulation with other participants. The varying opinions of participants also served as negative cases for initial questions and extended lines of questioning. We kept a record of our assumptions, procedures, and interpretations throughout the study involved. This record was made available to qualified peers for debriefing and further reflection. Member checking was also used to confirm the accuracy of our quotations and interpretations of participants' opinions and expressions. We have sought to describe in some detail our participants' work contexts and quote them as fully as seemed appropriate, in keeping with traditions of thick description in qualitative inquiry (Lincoln & Guba, 1985).

Results

We identified many significant themes that related to the issue of responsibility for learning from our participants. We chose quotes from individual participants that best represented the theme in question. We used pseudonyms for our participants and occasionally revised some quotes to allow for grammatical correctness or easier comprehension. In our member checks, our participants confirmed the accuracy of our representations of their comments.

Theme 1: Designers Shared Responsibility Despite Contextual Complexity

When we asked our designers about responsibility for learning, each assumed some form of shared responsibility between designer (and sometimes instructors) and learners. Most viewed themselves as facilitators of the learning process, which they saw as the province of the individual learner.

One of our designers, Donna, described the division of responsibility between her learners and herself as follows: “Learning is definitely in the hands of the learner, but it is my responsibility to make sure that they journey is somewhat easy for them.” This general description of how responsibility was shared between Donna and her learners sounded simple, but we also found that the division of responsibility between designer and learner was not fixed and constant, but contextual and frequently changing. Differences in many areas—such as learner audience, designer background, and learners’ willingness to try new things—can change the practical realization of that division of responsibility.

One example of this contextual variety came from Brody’s and Dan’s experiences. As a designer for a financial advisement service, Brody assumed that his learners were sufficiently self-motivated to learn financial investing. Assuming this, he felt no responsibility to sprinkle

external motivators throughout his instruction. However, Dan found it difficult to make his instruction not entertaining. He imagined some of his learners saying the following about the instructional materials he produces:

> 'Let me skip through this stuff and get to the meat of what's there. I am an adult learner, I'm in charge of my learning, I don't need it sugar-coated or entertaining.' . . . [It was] difficult for me because, as an entertainer, and even before that, as a teacher working with youth, it was all about, 'Let's make it fun, and let's bring in some games, and let's have a really cool graphic or like a really cool video!'

In his previous work with youth education programs, Dan had assumed more responsibility for supporting (or even supplying) learner motivation. But when designing for a different audience—one that apparently was already sufficiently motivated—he had to adjust to a role with less responsibility in that regard.

One of our designers, Brook, also taught online as an adjunct faculty at her university. She shared an example of a time when she found the right division of responsibility with an individual learner in one of her classes. In the end of semester evaluation of her teaching, a student told Brook that her class:

> was just an insane amount of work, but that he enjoyed the project-based style of the class. And that's probably my favorite comment I have ever gotten. . . . I love for them to say that I pushed them, and that I supported them, and that they learned something. . . . You don't want to push them so far that they quit, but that's really the designer's struggle for their learners of any age—making sure that learning happens without going too far.

It seemed that finding the right balance of pushing a learner to assume more responsibility while retaining some responsibility and not overwhelming a learner was a delicate balance to strike, and that that balance point would likely vary from learner to learner.

Theme 2: Designers Provided Learners Choices to Encourage Responsibility

As one way of facilitating learning while emphasizing learner responsibility, two of our designers—Brook and Sierra—provided options and choices to their learners that influenced the nature of the instruction. Brook described the kinds of choices she gave to her students and its effect on learner responsibility as follows:

> I . . . provide choices a lot for projects. . . . Choices within who they group with, choices in the type of product that they present . . . . I think adding having choice to a lot of different activities within a course can help involve student ownership.

Brook believed that "if you open up choice, some students will truly run with that and do amazing things . . . if they're really truly concerned about gaining something, about *process*, then those are the students that go above and beyond."

Sierra had similar experiences as both a student doing her own self-directed homework assignments and as an instructor providing self-directed homework assignments. When asked why she thought student choice affected student ownership or responsibility, she said,

> Because they don't know where the limit is. If you hold someone up to the minimum standard of expectations, they will meet the minimum standard of expectations, because that is what you told them to meet. But if you told them there is no limit, then they are definitely going to exceed the minimum.

According to Sierra, learners will meet the expectations you hold them to, so not disclosing the minimum standard of expectation was one of her ways of inviting students to take responsibility for their learning.

However, providing choices did not always lead to positive outcomes. Brook mentioned that students sometimes respond passively when invited to take a more active role in their own education:

> They're the ones usually that will ask a lot of questions, like, "Where's the rubric?", "What do you want me to do?", "I don't understand—what is it, exactly, you want me to do?" And they want a lot of guidance and basically for me to tell them what to do.

Thus, some of Brook's learners have been very reluctant to involve themselves more deeply in guiding their own education. They hesitated to take on that responsibility, and by asking Brook to tell them what to do, they even sought to avoid responsibility for taking their own initiative.

Theme 3: Designers Showed Relevance to Encourage Responsibility

Many of our designers also sought to ensure that their instruction would be perceived as relevant to the learner. Several of our participants seemed to assume that perceiving relevance would help learners take responsibility for their learning. Donna tried to communicate the relevance of her instruction, because she believed that

> If you are telling me something that is going to solve a problem [I have], you've got my attention immediately. But if you're just telling me stuff and I don't see how it applies back to a problem that I'm facing or how it can improve something in my life, then I'm not likely going to see the importance of it.

Donna saw adults as "problem-based learners" who would not only pay attention, but would also see the importance of the instruction, which implies a valuing or obligation on the learner's part.

> [It] can often be a challenge, because [the learners] come, they sit in a chair [and think], "I'm a sponge, fill me." And I think to myself, "You're coming to me with that mentality? . . . Let me make that connection with you right now: what I'm going to tell you can help you, you've got to take it in."

Donna's solution was to communicate the relevance of the training so that learners would feel motivated, choose to participate fully, and take responsibility for their learning.

Terri also recognized a link between perceived relevance of the instruction and the learners' subsequent behavior. She designed online supplemental materials for required college courses, and knew that students were sometimes not motivated to work hard in required courses. As a result, she expected that her learners would already be disengaged from her instruction:

> I think that the students—until something says, "Hey! Wait a minute! Stop! You've got to do something here!"—that's, I think, when the actual light turns on and they start paying attention.

Terri assumed that her learners would default to passivity, and go through her courses somewhat mindlessly, unless prompted or engaged by something unusual or different in the material.

However, our designers often found it difficult to know what will be relevant to learners. Donna mentioned a challenge she faces in teaching multiple learners at once while trying to maintain the relevance of the instruction:

> Sometimes it's incredibly hard to know what is relevant to them, because even within [a particular topic] you may have somebody in your class, who, to them,

> it's not an issue—they feel like they've got it under control. [But] you've got other people who [need more help].

If learners have different levels of familiarity with a particular topic or concept, then the responsibility shared between designer and learner might vary from learner to learner.

Theme 4: Sharing Responsibility with Unknown Learners was Difficult

Striking the right balance of retaining and sharing responsibility for learning, despite variety across learners, is compounded when the designer has very little interaction with the intended learner audience. Dan, for instance, described the distance between him and his learners as a difficulty:

> I often think of a military analogy. In World War I or the Civil War, you were killing somebody and looking them in the face as you did it. And that took a toll on the psyche of the soldier. And now, you fly a drone, or you're in a convoy, and you never see what you're doing. You might be thousands of miles away. And so this is like, modern instructional warfare.

Dan even used the term "capital L Learner" to refer to the generic learner for whom he designs, but whom he has never met. Despite this, he has learned to do his best to produce videos that he thinks will be valuable to his learners, despite never meeting them in person.

Brody, however, suggested that not knowing or interacting with his learners didn't necessarily hinder his effectiveness:

> They are all universal cognitive traits that our work is based on. And that's what we bring . . . . Not having interaction with the learners, it still can work or does work sometimes just because of those universal principles. That's what allows it all to still work.

When asked what universal cognitive traits or principles he was referring to, Brody mentioned cognitive load, dual-channel theory, and cognitive architecture generally.

Despite the seeming certainty of basing one's work on universal cognitive principles, Brody also expressed that he has good reason to expect significant variability in his learners' behaviors:

> I think some of that just comes down to personality. . . . Some people kind of like little quizzes and at the end that test their learning because it's just kind of fun to test your knowledge and see . . . , whereas other people think that it's a pain and won't do it. . . . It probably varies quite a bit.

It would seem that Brody has tried to design his learning activities in accordance with universal cognitive principles of learning, but at the same time he recognized that learners will vary in the amount and kind of activities they wish to complete. In general, without much information about their learners, our designers would either rely on their own judgment to reach individual learners, or simply change focus to aligning with basic universal principles which were assumed to obtain regardless of the learner audience. However, our designers knew to expect a wide variety of learners and their behaviors, which further complicated the issue of defining the division of responsibility between them and their learners.

Theme 5: Designers' Responsibility for Materials and Media Production

When asked directly about the designer's responsibility for student learning, Donna response focused on designers' creation of instructional materials and media:

> We [designers] bring that component of understanding how people learn and what the materials need to look like in order for people to have success out of an

> experience, but we can do that across topics even though we're not a subject matter expert.

In Dan's buffet analogy, he described the designer's responsibility for learning as follows:

> [It's] our responsibility to serve up the buffet . . . . It's our responsibility to make sure it's high-quality, that the audio is good, that it's packaged simply, and [that] it's what they see is what they're going to get.

Terri spoke of her responsibility in terms of the design of individual screens of content, and how the choice of images to accompany the written text was important:

> Our worst screen is content that has an abstract image on it that has nothing to do with the content. The learner doesn't connect. It's better to have just a screen of text, than a screen of text with an abstract image.

What's significant about these descriptions of the designer's responsibility for learning is how the focus is on the instructional materials—making sure they look right, are easy to understand, and so on.

Additionally, Terri and Dan both felt responsible to strike a balance of optimum information saturation, by strategically breaking up the instructional content so that a student would never be overwhelmed at the amount of information being communicated. Terri said,

> If I'm a student, if I go in there and I see 90 screens, I'm going to be overwhelmed—I don't want to even start it. . . . [But] if [as a designer] I've been able to chunk things like that and put 10 authors or 10 people who've contributed on one screen, that takes away 10 screens.

It seemed there was a balance of optimum saturation of information and number of slides that designers tried to achieve, so learners would neither feel bored by lack of information nor overwhelmed by too much information or too many slides.

In their emphasis on instructional materials and media production, our designers suggested that unless the materials look right, their learners would not be able to learn properly. This would suggest that, in their view, the designer and producer of the materials see themselves as having a significant responsibility for learners' learning—perhaps more even than the learners themselves.

Theme 6: Some Designers Felt Responsible to Control Learner Engagement

One significant responsibility that designers assumed was to maintain learner engagement throughout the course of their instruction, or even within a single learning activity. Dan spoke about learner engagement as being very dependent on the quality of the design—that certain kinds of designs will almost guarantee loss of learner engagement:

> You take [a] text-heavy [PowerPoint] slide and plop it on the screen, and expect someone to stare at it for 10 minutes while you're talking . . . talk about losing the engagement of the learner!

Other designers discussed their uses of clickable interactive elements as a way to foster learner engagement. Terri had the most to say about learner engagement and the function of clickable interactive elements in instructional materials. We asked her why she thought clickable interactives would be engaging for learners. She said

> [Without interactive elements], I can find myself sometimes reading, click, reading, click, and I don't even remember what I read a screen ago because I wasn't really engaged. . . . And so I think that by making a student actually do an

> action, where they physically have to move their hands and things like that, it just keeps them engaged.

For Terri there was almost an irresistibility to interactive elements. She believed that learners likely wouldn't be able to daydream and click through an interactive element at the same time. There is a kind of irony here: when her learners appeared to be most active (in clicking on and using interactive elements of instruction) is the time when she assumed her learners were actually quite passive, in the sense of being unable to resist mental engagement with the interactive element they've been asked to click on.

Our designers had assumed that learners were capable of engaging with the subject matter based on their own motivations (as in Brody and Dan's self-directed learners, described previously), and yet some also felt they were able to—and needed to—motivate and engage learners by virtue of clickable interactive elements in their instruction. This led us to wonder about what other things designers felt they could guarantee—like learning itself.

Theme 7: Designers Were Conflicted About Guaranteeing Learning

We asked our designers if it were possible for them to make learners learn, and what exactly does make learners learn. Brook indicated that even though designers can force participation in certain kinds of learning activities, she was uncertain that the resulting learning would last. Dan expressed a similar reservation about the possibility of forcing learning:

> I can't make my five year-old eat his vegetables. I mean, I guess I can . . . I can shove them down his throat . . . [but] is he really eating it? . . . You can drill into someone's mind the answers to a test . . . but I don't know that that really would count as learning, in the sense of what we want it to be.

For Brook and Dan there seemed to be a tradeoff between the possibility of forcing learning, and the kind of learning that would be achieved (or the length and strength of retention).

When we asked Brody if it were possible to make someone learn something, he answered in the affirmative and cited behaviorism as an example. However, he qualified his statement by saying that

> [When] you want to go from . . . basic behaviors to more higher order things, maybe your ability to force that on people decreases? . . . When you get into higher cognitive things, it requires someone to be interested and engaged and put forth effort to learn.

For Brody, lower levels of learning could indeed be forced, but higher levels of learning required the participation of a willing and interested learner. Thus Brody might feel responsible to address learner motivation and engagement (possibly through relevance and offering choices).

The very notion of whether designers can force learning to happen has significance for the basic nature of instructional design work, which Brody recognized:

> This even gets into—what type of work is instructional design? Is it design, and more of that empathy kind of stuff is important? Or is it more like engineering, where there are rules, like there are physics, and you create something that obeys these rules and it's going to be effective, and if you don't, then it won't be effective?

He ultimately concluded: "I don't think you can just be an engineer. I don't know, you've got to have a balance." Brody felt able and responsible to make learning happen when he could, but he also felt a need to involve his learners and help them contribute. This tension led him to seek a

balance between "engineering" and an approach to designing instruction that acknowledged learners' responsibility and contribution to their own education.

Discussion

We found much in our participants' perspectives and practices that tended toward an engineering approach to instructional design and learning. It seemed that our participants placed a significant responsibility on themselves—and on the materials they designed—to ensure that learning would take place. Perhaps because of the nature of delivering instruction through online means, our designers saw the materials they created as having significant responsibility for learning. In the era of formal programmed instruction, some advocates assumed that "learning is the responsibility of the materials, that the author [or designer] can, to a great extent, control and engineer quality and quantity of learning and is, by extension, accountable for the results" (Post, 1972, p. 14). It has been suggested that current online learning technologies are similar to programmed instruction in its heyday, due to their common underlying assumption of technological determinism (McDonald, Yanchar, & Osguthorpe, 2005).

The majority of our designers articulated a view of learning consistent with an acquisition metaphor (Sfard, 1998), wherein their responsibility was to produce and provide the information, which the learners were then simply expected to absorb. In this perspective on learning and instruction, the teaching and learning process is unidirectional, and the responsibility for learning is practically unilateral—on the designer's side. One consequence of this assumption about learning is that it can reinforce learners' sense of powerlessness: "All too often, students don't even see their education as *their* education at all; they see it as something done to them rather than something they do" (Manor et al., 2010, p. 11; italics in original). As noted earlier, instructional designers' assumptions shape "the ways instructional materials are designed, as the

designer inscribes their . . . standpoint into the designs they create" (Gray, 2015, p. 203). Therefore, designers who implicitly believe that the responsibility for learning rests largely upon the designer and the designed materials may potentially perpetuate the same problems of learner disengagement and attrition in online education mentioned previously (Angelino et al., 2007; Lee, Pate, & Cozart, 2015).

At the same time, we found that our participants were, in their design work, trying to move away from the instruction paradigm (Barr & Tagg, 1995), towards an approach to instructional design that placed increased responsibility on learners beyond passive reception. Despite institutional constraints and sometimes their own perspectives on learning, our designers felt a need to strike a balance between engineering learning and cooperating with their learners. Perhaps, instead of placing significant responsibility for learning on the instructional materials and media, designers could help put more responsibility on the learners

> by allowing for learner choice in how material is presented, organized, and studied; by emphasizing active participation in problem solving (with guidance available as needed); . . . and by providing learners with appropriate learning challenges (e.g., projects, problems, questions, writing assignments, etc.) that require creative student involvement, accompanied by appropriate performance feedback (McDonald, Yanchar, & Osguthorpe, 2005, p. 93).

Additionally, designers and scholars would benefit from considering perspectives on learning for their assumption (or not) of learner agency as a key ingredient for successful learning. Examples have been provided in past works (McDonald, Yanchar, & Osguthorpe, 2005), and recommendations for further analysis and synthesis of agency-oriented learning theories have also been offered previously (Matthews & Yanchar, 2016).

Future Directions

We recognize two main limitations of this study. First, although we sought to interview designers from many sectors of the instructional design workforce, according to Patton's (2014) quota sampling method, we were unable to interview designers working in corporate human resource settings on employee trainings. However, our findings from the sectors of the instructional design workforce that we were able to sample do tell us a great deal about the nature of design work in those sectors. Second, we relied primarily on interview data in this study, which does not provide a complete picture of designers' actual work practices. However, future studies could seek to embed a researcher or ethnographer within a design team, to conduct first-hand observations of designers at work. Findings from such studies would contribute to a more holistic account of designers' assumptions and practices concerning responsibility for learning, and reveal further ways that designers make room in their designs for learners to have a contribution and increased responsibility for their own learning.

Our participants' attempts to strike a balance between engineering and cooperating raises an interesting question about the nature of instructional design work—is it an engineering enterprise or a cooperative enterprise? Wilson (2013) suggested that the educational ideal is a trusting and engaged student and an attentive and committed instructor. Though he acknowledged that departures from this general condition are likely, he considered it to be of "surprising importance" (p. 45) to restore things to a more cooperative condition. Alternatively, if some sort of balance between manipulation and cooperation is ideal, then what is the nature of that balance? Future discussion and analysis could explore these differing approaches and reveal the various strengths and challenges associated with both manipulative and cooperative approaches to instructional design.

References

Abdelmalak, M., & Trespalacios, J. (2013). Using a learner-centered approach to develop an educational technology course. *International Journal of Teaching and Learning in Higher Education*, *25*(3), 324–332.

Angelino, L. M., Williams, F. K., & Natvig, D. (2007). Strategies to engage online students and reduce attrition rates. *The Journal of Educators Online, 4*(2) 1–14.

Barr, R. B., & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change*, *27*(6), 12–25.

Bichelmeyer, B., Boling, E., & Gibbons, A. S. (2006). Instructional design and technology models: Their impact on research and teaching in instructional design and technology. In M. Orey, V. J. McClendon, & R. M. Branch (Eds.), *Educational Media and Technology Yearbook* (Vol. 31, pp. 33–73). Littleton, CO: Libraries Unlimited, Inc.

Christensen, T. K., & Osguthorpe, R. T. (2004). How do instructional-design practitioners make instructional-strategy decisions? *Performance Improvement Quarterly, 17*(3), 45–65.

Clinton, G. & Hokanson, B. (2012). Creativity in the training and practice of instructional designers: The design/creativity loops model. *Educational Technology Research and Development, 60*(1), 111–130.

Cox, S., & Osguthorpe, R. T. (2003). How do instructional design professionals spend their time? *TechTrends*, *47*(3), 45–48.

Dick, W. (1996). The Dick and Carey model: Will it survive the decade? *Educational Technology Research and Development, 44*(3), 55–63.

Dick, W. (1997). Better instructional design theory: Process improvement or reengineering? *Educational Technology, 37*(5), 47–50.

Driscoll, M. P. (2000). *Psychology of learning for instruction* (2nd ed.). Needham Heights, MA: Allyn & Bacon.

Ertmer, P. A., Stepich, D. A., York, C. S., Stickman, A., Wu, X. L., Zurek, S., & Goktas, Y. (2008). How instructional design experts use knowledge and experience to solve ill-structured problems. *Performance Improvement Quarterly, 21*(1), 17–42. doi:10.1002/piq

Fishman, E. J. (2014). With great control comes great responsibility: The relationship between perceived academic control, student responsibility, and self-regulation. *British Journal of Educational Psychology*, *84*(4), 685–702. doi:10.1111/bjep.12057

Fleming, V., Gaidys, U., & Robb, Y. (2003). Hermeneutic research in nursing: Developing a Gadamerian-based research method. *Nursing Inquiry*, *10*(2), 113–20. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12755860

Gray, C. M. (2015). Critiquing the role of the learner and context in aesthetic learning experiences. In B. Hokanson, G. Clinton, & M. W. Tracey (Eds.), *The design of learning experience: Creating the future of educational technology* (pp. 199–213). Springer International Publishing. doi:10.1007/978-3-319-16504-2

Hannafin, M. J., & Rieber, L. P. (1991). Psychological foundations of instructional design for emerging computer-based instructional technologies: Part I. *Educational Technology Research and Development, 37*(2), 91–101.

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

Kenny, R. F., Zhang, Z., Schwier, R. A., & Campbell, K. (2005). A review of what instructional designers do: Questions answered and questions not asked. *Canadian Journal of Learning and Technology*, *31*(1), 9–26.

Kerr, S. T. (1983). Inside the black box: Making design decisions for instruction. *British Journal of Educational Technology, 14*, 45–58.

Kvale, S., & Brinkmann, S. (2009). *Interviews: Learning the craft of qualitative research interviewing* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Lawson, B., & Dorst, K. (2009). *Design expertise.* Oxford, UK: Architectural Press.

Lee, E., Pate, J. A., & Cozart, D. (2015). Autonomy support for online students. *TechTrends, 59*(4), 54–61.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Newbury Park, CA: Sage Publications.

Manor, C., Bloch-Schulman, S., Flannery, K., & Felten, P. (2010). Foundations of student-faculty partnerships in the scholarship of teaching and learning: Theoretical and developmental considerations. In C. Werder & M. Otis (Eds.), *Engaging student voices in the study of teaching and learning* (pp. 3-15). Sterling, VA: Stylus.

Matthews, M. T., & Yanchar, S. C. (2016). *Learner agency in educational technology learning theories.* Manuscript submitted for publication.

McDonald, J. K., Yanchar, S. C., & Osguthorpe, R. T. (2005). Learning from programmed instruction: Examining implications for modern instructional technology. *Educational Technology Research and Development*, *53*(2), 84–98.

Nelson, D., & Bianco, C. (2013). Increasing student responsibility and active learning in an undergraduate capstone finance course. *American Journal of Business Education*, *6*(2), 267–277.

Nelson, H. G., & Stolterman, E. (2012). *The design way: Intentional change in an unpredictable world* (2nd ed.). Cambridge, MA: MIT Press.

Nelson, W. A., Magliaro, S., & Sherman, T. M. (1988). The intellectual content of instructional design. *Journal of Instructional Development, 11*(1), 29–35.

Osguthorpe, R. T., & Osguthorpe, R. D. (2007). Instructional design as a living practice: Toward a conscience of craft. *Educational Technology*, *47*(4), 13–23.

Patton, M. Q. (2014). *Qualitative evaluation and research methods* (4th ed.). Thousand Oaks, CA: Sage Publications.

Post, D. (1972). Up the programmer: How to stop PI from boring learners and strangling results. *Educational Technology, 12*(8), 14–17.

Reigeluth, C. M. (Ed.) (1999). *Instructional-design theories and models: A new paradigm of instructional theory* (Vol. 2). Mahwah, NJ: Lawrence Erlbaum Associates.

Rieber, L. P. (1992). Computer-based microworlds: A bridge between constructivism and direct instruction. *Educational Technology Research and Development, 39*(3), 5–14.

Rowland, G. (1992). What do designers actually do? An initial investigation of expert practice. *Performance Improvement Quarterly, 5*(2), 65–86.

Rowland, G. (1993). Designing and instructional design. *Educational Technology Research and Development, 41*(1), 79–91.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action.* New York, NY: Basic Books, Inc.

Seels, B. (Ed.) (1997). Special issue: Examining the role of theory development in the field of educational technology. *Educational Technology, 37*(1), 12–21.

Seidman, I. (2013). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (3rd ed.). New York, NY: Teachers College Press. doi:10.1037/032390

Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Educational Researcher*, *27*(2), 4–13. doi:10.3102/0013189X027002004

Smith, K. M., & Boling, E. (2009). What do we make of design? Design as a concept in educational technology. *Educational Technology, 49*(4), 3–17.

Solomon, D. L. (2000). Toward a post-modern agenda in instructional technology. *Educational Technology Research and Development*, *48*(4), 5–20. doi:10.1007/BF02300497

Solomon, D. L. (2002). Rediscovering post-modern perspectives in IT: Deconstructing Voithofer and Foley. *Educational Technology Research and Development, 50*(1), 15–20.

Spector, J. M. (2001). Philosophical implications for the design of instruction. *Instructional Science, 29*, 381–402.

Stigliano, A. (1989). Hermeneutical practice. *Saybrook Review*, *7*(2), 47–69.

Visscher-Voerman, I., & Gustafson, K. L. (2004). Paradigms in the theory and practice of education and training design. *Educational Technology Research and Development*, *52*(2), 69–89.

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

Wedman, J., & Tessmer, M. (1993). Instructional designers' decisions and priorities: A survey of design practice. *Performance Improvement Quarterly, 6*(2), 43–57.

Westerman, M. A. (2004). Theory and research on practices, theory and research as practices: Hermeneutics and psychological inquiry. *Journal of Theoretical and Philosophical Psychology, 24*, 123–156. doi:10.1037/h0091238

Williams, D. D., South, J. B., Yanchar, S. C., Wilson, B. G., & Allen, S. (2011). How do instructional designers evaluate? A qualitative study of evaluation in practice. *Educational Technology Research and Development*, *59*(6), 885–907. doi:10.1007/s11423-011-9211-8

Wilson, B. G. (2013). A practice-centered approach to instructional design. In J. M. Spector, B. Lockee, Barbara, S. E. Smaldino, & M. C. Herring (Eds.), *Learning, Problem Solving, and Mindtools: Essays in Honor of David H. Jonassen* (pp. 35–54). New York, NY: Taylor & Francis.

Yanchar, S. C., & Gabbitas, B. W. (2011). Between eclecticism and orthodoxy in instructional design. *Educational Technology Research and Development, 59*(3), 383–398.

Yanchar, S. C., & Hawkley, M. (2014). "There's got to be a better way to do this": A qualitative investigation of informal learning among instructional designers. *Educational Technology Research and Development, 62*(3), 271–291.

Yanchar, S. C., & South, J. B. (2009). Beyond the theory-practice split in instructional design: The current situation and future directions. *Educational Media and Technology Yearbook*, *34*, 81–100. doi:10.1007/978-0-387-09675-9

Yanchar, S. C., South, J. B., Williams, D. D., Allen, S., & Wilson, B. G. (2010). Struggling with theory? A qualitative investigation of conceptual tool use in instructional design. *Educational Technology Research and Development, 58*(1), 39–60.

ARTICLE 3: Instructional Design as Manipulation or Cooperation? Questions Designers Can Ask Themselves

Instructional Design as Manipulation or Cooperation?

Questions Designers Can Ask Themselves

Michael T. Matthews

Brigham Young University, mthomasmatthews@gmail.com

(801) 318-5706, 150 MCKB, Brigham Young University, Provo, UT, 84602

Stephen C. Yanchar

Brigham Young University, stephen_yanchar@byu.edu

(801) 422-2608, 150-D MCKB, Brigham Young University, Provo, UT, 84602

Keywords: cooperative; design; manipulative; learning; questions; responsibility; technology

Abstract

Several authors have noted a tension between manipulative and cooperative tendencies in approaches to instructional design. From a qualitative study of practicing instructional designers, we found that designers struggle to involve their learners as co-contributors in their educational efforts. In this article, we show how some practicing instructional designers sought to keep cooperation with learners in mind while designing. Questions they asked themselves while designing had to do with (a) putting themselves in their learners' shoes, (b) trying to imagine what their learners were thinking and feeling, and (c) trying to generate ways to invite meaningful and significant learner engagement in the teaching and learning process. Based on the questions our participants asked themselves, we offer questions other designers could ask themselves while designing to change their designs to include a strategic, cooperative balance of control between designers and learners.

Instructional Design as Manipulation or Cooperation?

A tension between manipulative and cooperative tendencies in how one designs has been acknowledged by many writers in the field of educational technology. As a point of clarification, by using the terms manipulative or manipulation, we do not mean to imply that designers are using unscrupulous or Machiavellian tactics in designing instruction. Instead, we refer to a simpler meaning of manipulation, as in manipulating an object with moving parts to achieve a desired position or shape, with perhaps very noble motives.

According to Wilson (2013; see also Komoski, 1987), the ancient Greeks organized all technologies (they called them arts) into two categories: (a) those applied to matter and natural forces, and (b) those applied in work with human beings. The first kind of technologies have come to be known as manipulative technologies—such as those involved in carpentry, agriculture, sculpture, and cooking. The second kind of technologies have come to be known as cooperative technologies, because they depend for their success on the cooperation of the involved humans, as in medicine and teaching (Buchanan, 1963). Komoski (1987) pointed out that manipulative technologies, concerned primarily with effectiveness and efficiency, have shaped our thinking about educational technologies generally, leading to an emphasis on manipulation and control that is incompatible with the fundamentally cooperative nature of education.

Keitges (2012) framed the distinction between manipulation and cooperation in terms of designing for dominance (instrumental effectiveness and guaranteed outcomes) versus designing for dialogue (fostering critical thinking and higher order knowledge). According to Keitges, designing for dominance tends to eliminate ambiguity and chance, as well as their educative potential, by emphasizing complete control and cognitive mastery of content. Alternatively,

designing for dialogue would involve ill-structured designs that provide room for questioning and understanding between fully involved participants, leading to richer understanding and critical thinking. He suggested that the tension between dominance and dialogue is inherent in all designed learning objects and environments. It seems that some amount of manipulation—that is, purely unidirectional action on the designers' part—is unavoidable in instructional design situations, and must be balanced with some freedom granted to learners to significantly affect their own education.

Pieters (2004) recognized that "an intriguing design issue concerns the balance between allowing freedom and giving direction to the learners" (p. 83). He offers two reasons why it is difficult for designers to strike this balance between manipulation and cooperation. His first reason is that most instructional design models are tailored to an objectivist paradigm, wherein learning is thought of as knowledge transfer from teacher to student. If instructional design models were more harmonious with constructivist or other active-learner approaches, he suggests, designers might find it easier to move towards a balance of manipulative and cooperative tactics. His second reason why designers struggle to strike this balance between learner freedom and designer control concerns the fact that most instructional design models do not match the actual design processes of practicing designers. Many design models fail to capture the inherent messiness of designing instruction: "practice shows that the design of instruction is a complex problem-solving task" (p. 84), and even the nature of design as problem-solving is debated (Snodgrass & Coyne, 1992). A pattern or process for designing that matched designers' actual practices, and is oriented toward a cooperative approach, Pieters argues, would be valuable for designers trying to move toward a balance between manipulation and cooperation.

Studying Design Practice

As part of a larger study of the practices of instructional designers, we interviewed six practicing instructional designers from across the United States via videoconferencing (for a full description of our methods, see Matthews & Yanchar, 2016). In accordance with Patton's (2014) quota sampling strategy, we sought to interview participants from various sectors within the instructional design workforce, "regardless of their size and distribution within the population" (p. 285), to represent, to some extent, the field's diversity. Our participants had a variety of educational backgrounds, work contexts, and work experiences, as shown in Table 2 below.

Table 2

Participant Information

Name	Gender	Experience	Position / Industry	Highest Degree
Brody	Male	4 years	Instructional Designer / In-house Corporate	MS
Brook	Female	19 years	Instructional Designer / Higher Education	MS, Ph.D. coursework
Dan	Male	11 years	On-Demand Training Production Manager / In-house Corporate	MS
Donna	Female	7 years	Education Specialist / Government	Ph.D.
Sierra	Female	12 years	Language Instructor / Military	AS, Honorary Ph.D.
Terri	Female	17 years	Senior Instructional Designer / Higher Ed Publishing	MS, Ph.D. coursework

Data Collection and Analysis

We followed Seidman's (2013) three-interview protocol to conduct three semi-structured interviews with each of our participants, and formulated questions using elements of hermeneutic approaches (Fleming, Gaidys, & Robb, 2003; Kvale & Brinkmann, 2009) to qualitative inquiry (see the Appendix for our interview protocol). In addition to negative case analysis, member

checking and peer debriefing, we also maintained an audit trail throughout the entire inquiry, to meet the standards for trustworthiness and credibility specified by Lincoln and Guba (1985).

We found that our participants felt a responsibility to ensure that learning would take place, but at the same time they recognized that learners were not so pliable and able to be forced to learn (Matthews & Yanchar, 2016). Thus, we detected the same tension previous writers had noticed in instructional design. In describing their experiences with this tension, our designers revealed an interesting way to balance these competing demands, especially to avoid the common temptation to try to take too much control and not place the learner at the center of the experience. As part of their interviews, almost all of our designers shared questions they had asked themselves during the process of designing—questions that made space for their learners to have a contribution to their own learning. We found their questions to fit Pieters' (2004) criteria for a more true-to-life design pattern or guide for helping designers to better balance learner freedom and designer control.

We looked through our transcripts to find all instances where our participants shared questions they had asked themselves while designing, and categorized them by the instructional design purpose served by answering the question. We report below on the three most frequently asked kinds of questions designers reported asking themselves while designing.

Findings

The first two kinds of questions our participants asked themselves while designing centered around empathizing with their learners so that the designed instruction would be sensitive to their learners' situations and experiences. The third and final kind of question our participants asked themselves while designing concerned ways they could invite, but not force, cooperation and involvement from their learners during the course of instruction. By asking

themselves these three types of questions, our participants were attempting to do their part to establish a cooperative relationship with their learners (even distanced from them), and also to invite their learners to cooperate with them in the overall educational endeavor. Thus, we present our participants' questions here as guides that may help other instructional designers consider how to establish a cooperative relationship with their learners—and as guides that more closely resemble the actual process of designing, as have been called for by Pieters (2004).

Category 1: Projecting Oneself

Many of our designers asked themselves questions that seemed to reflect a desire to project themselves into their learners' situations in order to gain a sense of how they would feel if they were taking one of their courses—might they feel alienated, manipulated, or unmotivated by the instruction they were themselves designing? For example, when reflecting on the design of her language training courses at a high-level, Sierra would ask herself:

> "What would I want if I was taking this class?"

Beyond the level of the whole course, she was also concerned with how her learners would experience individual activities within her course of instruction. Being aware of ways people exploit loopholes in certain online learning arrangements, she asked herself:

> "Will I enjoy this? Or would I [skip] to the end?"

During Terri's time as the designer of a class on computer basics, she would ask herself:

> "Okay, I'm pretty good with computers, so when I started my entry into computers, where did I start?"

This kind of question shows the designer referring to his or her own experience to obtain a possible glimpse into another learner's experiences and feelings. This served to help designers understand both where to start (in terms of content) so the learners would not feel overwhelmed,

but it also helped our participants gain some sense of how learners would feel about, and possibly struggle with, the learning experience being designed.

Category 2: Perspective-Taking

Our designers also asked questions intended to facilitate "perspective taking", which is imagining what someone else is thinking and feeling (Batson, 2009), rather than imagining oneself in their place. For example, one of our designers, Terri, produced online supplemental materials for college courses, and often thought about how her students would experience her instruction. For one particular course, she would ask herself:

> "As an incoming freshman, what are the concerns and thoughts of these students? How do they feel about their college experience?"

Her concern for her learners was varied in this line of questioning—from the existential to the experiential.

Another example of perspective-taking questions asked by our participants was offered by Sierra, who wondered about the following issue when designing a module: "What are their struggles? What are their goals for that particular course?" These were questions that could have been partially answered by data gathered through learner analysis activities, but also would have required a deeper understanding of the learner—an understanding that seems likely to come more easily through interaction and a somewhat close relationship with the learners beforehand.

Category 3: Inviting Engagement

One of the most frequently asked question-types designers asked themselves while designing concerned how they could help their learners engage with the instructional materials in an authentic, and non-manipulative way. Brody designed for learners who often would not attend his institution's online, asynchronous, foundations course before coming in for the advanced

face-to-face workshop. He voiced his concern about this lack of preparation in the form of a question:

> "How do we get people to participate and engage and make sure that they're ready when they come to the workshop?"

Brody's question was about how he could help his learners want to prepare, so that he wouldn't have to resort to designing in a heavy-handed way to try and ensure their preparation.

This wish to educate learners' desires was also manifested in one of the questions Sierra would ask herself while designing modules and lesson plans:

> "How do I do it so that they are going to be interested?"

This is a significant issue for instructional designers—how can they design experiences that provide required content and information but that also invite learners to cooperate in the process of their own education? This ultimate question points to the designers' desire to meaningfully and authentically engage learners in their own learning—legitimately gaining their cooperation—rather than simply forcing it on them.

Discussion

The questions our participants asked themselves while designing reflected our designers' struggle to grant their learners freedom to do more than simply be shaped by the designed instruction. Our participants used these different types of questions to evaluate the quality of the instruction they were designing, according to the more cooperative paradigm they envisioned and were striving for. To other designers striving to include more learner freedom in their instructional designs, and thus achieve a more optimum balance of learner freedom and designer control, we recommend they ask themselves questions like those we saw in our study. In Table 3

(below), we have included additional questions, derived from the experiences and comments shared by our participants.

Seeking to answer these questions, and others like them, will greatly enhance traditional learner analysis activities, which Gray (2015) claimed "are not sufficient to develop empathy with the learner" (p. 203). The answers to some of these questions (such as "What are my learners' goals for this particular course?") can be ascertained through enhanced learner analysis activities or informal interactions with learners when possible, though the answers will likely vary from learner to learner. Over time, however, an inquiring designer may come to see certain patterns in responses and thus discover a learner-centered foundation on which to build certain elements of a course or courses. This is particularly true at educational institutions like colleges and universities, where a constant audience of learners provides ample opportunity to interact with and get to know the learner audience for a particular course.

Table 3

Questions Designers Might Ask Themselves

Question to be asked while designing	Purpose
What would I want if I were taking this class?	Projecting Oneself
Would I enjoy this? Or would I skip to the end?	
When I started learning this subject, where did I start?	
What helped me understand subject matter like this?	
When I was learning this, what was hard for me to understand?	
What might be the concerns and thoughts of my learners?	Perspective Taking
What is the overall learning experience going to be?	
What might my learners' struggles be?	
What are my learners' goals for this particular course?	
Is this course challenging enough?	
What am I asking the learners to do besides look at the screen?	
What types of active learning activities can I give them?	Inviting Engagement
Is clicking 'next' the only thing the learner can do in this course?	

Question to be asked while designing	Purpose
What aspects of this subject matter that might be most interesting? How will they feel about this course? Is it exciting enough? Would a family member of mine be engaged?	Inviting Engagement

However, simply knowing more information about learners (whether from traditional or enhanced learner analysis activities) does not automatically create space in an instructional design for increased learner choice or freedom. As our previous research has shown (Matthews & Yanchar, 2016), when learners have choices and freedom, they feel more responsible for their own learning. So the answers to other of the above questions (such as "How do I do this so that they are going to be interested?") would need to be generated by individual designers creating freedom for the learners they now know better, within their specific design contexts and constraints, in order to have the intended effect of increasing learners' felt responsibility for learning.

Limitations

We chose the previous questions for designers to consider primarily because they were already being used by practicing designers, and because it was suggested in the literature (Pieters, 2004) that properly oriented and more realistic design processes could help designers shift to more of a collaborative (or cooperative) approach to design. However, answering these questions does not guarantee that a designer will operate within a cooperative paradigm for educational technology. As we have stated elsewhere (Matthews & Yanchar, 2016), a designer's answers to these or any questions about learners and learning are likely to reflect the designer's experience, education, and theoretical leanings. But with the right kinds of questions in mind instructional designers can design in ways that better balance learner freedom and designer control.

Directions for Future Research

Future research could explore additional ways in which designers reach out to learners, invite their cooperation, and remind themselves and the learners of the importance of this cooperation while designing. Beyond the practices of individual designers, a more cooperative paradigm for educational technology remains to be fleshed out in the literature and discussion of the field. An examination of design processes, models, and theories could reveal an underlying tendency to either manipulation or increased cooperation. Also, the voices of real-world learners have not yet been heard in this discussion of manipulation versus cooperation. Future researchers could interview learners in a variety of settings to learn their beliefs and experiences on the receiving end of the instruction. Indeed, involving learners in the inquiry process seems especially appropriate for advocates of increased cooperation between designers and learners.

References

Batson, C. D. (2009). These things called empathy: Eight related but distinct phenomena. In J. Decety & W. Ickes (Eds.), *The social neuroscience of empathy* (pp. 3–15). Cambridge, MA: MIT Press.

Buchanan, S. (1963). Technology as a system of exploitation. In Carl F. Stover (ed.), *The technological order: Proceedings of the Encyclopaedia Britannica conference* (pp. 151–159). Detroit, MI: Wayne State University Press.

Fleming, V., Gaidys, U., & Robb, Y. (2003). Hermeneutic research in nursing: Developing a Gadamerian-based research method. *Nursing Inquiry*, *10*(2), 113–20. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12755860

Gray, C. M. (2015). Critiquing the role of the learner and context in aesthetic learning experiences. In B. Hokanson, G. Clinton, & M. W. Tracey (Eds.), *The design of learning experience: Creating the future of educational technology* (pp. 199–213). Springer International Publishing. doi:10.1007/978-3-319-16504-2

Keitges, M. J. (2012). From design for dominance to design for dialogue. *E-Learning and Digital Media*, *9*(4), 385–391. doi:10.2304/elea.2012.9.4.385

Komoski, P. K. (1987). *Educational technology: The closing-in or the opening-out of curriculum and instruction*. Syracuse, NY: ERIC Clearinghouse on Information Resources.

Kvale, S., & Brinkmann, S. (2009). *Interviews: Learning the craft of qualitative research interviewing* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Newbury Park, CA: Sage Publications.

Matthews, M. T., & Yanchar, S. C. (2016). *Learner agency in educational technology design practice.* Manuscript submitted for publication.

Patton, M. Q. (2014). *Qualitative evaluation and research methods* (4th ed.). Thousand Oaks, CA: Sage Publications.

Pieters, J. M. (2004). Designing artefacts for inquiry and collaboration: When the learner takes the lead. *European Educational Research Journal*, *3*(1), 77–100. doi:10.2304/eerj.2004.3.1.15

Seidman, I. (2013). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (3rd ed.). New York, NY: Teachers College Press. doi:10.1037/032390

Snodgrass, A., & Coyne, R. (1992). Models, metaphors and the hermeneutics of designing. *Design Issues*, *9*(1), 56–74. doi:http://dx.doi.org/10.2307/1511599

Wilson, B. G. (2013). A practice-centered approach to instructional design. In J. M. Spector, B. Lockee, Barbara, S. E. Smaldino, & M. C. Herring (Eds.), *Learning, problem solving, and mindtools: Essays in honor of David H. Jonassen* (pp. 35–54). New York, NY: Taylor & Francis.

Appendix: Interview Protocol

Interview 1

- How did you become a designer?
- What kinds of designs do you produce?
- What constraints do you experience in your work?
- What is your opinion about the design process you use?

Interview 2

- Why do you think your learners are motivated to learn your content?
- What do you think makes the biggest difference for whether or not people learn through your product? Why?
- What is your responsibility, as the instructional designer, for ensuring that learning takes place? What is the learner's responsibility?
- In your opinion, is it possible to make someone learn something? Why/not? What makes a learner learn?

Interview 3

Review tentative findings, ask about negative cases, clarify and seek further understanding.

Michael T. Matthews is a doctoral candidate in, and **Stephen C. Yanchar** is an associate professor of, Instructional Psychology & Technology at Brigham Young University. They share interests in design practices and agency in education.

DISSERTATION DOCUMENT CONCLUSION

Through the articles contained in this dissertation, I have sought to introduce and clarify the notion of learner agency, and show its presence in major theories of learning (Article 1), show how instructional design practice reflects certain implicit assumptions about learner agency as responsibility for learning (Article 2), and recommend some practical ways designers can keep the learner at the forefront of their design thinking while potentially challenging their existing assumptions about learners and learning (Article 3). Though the concept of agency is both broad and deep, I hope to have helped make the concept more accessible and understandable to a new audience. I also hope to have shown the practical value of addressing the issue of learner agency and to have offered practical help for designers who wish to incorporate these ideas into their design work.

More carefully considering the issue of learner agency (and companion issues like responsibility for learning) can make a powerful practical difference among instructional design practitioners. Instructional designers may be going about their work relatively unreflectively (concerning learner agency and responsibility), but scholarly discussions could help these practitioners to reflect on their own assumptions and design in greater accordance with their own assumptions and beliefs. It is not unreasonable to assume that, as a consequence, we would see a proliferation of theories and designs for instruction, of which some are agentic and others are more deterministic. This would result in more conscientious and reflective scholars and practitioners, who can not only better select from stronger theories of learning available in the field, but who are also sufficiently self-aware to repurpose existing theories or even synthesize new ones that harmonize with personal beliefs and assumptions.

DISSERTATION DOCUMENT REFERENCES

Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education.* New York, NY: The Macmillan Company.

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

Kolb, D. (1984). *Experiential learning: Experience as the source of learning and development.* Upper Saddle River, NJ: Prentice-Hall.

Lebow, D. (1993). Constructivist values for instructional systems design: Five principles toward a new mindset. *Educational Technology Research and Development*, *41*(3), 4–16.

Lindsey, L., & Berger, N. (2009). Experiential approaches to instruction. In C. M. Reigeluth & A. A. Carr-Chellman (Eds.), *Instructional-design theories and models: Building a common knowledge base* (Vol. 3., pp. 117–142). New York, NY: Routledge.

Parrish, P. E. (2009). Aesthetic principles for instructional design. *Educational Technology Research and Development*, *57*(4), 511–528. doi:10.1007/s11423-007-9060-7

Wilson, B. G. (2012). Constructivism in practical and historical context. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and Issues in Instructional Design and Technology* (3rd ed.) (pp. 45–52). Boston, MA: Pearson Education Inc.

Wilson, B. G., & Parrish, P. E. (2011). Transformative learning experience: Aim higher, gain more. *Educational Technology*, *51*(2), 10–15.