Learning and Instructional Design Philosophy

As an instructional designer I strive to design and develop learning solutions that are rooted in evidence-based notions about learning. The following paper reflects my current beliefs regarding how people learn; what influences our learning; and the instructional designer’s role in learning.

Beliefs about the Learning Process

Learning occurs within an individual's zone of proximal development. The zone of proximal development (ZPD) suggests that it is the "buds" within cognitive development rather than the "fruits" of development that matter in learning (Vygotsky, 1978). The ZPD heuristic furnishes educators with a tool through which the internal course of development can be understood - taking account of both what has already happened along with what a person is capable of with assistance (Vygotsky, 1978). It is important in operationalizing the ZPD heuristic to note that learning processes stimulate and push forward the maturation process; furthering the development of complex mental functions (Vygotsky, 1978). Therefore, instruction must recognize where students can go with assistance, move ahead of development, and then guide it (Gredler, 2005).

People learn as they actively construct meaningful, flexible schema within a domain. Learning should be meaningful. There are several processes involved in the process of actively constructing meaningful, flexible schema. Information processing theory asserts that our conceptual structures (schema) are evolving mental structures that can be enriched and elaborated upon (Gredler, 2005). Other evidence suggests that we make meaning out of information by elaborating on existing conceptual structures (Case, 1993; Roth, 1990; Carey and Smith, 1993). People actively construct meaning through processes involving perception, encoding and retrieval. Long-term retrieval of information is dependent upon accurate perception and construction of meaningful links with previous schema during encoding (Gredler, 2005).

As noted earlier our schema, however, is not a fixed entity - through the process of conceptual change we can construct qualitatively different conceptual structures (Case, 1993; Gredler, 2005). A Piagetian based goal in learning is for these qualitatively different conceptual structures to produce gamma and accurate beta responses (Gredler, 2005). However, in order for meaningful conceptual change to occur our everyday knowledge and domain knowledge must meet, conflict, reconstruct and integrate (Roth, 1990).

Learning reflects that knowledge is contextually specific and shared within a culture. *Knowledge* is contextually specific. Knowing and doing are interlocked and inseparable (Brown, Collins, and Duguid, 1989). Brown, Collins, and Duguid (1989) suggest that activity, concept, and culture are also interdependent. People learn contextualized knowledge through enculturation into a community of practice (Brown, Collins, and Duguid, 1989). For example, evidence suggests that peripheral participation, or exposure to a model functioning just slightly beyond the participant's level, can facilitate important learning processes such as conceptual conflict and produce enduring conceptual change (Brown, Collins, and Duguid, 1989; DeLisi and Golbeck, 1999).

Beliefs about Influences on Learning

Students' zone of proximal development and everyday schema are influential in learning. Evidence suggests that scaffolded support within a student's zone of proximal development can positively influence learning. When the term scaffolding was introduced Wood, Burner, and Ross (1976) noted two salient aspects, which explain how scaffolded instruction within the ZPD can influence learning. First, scaffolding enables a novice to solve a problem or carry out a task that would be beyond unassisted efforts. Second, scaffolded learning allows the learner to concentrate on and complete elements within their range of competence. When scaffolded tasks fall toward the high end of the child's zone of proximal development (i.e. tasks are both challenging and use student skills) accelerated learning is produced (Meyer, 1993).

Students' everyday schema (a.k.a. prior knowledge) also strongly influences learning. Our current schema and learning are mutually dependent upon each other. Our current schema influences learning in that it provides framework into which data must fit in order to be comprehended and assists in filling gaps in information from the environment. Current schema influences our perception - the identification of information; and attention - a function that selects information for further processing (Gredler, 2005). Likewise, learning (under the correct conditions) can influence our everyday schema as we reorganize through the processes of assimilation and accommodation (Roth, 1993; Case, 1993; Gredler, 2005; Carey and Smith, 1993).

Student's metacognitive abilities influence learning processes. The development of metacognitive abilities influences our ability to process information impinging on our senses. Metacognitive abilities influence learning by acting as an executive control function for all aspects of information processing. As our metacognitive abilities develop we increase our capacity for all aspects of Broadbent's (1958) model for information processing including working memory and long-term memory (Gredler, 2005). Zimmerman (1989) also provides evidence that students who can actively regulate their metacognitive processes are able to influence academic performance (Hofer, Yu, and Pintrich, 1998).

Culture and context are interdependent and influence our learning. Language and culture play a central role in our cognitive development - our thinking depends upon our speech and speech depends on our culture (Wertsch and Tulviste, 1992). Thus, all major concepts, means of communication, and ways of viewing the world are created and shared within a culture (Gredler, 2005). Context is interdependent upon culture and also strongly influences learning. Our mental activities make sense in terms of their results in a specific circumstance (Resnick, 1987). Our culture however, propagates the context. Resnick (1987) notes that cognitive activity is also shaped by and dependent upon the kinds of tools available to a culture. Neither knowledge nor context remains stable. Both co-evolve as a natural part of human interaction and development (Roth, 1993). Our interaction with articles of our cultural in specific circumstances influences our construction of knowledge (Roth, 1993).

Student motivation is a multi-faceted construct that influences the learning process. Motivated students exhibit engaged behaviors on learning tasks including: direction, persistence, activity level, continuing motivation and thoughtful performance (Gredler, 2005). Evidence suggests that presence of these behaviors influences thoughtfulness in the learning process (Blumenfeld, Puro, and Mergendoller, 1992). There are three current models that seek to explain the presence of motivated behaviors: self-efficacy beliefs; goal orientation; and value-expectancy.

Students' self-efficacy beliefs, or one's beliefs about their capability to perform on a task, affect motivated behavior toward learning tasks. Self-efficacy beliefs are multi-dimensional in the sense that they differ based upon context and criteria for mastery. Therefore, beliefs may differ from one task to the next (Zimmerman, 2000). Zimmerman (2000) suggests that students with a high self-efficacy for a certain task - participate more readily; work harder; persist longer; choose more challenging tasks; and mediate difficulties in learning with use of metacognitive strategies.

Students' goal orientation also addresses reasons for motivated behaviors during learning tasks. Students who perceive the classroom as one that stresses learning versus performance goals report more positive attitudes toward the subject; more intrinsic motivation; and more cognitive engagement (thoughtfulness) (Blumenfeld, Puro, & Mergendoller, 1992). On the other hand, a performance goal orientation is associated with maladaptive behaviors including: calculated efforts that subvert learning; focusing on outperforming others; avoidance strategies; and anxiety toward learning assessment (Gredler, 2005; Patrick, Turner, Meyer, Midgley, 2003).

Finally, students' expectations for success combined with the value (why am I doing this) students ascribe to the learning tasks provide information about student choice in engagement behavior (Gredler, 2005). Intrinsic and attainment value in a task coupled with expectancy for success can predict students' engaged behavior toward a certain domain or task (Gredler, 2005). On the other hand, other values that may be ascribed include utility and cost. These are generally tied to external factors, which evidence suggests can undermine the purposes of learning (Gredler, 2005).

Practices, curricula, and assessment enacted within various educational environments influences motivated behavior and learning. Classroom curricula and practices based upon social-constructivist views positively influence student thoughtfulness, motivation, and achievement. For instance, practices based upon social-constructivist views of learning were found to enhance students' interest in the material being presented thus translating motivation into thoughtfulness (Blumenfeld, Puro, & Mergendoller, 1992). Empirical evidence has also been collected showing that social constructivist programs can produce success on standardized achievement tests (Schneider, Krajcik, Marx, and Soloway, 2002).

Assessment practices at the classroom, school, statewide, and national levels also influence motivated behavior and learning. A fundamental purpose of assessment is for teachers to arrive at valid inferences about students' skills and knowledge. These inferences should then be used to inform instructional practice and curriculum (Popham, 2004). Evidence, however, also suggests that tying high-stakes to assessment at any level often has negative effects on students' motivated behavior and learning outcomes (Popham, 2004; Paris, 2000; Paris and Urdan, 2000).

Beliefs about the Instructional Designer’s Role in Facilitating Learning

Instructional designers should focus on designing instructional tasks that support students in developing meaningful, flexible, and useful conceptual understanding. When selecting tasks one must consider several factors including: the level of challenge and use of skills (Turner, Meyer, Cox, Logan, DiCinto, and Thomas, 1998); students' zone of proximal development (Meyer, 1993); and characteristics of authentic tasks (Blumenfeld, et. al., 1997). Conceptual change does not occur without intervention. Teachers must also adopt practices that support students in the process of conceptual change (Roth, 1990; Carey & Smith, 1993; Blumenfeld, et. al., 1997). Literature on the process of conceptual change provides several implications for instructional practice. Some of the most salient features of this literature include: selection of a few cognitively rich topics for instruction; identifying students prior knowledge and misconceptions; creating experiences for conceptual conflict to occur; organizing information to be learned; supporting students in reconciling the new conception with their prior conception; providing rich examples that illustrate why it is valuable beyond the classroom; probing students beyond rote recall; use of well-structured peer learning techniques; and connecting students with a community of practitioners within the domain (Case, 1993; Roth, 1990; O'Donnell and O'Kelly, 1994; DeLisi and Golbeck, 1999; Brown and Campione, 1994; Brown, Collins, & Duguid, 1989).

Instructional practices based upon themes from scaffolded instruction support students in developing conceptual understanding. Literature suggests that teachers who provide scaffolded support to students within the ZPD will enable students to perform at levels beyond current abilities. (Meyer, 1993; Wood, Bruner, and Ross, 1976). Types of teacher support in negotiating the constructing meaningful understanding include: creating an inviting and challenging classroom dialogue; marking critical features; providing non-evaluative collaboration; gradually transferring responsibility to students during dialogue; supporting students in the assimilation and accommodation of new data into their schema; and providing for student choice in learning (Meyer, 1993; Roth, 1990)

Instructional practices that develop metacognitive abilities support students in actively constructing conceptual understanding. Fostering development of metacognitive abilities increases capacity for all stages in the information-processing model (Gredler, 2005). Practices that influence development of metacognitive abilities include: modeling use of metacognitive abilities (Brown and Campione, 1994); use of ill-defined problems (Gredler, 2005); and providing declarative, procedural and conditional knowledge regarding strategy use (Hofer, Yu, and Pintrich, 1998).

Instantiating instructional practices and curriculum based upon social-constructivist views of learning support student thoughtfulness. Social constructivist curricula provide examples of best practices in instantiating many evidenced notions in constructivist learning including: scaffolded instruction; fostering cognitive and metacognitive strategy development; and instantiation of conceptual change processes (Blumenfeld, et. al., 1997; Brown & Campione, 1994; Cognition and Technology Group at Vanderbilt, 1992). Practices from social constructivist views of learning used to develop thoughtfulness and meaningful understanding include: engaging students in conversation with practitioners; anchoring instruction in real-world contexts through the selection of authentic driving questions (topics) for investigation; providing tools used by practitioners for use during learning and assessment; creating assessments that focus on mastery and have value beyond the classroom; and allowing for differentiated instruction and shared cognition through guided discovery (Blumenfeld, et. al., 1997; Brown & Campione, 1994; CTGV, 1992).

Instructional Designers should enact practices proven to translate motivation into thoughtfulness. Practices informed by each of the three major lines of motivation theory provide a framework for building a positive psychological classroom environment. For instance, establishing a learning goal oriented environment has been linked with presence of adaptive and engaged behaviors (Gredler, 2005; Patrick, et. al. 2003; Blumenfeld, Puro, and Mergendoller, 1992). Related practices include: holding students accountable for learning and understanding - not for getting right answers; giving students freedom to take risks and be wrong; stressing improvement over time; making resources and recognition available to all students; establishing that time is flexible; minimizing comparison and competition; and using private evaluation practices (Blumenfeld, Puro & Mergendoller, 1992).

Enhancing students' perceived ability and expectancies for success also translates into student thoughtfulness. Evidence suggests that teacher practices can enhance students perceived ability and expectancies for success (Zimmerman, 2000; Blumenfeld, Puro, & Mergendoller, 1992). Related practices from the literature include: choosing activities within a child's ZPD; providing recognition for effort and improvement; using mistakes made during teaching as opportunities to collaborate; teaching learning strategies to enable students to accomplish the tasks; and avoiding reporting ability-related information (Zimmerman, 2000; Blumenfeld, Puro, & Mergendoller, 1992).

Finally, enhancing students perceived value also translates into student thoughtfulness. Evidence suggests that teacher practices can enhance students' value assignment on the task and expectancies for success (Gredler, 2005; Blumenfeld, Puro, & Mergendoller, 1992). Related practices include: emphasizing intrinsic reasons for learning; relating the material to students' lives; offering students choices with regard to learning tasks; assigning ill-defined problems; and designing projects that provides some form of closure (Blumenfeld, Puro, & Mergendoller, 1992).

Instructional Designers should design assessments that can be used to make inferences regarding students' knowledge and skill and use those inferences to inform learning, instruction, and curriculum. Archibald and Newmann (1992) argue that assessment used to inform learning, instruction, and curriculum should provide exhibition of mastery, integrate prior knowledge with new learning and have some value beyond evaluative purposes (Blumenfeld, et. al., 1997). It is important to note that in creating assessments teachers need to consider the subject of validity. As teachers construct assessment they should consider enacting methods to ensure proper scoring and construct validity such as inviting blind-scorers to participate or looking for an already established reliable scoring rubric for the task (Popham, 2004). Once validity is achieved certain practices can be enacted that can enhance the utility assessment has to informing learning, instruction, curriculum. Related practices include: anchoring assessment tasks in real-world contexts and encouraging real-world approaches (i.e. collaboration, tool use, etcetera); use of dynamic assessments (i.e. individual interviews) allowing for further probing of student understanding; using the assessment to inform students of progress not as a capstone event; using assessment results to help students set incremental learning goals; and using portfolios to provide a way to measure students over time (Blumenfeld, et. al., 1997; Brown and Campione, 1994; Paris and Urdan, 2000).

Beyond assessments created in the classroom, teachers should know how to use the results of standardized tests to inform teaching and curriculum. However, it is important to note that different types of standardized assessments are created to serve specific purposes for informing curriculum and instruction. There are generally two types of standardized tests. The first type is a norm-referenced instrument, which provides a picture of where students are in relationship to other students across a population. These tests are usually instructionally insensitive in that they usually test what students bring to school, not what happens as a result of instructional efforts at school (Popham, 2004). The second type is a criterion-referenced test, which provide a picture of individual student performance on a specific set of criteria (i.e. content standards). These tests are usually instructionally sensitive in that they test what students learn at school (Popham, 2004). Knowing the difference between the information provided by the tests is essential to test selection and the process of informing instruction and making enhancements based upon data (Popham, 2004).

Instructional Designers in a K-12 setting should be informed regarding educational policy and able to communicate with students, parents, administrators, and legislators regarding the appropriateness of the policies. Currently, teachers should be aware of the No Child Left Behind (NCLB) Act. In general, NLCB institutes policies that tie high-stakes to student performance and annual improvement on standardized tests (Popham, 2004). Evidence suggests that policies that tie high-stakes to inappropriate testing practices (given the purposes of evaluation) negatively effects student motivated behavior and learning (Paris, 2000; Paris and Urdan, 2000; Popham, 2004). Teachers should be prepared to communicate and enact more accurate ways of evaluating school and teacher quality (Popham, 2004). Advocates for alternative school assessment (Popham, 2004; Paris, 2000; Paris and Urdan, 2000) propose measures for reporting classroom and school quality which include: instructionally supportive tests that measure a small number of essential standards; students work samples including pre and post samples; affective data collection on indicators of engaged and adaptive behavior; and non-test academic indicators relevant to the school district such as attendance rates, tardiness rates, advance placement courses, college entrance, placement after high school, etcetera.

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