Epistemic Metacognition - A Necessary Competency for the Online Learner

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Background

As an experienced and competent online learner I am dumbfounded when someone suggests that "they don't like to learn in the online environment." When I ask why, the response is usually vague finishing with "I guess I just like face to face interaction." When I ask why to that, the answer back may go something like "I like to see my instructor, I learn more that way." I find this perplexing as I am an individual that could care less whether the instructor is two thousand miles or three feet away. I will learn regardless.

Consider how restricted this learner's world is by the fact that he feels that he must be on location to experience learning. The questions arise as to what his assumptions are about knowledge and learning that places him in that space and how can his learning space be opened up? My sense is that I am coming to the online table with very different assumptions about knowledge than this other learner. Also I have a certain amount of confidence in my ability to negotiate my way through this environment and accomplish the learning tasks at hand. This is something that this other learner may be lacking. Is it possible to make this learner more competent in his ability to engage in the online environment? How do we create online learning environments that support the conditions necessary for learner success and that enhance lifelong learning development?

Introduction

As distance learning has exploded on to the learning landscape the rapid development of distance learning technologies has facilitated a growing interest in exploring pedagogical considerations in teaching and learning. As traditional education has moved towards constructivist theory emphasizing a learner-centered model, technology has enabled the same shift to occur in distance education. Hence, educators and learners find themselves challenged to not only a new paradigm of teaching and learning but new learning environments created by emerging technologies.

The concept of learner-centeredness assumes that learners are responsible partners for their learning. This rests on a constructivist foundation that learners construct their own schema of knowledge based on prior experience and their interaction with their environment. This demands that learners be competent in problem solving, critical thinking, reasoning, and reflective in their use of knowledge (Derrick, 2003). Learners need to be adaptable and flexible in their learning strategies as they respond to new situations. These are competencies that are required to be successful in today's world.

These attributes are even more important for online learners. Research has shown that online learners need to be more self-directed than traditional learners in a face to face environment. To be successful the online learner needs to have the self-discipline, initiative, motivation, commitment, time management skills, and organization skills to work independently (Ko & Rossen, 2004, Simonson, Smaldino, Albright, & Zvacek, 2003). Hongmei (2002) suggests that self-motivated and self-disciplined students are most likely to succeed in online learning. Therefore, their success is dependent upon their ability to apply successful learning strategies in self-directed learning.

Although these attributes for online learners are acknowledged as essential for their success, distance education student evaluations continue to be concerned primarily with (1) student outcomes (achievement, grades, test scores), (2) attitudes of students and instructors and, (3) satisfaction of students and instructors (Walker, 2002). In fact, the instructional design process for distance delivery draws from a behaviourist paradigm that emphasizes achievement oriented outcomes. These outcomes generally do not address attributes such as self-discipline, motivation, and self-direction. Hence, there is a dissonance between what we say are essential learner competencies and instructional design and teaching practices that might support that goal.

The constructivist paradigm immerses learners in a domain that requires them to adapt their learning strategies to their personal characteristics and to the learning context. This requires that students be able to critically reflect on their use of cognitive strategies. Romainville (1994) asserts that students are not adept at this and that the high rate of failure in the first academic year of university may be attributable to the lack of awareness and mismanagement of cognitive strategies. Teaching learners how to be more aware of their learning processes and how to regulate those processes will contribute to their efficacy as autonomous, self-directed learners.

The American Psychological Association (APA) developed a Learner-Centered Framework that included 14 principles about learners and learning. These principles were organized into four domains, metacognitive and cognitive, affective and motivational, developmental and social, and individual-differences. These provide a framework for practices that can be applied to distance learning environments (McCombs &Vakili, 2005). The cognitive-metacognitive domain is one that will be addressed in this discussion.

Metacognition

Metacognition has been identified as a significant factor that impacts on learning. Metacognition refers to higher order thinking which involves active control over the cognitive processes engaged in learning. "Metacognition" can be simply defined as "thinking about thinking." Flavell (1976) the pioneer of metacognition research, described it as follows: "Metacognition refers to one's knowledge concerning one's own cognitive processes or anything related to them, e.g., the learning-relevant properties of information or data. For example, I am engaging in metacognition if I notice that I am having more trouble learning A than B; if it strikes me that I should double check C before accepting it as fact" (p.236).

Metacognition is concerned with the monitoring and regulation of cognitive processes. Essentially we have thoughts and they consist of what one knows (i.e., metacognitive knowledge), what one is currently doing (i.e., metacognitive skill), or what one's current cognitive or affective state is (i.e., metacognitive experience) (Hacker, 1998).

Metacognitive regulation consists of sequential processes that help to regulate learning. Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task are metacognitive in nature. For example, after reading content the learner may use self-questioning to ensure that she understands what she just read. After self-questioning she may find that she does not understand the material and she determines what needs to be done to meet the cognitive goal of understanding the content (Livingston, 1997). Can this process of metacognitive monitoring and regulation enhance the learning process of the online learner? Would metacognition be considered a necessary competency for the online learner?

Romainville (1994) found that a relationship exists between academic performance and high achievement of students who actively apply their metacognitive knowledge about cognitive processes. The implications of this for instructional design for distance learning environments are clear. Curriculum design for any online course or program must incorporate strategies to facilitate metacognitive processes to ensure learner success.

However, as I recognize metacognition as a clear competency to accomplish learning goals, I have a nagging feeling that there is something more to this, i.e., an a priori awareness that precedes metacognition and opens the door to engage in learning.

Epistemology

Metacognition has been discussed as the regulation and control of cognitive strategies for learning. There is no doubt that metacognition represents a necessary competency for today's online learners. However, the whole notion assumes the existence of a learner who is ready to actively engage in learning in whatever learning environment is presented.

Research has shown that students' perceptions of instructional practices are interpreted through the lens of their epistemological assumptions. Personal epistemology is essentially the beliefs that individuals hold about knowledge and such beliefs influence the readiness of learners to engage in the learning process. Thus, students have particular views about how academic tasks, testing, interactivity, the structure of the classroom, textbook choices, etc. relate to knowledge acquisition (Hofer, 2004). It is this personal epistemology that determines how the learner engages in the learning activity and it is this that precedes the regulatory and control functions of metacognition. Therefore, epistemic metacognition is an additional dimension that needs to be added to the toolkit of metacognitive strategies.

Personal epistemology can be addressed from two areas: the nature of knowledge (what do I know) and the process of knowing (how do I know what I know). These can be further divided respectively into the dimensions of certainty and simplicity of knowledge and source of knowledge and justification of knowing (Hofer, 2004). These dimensions can be viewed as existing on a continuum and are applied to the learner as follows:

Certainty of knowledge. At one end, the learner views knowledge as representing absolute truth and certainty. At the other end, the learner's perspective is that there is no absolute knowledge as it is continuously evolving.

Simplicity of knowledge. At one end the learner views knowledge as discrete facts. At the other extreme, the learner views knowledge as contextual and relative.

Source of knowledge. The learner might see knowledge as existing external to self and residing in an expert authority. At the other end of the continuum the learner might see knowledge as being actively constructed in social interactions.

Justification for knowing. This dimension addresses how the learners justify and evaluate their beliefs. At one end of the continuum they might justify their beliefs using authority. At the other end they would evaluate the evidence and the expertise of the authority.

It is important to understand how students make epistemological sense of their learning environment. One instructor noted how frustrating it can be to engage students who are for example, at one end of the continuum at certainty of knowledge where their beliefs may be grounded in religious authority. These students simply did not see the need for dialogue as their knowledge was certain and not debatable. This problem is exacerbated in the online environment

where the student can literally turn off the conversation. It is evident that this epistemological belief impacts on how or even if the student engages in the learning community.

Beliefs about knowledge will also influence the student's choice of learning strategies. Perhaps the student believes that knowledge is simple and factual, and therefore will memorize the facts with little thought to evaluating those facts. At this point a cognitive prompt could be used, but the student may disregard it if they believe that there is no rationality for evaluating the facts.

Epistemological beliefs can be general or subject specific. For example, students may have beliefs about knowledge in the area of mathematics that differ from their beliefs about knowledge in psychology. Therefore, facilitating student awareness of their beliefs in this particular subject area needs to be constructed in a comparative way to their general beliefs about knowledge. If they see dissonance between the two there is a window for reconciliation of the two sets of beliefs and movement up the continuum.

Implications for the distance learner

There is evidence that students can move along this continuum of their beliefs and there are interventions that will effect epistemological belief change in learners moving them from simple to more complex reasoning (Hofer, 2004). Epistemology could be said to be an aspect of metacognition and consequently training students to be epistemically aware will ensure their success in applying metacognitive processes.

Instructional approaches have been developed that integrate the development of metacognitive thinking processes into online curricula. In addition to this, instructional design should focus on using the technology to incorporate epistemic metacognitive processes as well.

This dimension of the metacognitive domain should be introduced at the very start of online coursework with accompanying assessments of learner engagement. As the learner becomes more adept at capturing their epistemic understandings, they can move from simple to more complex beliefs. Practice in this type of thinking can make it a habit of the mind and will guide the learner to becoming a competent lifelong learner.

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