Intentionality as much more complex than Martinez allows.

Expanding Beyond a Cognitivist Framework: A Commentary on Martinez's "Intentional Learning in an Intentional World"

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One of the looming challenges educators face today is understanding how student diversity and uniqueness impacts the complex process of learning. Affective and conative factors are increasingly examined as we seek to understand how to teach and support the *whole learner*. The goal is to build theory that informs practice so that we may, as Martinez argues, move beyond "fuzzy, one-size-fits-all [instructional] solutions" to instruction that is designed to match individual learning needs.

Factors such as motivation (McCombs, 1991, Deci and Ryan, 1991), self-efficacy (Bandura, 1986), learning styles (Rayner and Riding, 1997), and emotional intelligence (Goleman, 1996) have become increasingly common terms in educational research as we seek to define affective and conative variables that impact the learning process as well as design of instruction. However, as with much of educational research, there are a vast number of complex, interrelated variables to consider and no one easy solution.

After examining Martinez's web site (see http://mse.byu.edu/projects/elc/ilsum.htm#loc), we found that she builds on the work of several educational researchers, including Bandura, Scardamelia and Bereiter, McCombs, Snow, Pintrich, and others in order to build a set of metalevel profiles of learner differences. These profiles differentiate types of learners in order to understand the influence of emotions and intentions on learning. The goal of Martinez's theory is to match an individual learner's orientation to an appropriate learning environment.

Though Martinez's goal for understanding learner needs and supporting those needs through instruction is a worthy one, there are several major issues with the implementation of intentional learning theory in this particular study. After addressing these issues, we will discuss implications as well as remaining questions we have based upon our perspective as constructivists and instructional designers.

Implementation of Intentional Learning Theory

Overall, we applaud Martinez's goal to better understand the role of learner intentionality with regard to instructional design. However, from an instructional design perspective, a major criticism we have of Martinez's article is her lack of detail describing the actual instruction given to each group of learners. Although she did state that "the course had eight lessons with practice, feedback, and assessment activities," we found that a less than adequate description considering the major importance of instruction in this study. By providing information on instructional tasks, strategies, types of learner interactions, feedback, and assessment methods used, we could better understand how those variables may have impacted learner orientation.

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In fact, Martinez focuses her discussion more within the design of the SILPA system rather than the design of the instruction itself. Students were classified as conforming, performing, and intentional using an instrument of unknown reliability and validity. These people were assigned, in equal proportions, to three treatment conditions that varied by the tools and orientation provided. However, it is not that there were alternative environments provided, but rather the conditions successively removed support—first an orientation and then support tools. The first group received an intervention called Intentional Learning Training (ILT) at the beginning of the course. It also provided a special interface that enabled learners to examine course content, self-assess progress, and sequence tasks. The second group, performing learners, had the same instruction and resources, but the ILT intervention instruction was not offered. The third group, conforming, received a restricted, linear sequenced, menu-driven version of the instruction without the ILT or other resources.

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We have two concerns here. First, with 71 participants, most of them conforming, there is no reasonable means of examining the relation of style to learning environment. There just are not enough participants (especially performing and intentional) to look at the interaction. While Martinez makes this point early in the methods section, the analyses she performs seem to go ahead and try to examine this relationship—but without suggesting the size of the n in each of the nine cells (three styles by three treatments). It is unclear what conclusions we can draw from the data.

Further, we have some question about the treatment conditions in which the control groups remove resources and orientation. If our goal is to support diverse learning needs, we should provide resources that assist their unique learning orientations rather than limit their learning environment. For example, to support a performing learner, we might design a learning environment that is more interactive and competitive in order to increase engagement. To support a conforming learner, we may design an environment that is highly scaffolded and supportive. The instruction within these environments may also differ so that it supports the orientations. In fact, Martinez stated toward the end of her article that "those [students] in the two control groups were not in an environment that would help them experiment and improve intentional learning ability." After all, the heart of Martinez's argument is that we need to understand how to design instruction and environments to support these individual needs and solutions.

The outcomes of Martinez's study indicated that learning orientations alone do not influence satisfaction, learning efficacy, achievement, and intentional learning performance. Although Martinez's theory of intentional learning is in the early stages of development and we expect her to continue work in this area, it is important to expand beyond four categories of learner orientations. We need to consider the vast range of variables and constructs that support learner diversity and complexity. This means we need to design instruction that reflects these types of learners and learning contexts rather than treating audiences as four (instead of one) groups of "homogenous conglomerates."

In her introduction, Martinez alludes to the importance of better understanding online learning. One issue we would like to see addressed is how using the computer to deliver instruction might have impacted learning orientation. Would that perhaps impact learner efficacy or even intentionality? If so, would it be due to use of the computer as a new learning tool, with which some have little experience? (In this regard, she did use a very diverse learner population, which we suspect included people with little computer experience). This also points to a similar issue of whether learning orientation changes depending on minor situations, such as a change in instructional method, a new topic, a specific sort of task. This is an important issue to address in future studies on instructional systems.

Martinez's study does point to the need for developing new and innovative technological tools

that enhance and enable the range of learner orientations, including even those who may be resistant to learning. We envision a range of active learning environments available where students are actively engaged in instruction and environments that are motivating, challenging, satisfying, and enable them to perform at their highest levels.

Finally, from a research methods perspective, we recommend that Martinez work to establish validity of her intentional learning theory constructs as well as reliability of the instrument consisting of 25 questions measuring learning orientation (Creswell, 1994). A research study based on one author's theory, model, questionnaire, and instruction needs some form of outside validation before it can be confidently applied in other research studies.

Expanding Beyond the Cognitivist Framework

As we continue to define attributes and orientations of learners, it becomes critical that we consider the shift in the epistemological view of learners as constructors of knowledge based on their goals and interactions with the outside world rather than minds that are mapped with knowledge from the outside world. (Cunningham and Duffy, 1996). Within Martinez's intentional learning theory, it seems that a framework of motivation is used to describe how learning as a process of mapping knowledge onto the learner's mind. We say this because it seems (although we cannot be sure due to the limited description), that the instruction (eight lessons with practice, feedback, and assessment activities) are a seemingly traditional cognitivist learning environment. We would like to expand intentional learning to consider other theories as well as types of learning environments.

Taking a socio-constructivist stance (Vygotsky, 1978), learning is a complex process involving culture, community, context, and tools. Learning becomes a process of acculturation into an established community of practice (Cunningham and Duffy, 1996). Lave and Wenger (1991) define learning as a process of acculturation where the learner participates in the activities of the culture through legitimate peripheral participation. One question that arises from this perspective is how a learner's orientation or intention might be influenced by situations in which they are learning and by the reasons for which they are learning (Brown, Collins, and Duguid, 1989). For example, if one is studying a subject that is not situated in the context of learning (it was not a course), would that perhaps influence a learner's sense of intentionality? Could we assume that more authentic and purposeful learning may in itself increase learner intentionality? When educational researchers call for more authentic and purposeful learning environments, these are important questions to consider in expanding the framework of intentionality beyond cognitive constraints. Considering these questions provides an opportunity to consider how these issues would play out in a socio-constructivist framework.

Maintaining a purpose for instruction in an authentic context is an important variable to consider with intentionality, since the challenge is to design environments and instruction that support learning as a goal rather than an incidental outcome (Scardamelia and Bereiter, 1991). Therefore, it seems important to consider relevancy of learning as an important part of process. Would instructional systems like SILPA provide opportunities to work with other students in real world learning contexts based on authentic types of problems or issues?

From a constructivist perspective, the role of instruction is to enable students "to construct knowledge, to promote collaboration with others, to show the multiple perspectives that can be brought to bear on a particular problem, and to arrive at self-chosen positions to which they can commit themselves, while realizing the basis of other views with which they may disagree" (Cunningham, 1991, p. 14). So if Martinez had used a problem-based instruction, how might this have impacted learner orientation? How is intentionality affected when learners ask questions, think critically, and solve problems to learn?

Bransford, Brown and Cocking (1999) state that "participation in social interactions is a fundamental form of learning." How would social interactions impact intentionality? In her article's "Table of Psychological Learning Factors," Martinez lists social factors as a major influence over learner behaviors and performance. Social interactions

and learning is an area that is critical to examine so that we may understand the role and impact of certain social interactions on intentionality. It is also important to note that social interactions are not usually controlled by the designer but by the learners. Therefore, it is critical that we understand the impact of social interactions on learner intentionality, especially with regard to online learning environments which often rely on social interaction as a learning tool.

These are just a few questions and issues that Martinez's study provoked within our own perspectives. We have briefly discussed how framing learner intentionality within a socio-constructivist framework would address current learning theories as well as the design of learning environments and tools. Until we better understand how to design instruction that meets the diverse needs of all learners, we must continue to research and understand the complexity of learners and the learning process.

In conclusion, the inherent danger in any sort of categorization scheme is that we begin to think in categories of four, or six, or eight, which may lead us to think in "prescriptions of design criteria" that we can apply to specific types of learners. However, we argue that learner differentiation is endlessly complex and cannot be reduced to a few variables. Therefore, it becomes the challenge of designers to create generative learning environments with instruction and tools that enable learners to take control of their learning process in ways that work best for them as individuals.

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