The Language of Teaching Well with Learning Objects

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Abstract

Providing our students access to digital learning objects is one thing: how we as educators then converse with our learners about those objects in our online courses – how we *teach* using them - is quite another. This paper discusses the many ways in which instructional conversations about digital learning objects can be powerful and powerfully different from how we have traditionally taught with analog realia (textbooks, worksheets, overheads) and how such conversations can be enriched through awareness of digital learning object attributes and their potential roles in instructional conversations. A brief introduction to the concept of instructional conversations is followed by discussion of the attributes of learning objects that can serve instructional conversations well. The anatomy of resulting instructional conversations then serves as the foundation for direct application in teaching and learning. Samples of the language that can be used when teaching in concert with learning objects are then provided and discussed.

Keywords: instructional conversations, digital learning objects, language in education, online instructional strategies

Education happens in conversations where the combined mental resources of teacher and learner are focused on developing the learner's understanding.
Neil Mercer, *Words and Mind*. 2000:169

Language in Teaching and Learning

Language - written, spoken, and hybrid online talk - is our medium of teaching and learning. It is often an unstated fact that excellent educators have an excellent command of language. Moreover, whether it is listening to an instructor or reading her words, it is those words that mediate students' learning. Indeed, teaching and learning is principally about students mastering the language of the discipline and thereby becoming literate members of the target discipline community. This literacy translates into one's being skilled at reading, speaking, writing, and comprehending discipline-specific discourse with some fluency and it is this fluency that we typically expect of students in higher education, be it talk and writing about poetry or talk and writing about particle physics. We assess the degree to which students have achieved this fluency through their performance on examinations and through the extent to which their written work reflects their control over the target content as expressed through the discourse norms of the target discipline community.

Given this view that language and its disciplinary complexities are central to teaching and learning, we understand that simple information is not sufficient for learning. True, discrete elements are the building blocks for eventual fluency, but mastery of the target content and the discipline-specific ways it is expressed is certainly *not* about students repeating back easily grasped absolutes. It is the command of various ways of understanding and expressing the complexities of the information that constitutes true learning (Brown and Campione, 1994; diSessa, 2000; Gee, 2004). Contemporary teaching and learning is about learners grappling with messy and ambiguous realities and learning to critically and articulately make sense of them from a variety of perspectives in the language appropriate to the content and context. To do so, students master the language of the discipline as their primary tool.

As full-fledged members of our discipline communities, we have mastered our disciplines' discourses, both the written and spoken language and the ways of thinking germane to that discipline. When we teach, we apprentice learners in doing the same. We nurture their linguistic and conceptual growth by initiating them into disciplinary ways of knowing and communicating. Traditional forms of this discourse initiation are through students being passively exposed to classroom/instructional language whereby instructors are the center of attention and tasks are instructor-centered. If we consider the optimal ways that humans learn – through engaging in productive, generative, problem solving interaction with others in natural conversation - the traditional, instructor-centered classroom is indeed an impoverished form of teaching and learning. This is reflected in Figure 1 which contrasts the language of traditional classroom instruction with that of natural communication.

	Classroom	Natural
Roles:	Fixed	Negotiated
Tasks:	Teacher-oriented	Group-oriented
	Position-centered	Person-centered
Knowledge:	Focus on content	Focus on process
	Accuracy	Fluency

Figure 1. Classroom versus natural language (from Kramsch, 1985).

Figure 1 lays out the contrasting features of traditional classroom language and those of natural conversation. The impoverishment of traditional classroom language as compared to the everyday communicative language we thrive on in social contexts is striking. Where how we communicate outside the classroom is rich and generative, traditional classroom language is pointedly not. Where how we communicate outside of the classroom is oriented to process and fluency, traditional classroom language is decidedly not. Where everyday communication tends to be egalitarian, the teacher-centered, position-centered nature of traditional classroom language hardly lends itself to a level playing field. Between these two contrasting poles lie instructional conversation strategies that we consider below.

Instructional Conversations

As we have discussed, excellent teaching and learning is, in essence, discursive with successful learning being the mastery of the targeted disciplinary discourses (Cazden, 1988; Sfard, 2000; Wegerif, Mercer, and Dawes, 1999; Wickstrom, 2003). It follows that optimal formats for teaching and

learning would thus be through what is known in the field of education as "instructional conversations". As defined by Tharp and Gallimore (1988, 1991), the term "instructional conversation" refers to productive, interactive verbal strategies used by educators to engage learners in active thinking, negotiation of meaning, and, consequently, learning. Such conversations are thinking and speaking joined dialectically and thus dynamically to generate engagement in learning processes and thereby mastery of the target ways of knowing and communicating. According to Goldenberg (1991), instructional conversation is about discussing concepts, not ready answers, with a great degree of freedom while maintaining a focus on specific learning goals. It is talk that is socially engaging with the instructor guiding the conversation without dominating it. It is collective, cumulative talk that aims toward shared, mutually generated understanding. It is through engagement in the discourse of the discipline that learners ultimately gain access to and membership in that intellectual community. Learning objects, or aspects of them, can be readily employed as focal materials in the endeavor. The following sections discuss some of the attributes of discursive forms of teaching and learning online and the anatomy of instructional conversations that make use of learning objects as conversational complements and tools.

Digital Learning Objects

Where the real work of online teaching and learning was once done with words, it can now be done with words in orchestration with the digital learning objects we link to, direct learners to manipulate, discuss, assign, and refer to in our instructional conversations. Where there are several characteristics of digital learning objects that make them unique from traditional, analog learning objects (slides, worksheets, diagrams, for example), contemporary digital learning objects fundamentally differ from the analog in that for the most part they are designed to be subject to individual student/user control and therefore subject to independent exploration. In short, digital learning objects do not always lend themselves to the static referring we have done with work sheets and overheads for many decades. Because contemporary learning objects can be under the control of individual students, directing their attention becomes a more challenging, but in the long run more effective, form of instruction. For, if you refer to a particular outcome in response to particular student input, then the student is forced to relocate on her running mental map of the learning object's properties, its terrain and related decisions made. In doing so, learners actively dialog with the learning object. This dialoging opens up opportunities to employ the discourse of the discipline actively and interactively. In this regard, digital learning objects can offer far more stimulation and discourse-rich referring than the static page of the textbook.

In addition to this overall dynamic quality of contemporary digital learning objects, and their popular tag as "reusable" (Downes, 2004), there are additional attributes we can consider. They are:

Public – anyone can access any time
Malleable – anyone can manipulate
Unstable – what is on the screen may act unpredictably
Anarchic – meant to be manipulated independently

and they provide the instructional conversation with **Anchored Referents;** that is, what is on the screen can serve as referential tools (from Meskill, Mossop and Bates, 2000).

Now that we have these powerful, dynamic representations in our respective content areas, objects that potentially enhance our craft, we are left with the question: How can the attributes of digital learning objects be linked to the linguistic and be incorporated into the kinds of online instructional conversations that affect learning?

Online Instructional Conversation Strategies with Digital Learning Objects

Given the vast array of digital learning objects at our disposal (e.g., http://merlot.org), the possibilities for integrating these into and using them to complement our instructional conversations with students are indeed endless. Be it for reinforcing and/or referencing discipline-specific terms and concepts, or

engaging in synthetic talk about complex processes, the marriage of instructional conversation with digital learning object can be a solid one.

In our work with language educators (Meskill and Anthony, 2004, 2005), we have identified a number of online instructional conversation strategies that can make good use of learning objects. These are:

1. Referring/Anchoring
2. Saturating
3. Corralling
4. Providing linguistic/thinking tools
5. Modeling
6. Encouraging combinatory or synthetic responses
7. Hyperlinking
8. Internal Dialog.

Referring/Anchoring

One feature of instructional conversations is "connected utterances". These are multiple, connected, interactive turns in conversation (Goldenberg and Patthey-Chavez, 1995) that can be facilitated through referring to and thus anchoring language to target properties or characteristics of digital learning objects. This kind of instructional conversation strategy takes advantage of the anchored referent feature of digital learning objects and may, in addition, exploit the public feature insofar as what is referred to in the instructional conversation might well be a publicly shared referent.

EXAMPLE: African Drums http://www.dancedrummer.com/museum.html

Instructional conversations whose aim is student mastery of names and properties, both visual and auditory, of different African drums can make systematic reference to specific drums and their visual and auditory characteristics. The discourse of drum identification can be enlivened in many forms through these anchored referents. Through instructor language making reference to the visual, textual, and auditory features of each of these musical instruments, learners can be guided to incorporate these terms and concepts into their developing disciplinary discourse. Figure 2 illustrates potential references that an instructor working with this learning object can make between the musical term "gankogui", its textual description, physical characteristics, sound representation, three-dimensional appearance, and sample uses.

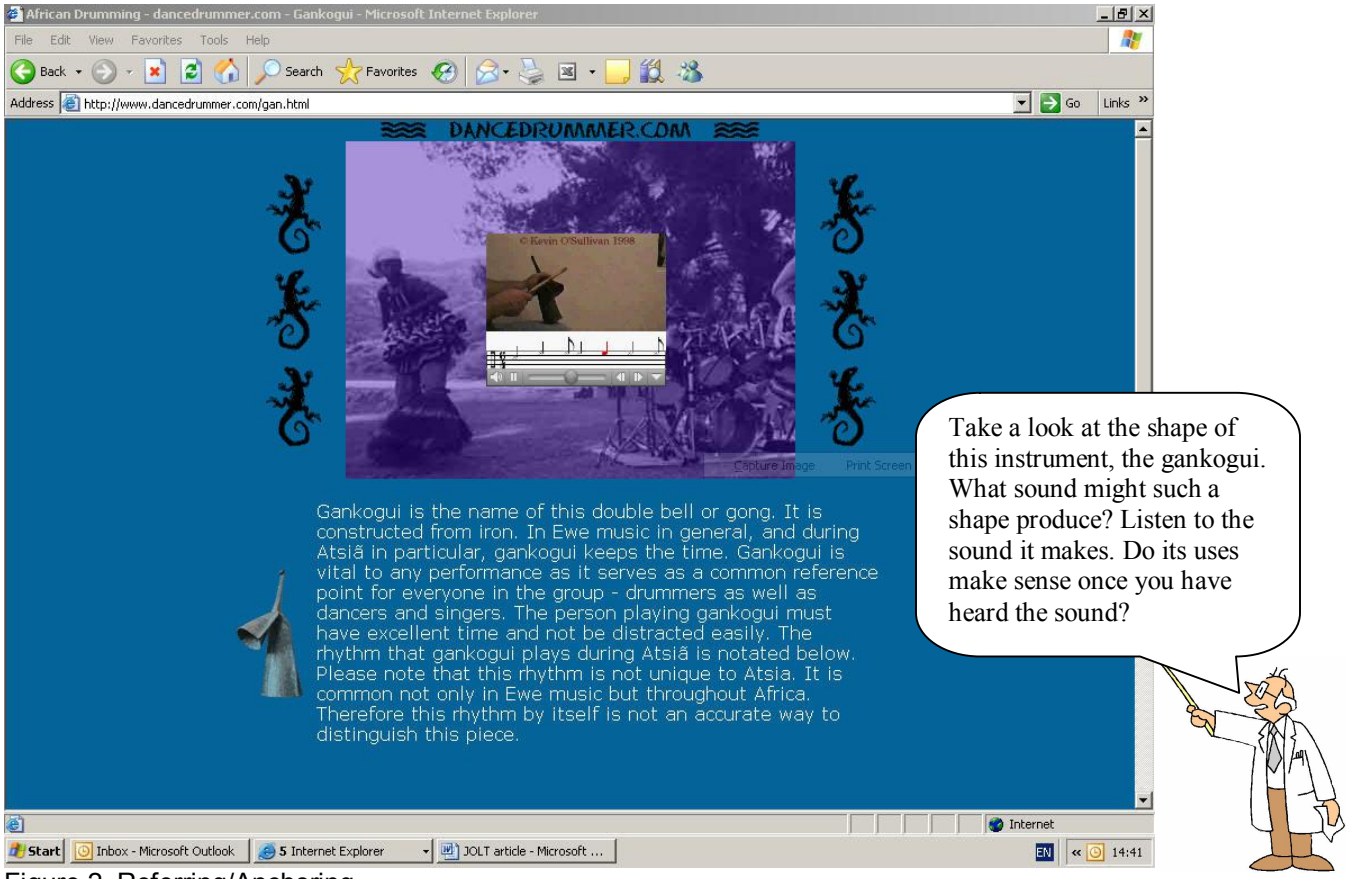


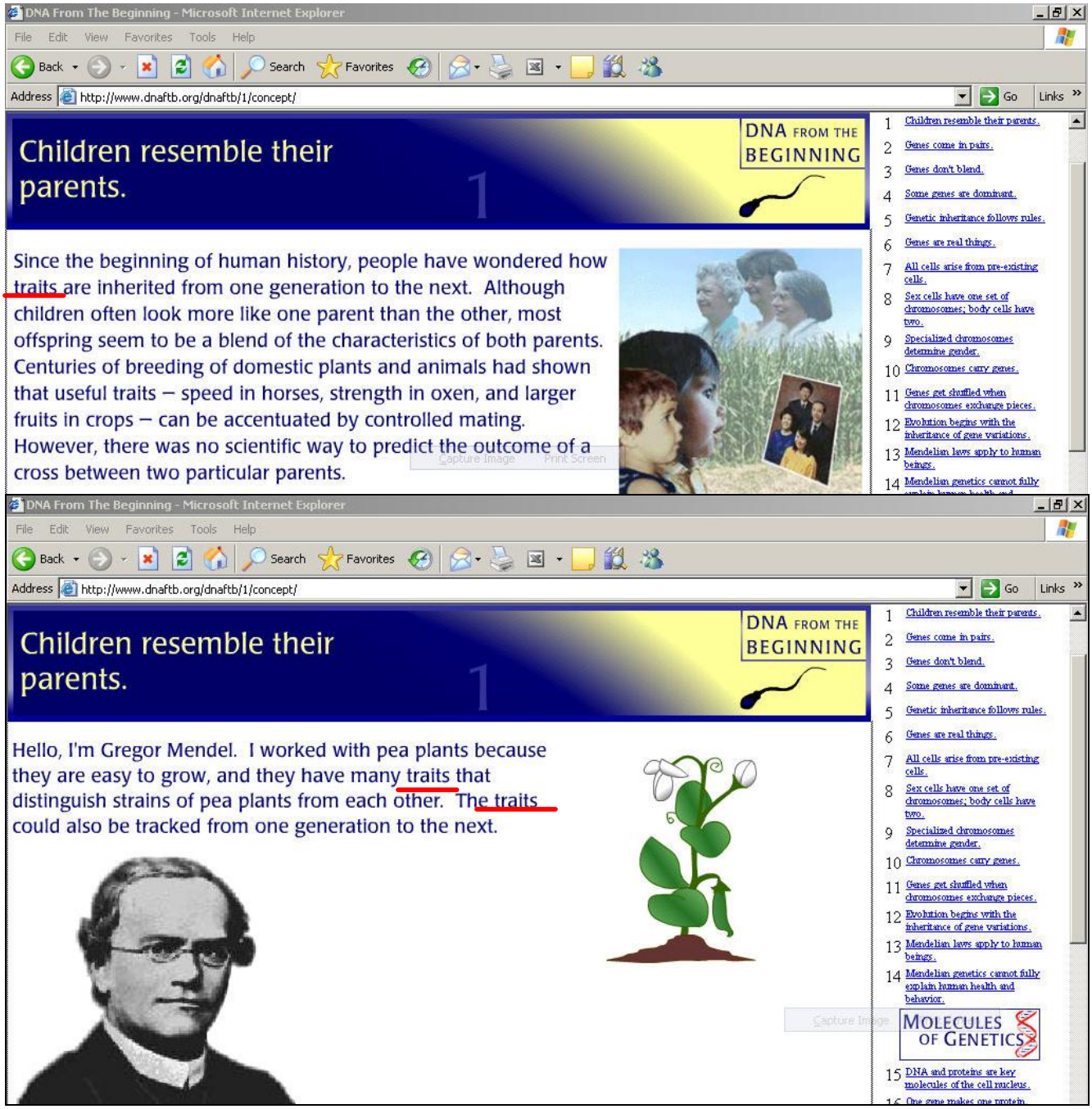
Figure 2. Referring/Anchoring

Saturating

In both framing and referring to target content/concepts, we can also use the instructional conversation strategy "saturating" (Meskill & Anthony, 2004); that is, using a target word or words repeatedly throughout our instructional conversations with students to initiate their acquisition of this target terminology. Given a digital learning object that contains a target term, through instructional conversations instructors can saturate the discourse with that term. There is no greater way for learning disciplinary vocabulary than to hear it, read it, and use it repeatedly as part of and in the context of disciplinary discourse.

EXAMPLE: Classical Genetics http://www.dnaftb.org/dnaftb/1/concept/

Repetition of the target term "traits" as a natural part of instructional conversation about its properties in the description of the concept, audio, video, animation, and image titles can anchor learner attention appropriately and the target term can become a key term in students' developing disciplinary repertoire. Instructional conversations can be saturated with both the target term and the language that describes the phenomenon as students explore and manipulate the object. Saturating then reinforces students' conceptual/linguistic acquisition of target terms and phrases.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Go Links
Children resemble their parents.
1
DNA FROM THE BEGINNING
Since the beginning of human history, people have wondered how traits are inherited from one generation to the next. Although children often look more like one parent than the other, most offspring seem to be a blend of the characteristics of both parents. Centuries of breeding of domestic plants and animals had shown that useful traits – speed in horses, strength in oxen, and larger fruits in crops – can be accentuated by controlled mating. However, there was no scientific way to predict the outcome of a cross between two particular parents.
1 Children resemble their parents.
2 Genes come in pairs.
3 Genes don't blend.
4 Some genes are dominant.
5 Genetic inheritance follows rules.
6 Genes are real things.
7 All cells arise from pre-existing cells.
8 Sex cells have one set of chromosomes; body cells have two.
9 Specialized chromosomes determine gender.
10 Chromosomes carry genes.
11 Genes get shuffled when chromosomes exchange pieces.
12 Evolution begins with the inheritance of gene variations.
13 Mendelian laws apply to human beings.
14 Mendelian genetics cannot fully
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Children resemble their parents.
1
DNA FROM THE BEGINNING
Hello, I'm Gregor Mendel. I worked with pea plants because they are easy to grow, and they have many traits that distinguish strains of pea plants from each other. The traits could also be tracked from one generation to the next.
1 Children resemble their parents.
2 Genes come in pairs.
3 Genes don't blend.
4 Some genes are dominant.
5 Genetic inheritance follows rules.
6 Genes are real things.
7 All cells arise from pre-existing cells.
8 Sex cells have one set of chromosomes; body cells have two.
9 Specialized chromosomes determine gender.
10 Chromosomes carry genes.
11 Genes get shuffled when chromosomes exchange pieces.
12 Evolution begins with the inheritance of gene variations.
13 Mendelian laws apply to human beings.
14 Mendelian genetics cannot fully explain human health and behavior.
MOLECULES OF GENETICS
15 DNA and proteins are key molecules of the cell nucleus.

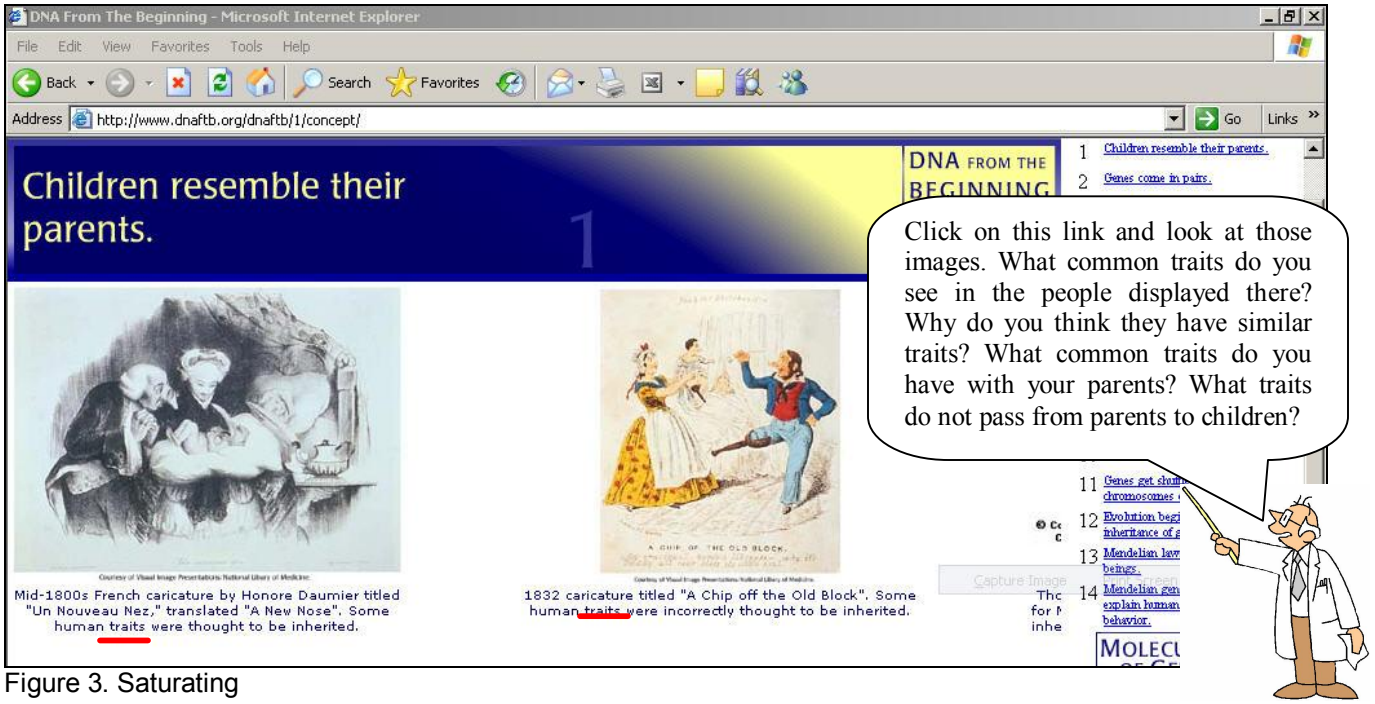

Figure 3. Saturating

Corralling

We use the term “corral” to refer to instructional conversation that corrals or traps students into using specific target language forms under study. Corralling is achieved through asking questions, providing topics and tasks, scaffolding a student’s spoken and written utterances, etc. The strategy takes special advantage of the malleable and anarchic features of digital learning objects in that students’ independent exploration of the object can be refocused, “corralled”, through instructional conversation.

EXAMPLE: Check Mystery
http://www.pbs.org/wgbh/evolution/educators/course/session1/explore_a.html

The Check Mystery assignment is intended to help learners learn how “to make inferences from available evidence to create explanations”. Learners are directed to scrutinize series of bank checks for the purpose of building and strengthening a hypothesis based on the evidence. By asking learners to summarize what they have learned and answer questions, instructors corral students into using the target linguistic forms such as “hypothesis”, “evidence”, “interference”, etc.

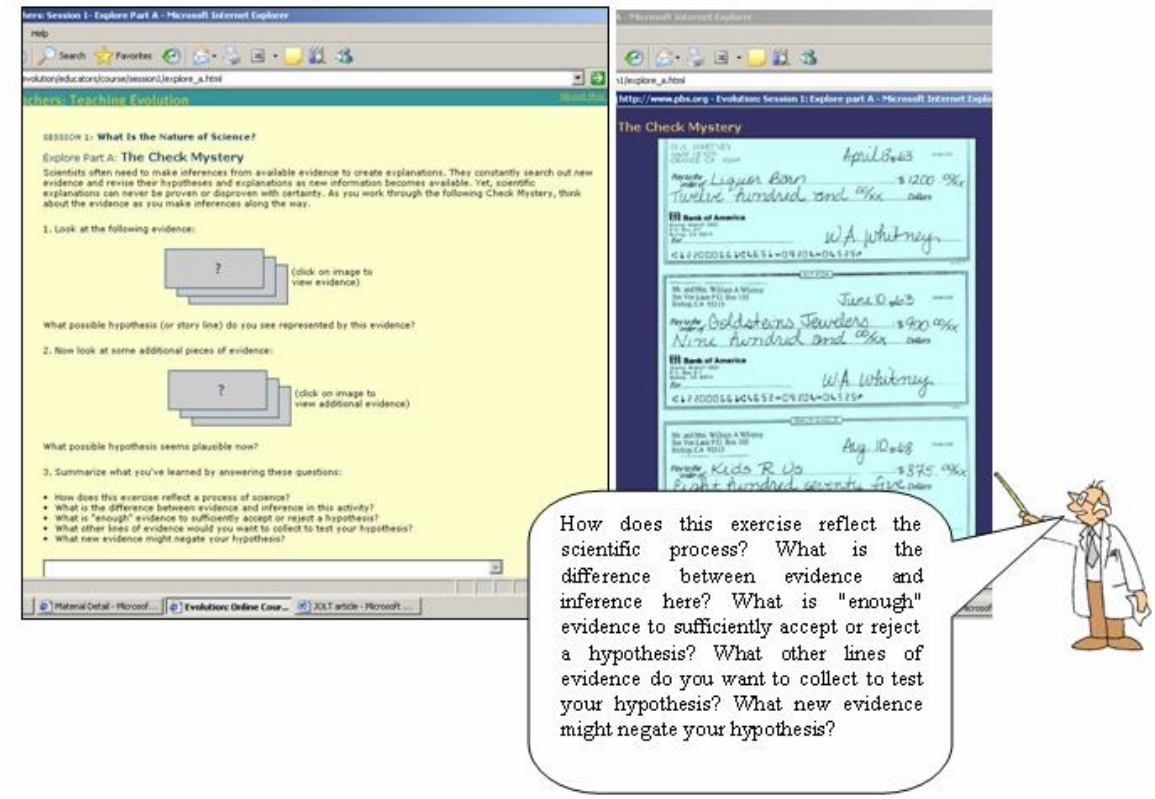

FIgure 4. Corralling.

Providing linguistic tools

Traditional ways of providing linguistic tools - disciplinary words and phrases – are via word lists, glossaries, and, of course, lectures. When we involve digital learning objects in our instructional conversations, we can readily point to them as representing the target terminology. Since these illustrations are often non-static, learners can not only see contextualized content, but see that content in action. The kinds of linked information in the following sample learning object can be nicely reinforced through instructor instructional conversation that provides the conceptual/organization guidance learners need to navigate and make sense of the specialized content.

EXAMPLE: ePSYCH http://epsych.msstate.edu/index.html

In ePSYCH, students engage target concepts visually. The linguistic tools to navigate and make sense of this dense information can be provided by the instructor through the construction of tasks that require referencing the correct vocabulary. Moreover, the features of anchored referents and the potentially public nature of the object are supportive in supplying the linguistic tools, in this case specialized terminology in psychology, for learners to interact with and master.

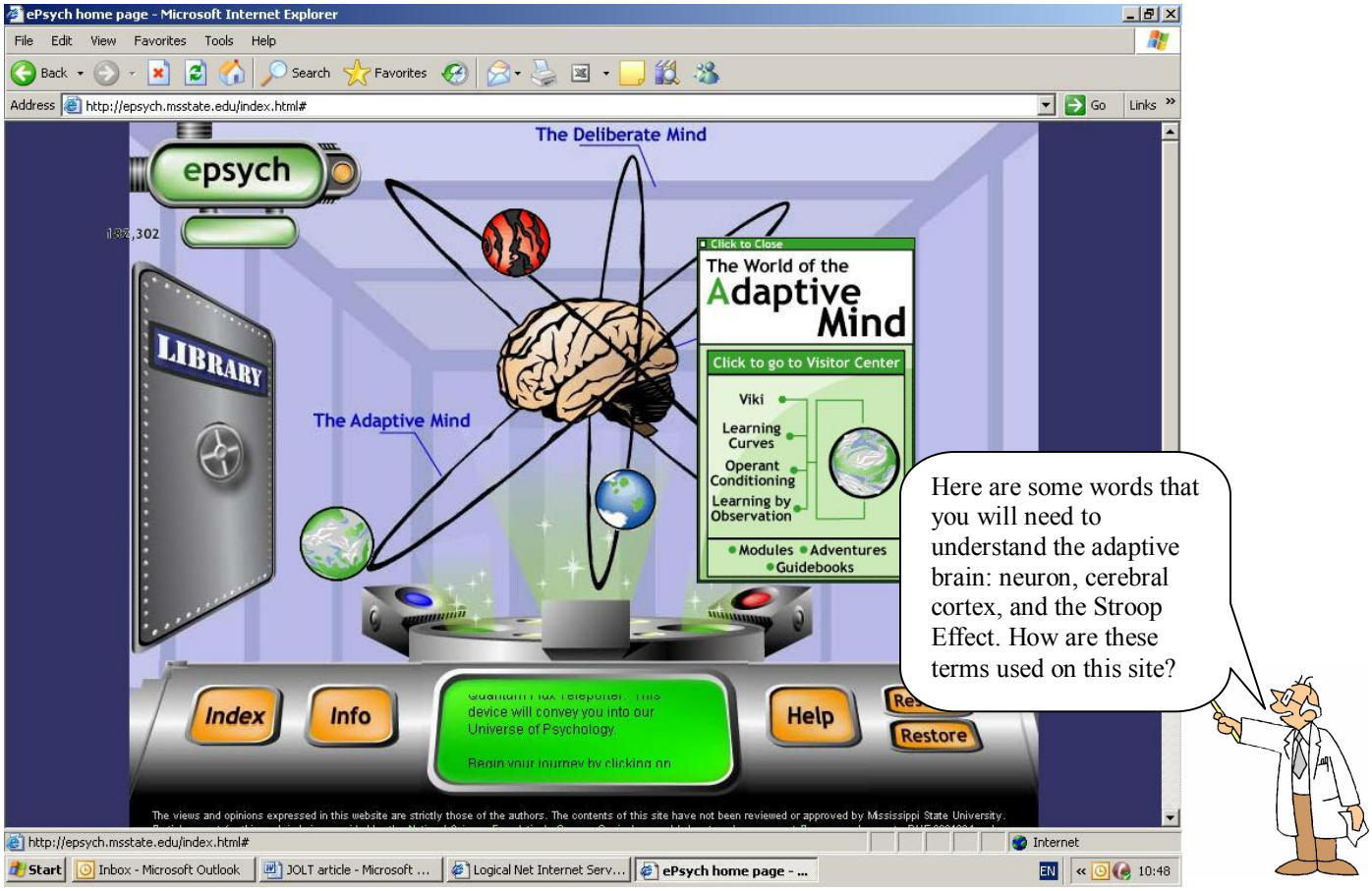

Figure 5. Providing Linguistic Tools

Modeling

Instructional conversations mean that we communicate disciplinarily. Students indeed learn quite a bit about the target discourse communities that we model in our instructional conversations. How we incorporate reference to a specific learning object in conversation can serve to illustrate and scaffold the target discourse to make it that much more accessible.

EXAMPLE: The Water Puzzle http://www.cut-the-knot.org/water.shtml

Describing the problem solving processes that a mathematician undertakes - constructing hypotheses, manipulating variables – while students directly interact with the phenomenon that the instructional conversation describes is an example of modeling being supported by a learning object. Simple problem solving language models the language and cognitive processes that mathematicians and scientists undertake in their work. The malleability and anarchic nature of the learning object allows for student manipulation and enactment of the language and thinking that gets modeled through instructional conversation.

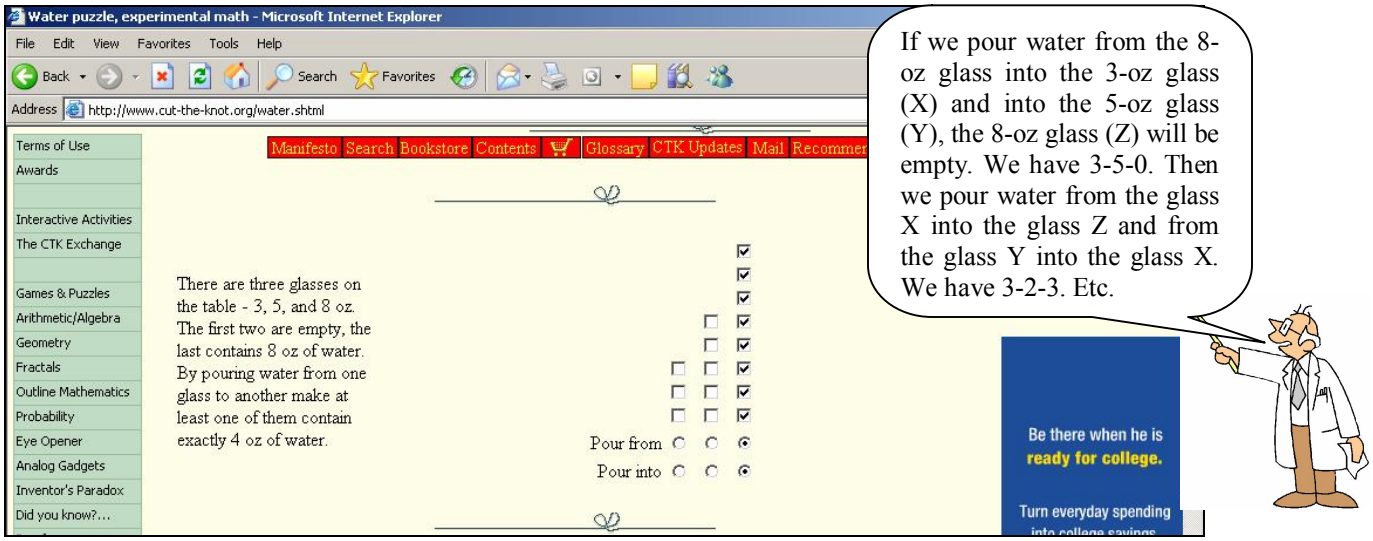

Figure 6. Modeling

Encouraging synthetic responses

The multi-dimensional and dynamic nature of many learning objects lends itself well to encouraging learners to undertake both active problem solving and the synthetic thinking that can result. By setting learner tasks that require investigation of multiple facets of a digital learning object and eventual synthesis of that experience which they must carefully articulate, students actively learn to understand and express using the discourse of the discipline. A WebQuest is an excellent learning object for such learning.

EXAMPLE: Copabacana Restaurant WebQuest
http://members.tripod.com/the_english_dept/foodquest/index.html

In this WebQuest example, students are assigned a multi-part task. In the end, students synthesize their work into an articulate statement of process and findings thus employing the discourse of the culinary arts in a communicative way. Both the public nature, whereby learners interact with one another in public fora, and the anarchic nature of digital learning objects that render them open to student exploration and discovery are particularly well represented by WebQuests.

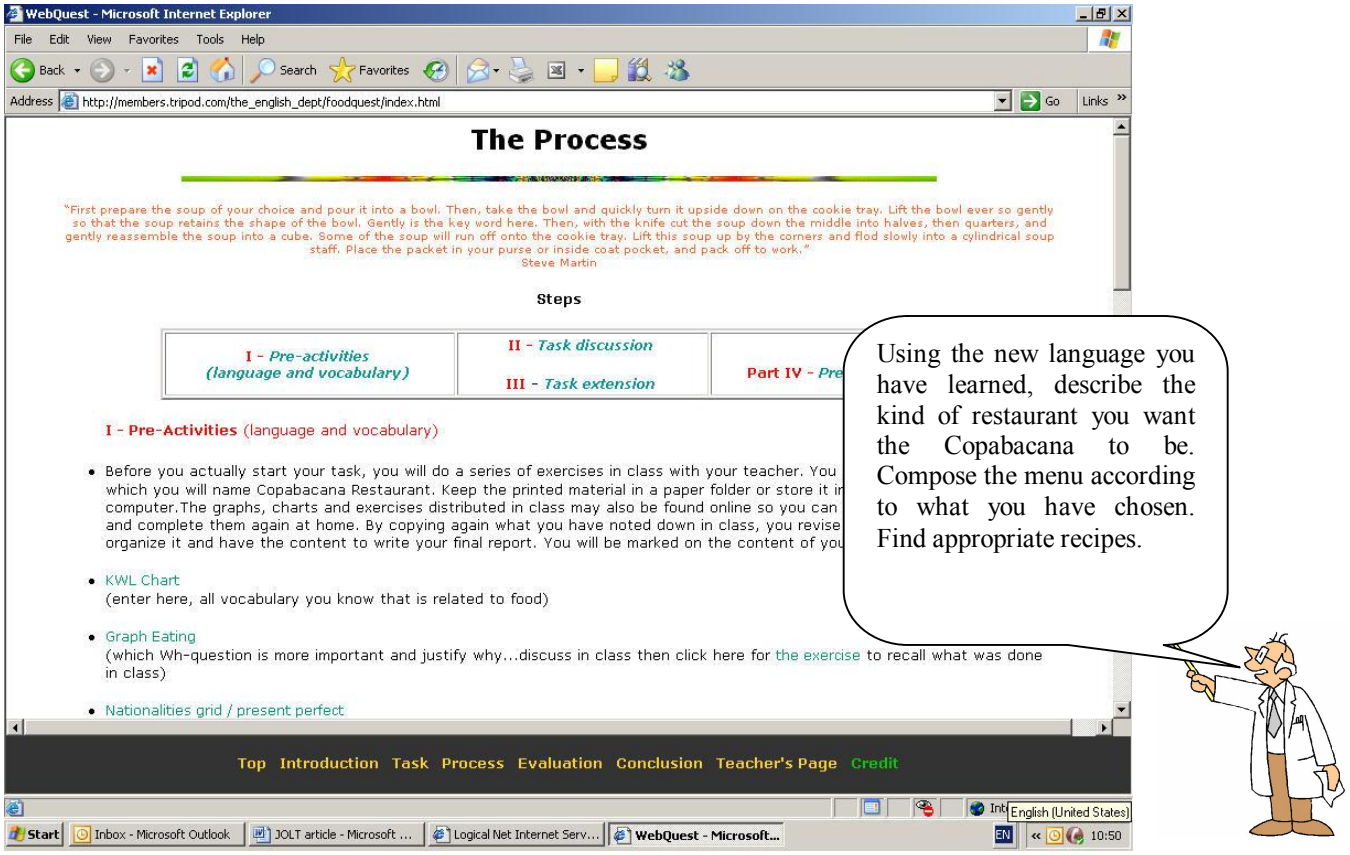

Figure 7. Encouraging Synthetic Responses

Hyperlinking

Providing hyperlinks as part of instructional conversations, indeed all kinds of online conversations, is commonplace. By doing this, we can provide additional relevant material and information to the topic at hand. Indeed, contemporary learners are accustomed to hyperlinks providing supplemental information to the text with the purpose of deepening or expanding understanding. This strategy works well with multimedia learning objects in the way of inserting subtitles, adding a running slogan, providing headlines from newspapers and magazines, or adding hyperlinks to documents.

EXAMPLE: Neuroscience for Kids
http://faculty.washington.edu/chudler/neurok.html

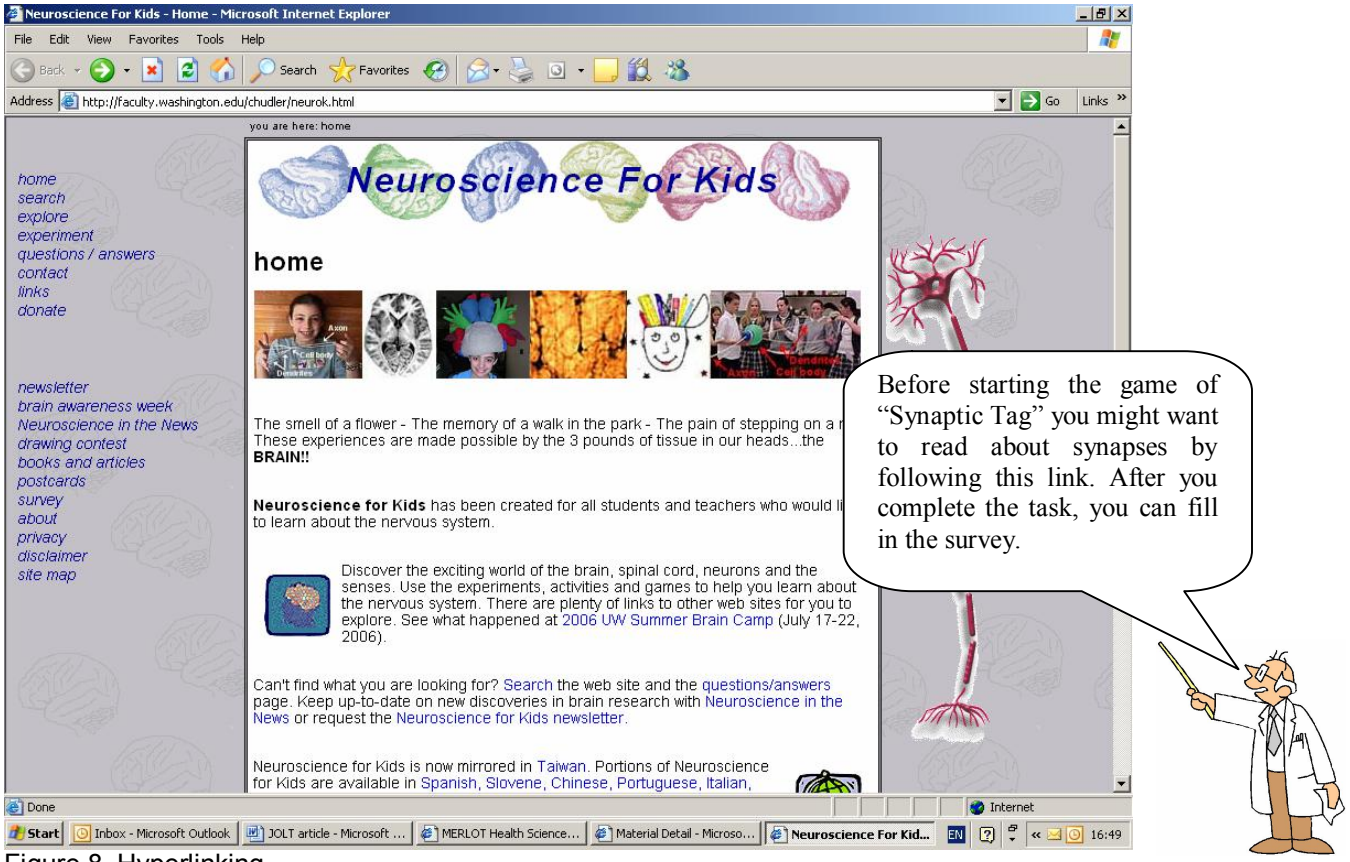

Figure 8. Hyperlinking

Internal dialog

This instructional strategy can be used in online courses when instructors working with learning objects try to simulate live interaction. Instructors ask themselves questions and answer those questions as if they were students being asked and answering those questions. This instructional device calls student attention to the concepts expressed in appropriate, disciplinary discourse.

EXAMPLE: Interactive Mathematics Miscellany and Puzzles http://www.cut-the-knot.org/

Comparing two Javascript applets representing a puzzle and an optical illusion at http://www.cut-the-knot.org/SimpleGames/CommonThing.shtml, the instructor involves learners in his internal dialog by asking and then answering his own questions. By answering the questions, the instructor calls learners' attention to such terms as theorem, measurement, distance, etc.

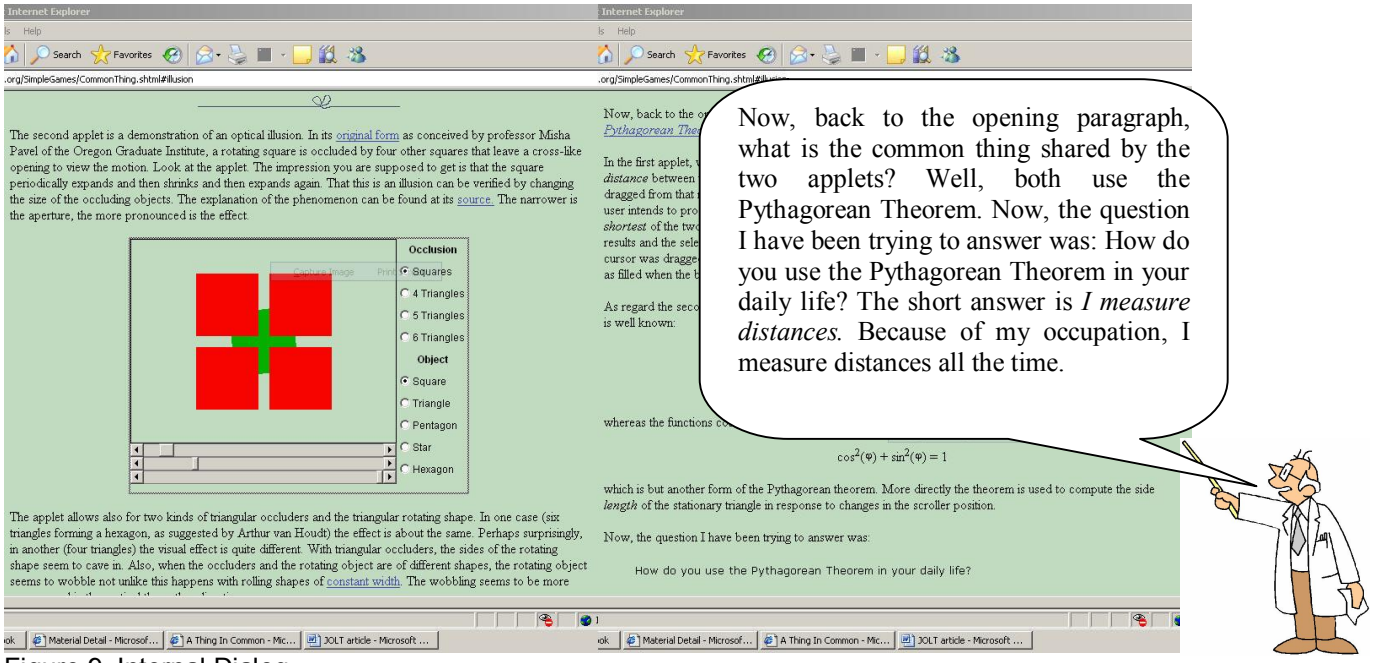

Figure 9. Internal Dialog

Why are Instructional Conversation Strategies with Digital Learning Objects Important?

We see the use of instructional conversation strategies becoming increasingly important as 1) online teaching becomes more widespread; 2) the use of digital learning objects augments; and 3) a need for training in effective online instructional language follows suit. In sum, good instructional communication strategies for nurturing learners into the target disciplinary discourse that at the same time capitalizes on the features of digital learning objects are also important because they can:

-be responsive to the many studies of online learner satisfaction that underscore the importance of instructor engagement through active communication (Swan et al, 2000)

-help develop learners' meta-awareness of language forms as they function in the disciplinary context

-serve as pedagogical frames when considering if and how learning objects can be incorporated in teaching

-be thrown into the mix as informed instructional design decisions are made

-support the development of 'metapedagogical awareness' for educators.

Finally, naming such instructional conversation strategies with digital learning objects can perhaps serve to anchor our own interdisciplinary conversations about the craft of teaching and learning.

Conclusion

When we return to the core element of teaching and learning – communication through mutual perspective-taking that gets mediated through human language – we identify how our species learns best: from the active negotiation of meaning with others. Applying this concept to the use of digital

learning objects brings new ways to consider the substance of teaching and the conversational strategies that make sense in guiding and immersing our students in our disciplinary discourse communities. Designing and conducting conversations that promote learner participation and consequent development as fluent communicators is a realm of instruction that digital learning objects can certainly support and complement well.

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