

## Final Activity

### Effects of Technology in Changing the Nature of Cognition in Learning

The project started with instructions to find 20 “synecdochal chunks.” While I was familiar with the word “synecdochal” from English class I was not really sure what a synecdochal chunk was. This caused confusion with the assignment and to the best of my understanding I needed to find sentences that I thought were important enough to underline several times. Somehow I got it fixated in my mind that these had to be single sentences and not 1-5 sentences chunks. This made it much harder because it was difficult to find single sentences that had great depth to them.

To find these synecdochal chunks I went back to the class forums to reread student posts. The first very useful thing that this project caused was a deeper understanding of my classmates thoughts. When I originally read each of the posts my focus was on responding more than understanding. In other words, the first assignment gave a task to respond to posts while the second assignment gave a task to find the most important element of the posts and these different responsibilities caused me to read in a unique way for each. Below are the synecdochal chunks that were generated:

Quote	Tag
With the radical changes in the nature of technology available (e.g., its rapid access quality; or the easy availability of so much of the world’s knowledge on the Web through precisely targeted search), however, it is now more likely than ever that technology will radically change the most fundamental aspects of learning and, more broadly, cognition.	digital random access media
In ill-structured domains, examples or cases are not instances of higher-order	ill-structured

<p>concepts, with the former neatly nested under the latter -- that is what makes them ill-structured domains (they don't fit neatly in that way) -- so the alternative is to start from the (messy) actual examples/cases/occurrences and see how the abstract categories weave naturally/ecologically through them.</p>	<p>domains, authentic learning</p>
<p>These are most definitely aspects of writing that we discuss and model and imitate within the classroom – but there is no perfect formula, no right or wrong answer. In some ways, it feels as if we are talking about the soul of a subject – that indefinable, insubstantial part that eludes classification or identification. But I think it’s the part that is most closely aligned with the definition of an ill-structured domain.</p>	<p>ill-structured domains, authentic learning</p>
<p>Clearly for ill structured domains the process of essential information is difficult to narrow down.</p>	<p>ill-structured domains</p>
<p>[Instruction] can assist or provide reminders, but the process of ‘doing’ provides the essential understandings in authentic contexts.</p>	<p>authentic learning</p>
<p>Our world does not need more robots, adept at parroting back what they have been told; rather, we need thinkers, skilled in negotiating the massive volumes of information available to them in order to select, consider, discriminate, and re-assemble knowledge, facts, situations, and nuances of all.</p>	<p>authentic learning, digital random access media</p>
<p>In many cases it may be instrumental to have been directed to learn certain information as a foundation in which the learner could then branch out on their own to further learn by exploring new ways of doing things based on the basic understandings of how things work.</p>	<p>constructivism</p>
<p>The question is complicated by the individual motivations of the student--one who is motivated by active involvement and naturally curious might take well to a discovery method, while a student who lacks both skill and confidence may need more guidance or scaffolding in the early stages of learning.</p>	<p>motivation, constructivism</p>
<p>Most learning outside of school seems to naturally fit into the constructivist approach and people not adept at it will struggle to learn.</p>	<p>authentic learning</p>
<p>I think that moving from an WSD to an ISD is a shared responsibility of both the instructor and the learner, as it is ultimately the learner who will be empowered by the gains in understanding and knowledge by being able to leverage what they know in an unforeseen circumstance to best come up with a solution to a problem they are faced with. So while I do think it is crucial to find that balancing point of transition from a WSD of “essentials” to an ISD where the learner can explore new ways of learning and discovery of the subject - I think finding that point is the real magic as an instructor.</p>	<p>ill-structured domains</p>
<p>The further we travel down the continuum toward ill-structured domains, the more we are required to teach our students models of thinking that may apply</p>	<p>ill-structured domains</p>

<p>to a given situation, singly, combined, or re-configured. Teaching students that a “pre-packaged” schema does not necessarily exist for a given subject or lesson allows students to explore possible solutions rather than to seek the right answer from a well of essential knowledge.</p>	
<p>The world doesn't go in a line and isn't organized into chapters. Yet we wonder why students have so much trouble applying their knowledge outside of the context in which it was originally taught. We have the possibility now to support the representation of knowledge in ways that are more closely attuned to the needs for using that knowledge.</p>	<p>ill-structured domains, digital random access media, authentic learning</p>
<p>Considering the inherent differences between well-structured domains and ill-structured domains there is a clear difference in how they will be treated.</p>	<p>ill-structured domains</p>
<p>The well-structured domain allows for a straight process or even algorithmic process of learning there are many applications of technology that can assist this structure of learning... For ill-structured domains the availability and use of technology greatly enhances the ability to learn from multiple examples, multiple viewpoints and other complex variations of the concepts and ways of interpretation.</p>	<p>ill-structured domains</p>
<p>The benefit of technology lies within the flexibility. Due to the dynamic nature of information access, varieties of input, multiple methods of interaction, and many forms of output, technology be can effectively utilized in either environment. I find it logical that technology is used for replication of tasks, skill and drill, transmission of knowledge and other expressed characteristics of well-structured learning environments. Similarly, technology is repurposed in ill-structured environments to provide opportunities for discovery, self-directed learning, and more open-ended platform choices to accommodate for the changes in the environment. The preparation comes in the knowledge of the teachers and learners to understand what the technology can do within each environment and how it can best be repurposed to meet the objectives.</p>	<p>ill-structured domains, digital random access media</p>
<p>Now, with the use of powerful search engines such as Google, learners have the ability to search the entire globe, across centuries of knowledge on the subject of study that would previously not been possible.</p>	<p>digital random access media</p>
<p>What I see good teachers do is constantly monitor what their students are able and willing to do, moving them always from dependency to independence, from direction to discovery.</p>	<p>constructivism</p>
<p>This means ill-structured domains require multiple perspectives, multiple analogies, and multiple examples. The idea of using multiple approaches is to compensate for the weakness found in a single alternative. Using multiple methods means educational technology can play a pivotal role. Recent</p>	<p>ill-structured domains, digital random access media</p>

technology is well suited for tackling a concept from different perspectives.	
I would agree that project-based learning is the flavor of the day in education. However, it is a huge assumption that its promotion by educational media and consultants is equivalent to its pure application in real world classrooms. And it is a second leap to posit it as the cause of a questionable “problem” for which the authors provide no evidence. So my question is this: Where does this very purist form of discovery or problem-based learning, totally free of scaffolding or guidance, exist?	constructivism
I would contend that “knowledge” that has been “rehearsed” doesn’t automatically become “learned.” To me, real learning involves making personal meaning from a snippet of information.	constructivism, authentic learning
If higher aptitude students achieve at higher levels under less guided instructional approaches, doesn’t this indicate a need for constructivism?	constructivism
With the rapid expansion of web based technology it would be a great discussion to look at how the rise and fall of new tech-tools change the way we search and consume information. At an ever-growing pace it seems as though less has become more, and attention spans are shorter than ever to allow us to consume far greater sources of information, but does that come at a cost of the depth of understanding?	digital random access media
The swimmer possesses a unique sense of his buoyancy and balance, which the coach cannot begin to understand in the way that the swimmer does, and so the swimmer must be trusted to construct his own stroke to adapt his body to this task. When the swimmer has this level of understanding (intermediate or expert level), it is better to use a constructivist approach if you are planning to make changes to the stroke mechanics.	constructivism, motivation
Through a dynamic collaboration with the Web, what it is you are trying to learn evolves and starts to take multiple shapes (all useful for different occasions beyond the present one, this facilitating future transfer of knowledge).	digital random access media
By not letting you lose yourself very easily in a web of new connections Wikipedia provides an illusory solidity that acts as an anchor when what is really needed is lightness and coursing flight.	digital random access media
If we want to prepare students for nonlinear world we must begin with nonlinear learning.	authentic learning
It means developing and supporting the skill of flexibility adaptive assembly of knowledge to end overreliance on the retrieval of prepackaged knowledge schemata from memory, rigidly compiled structures that are ill fit to the knowledge application situations we try to shoehorn into them.	authentic learning, constructivism

<p>In this course, I am trying to examine personal meaning for each student through wrap-around blog posts that focus on application of the knowledge we have “learned” during class.</p>	<p>authentic learning, digital random access media</p>
<p>First, it is unclear that learners of all ages can construct knowledge. Maybe it is more specific to say it is unclear that learners can automatically construct knowledge around a given learning module. Second, I am skeptical that learners are constructing a mental representation regardless of how the information is presented. I have seen many times where students simply remember steps without any real understanding of what is taking place. How much the instruction requires the students to explore the concept would seem to have an influence on how rich the mental representation is.</p>	<p>constructivism</p>

As you can see this process generated over 30 chunks. Most of them came from the student forums. However, some of my best ones came from articles in The New Gutenberg Revolution. These articles were extremely useful in elucidating the core principals of the entire course. Those reading were synecdochal chunks in and of themselves.

The next step was to tag my chunks. To stay with the spirit of the class I registered with Evernote. I imported my chunks and used the tagging feature it provides (although for convenience I listed the same information here). It took some time to tag all of them and I came up with five tags: ill-structured domains, digital random access media, authentic learning, motivation, and constructivism. These tags were generated from themes that I used while analyzing the question, “How does technology change the nature of learning?” The themes and tags are broken down below:

Tag	Theme
motivation	The role motivation plays in learning
digital random access media	How digital random access media can change learning ( AWE, WOW)

ill-structured domains	The importance of understanding the domain from WSD to ISD.
authentic learning	Why authentic learning is important.
constructivism	Using constructivist principles for delivery and acquisition of knowledge.

Many of the chunks had multiple category tags. This is one of the big take home messages. That is, ill-structured domains are not easily categorized and there is richness that surrounds the concepts and overlapping of ideas. The benefit is obvious. Freshmen college students, for example, have trouble seeing how connected their courses are. For them, each course they are taking is separate and distinct. As we progress in our education we start to see how interconnected and overlapping concepts and ideas are. This approach encourages a student to contemplate a wider perspective.

While I originally had five categories combinations of categories created five more themes: ill-structured domains/authentic learning, ill-structured domains/digital random access media, motivation/constructivism , digital random access media/authentic learning, constructivism/authentic learning. The ill-structured domains/authentic learning theme focuses on how ill-structured domains can't be "shoehorned" into neat package and attempts to do so might help a student do well on a test, but will not be less practical for real world challenges. Looking at motivation/constructivism what emerges is that instruction that follows these principles are presumably more motivating to learners. When looking at the combined category of ill-structured domains/digital random access media we can see that in the past students may have only had a single textbook and therefore would be ill-equipped to tackle nebulous concepts like justice. New digital technologies can help learners transform and reformulate knowledge—see Advanced Web Exploration (AWE). The theme digital random access media/authentic

learning focuses on using new digital technology to allow learners to explore a topic from multiple perspectives making their learning much more authentic. This is achieved in the psychological state Wide-Open-Web (WOW). Finally, constructivism/authentic learning theme focuses on how developing flexibility through authentic learning can end an “overreliance on the retrieval of prepackaged knowledge schemata from memory.”

The next step was to whittle the large set of synecdoches to 6-8 of the best ones. Then give the epitomes a brief title, which I have done below:

Title	Quote	Reaction	Tags
<b>1) Messy Concepts</b>	In ill-structured domains, examples or cases are not instances of higher-order concepts, with the former neatly nested under the latter -- that is what makes them ill-structured domains (they don't fit neatly in that way) -- so the alternative is to start from the (messy)	This gives a nice explanation of ill-structured domains and makes clear that dealing with them is “messy.”	ill-structured domains, authentic learning
<b>2) How to Write</b>	These are most definitely aspects of writing that we discuss and model and imitate within the classroom – but there is no perfect formula, no right or wrong answer. In some ways, it feels as if we are talking about the soul of a subject – that indefinable, insubstantial part that eludes classification or identification. But I think it’s the part that is most closely aligned with the definition of an ill-structured domain.	Although ISD seems to be used in the context of a body of knowledge here ISD is being used to describe a task—in this case writing.	ill-structured domains, authentic learning
<b>3) Critical Thinkers Navigate a</b>	Our world does not need more robots, adept at parroting back what they have been told;	As we amass data and information this synecdochal chunk stresses the	authentic learning, digital random

<p><b>Sea of Information</b></p>	<p>rather, we need thinkers, skilled in negotiating the massive volumes of information available to them in order to select, consider, discriminate, and re-assemble knowledge, facts, situations, and nuances of all.</p>	<p>importance being able to use that information in a useful way.</p>	<p>access media</p>
<p><b>4) The Real World is not a Textbook</b></p>	<p>The world doesn't go in a line and isn't organized into chapters. Yet we wonder why students have so much trouble applying their knowledge outside of the context in which it was originally taught. We have the possibility now to support the representation of knowledge in ways that are more closely attuned to the needs for using that knowledge.</p>	<p>This is a commentary on how we are currently teaching students and the doors that have been recently opened to change that.</p>	<p>ill-structured domains, digital random access media</p>
<p><b>5) Technology Repurposed for Self Discovery in Ill-structured Domains</b></p>	<p>The benefit of technology lies within the flexibility. Due to the dynamic nature of information access, varieties of input, multiple methods of interaction, and many forms of output, technology be can effectively utilized in either environment. I find it logical that technology is used for replication of tasks, skill and drill, transmission of knowledge and other expressed characteristics of well-structured learning environments. Similarly, technology is repurposed in ill-structured environments to provide opportunities for discovery, self-directed learning, and more open-ended platform choices to accommodate for the changes</p>	<p>This chunk hits home the importance technology plays for both WSD and ISD.</p>	<p>ill-structured domains, digital random access media</p>

	<p>in the environment. The preparation comes in the knowledge of the teachers and learners to understand what the technology can do within each environment and how it can best be repurposed to meet the objectives.</p>		
<p><b>6) Making it Personal</b></p>	<p>I would contend that “knowledge” that has been “rehearsed” doesn’t automatically become “learned.” To me, real learning involves making personal meaning from a snippet of information.</p>	<p>This was of interest because it started to get to the question of how deeply is material learned.</p>	<p>constructivism, authentic learning</p>
<p><b>7) The Real World is Messy</b></p>	<p>It means developing and supporting the skill of flexibility adaptive assembly of knowledge to end overreliance on the retrieval of prepackaged knowledge schemata from memory, rigidly compiled structures that are ill fit to the knowledge application situations we try to shoehorn into them.</p>	<p>By treating ISD like WSD teaching has wrongly focused on route memorization that will not fit many situations.</p>	<p>authentic learning, constructivism</p>
<p><b>8) Technology Aids in Multiple Perspectives</b></p>	<p>This means ill-structured domains require multiple perspectives, multiple analogies, and multiple examples. The idea of using multiple approaches is to compensate for the weakness found in a single alternative. Using multiple methods means educational technology can play a pivotal role. Recent technology is well suited for tackling a concept from different perspectives.</p>	<p>This gives the remedy to what is been explained to be the disease. Mainly that ISD are being “shoehorned” to fit a narrow scheme.</p>	<p>ill-structured domains, digital random access media</p>

The final task, called the lighting round, was to list the eight epitomes above in a circle and rapidly look for relations between them.

### **Lighting Round**

1-2) Interesting. When writing the topics can be WSD or ISD. However, can the actual task of learning to write be ill-structured? That is, is it possible we need to arrive at a more widespread approach to the task of writing instruction?

1-3) The combination seems to fit. That is we need citizens that are adept at critic thinking because the world is filled with messy problems with answers that can't simply be looked up in a book.

1-4 ) These two chunks are saying similar things. One is making it clear that this is the way the world operates while the other is emphasizing that new approaches (using technology) can help the learner to operate in that world.

1-5) Again, these chunks combined to emphasis the importance of new technologies in learning.

1-6) It is hard to rehearse for something that is constantly changing. However, does making it personal alleviate any of the problems?

1-7) What happens when there is an overreliance on teaching pedagogy that best fits WSD?

1-8) If the world consists of ISD using multiple perspectives when teaching is a way to compensate.

2-3) Writing can be used to spur creative and critical thinking.

2-4) These makes me think about using writing to apply knowledge outside the context of what is taught.

2-5) For beginning writers drill and practice software could be useful, but as they advance can technology be used to improve writing skills?

2-6) Teaching students to write about their own personal story.

2-7) Teaching students to write in multiple mediums.

2-8) Using technology to deeply explore a topic before writing on it.

3-4) These chunks have similar thoughts (see 1-4).

3-5) Since we are wanting to develop thinkers who can “negotiating the massive volumes of information” shouldn’t we be utilizing the affordance of digital random access media?

3-6) If we want to develop thinkers that can “discriminate, and re-assemble knowledge, facts, situations” is it possible to show them how it they would be affected personally if they just regurgitate facts?

3-7) See 3-4.

3-8) To “discriminate, and re-assemble knowledge, facts, situations” we need to see things from many perspectives and understand the nuances of ISD.

4-5) If we want to “support the representation of knowledge in ways that are more closely attuned to the needs for using that knowledge” using the “flexibility” of technology seems prudent.

4-6) Does making the content of learning “personal” help learners apply their knowledge outside of the context? It is possible that it would be less as a result.

4-7) Instead of focusing on memory as a storage device let’s focus on decoding the jungle of information out there.

4-8) Since we are focusing on helping learners make sense of the vast amounts of data, practicing with digital random access media would surely be a benefit.

5-6) Learning to make content personal means learning to repurpose and the goal of chunk #5 is learning to use technology within different environments and how it can best be repurposed to meet the objectives. Seems to interrelate.

5-7) To deal with ISD we want to develop flexibility. Using technology to handle open-ended questions does just that.

5-8) The connection here seems obvious. If we want to look at ISD from multiple perspectives than what better resource than digital technology?

6-7) Requiring a learner to find ways to relate information to him or her personally seems to be a way to “supporting the skill of flexibility adaptive assembly of knowledge.”

6-8) How can different perspectives of a given topic affect a learner personally?

7-8) Since the real world is messy and concepts often cannot be fully learned by looking at them from one perspective why not use the affordances of technology to increase the learners scope?

Working on this last portion has made the rationale of the assignment become clear. Essentially we are playing with Tinker Toys or Legos. (That is why the instructor stated, “If you’re not having fun, you’re not doing it right.”) By creating our synecdochal chunks we gather our building blocks (Legos) and then we can commence to play around with them putting them together to create novel structures. Although, I methodically connected each block to every other there was nothing to stop me from connecting more blocks and doing it in a more random manner.

### **Summary**

I have over 300 higher education credits and I have never taken a course that approached the material in this manner. Most of the course consistent of a lot of reading. I have read Mortimer Adler’s *How to Read a Book* and it instructs on using syntopical approach to reading. The syntopical approach employs some of the techniques used in the final activity and therefore I have thought through topics on this level. Teaching students to use the syntopical approach is lengthy and difficult. However, our assignment demonstrated a simple method to push students to think at a higher level and to come at a topic from different perspectives. It employed new ways for students to construct information. As mentioned above the idea of breaking down ideas to simple concepts and then using those pieces to construct new ideas is clever.

This “project” turned into more work than I anticipated. A large amount of that work was understanding and thinking. First, understanding how to construct this project. Since I have never done this before it require more than usual amount of time puzzling out how to proceed. Second, I spent a lot of time thinking what these topics meant to me. As I started building my ideas in the lightning round new ideas and thought would come to me. It would seem a very

useful approach to brainstorming a problem because it forces you to interlink ideas that may not normally be linked. Also, we were required to keep a reflective journal of the activities and this required thinking even deeper. It produced a metacognitive thinking about thinking.

In addition, this process used some of the latest technologies to implement our work. It is rare that I use new technologies in the a course, but in this one I have learned Diigo and Evernote. How did I ever get along without Diigo? Using these technologies certainly fits well with the model of the class. Even though I worked with my chunks in Evernote I still ended up using Word to write up my results. I am not sure if either technology could produce a better “paper” but it is worth exploring further because they can utilizing tagging much more efficiently.

As I mentioned the techniques of this class were fruitful. Having to carefully re-read posts made for a much better insight. Taking the essence of ideas and categorizing and tagging them led to a deeper understanding. Joining concepts to create new ones is brilliant. Each task made me think about how this could be used for classes I am teaching.