Looking to make your course more engaging for your students? Are you implementing authentic learning tasks into your courses? Have you tried VoiceThread in your classes? Do you want to implement evidence-based practice in the design and development of your courses? If your answer to any or all of these questions is “Yes!”, then connect with the instructional designers. We are available to consult with you regarding overall course design and development as well as targeted components of the instructional process, such as assessment or learning activities. Additionally, we can provide instruction and support for the use of technology to augment and enhance instructional methods.

Connect with the Instructional Design team!

Get Connected! Learn more at hsd.luc.edu/iilt
Meaningful learning can be described as learning that makes a difference in one’s mind and in one’s life (Galindo). Meaningful learning refers to a learning process where new knowledge to acquire is related with previous knowledge (Ausubel, 2000). According to Ausubel, the key concept is the cognitive structure -- the sum of all the knowledge we have acquired as well as the relationships among the facts, concepts and principles that constitute that knowledge. Learning for Ausubel amounts to bringing something new into our cognitive structure and attaching it to the existing knowledge that is stored there. This is how we make meaning. Mayer (2001) suggested that there are three major internal conditions that must be met for instruction to foster meaningful learning. The diagram below depicts these conditions.

**Cognitive Strategies for Meaningful Learning**

**Select**
Does learner attend to relevant information?
- Yes
- No

**Organize**
Does learner build internal connections?
- Yes
- No

**Integrate**
Does learner build external connections?
- Yes
- No

**Understanding**
Good retention, good transfer

**Nonlearning**
Poor retention, poor transfer

**Nonlearning**
Good retention, poor transfer

**Nonlearning**
Good retention, poor transfer

**How to Foster Meaningful Learning**

Our goal is to promote meaningful learning -- that is, learning in which the learner engages in active cognitive processing that leads to transfer. Transfer is the effect of previous learning on new learning or problem solving. The process of meaningful learning depends both on the material that is being presented -- the teaching side of the process -- and on the way that the material is processed by the learner -- the learning side of the process. Thus, the two ways instructors can foster the process of meaningful learning are through:

1. Improving the way the material is presented (i.e., instructional methods)
2. Improving the way the students process information (i.e., learning and thinking strategies)
Cognitive strategies are defined as the “internal processes by which learners select and modify their ways of attending, learning, remembering and thinking.” (Gagne, Brigg, and Wagner, 1988, p. 67) Cognitive strategies are useful tools for supporting the learner as he or she develops internal procedures that enable him/her to perform tasks that are complex (Rosenshine, 1997). Cognitive strategies are task-specific and involve a learner manipulating new information to help them to organize and make sense of it.

Spatial Strategies

Spatial strategies help the learner organize information visually. The two major types of spatial strategies are frames and concept maps.

Frames

Frames show the organizational structure and provide the learner with an understanding of the “big picture” or overall schema of a particular theme or topic area. Frames are useful for “demystifying” a topic area by allowing learners access to the larger themes, thereby facilitating the metacognition described by Ausubel and other cognitive psychologists. According to Ausubel, metacognition is the process of active reflection on learning. In other words, it is “thinking about thinking.” This process fosters meaningful, deep learning to occur. This table is an example of a simple frame.

<table>
<thead>
<tr>
<th>Spatial Strategies</th>
<th>Type of Strategy</th>
<th>Purpose</th>
<th>Examples</th>
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</thead>
<tbody>
<tr>
<td>Frames</td>
<td>Provide visual organizational structure</td>
<td>Tables</td>
<td></td>
</tr>
<tr>
<td>Concept Mapping</td>
<td>Displays concepts and relationships</td>
<td>Chain, Hierarchical, Spider</td>
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This section of the newsletter highlights features of Sakai and how they can enhance the learning environment and augment student engagement. In this issue, the peer assessment feature of the assignment tool is highlighted. Peer assessment enables students to review and critique each others’ assignment submissions. Peer assessment and peer review are processes whereby students grade each other’s work for either summative or formative purposes (Bostock, 2006). Depending on how the assignment is constructed, the Sakai peer assessment feature can support both formative and summative assessment types. The peer assessment process is beneficial for the student receiving the feedback, as well as for the student providing the feedback. Students generally perceive peer review as a non-threatening process that benefits their learning by providing suggestions from their peers about how to improve their work and by helping them understand the criteria that the instructor will base the assessment of their work upon.

**Benefits of Peer Review**

**Engage students fully in the learning process and foster active learning.**

**Increase learning.** Students connect with learners at the same level they are at and often gain clarity and understanding from peer feedback and explanations. Students can learn more by dissecting what others have to say about a common topic or they can expand their learning when evaluating assignments done on different topics.

**Enhance written communication skills.** Students have an opportunity to develop skill in composing clear and concise written communication when peer assessment extends beyond completing a rubric and requires written feedback.

**Enhance collaboration in the learning environment.** Through evaluating other students’ work, students gain insight into various perspectives and experience different styles of writing.
Fostering Meaningful Learning
Cognitive Strategies

Memorization Strategies

Learners use memorization strategies to enhance the capacity of their working memory and facilitate the transfer of information to long-term memory. These strategies are also referred to as multipurpose strategies because they are used in a variety of settings. These tools are relatively simple learning strategies that we employ regularly.

It may seem contradictory to say that memorization is a good way to promote transfer. However, memorization strategies can promote transfer in two ways. First, when learners have memorized basic facts, it takes minimal effort to use them in higher-order thinking. Second, memorization strategies can help learners make sense out of new material and generate a degree of meaningfulness. These strategies aid in elaboration which involves adding information to the information being learned. The more a learner elaborates on what was learned through processing, the better he or she remembers it. This is because, as we tie the new information to existing information or we create other information related to the new information, we create more pathways to get to the new information as we try to remember it.

Paivio (1971) argues that memorization strategies prompt the learner to become more cognitively active by forming images or making mental connections:

**Dual Coding.** Many memory strategies involve using imagery as well as verbal representations. This approach provides two distinct codings of the same material thus providing more ways to find the information in memory.

**Organization.** Many memory strategies provide a coherent context or organization into which new information can be fit. The organization serves to hold the information together rather than the information being stored as separate bits.

**Association.** Many memory strategies involve forming strong associations between elements. Stronger associations allow for superior remembering.

<table>
<thead>
<tr>
<th>Memorization Strategies</th>
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<tbody>
<tr>
<td><strong>Type of Strategy</strong></td>
</tr>
<tr>
<td>Rehearsal</td>
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<tr>
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<tr>
<td>Imagery</td>
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<tr>
<td>Mnemonics</td>
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</tbody>
</table>
THEORETICAL FOUNDATIONS

Illustrate Instruction
Illustrations for Deeper Learning

Students learn more deeply from words and graphics than from words alone.

Decorative
Used to break up a page so it is appealing to the viewer. Can be motivational to the learner.

Representational
Illustrate a major portion of important textual information. Provide a concrete reference for verbal information making it more meaningful to the learner.

- Sources of hope, strength, comfort, meaning, peace, love and connection
- The role of organized religion for the patient
- Personal spirituality and practices
- Effects on medical care and end-of-life decisions

Organizational

Transformational
Used as a mnemonic learning aid. Provide learner with a visual anchor for recalling facts. Combines concrete images to help learners recall abstract ideas.

Explanative/Interpretation
Help learners understand difficult or abstract information. Provide visual interpretation of the content. Used to explain how systems work.

Illness-Wellness Continuum

THEORETICAL FOUNDATIONS
THEORETICAL FOUNDATIONS

Attention
Gaining attention - precondition to learning
• Complexity of illustration draws and holds attention
• Provides novelty - a key to gaining attention

Retention
• Dual-coding
• Provides multiple pathways for retrieval of information
• Assist in building well-structured schemas
• Hierarchy building
• Performance aids

Understanding
• Abstractions for concrete concepts
• Concrete metaphors for the abstract
• “Whole-brain learning”

Create Context
• Situated learning - illustrations establish a realistic context
• Instructional metaphors - use as effective mnemonic devices

MULTIMEDIA PRINCIPLES

Learn more...
• Research Based Principles for Designing Multimedia
• Applying Multimedia Design Principles Enhances Learning in Medical Education
• Effective Use of Patient Education Illustrations
Fostering Meaningful Learning
Cognitive Strategies

Spatial Strategies
Concept Mapping

Concept maps provide visual representation of complex themes. Concept maps are a powerful instructional tool that:

- Provide a visual aid to learning and instruction -- powerful visual picture of information.
- Allow the mind to see undiscovered patterns and relationships.
- Integrate new concepts with prior knowledge.
- Brainstorm and generate new ideas
- Design complex structures, processes and flows

There are three basic types of concept maps: chain, hierarchy and spider maps.

Chain Maps

Chain maps are useful in showing stages of development when relationships are linear or sequential. Steps in a procedure, such as hand washing, could be depicted using a chain concept map. Chain maps can help learners see the whole process.

Hierarchy Maps

Multiple factors involved with a process or product and their relationships can be exhibited with hierarchy maps. Hierarchy maps are linear in nature, flowing in one direction from top to bottom. The best example of a hierarchy map is an organizational chart.

Spider Maps

Spider maps are used to depict more complex relationships among concepts. A spider map identifies the elements important in a common theme as well as the interrelationships. See the example below.
Fostering Meaningful Learning
Cognitive Strategies

Memorization Strategies

Mnemonic Methods
Medical education employs many different acronyms to encourage learning and retention. Memory systems incorporate the technique of visualization and association. The three basic steps of the visualization and association technique are:

1. Formulate “substitute words” to dissect complex concepts.
2. Activate the imagination to create vivid mental images of the ideas.
3. Mentally associate the visual images to one another.

Keyword Method
The keyword method involves a contrived acoustic and visual linkage between separate items of verbal target information, such as medical terms and their definitions. Trout-Ervin (1990) found that instructor-provided keywords were effective in initial learning (acquisition) and long-term retention of medical terminology. Students instructed to use the keyword method learned more and retained the information better than did students who learned through lecture alone (Troutt-Ervin, 1990).

Take a look at the example to the left. It is helpful if the image is silly, gigantic, or impossible. The mind forgets the ordinary. It’s the unusual that gets remembered!

Acronyms
Acronyms are a familiar memorization method that learners employ to help them remember facts, concepts or procedures. Instructors can assist students by offering acronyms for new material being presented. Acronyms are mnemonic words formed from the first letter or letters of several words. Here’s a clever acronym for ordering the abdominal muscles:

T = Transversus abdominis
I = Internal abdominal oblique
R = Rectus abdominis
E = External abdominal oblique

The word TIRE stands for the four abdominal muscles. Think of a spare tire, which is the nickname for the extra fat that can build up around a person’s abdomen.

Mnemonic Sentences
A mnemonic sentence is an expanded acronym, where the target information is associated with a contrived sentence. Mnemonic sentences are effective elaborators for learners of all ages. Can you guess what anatomical structures these sentences are acronyms for?

Help Five Police To Find Ten Missing Prisoners.
The Circus Needs More Interesting Little Clowns.
Organization or structure strategies prompt active learning by encouraging learners to mentally select relevant pieces of information and relate them to one another within a structure. This process helps learners build internal connections. Integration strategies or “bridging” strategies help learners to integrate information. These cognitive strategies are used to promote the learning and retention of new information (Mayer, 2003).

### Advance Organizer

An advance organizer is information that is presented prior to learning and that can be used by the learner to organize and interpret new incoming information. The advance organizer activates or provides organized prior knowledge that can be used to assimilate the incoming information into existing schema. Presented at a higher level of abstraction, generality, and inclusiveness, “An advance organizer is not an overview, but rather a presentation of information (either verbal or visual) that are “umbrellas” for the new material to be learned.” (MEST 2006).

### Comparative Organizers

are used with information with which the student already is somewhat acquainted. By acting as reminders, the organizer activates existing schemas, and builds on the prior knowledge of the learners.

### Expository Organizers

are often used when the new learning material is unfamiliar to the learner, and the learner requires some scaffolding to link the new concepts to what they already know. The following strategies can be used to implement Advance Organizers:

- Review basic concepts prior to studying a new concept
- Have students identify the characteristics of a known phenomenon and then relate them to the new concept
- Give a scenario and ask students to infer rules based upon their current knowledge
- Use charts, diagrams, oral presentations, or concept maps
- Ask students to compare and contrast the new content based on what they already know
- Identify a problem and ask for a reason why it may occur (before teaching the reason)

### Metaphor/Analogy/Simile

Metaphors, analogies, and similes bridge the known to the unknown. These bridging strategies alter the learner’s conceptual system of existing knowledge by modifying and strengthening its associations. Here is an interesting study on metaphors in medical education:

- [Metaphors in the mirror: The influence of teaching metaphors in a medical education programme](/)
Learning Technologies
Strategies for Implementation

Innovate your instruction!
The Instructional Design team is here to assist you with incorporating innovative technologies and pedagogies that augment teaching and learning in traditional face-to-face, hybrid or fully online learning environments. Here are a few ideas to enhance student learning and engagement through innovative teaching strategies and the use of learning technologies.

Infographic
In this newsletter we have presented a case for the use of illustrations in instruction. An extension of the practice of incorporating visuals into instructional materials is the infographic approach to instruction. In fact, pages 6 and 7 feature infographics that highlight aspects of the use of illustrations for instruction. This approach is gaining in popularity and has been used successfully in the MNSON. In the Community Health course for the RN-BSN program, students used various learning technologies to create infographics about sexually transmitted diseases. Groups of students collaborated to design and construct an infographic that could be used for patient education on a specific STD. Infographics are a sound pedagogical strategy for reaching visual learners. Additionally, engaging learners in image creation helps them understand the visual culture of the world around them (Mitchell, 2002). And finally, the creation of pictorial representations of written arguments requires that students engage in important critical analysis of the material that they are learning (Danis, 1993).

Atomic Learning
Get 24/7 access to training with flexible, just-in-time learning. Atomic Learning is an online, on demand, training site that offers over 50,000 tutorial videos on over 250 technology applications, including Microsoft and Adobe. Topics are subdivided into very small chunks, and presented in videos of one or two minutes, so learners can easily and quickly find the training they need on specific topics. Instructors can embed Atomic Learning videos directly into their Sakai courses. Learn more about this resource from ITRS. You can even learn how to create infographics through Atomic Learning!

Loyola Media
Loyola Media is a cloud based web service developed which facilitates the conversion and distribution of various audio and video media formats. Faculty, staff and students may upload media content to the Loyola Media server which automatically converts and optimizes your media for hassle-free distribution on the web. Once uploaded, Loyola Media will provide links and embed code that you can use to share your media with others.
# Workshop Topic Learn:

<table>
<thead>
<tr>
<th>Workshop Topic</th>
<th>Learn:</th>
<th>Dates*</th>
</tr>
</thead>
</table>
| The Chunking Principle                              | • About the theory underlying the principle and the effect of chunking on student learning  
• Evidence-based principles for structuring modules and multimedia in blended, hybrid and online learning environments | October 4       |
|                                                      |                                                                        | November 2      |
| Case-based Learning                                 | • How to design case-based activity to support conceptual understanding of topics  
• Techniques to facilitate case-based learning activities | October 12      |
|                                                      |                                                                        | November 8      |
| Discussion-based Teaching                           | • How to design discussion activity to promote critical thinking  
• Techniques to facilitate faculty-student and student-student interactions | October 20      |
|                                                      |                                                                        | November 15     |
| Formative Evaluation Methods                        | • Methods for garnering student input throughout the course to gauge student understanding of course content  
• Relevant learning technologies to augment formative evaluation measures | October 6       |
|                                                      |                                                                        | October 27      |
| Ignatian Pedagogy: Designing Instructional Strategies to Foster Transformation | • Principles of the Ignatian Pedagogy Paradigm  
• How to apply principles of Ignatian Pedagogy in the design of instructional strategies | October 11      |
|                                                      |                                                                        | November 3      |
| Motivation Design of Instruction                    | • Principles and applications of motivational design theory  
• Relevant learning technologies to augment motivational design strategies | October 19      |
|                                                      |                                                                        | November 9      |
| Using VoiceThread to Support Learning               | • About the theory underlying collaborative learning  
• How to create collaborative learning experiences and/or use VoiceThread for assessment | October 25      |
|                                                      |                                                                        | November 17     |
| Effective Instruction in the Online Environment (3-Part Self-Paced Certification Course) | Unit 1: Teaching & Learning  
Unit 2: Course Creation  
Unit 3: Course Facilitation |                |

* Sessions will be offered at 12:00 pm and 5:00 pm on all dates.