MLT 803(903)/MID834/MPS803(903): Technologies as Cognitive Tools

January 2019

Dates and Venue

Dates:

39/54 (3AU/4AU) hours in 13 weeks

14/1-12/4, Friday (18:00-21:00)

Venue: ECL1, 2-02-10

Lecturer

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Tel: 6790 3267

Office: 2-03-21

Course Description

One of the effective ways of using technologies to support student learning is to use technologies as cognitive tools or Mindtools (Jonassen, 2000). Students can use mindtools to construct personal meaning, engage in critical, creative, and complex thinking. Mindtools act as intellectual partners that the students learn with, rather than the traditional computer-assisted instruction where students learn from computers. Examples of mindtools include concept mapping tools, and collaborative learning tools.

In this course, participants will learn the underpinning learning theories and practical considerations for the use of technologies as mindtools. At the end of the course, participants should be able to use certain ICT tools as mindtools to enhance students’ cognition. Participants are expected to engage in critical thinking and collaborative learning in this course.
Course Website

- Weebly: http://cogtools.weebly.com/
- Blackboard: http://lonline.nie.edu.sg

Course Objectives

Through readings, online learning and discussions, and classroom hands-on activities, participants should be able to:

a. Analyze the affordances and demonstrate effective strategies to use appropriate mindtools to enhance learning in specific subject areas;
b. Design coherent and effective lesson plans or learning processes with appropriate combinations of mindtools; be able to justify the choice of tools in relation to classroom learning problems and assess the effectiveness of the implementation;
c. Consider issues related to the integration of cognitive tools into the teaching and learning process.

Course Evaluation

1. Participation (10%, individual)
   a. Attend face-to-face sessions, be punctual, and take part actively in class discussions (5%)
   b. Complete online activities on time (5%)
2. Online reflections (10%*3, individual): Each online reflection covers:
   a. your understanding of the specific topic (5%); and
   b. the application of the topic into your teaching practice (5%)
3. Online activities (Concept mapping, 10%)
   a. Build an individual concept map of your personal understanding of ICT as cognitive tools.
   c. At least 40 nodes (for 3AU) or 50 nodes (for 4AU) with labelled relationship
4. Online sharing and critique (20%)
   a. Describe a cognitive tool you have used (or intended to use) in your teaching subject. Specify its actual and perceived affordances, (pedagogical, social and technical) affordances for teaching and learning, how it is used to
facilitate cognition, its outcomes and takeaways from the use of the tool for learning (15%)

b. Critique on the sharing given by peers (5%)

5. Ideas to design a lesson which incorporates the use of 2-3 cognitive tools (30%, group) (Group size: 4). The ideas should include the following components:
   a. Learning context (subject topic, level of learning, learner characteristics, lesson objectives, lesson duration and learning environment) (2%)
   b. Learning activities (includes a description of the strategies) that are supported by cognitive tools (8%)
   c. Justification for why the tools are chosen based on the PST model and how they are used as cognitive tools in the lesson (10%).
   d. Discussion of possible implementation issues (5%)
   e. Group presentation (5%)

Course Delivery

The course delivery will be a mixture of face-to-face tutorials and online learning (asynchronous learning and synchronous video conferencing). The participants are expected to read beyond the materials provided and to engage in active discussions and sharing.

Course Materials

Lecture slides and relevant materials can be downloaded from the course website. The participants are encouraged to share their resources and ideas through the course website.

3AU/4AU differences

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<thead>
<tr>
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<th>3AU</th>
<th>4AU</th>
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<tbody>
<tr>
<td>Each F2F session</td>
<td>• Read the online materials</td>
<td>• Read the online materials</td>
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<td>• Online discussion: give at least 2 comments and 1 reply on the websites</td>
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<tr>
<td>Online session:</td>
<td>• Create a video of about 15 minutes</td>
<td>• Create a video of about 20 minutes</td>
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<td>tool sharing</td>
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<tr>
<td>Online session:</td>
<td>• At least 40 nodes</td>
<td>• At least 50 nodes</td>
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<td>Concept mapping</td>
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Online session: Modeling

- Read online materials and do online activities
- Read online materials and do online activities
- Online discussion: 2 comments and 1 reply

Key References

**Cognition & Cognitive Tool**


**Affordances**

**Concept Mapping**


**Computer-Supported Collaborative Learning**


**Modeling**


**Mobile Learning**


**AR/VR**


**STATEMENT ON ACADEMIC HONESTY**

Academic dishonesty is a serious offense and will not be tolerated. Evidence of cheating or plagiarism of any kind will result in severe penalties. Students must ensure that their works have been responsibly and honorably completed. Any attempt to gain an unfair advantage over other students is considered dishonest. An example is passing off another person’s assignment as one’s own. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the course lecturers.
# Course Schedule

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Activities</th>
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<tbody>
<tr>
<td>1. 18/1</td>
<td>Foundation: What are cognitive tools and why use cognitive tools?</td>
<td>Course administration, ICT as cognitive tools, Hand-on activities</td>
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<tr>
<td>2. 25/1</td>
<td>Learning theories, Classification of and research on cognitive tools, Use of technology as cognitive tools, Cognitive engagement</td>
<td>ICT as cognitive tools, Hand-on activities, Reflection 1, BSL (Blended synchronous learning) 1</td>
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<tr>
<td>3. 1/2</td>
<td>Concepts of Affordances, Actual/perceived affordance</td>
<td>Self-directed learning: online materials, Discussion on affordance, Hands-on activities, BSL2</td>
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<tr>
<td>4. 08/2 (CNY)</td>
<td>Online sharing: Share and discuss the affordances of an IT cognitive tool used in your school setting (Video recording and sharing)</td>
<td>PST designs, Affordance analysis on ICT tools, BSL3</td>
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<tr>
<td>5. 15/2</td>
<td>Affordance design and analysis, PST affordances</td>
<td>Discussion the concept and issues of concept/mind mapping, Hands-on activities, BSL4</td>
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<tr>
<td>6. 22/2</td>
<td>Theoretical underpinning of concept/mind mapping tools</td>
<td>BSL5</td>
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<tr>
<td>7. 1/3</td>
<td>Create a concept map based on your personal understanding of ICT as cognitive tools</td>
<td>BSL6</td>
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<tr>
<td>8. 8/3</td>
<td>Collaborative learning and computer supported collaborative learning (CSCL)</td>
<td>Self-directed learning: online materials, Discuss the concept and issues of CSCL, Hands-on activities on CSCL tools, Group assignment briefing, Reflection 2, BSL7</td>
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<tr>
<td>9. 15/3</td>
<td>Mobile learning</td>
<td>BSL8</td>
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<tr>
<td>10. 22/3</td>
<td>VR/AR</td>
<td>Discuss concepts and affordances of VR/AR for teaching and learning, Hands-on activities, Reflection 3, BSL9</td>
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<tr>
<td>11. 29/3</td>
<td>Model building</td>
<td>Self-directed learning: online materials, Online activities, Video conferencing (1h)</td>
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<tr>
<td>12. 05/4</td>
<td>Consolidation, Project consultation</td>
<td>Summary of the main topics, Group work, Project consultation</td>
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<tr>
<td>13. 12/4</td>
<td>Group presentation</td>
<td>Group sharing, presentation and discussion</td>
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