

GEORGE MASON UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
Learning Technologies Design Research (LTDR) PhD Specialization
EDIT 802 – DL2 (3 credits)
Cognition and Technology: A Multidisciplinary Approach
Fall 2020 Syllabus

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Prerequisites: Admissions to PhD in Education Program or Permission of Instructor

Catalog Description

Examines learning interactions between cognition and technology using multiple disciplinary perspectives including, cognitive science, psychology, neuroscience, education, design theory, instructional design, technology design, anthropology, sociology, information science, philosophy, semiotics, and linguistics.

Course Overview

The course focuses on the multidisciplinary exploration of cognition and technology. Although, central to doctoral study in Learning Technologies Design Research (LTDR), students from other doctoral programs including education, computer science, psychology, philosophy, sociology, and anthropology are encouraged to participate. The course is designed to provide an opportunity for doctoral students to investigate and discuss the multiple learning sciences disciplines that guide our understanding of human learning and cognition.

Course Delivery Method

This course will be delivered **100% online** using mostly in an **asynchronous format** via the Blackboard Learning Management system (LMS) housed in the MyMason portal. You will log in to the Blackboard (Bb) course site using your Mason email name (everything before @masonlive.gmu.edu) and email password. The course site will be available on the first day of class. There will be **eight synchronous meetings** using Zoom or similar platform on the following dates (**please mark your calendars accordingly, invites will be sent by instructor**):

1. Thursday August 27, 4:30 – 6:00 PM
2. Thursday September 10, 4:30 – 6:00 PM
3. Thursday September 24, 4:30 – 6:00 PM
4. Thursday October 8, 4:30 – 6:00 PM
5. Thursday October 22, 4:30 – 6:00 PM
6. Thursday November 5, 4:30 – 6:00 PM
7. Thursday November 19, 4:30 – 6:00 PM
8. Thursday December 10, 4:30 – 6:00 PM

It is expected that students will share multidisciplinary perspectives based on the course readings through online discussions/blogs/presentations, conduct research on the affordances of learning technologies, contribute to an online knowledge base, and work collaboratively on interdisciplinary projects. Special emphasis may be placed on a specific learning sciences discipline in a particular semester. Such emphasis will depend on the individual student, the instructor's research area, or collective interests. Several technologies will be used to generate course content and document student learning and contributions.

Learning Outcomes or Objectives

- Understand the multidisciplinary nature of human learning and cognition and its impact on learning technologies from a learning sciences perspective.
- Understand how knowledge is constructed, shared, internalized, and mediated through each of the perspectives examined.
- Understand the theory of affordances and its impact on the design of technology supported learning environments.
- Examine the interactions between technology and cognition and the affordances that this interaction enables.
- Analyze a variety of **Technology Supported Learning Environments (TSLEs)** to determine the demands they place on human learning and cognition and the ways in which the human cognitive system responds in these environments.
- Improve formal and informal learning in virtual and physical settings by generating design principles based on the theories examined.

Professional Standards

The learning outcomes for this course align with the Design Standard for programs in Educational Communications and Instructional Technologies as established by the Association of Educational Communication and Technologies (AECT).

Standard 1 – Design

- 1.1.b Identify theories from which a variety of instructional design models are derived and the consequent implications.
- 1.1.2.a Demonstrate in-depth synthesis and evaluation of the theoretical constructs and research methodologies related to instructional design as applied in multiple contexts.
- 1.1.3.b Utilize the research, theoretical, and practitioner foundations of the field in the development of instructional materials.
- 1.1.4.a Conduct basic and applied research related to technology integration and implementation.
- 1.1.5.c Articulate the relationship within the discipline among theory, research, and practice as well as the interrelationships among people, processes, and devices.
- 1.3.a Identify multiple instructional strategy models and demonstrate appropriate contextualized application within practice and field experiences.

Required Texts

1. (2009) *Acting with Technology: Activity Theory and Interaction Design* by Victor Kaptelinin and Bonnie A. Nardi. ISBN-13: 978-0262513319 ISBN-10: 0262513315
2. (2012) *Activity Theory in HCI: Fundamentals and Reflections* (Synthesis Lectures on Human-centered Informatics) by Victor Kaptelinin and Bonnie Nardi. ISBN-13: 978-1608457045/52

Additional readings will be on the Blackboard course site. Students are encouraged to contribute additional articles to help build the knowledge base of this course.

Course Requirements and Performance Evaluation

There are three main course requirements or performance-based assessments:

- (1) **Class Participation and Contributions (25%):** Effective class participation involves not only preparation and communication skills, but also contributing to the online knowledge base and commenting on peers' contributions. Specifically, students must make significant contributions towards building a shared interpretation of the readings and theories being discussed individually and collaboratively. This includes critical analysis of the readings through presentations, discussions, and analytic commentary using a blogging platform (e.g., WordPress) or discussion forum as assigned.
- (2) **Affordance Analysis of Digital Technologies (35%):** In small teams or individually, students will select a digital technology, software application, platform, etc., and critically examine the physical, functional, sensory, and cognitive affordances of this technology and develop a list of design affordances that are optimal for its use as a learning technology. The goal is to develop learning design criteria for each selected technology based on its technological and pedagogical affordances and ultimately a comprehensive set of design criteria for a TSLE.
- (3) **Learning Design Analysis of a TSLE (40%):** In small teams or individually, students will select a TSLE (i.e., a fully developed course, simulation, game, learning or training system) and will use the learning design criteria developed in assignment #2 to analyze the TSLE. The analysis should include: (a) a brief introduction to the analysis, (b) description of the TSLE, (c) description of the technologies used in the TSLE, (d) a description of the analysis process, (e) a description of the results, and (f) conclusions and recommendations.

Evaluation Criteria

Participation rubric for online participation and contributions (25%):

- *Outstanding contributor:* contributions reflect exceptional preparation. Ideas offered are always substantive, providing one or more major insights as well as direction for the class. Frequent references are made to the readings and/or to knowledge from other sources, often showing the ability to generalize or extend the material under discussion. If this person were not a member of the class, the quality of discussion and knowledge building would be diminished markedly.
- *Good contributor:* contributions reflect thorough preparation. Ideas offered are usually substantive, providing good insights and sometimes direction for the class. Occasional references are made to the readings and/or to knowledge from other sources, sometimes showing the ability to generalize or extend the material under discussion. If this person were not a member of the class, the quality of discussion would be diminished.
- *Adequate contributor:* contributions reflect satisfactory preparation. Ideas offered are sometimes substantive, providing some useful insights but seldom offer new direction for the discussion. Some references are made to the readings and/or to knowledge from other sources but seldom generalize or extend the material under discussion. If this person were not a member of the class, the quality of discussion would be diminished somewhat.
- *Unsatisfactory contributor:* Contributions reflect inadequate preparation and/or there is little contributions in class or online. Ideas offered are seldom substantive, providing few insights and no direction for the class. References to readings are rare or non-existent. If this person were not a member of the class, the quality of discussion and knowledge building would be unchanged.

Point Assessment for Class Participation and Contributions (25%):

	Category 1	Category 2	Category 3	Category 4
Criteria	Unsatisfactory Contributor	Adequate Contributor	Good Contributor	Outstanding Contributor
Synchronous participation	5-6	7	8	9-10
Asynchronous participation	5-8	9-11	12-13	14-15
Score	10-14	16-18	20-21	23-25

Rubric for Affordance Analysis of Digital Technologies (35%):

	Category 1	Category 2	Category 3
Criteria	Unsatisfactory Analysis	Satisfactory Analysis	Excellent Analysis
Congruency - affordances of selected technology are reflective of the technology's utility and usability	5-6	7-8	9-10
Comprehensiveness – affordances of selected technology include all applicable types of affordances and demonstrate a critical affordance analysis of the technology based on the readings	5-6	7-8	9-10
Inferences – learning design criteria are a direct result of the affordance analysis, showing progressive development, incorporation of feedback, and understanding of the affordance design process	5-6	7-8	9-10
Evidence of team collaboration (if applicable) on every aspect of this analysis	2	3-4	5
Score	17-20	24-28	32-35

Rubric for Learning Design Analysis of a TSLE (40%):

	Category 1	Category 2	Category 3
Criteria	Unsatisfactory Analysis	Satisfactory Analysis	Excellent Analysis
All components of the learning design analysis are substantively addressed	5-6	7-8	9-10
Learning design criteria are used to analyze the TSLE and clearly documented	5-6	7-8	9-10

Results of the learning design analysis are clearly documented and used to provide recommendations for improving the design of the TSLE	5-6	7-8	9-10
Evidence of team collaboration (if applicable) on every aspect of this analysis	5-6	7-8	9-10
Score	20-24	25-35	36-40

Grading Scale:

A = 94-100; A - = 90-93; B+ = 86-89; B = 83-85; B- = 80-82; C = 70-79; F = <70

Technical Requirements

Under no circumstances may candidates/students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.

To participate in this course, students will need to satisfy the following technical requirements:

- High-speed Internet access with standard up-to-date browsers. To get a list of Blackboard's supported browsers see: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#supported-browsers
- To get a list of supported operation systems on different devices see: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#tested-devices-and-operating-systems
- Students must maintain consistent and reliable access to their GMU email and Blackboard, as these are the official methods of communication for this course.
- Students may be asked to create logins and passwords on supplemental websites and/or to download trial software to their computer or tablet as part of course requirements.
- The following software plug-ins for PCs and Macs, respectively, are available for free download: [Add or delete options, as desire.]
 - Adobe Acrobat Reader: <https://get.adobe.com/reader/>
 - Windows Media Player: <https://support.microsoft.com/en-us/help/14209/get-windows-media-player>
 - Apple Quick Time Player: www.apple.com/quicktime/download/

Expectations

- **Course Week:** Our course week will begin on **Thursday** and end on **Wednesday**.
- **Log-in Frequency:** Students must actively check the course Blackboard site and their GMU email for communications from the instructor, class discussions, and/or access to course materials **at least 3 times per week**. In addition, students must plan to attend all **eight synchronous meetings** listed above. The instructor may cancel some of those meetings with due notice and depending on course progress and learning needs.

- **Participation:** Students are expected to actively engage in all course activities throughout the semester, which includes viewing all course materials, completing course activities and assignments, and participating in course discussions and group interactions.
- **Technical Competence:** Students are expected to demonstrate competence in the use of all course technology. Students who are struggling with technical components of the course are expected to seek assistance from the instructor and/or College or University technical services.
- **Technical Issues:** Students should anticipate some technical difficulties during the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.
- **Workload:** Please be aware that this course is **not** self-paced. Students are expected to meet *specific deadlines* and *due dates* listed in the **Class Schedule (timeline)** section of this syllabus. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.
- **Instructor Support:** Students may schedule a one-on-one meeting to discuss course requirements, content or other course-related issues. Those unable to come to a Mason campus can meet with the instructor via telephone or web conference. Students should email the instructor to schedule a one-on-one session, including their preferred meeting method and suggested dates/times.
- **Netiquette:** The course environment is a collaborative space. Experience shows that even an innocent remark typed in the online environment can be misconstrued. Students must always re-read their responses carefully before posting them, so as others do not consider them as personal offenses. *Be positive in your approach with others and diplomatic in selecting your words.* Remember that you are not competing with classmates, but sharing information and learning from others. All faculty are similarly expected to be respectful in all communications.
- **Accommodations:** Online learners who require effective accommodations to ensure accessibility must be registered with George Mason University Disability Services.

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times. See <https://cehd.gmu.edu/students/policies-procedures/>

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/>.

GEORGE MASON UNIVERSITY POLICIES AND RESSOURCES FOR STUDENTS

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see <https://catalog.gmu.edu/policies/honor-code-system/>)
- Students must follow the university policy for Responsible Use of Computing (see <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>)
- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.

- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see <http://ds.gmu.edu/>).
- Students must follow the university policy stating that all sound emitting devices shall be silenced during class unless otherwise authorized by the instructor.

Campus Resources

- Questions or concerns regarding use of Blackboard should be directed to <https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/>
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking:

As a faculty member, I am designated as a “Responsible Employee,” and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance from Mason’s Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

For additional information on the College of Education and Human Development, please visit our website <https://cehd.gmu.edu/students/>

EDIT 802 - Course Schedule (subject to change) – Week starts on Thursday ends on Wednesday

Week	Topics/Activities/Assignments/Due Dates	Readings for Next Class
Week 1 (08/27 – 09/02) Synchronous Class on Thurs 08/27; 4:30 – 6 PM	Intro to course – what are affordances <i>Select dyads for affordance analysis</i> <i>Blog (#1) contribution on week 1 readings due <u>Wed 09/02 by 11:59 PM</u></i>	<ul style="list-style-type: none"> • Chapters 1&2 in <i>Acting with Technology</i> book (2009) and Chapter 1 in <i>Activity Theory in HCI</i> (2012) book
Week 2 (09/03 – 09/09) Asynchronous	<i>Select digital technology (DT) for affordance analysis (AA), post selection in wiki by Wed 09/09</i> <i>Prepare a Pecha Kucha presentation to share next week in synchronous class</i> <i>Comments on week 1 blogs due <u>Wed 09/09 by 11:59 PM</u></i>	<ul style="list-style-type: none"> • Hartson, R. & Pyla, P. (2012). <i>Affordances Demystified</i> • Bower, M. (2017). Chapter 4 in <i>Design of Technology-Enhanced Learning</i>
Week 3 (09/10 – 09/16) Synchronous Class Thurs 09/10; 4:30 – 6 PM	<i>Share Pecha Kucha presentation</i> <i>Discuss week 2 readings</i> <i>Review examples of affordance analysis</i> <i>Work on affordance analysis (AA)</i> <i>List of affordances for the DT due 09/16</i>	<ul style="list-style-type: none"> • Bower, M. (2008). <i>Affordance Analysis</i> • Bower, M. (2017). Chapter 11 in <i>Design of Technology-Enhanced Learning</i>
Week 4 (09/17 – 09/23) Asynchronous	<i>Work on AA using week 3 readings</i> <i>Prepare AA document and presentation</i> <i>Provide feedback on list of affordances</i>	
Week 5 (09/24 – 09/30) Synchronous Class Thurs 09/24; 4:30 – 6 PM	<i>Present AA during synchronous session</i> <i>Provide feedback on AA by Wed 09/30</i> <i>Blog (#2) contribution on activity theory by <u>Wed 09/30 by 11:59 PM</u></i>	<ul style="list-style-type: none"> • Chapters 3&4 in <i>Acting with Technology</i> book (2009) and Chapter 2 in <i>Activity Theory in HCI</i> (2012) book
Week 6 (10/01 – 10/07) Asynchronous	<i>Online discussion (#1) on week 6 readings (Friday – Tuesday)</i> <i>Comments on week 5 blogs due <u>Wed 10/07 by 11:59 PM</u></i>	<ul style="list-style-type: none"> • Chapters 5 in <i>Acting with Technology</i> book (2009) and Chapters 3&4 in <i>Activity Theory in HCI</i> (2012) book
Week 7 (10/08 – 10/14) Synchronous Class Thurs 10/08; 4:30 – 6 PM	<i>Discussion synthesis</i> <i>Blog (#3) contribution on week 7 readings due <u>Wed 10/14 by 11:59 PM</u></i>	<ul style="list-style-type: none"> • Chapters 8&9 in <i>Acting with Technology</i> book (2009) and Chapters 5&6 in <i>Activity Theory in HCI</i> (2012) book
Week 8 (10/15 – 10/21) Asynchronous	<i>Online discussion (#2) on week 8 readings (Friday – Tuesday)</i> <i>Comments on week 7 blogs due <u>Wed 10/21 by 11:59 PM</u></i> <i>Begin developing learning design (LD) criteria based on AA and new readings</i>	<ul style="list-style-type: none"> • Chapters 10&11 in <i>Acting with Technology</i> book (2009)
Week 9 (10/22 – 10/28) Synchronous Class Thurs 10/22; 4:30 – 6 PM	<i>Discussion synthesis</i> <i>Advance organizer</i> <i>Continue working on LD criteria based on AA and new readings</i>	<ul style="list-style-type: none"> • Bower, M. (2017). Chapter 3 in <i>Design of Technology-Enhanced Learning</i> • Bower, M. (2017). Chapter 7 in <i>Design of Technology-Enhanced Learning</i>

Week 10 (10/29 – 11/04) Asynchronous	<i>Refine LD criteria</i>	
Week 11 (11/05 – 11/11) Synchronous Class Thurs 11/05; 4:30 – 6 PM	<i>Present LD criteria Select TSLE Blog (#3) contribution on week 7 readings due <u>Wed 11/11 by 11:59 PM</u></i>	<ul style="list-style-type: none"> • Grudin, J. (2009). AI and HCI • Popenici & Kerr (2017). Exploring the impact of AI on teaching and learning
Week 12 (11/12 – 11/18) Asynchronous	<i>Comments on week 11 blog due <u>Wed 11/18 by 11:59 PM</u> Work on TSLE analysis</i>	<ul style="list-style-type: none"> • Kaptelinin, V. (2014). Affordances-and-Design. Denmark: The Interaction Design Foundation
Week 13 (11/19 – 11/25) Synchronous Class Thurs 11/19; 4:30 – 6 PM	Class synthesis Guest speaker	
Week 14 (11/26 – 12/02) Asynchronous	<i>Thanksgiving Break</i> <i>Work on TSLE analysis</i>	
Week 15 (12/03 – 12/09) Asynchronous	<i>Work on TSLE analysis Submit self-assessment reflection</i>	
Week 16 (12/10 – 12/16) Synchronous Class Thurs 12/10; 4:30 – 6 PM	<i>Analysis of TSLE presentations Learning Design Analysis Report due</i>	