הפקולטה לחינוך
למדע וטכנולוגיה

Faculty of Education
in Science and Technology

הטכניון | Technion
מכון טכנולוגי | Israel Institute
לישראל | of Technology

The Web as a Learning Environment 216101

Course URL: http://moodle.technion.ac.il

Course dates and structure: nine sessions, with additional hours of personal advising. The course is based on the studio approach – short lectures, workshops, homework assignments, and students' presentations.

Course Objectives: Familiarity with advanced pedagogical approaches: from theory to practice. Experiencing various methods of online teaching and learning (asynchronous, synchronous, and blended). Discussion research topics at the forefront of contemporary education, including: 21st century skills, mobile and ubiquitous learning, the flipped classroom, MOOCs, augmented worlds, wisdom of the crowds, and citizens science.

Course requirements: Full attendance in all classroom sessions; reading of articles as preparation for the lessons; submitting assignments on time; and significant contribution to in-class and online discussions. Grades will be assigned according to the following table:

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References

21st Century Skills

Griffin, P., McGaw, B., & Care, E. (Eds.) (2012). *Assessment and Teaching of 21st Century Skills*. Dordrecht: Springer.

Pelligrino, J. & Hilton, M. (Eds). (2012). *Education for life and work: Developing transferable knowledge and skills in the 21st century*. Washington, D.C: The National Academies Press.

Online discussion groups and peer assessment

Barak, M., & Dori, Y. J. (2009). Enhancing higher order thinking skills among in-service science education teachers via embedded assessment. *Journal of Science Teacher Education, 20*(5), 459-474. Available online at: http://link.springer.com/article/10.1007%2Fs10972-009-9141-z?LI=true

Barak, M., & Rafaeli, S. (2004). Online question-posing and peer-assessment as means for Web-based knowledge sharing. *International Journal of Human-Computer Studies*, *61*(1), 84-103. Available online at: http://www.sciencedirect.com/science/article/pii/S1071581903002064

Animations and Simulations

Barak, M., & Dori, Y. J. (2005). Enhancing undergraduate students' chemistry understanding through project-based learning in an IT environment. *Science Education*, *89*(1), 117-139. Available online at: http://onlinelibrary.wiley.com/doi/10.1002/sce.20027/abstract

Barak, M., & Dori, Y. J. (2011). Science education in primary schools: Is an animation worth a thousand pictures? *Journal of Science Education and Technology, 20*(5), 608-620.

Mobile learning

Barak, M., Harward, J., Kocur, G., & Lerman, S. (2007). Transforming an introductory programming course: from lectures to active learning via wireless laptops. *Journal of Science Education and Technology*, *16*(4) 325-336. Available online at: http://link.springer.com/article/10.1007%2Fs10956-007-9055-5?LI=true

Barak, M., Harward, J., & Lerman, S. (2007). Studio-based learning via wireless notebooks: A case of a Java programming course. *International Journal of Mobile Learning and Organization*, *1*(1), 15-29. Available online at: http://inderscience.metapress.com/content/exvkjgrm1e176u22

Barak, M., & Ziv, S. (2013). Wandering: A Web-based platform for the creation of location-based interactive learning objects. *Computers & Education*, *62*, 159-170.

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Flipped classroom

Herreid, C.F. & Schiller, N.A. (2013). Case Studies and the Flipped Classroom. *Journal of College Science Teaching*, 42(5), 62-66.

Kahn, S. (2011). *Let's use video to reinvent education*. Speech presented at TED2011. Retrieved February, 2013, from: http://www.ted.com/talks/salman_khan_let_s_use_video_to_reinvent_education.html

Topp, G. (2011). Flipped classrooms take advantage of technology. *USA Today*. Retrieved February, 2013 from: http://www.usatoday.com/news/education/story/2011-10-06/flipped-classrooms-virtual-teaching/50681482/1

MOOC- Massive online Open Course

Barak, M., Watted, A., & Haick, H. (2016). Motivation to learn in massive open online courses: examining aspects of language and social engagement. *Computers & Education, 94*, 49-60. DOI:10.1016/j.compedu.2015.11.010

Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course. *International Review of Research in Open and Distance Learning*, 12(3).

McAuley, A., Stewart, B., Siemens G. & Cormier D. (2010). *The MOOC Model for Digital Practice*. University of Prince Edward Island and the Social Sciences and Humanities Research Council Publication.

Martin, F.G. (2012). Will massive open online courses change how we teach? Communications of the ACM 55(8), 26-28. DOI:10.1145/2240236.2240246