We live in an exciting new age of rapid global change with no sign of slowing down. Consequently, fundamental and rapid technological changes that are reshaping our world will motivate educational institutions to work towards meeting new economical, social and pedagogical demands (Tuomi, 2005). As a result, learning environments of the future will shift the educational paradigm from an industrialized teacher-centered statically authoritative prescribed knowledge process to a student-centered, creative, open and global forum (Rudd, Davia, and Sullivan, 2009). Of course change within established educational institutions will not occur rapidly or easily, but it is already in progress (Davidson and Goldberg, 2009).

Future learning environments will be inclusive learning spaces (Punie, Cabrera, Bogdanowicz, Zinnbauer and Navajas, 2006). Ubiquitous mobile communication devices, for example, promise to lead the way in changing the educational landscape (Rudd, et al., 2009). Affordability, popularity and versatility of mobile devices such as cell phones and tablets will make them an attractive tool for both educators and learners (Johnson, Adams, and Cummins, 2012). Studies have found that students enjoy the versatility and freedom mobile learning devices provide them (Chih-Kai, and Ching-Kun, 2011; Swan, Hooft, Kratcoski and Unger, 2005). Teachers and schools will use inexpensive, feature-rich mobile technologies to facilitate constructivist learning principles (Lan, Sung and Chan, 2009; Johnson et al., 2012). Mobile technologies will also promote lifelong learning opportunities alongside other wireless technologies (Punie et al., 2006). The future will be about learning anywhere, anytime with anyone (Punie et al., 2006).

Future learning environments will promote collaborative open networking that harnesses the strengths of peer review, information sharing, and divergent thinking among a global audience (Davidson and Goldberg, 2009). Such environments will encourage social networking that takes learning beyond classroom walls. These social networks will be highly mobile, flexible and innovative (Davidson and Goldberg, 2009). In the future, education will depend less on rigid hierarchical learning processes. Instead, learning will be peer to peer where digitized information is shared between learners in real time across wireless and mobile global social networks (Rudd et al., 2009). Teachers will remain in the periphery playing the role of coach and cheerleader (Mitra and Dangwal, 2010).

Meaningful, higher-order learning takes place when learners are active participants collaboratively solving relevant problems rather than passively receiving information to be stored and used at some later date (Cheaney and Ingebritsen, 2005). Blending online distance learning with face-to-face classroom time will be an ideal way for many learners of the future (Scripture, 2008). Understanding student learning needs is crucial to preparing effective problem-based learning (Scripture, 2008). Future learning environments will be tailored to match individual needs, providing students with relevant learning opportunities (Prince, Moyer, Scheerer, and Feltner, 2011). Learning analytics will assist teachers in real time on how to determine what those needs are, and organize lessons and assessment accordingly (Johnson, Adams, and Cummins, 2012).

Future learning environments will be creative, fun and student-centered spaces. Student-centric environments coupled with ICT tools promote critical thinking and creative problem solving skills (Punie et al., 2006). These learning spaces will be both virtual and physical, modeled on learner-centered principles (Punie et al., 2006). Virtual classrooms or multi-user virtual environments (MUVEs) will offer learners' a safe space to actively participate within an array of interesting scenarios such as debating ethical issues, examinig theories or practicing what otherwise could be dangerous endeavors for novice students (Tuomi, 2005; Morrison and Dede, 2004). Researchers have already noted the learning benefits of massively multiplayer online games (MMOGs), single-player computer simulation games and virtual playgrounds (Davidson and Goldberg, 2009). These computer enhanced environments will promote collaboration and improve active problem-solving skills. The 2012 NHC Horizon Report stated "open-ended, challenge-based, truly collaborative games are an emerging category of games that seems especially appropriate for higher education" (Johnson et al., 2012, p. 19). Meanwhile, physical classrooms will be places where students can congregate, collaborate and work towards solving meaningful problems using a variety of traditional and ICT tools.

Future learning environments will be "open and reflexive spaces" (Punie et al., 2006, p. 12). ICT tools will continue to provide easy and interesting ways for learners to connect, express themselves, share, and manage information (Rudd et al., 2009). With open learning environments, educators act as guides for students who are self-regulated, responsible, reflective life-long learners (Mitra and Dangwal, 2010). Learning environments will be open to diverse cultural and socio-economic groups (Rudd et al., 2009; Keengwe and Onchwari, 2009). The low cost of ICT equipment and software, especially mobile devices, and the affordability of distance education will provide educational opportunities to groups otherwise unable to participate (Greville Rumble, 2007). Future learning environments will be truly global in scope.

This vision of the future will not come to pass easily (Tuomi, 2005). Nevertheless, the tide of technological progress is quickly eroding traditional learning environments and constructing new ones. As ICTs continue to improve and drop in cost, learning environments will exist wherever learners wish them to be. Classrooms will evolve into open, flexible, learner-centered communities. Individuals will gravitate towards spaces sharing personally interests and goals. A future learner will construct knowledge that is meaningful to him or her as an individual or as part of a socially constructed network. A future student will navigate through ill-structured problems on his or her own, with a partner or as part of a group. These spaces, whether physical or virtual, will provide a diverse population with a safe setting to explore share and learn.

Works Cited

1. Bottino, R. (2004). The evolution of ICT-based learning environments: which perspectives for the school of the future?. British Journal Of Educational Technology, 35(5), 553-567. doi:10.1111/j.0007-1013.2004.00413.x

2. Cheaney, J. D., & Ingebritsen, T. S. (2005). Problem-Based Learning in an Online Course: A Case Study. International Review Of Research In Open And Distance Learning, 6(3).

3. Chih-Kai, C., & Ching-Kun, H. (2011). A mobile-assisted synchronously collaborative translation-annotation system for English as a foreign language (EFL) reading comprehension. Computer Assisted Language Learning, 24(2), 155-180. doi:10.1080/09588221.2010.536952

4. Davidson, C., & Goldberg, D.T. (2009). The future of learning institutions in a digital age. Cambridge, MA: The MIT Press. Retrieved from http://mitpress.mit.edu/books/chapters/Future_of_Learning.pdf.

5. Jimoyiannis, A. (2010). Designing and implementing an integrated technological pedagogical science knowledge framework for science teachers professional development. Computers & Education, 55(3), 1259-1269. doi:10.1016/j.compedu.2010.05.022.

6. Johnson, L., Adams, S., and Cummins, M. (2012). The NMC Horizon Report: 2012 Higher Education Edition. Austin, Texas: The New Media Consortium. Retrieved from http://net.educause.edu/ir/library/pdf/HR2012.pdf.

7. Keengwe, J., & Onchwari, G. (2009). Technology and student learning: Toward a learner-centered teaching model. AACE Journal, 17(1), 11-22.

8. Lan, Y., Sung, Y., & Chang, K. (2009). Let us read together: Development and evaluation of a computer-assisted reciprocal early English reading system. Computers & Education, 53(4), 1188-1198. doi:10.1016/j.compedu.2009.06.002

9. Mitra, S., & Dangwal, R. (2010). Limits to self-organising systems of learning--the kalikuppam experiment. British Journal Of Educational Technology, 41(5), 672-688.

10. Morrison, J. L., & Dede, C. (2004). The future of learning technologies: An interview with Chris Dede. Innovate. Retrieved from http://innovateonline.info/pdf/vol1_issue1/The_Future_of_Learning_Technologies-_An_Interview_with_Chris_Dede.pdf.

11. Prince, K., Moyer, J., Scheerer, L., & Feltner, J. (2011). Models for the future of learning. KnowledgeWorks, 1-17. Retrieved from http://blog.futureofed.org/wp-content/uploads/110127-Yellow%20Springs%20Report-FINAL.pdf

12. Punie, Y., Cabrera, M., Bogdanowicz, M., Zinnbauer, D., & Navajas, E. (2006). The future of ICT and learning in the knowledge society. Institute for Prospective Technological Studies. Retrieved from http://ftp.jrc.es/EURdoc/eur22218en.pdf

13. Rudd, J., Davia, C., & Sullivan, P. (2009). Education for a smarter planet: The future of learning. Redguides for Business Leaders. Retrieved from http://www.redbooks.ibm.com/redpapers/pdfs/redp4564.pdf.

14. Rumble, G. (2007). Social justice, economics and distance education. Open Learning, 22(2), 167-176. doi:10.1080/02680510701306715.

15. Scripture, J. D. (2008). Recommendations for Designing and Implementing Distributed Problem-Based Learning. American Journal Of Distance Education, 22(4), 207-221.

16. Swan, K., Van't Hooft, M., Kratcoski, A., & Unger, D. (2005). Uses and Effects of Mobile Computing Devices in K-8 Classrooms. Journal of Research on Technology In Education, 38(1), 99-112

17. Tuomi, I. (2005). The future of Learning in the Knowledge Society: Disruptive Changes for Europe by 202. Retrieved from http://www.meaningprocessing.com/personalPages/tuomi/articles/TheFutureOfLearningInTheKnowledgeSociety.pdf.

Images and videos

1, 13: [screenshot] Changing Education Paradigms. RSA Animate. Retrieved July 28, 2012 from http://www.youtube.com/watch?v=zDZFcDGpL4U

2, 13: Australia's classroom of the future. Architecture Source. Retrieved July 21, 2012 from http://designbuildsource.com.au/portables-with-a-punch-australias-classroom-of-the-future

3, 13: [screenshot]. Rethinking Learning: The 21st Century Learner. MacArthur Foundation. Retrieved July 28, 2012 from http://www.youtube.com/watch?v=c0xa98cy-Rw

4, 13: [screenshot]. Welcome to the 2020s (Future Timeline Events 2020-2029). Retrieved July 28, 2012 from http://www.youtube.com/watch?v=1Lmd3l0W5Jl

5, (3, 6, 8, 12, 13 and 16): [excerpt]. A Day Made of Glass 2: Same Day. Expanded Corning Vision. Retrieved July 27, 2012 from http://www.youtube.com/watch?v=jZkHpNnXLB0&feature=relmfu

6, 12: Mobile learning. Sealund. Retrieved July 21, 2012 from http://www.sealund.com/mobilelearning.php

7, (4, 9, and 13): [excerpt]. Future Vision of Information Technology & Our Life Style. Retrieved July 28, 2012 from http://www.youtube.com/watch?v=URaiVEY9QZU

8, (2, 6, 11 and 15): [excerpt]. A Day Made of Glass 2: Same Day. Expanded Corning Vision. Retrieved July 27, 2012 from http://www.youtube.com/watch?v=jZkHpNnXLB0&feature=relmfu

9, 12: [excerpt]. A Day Made of Glass 2: Same Day. Expanded Corning Vision. Retrieved July 27, 2012 from http://www.youtube.com/watch?v=jZkHpNnXLB0&feature=relmfu

10, (10 and 17): [excerpt]. Introduction to Second Life (historical view). Retrieved July 27, 2012 from http://www.youtube.com/watch?v=b72CvvMuD6Q

11, (10 and 17): [excerpt]. A Day Made of Glass 2: Same Day. Expanded Corning Vision. Retrieved July 27, 2012 from http://www.youtube.com/watch?v=jZkHpNnXLB0&feature=relmfu

12, (10 and 17): [excerpt]. Boeing 737 Takeoff Pitch Failure & Crash (Flight Simulator X). Retrieved July 27, 2012 from http://www.youtube.com/watch?v=rB8G5gs0UZ4

13, 4: The WOW community is already destroying SWTOR! Gamezenith. Retrieved July 21, 2012 from http://www.gamezenith.com/?p=1561

14, 4: N.n. (2010). MMOG. Media & Cyberculture. Retrieved July 21, 2012 from http://amjadmehmood.blogspot.com/2010/12/mmog.html

15, 4: Sammut, N. (2012). The virtual classroom. Nikolai's Blog. Retrieved July 21, 2012 from http://nikolaisammut.blogspot.com/2012/06/virtual-classroom.html

16, 6: [excerpt]. TAURI WoW: Ulduar 10 TeamWork vs. The Iron Council HARD. Retrieved July 28, 2012 from http://www.youtube.com/watch?v=kr8N6ZaCGb4

17, 12: Active learning. Education Scotland. Retrieved July 21, 2012 from http://www.educationscotland.gov.uk/learningteachingandassessment/approaches/activelearning/index.asp

18, 12: Floyd, C. (2011). Colleges: Hard up for cash? Hit up the parents for a donation. The Chronicle of Higher Education. Retrieved July 21, 2012 from http://chronicle.com/article/Colleges-Hard-Up-for-Cash-/127546/

19, 12: High School English Strategies for Active Learning. Retrieved July 21, 2012 from http://www.ehow.com/way_5299322_high-english-strategies-active-learning.html

20, 12: [excerpt]. A Day Made of Glass 2: Same Day. Expanded Corning Vision. Retrieved July 27, 2012 from http://www.youtube.com/watch?v=jZkHpNnXLB0&feature=relmfu

21, 13: [screenshot]. Future Vision of Information Technology & Our Life Style. Retrieved July 28, 2012 from http://www.youtube.com/watch?v=URaiVEY9QZU

22, 13: [screenshot]. Rethinking Learning: The 21st Century Learner. MacArthur Foundation. Retrieved July 28, 2012 from http://www.youtube.com/watch?v=c0xa98cy-Rw

23, 13: [screenshot]. Rethinking Learning: The 21st Century Learner. MacArthur Foundation. Retrieved July 28, 2012 from http://www.youtube.com/watch?v=c0xa98cy-Rw

24, 13: Mitra, S., & Dangwal, R. (2010). Limits to self-organising systems of learning- the kalikuppam experiment. British Journal Of Educational Technology, 41(5), figure 2, p. 676.

25, 17: Portal 2 Coop Debut Trailer. Retrieved July 27, 2012 from http://www.youtube.com/watch?v=95fymaCWvil