REFORMATTING THE HARD DRIVE OF SOUTH AFRICAN EDUCATION FOR THE KNOWLEDGE ECONOMY

JASON DAVIS

Department of Public Management and Economics
Durban University of Technology, South Africa

JEL Classifications: A2

Key words: Economic education, educational gaming, interactive game.

Abstract: South African education system needs reformatting in order to produce employable graduates. By introducing educational gaming into the formal learning programmes, the nature and quality of learning can be enhanced to create the innovative professionals need for the new knowledge economy.

ISSN: 1804-0527 (online) 1804-0519 (print) PP. 132-134

Background

The new knowledge economy requires the development of innovative professionals across all fields in the work place. This requirement is necessary, as Schaffer (2005) points, out that all professional and manufacturing employment is exportable learning , and the only way to retain the employment is by creating innovative and productive professionals in all occupations.

In South Africa the education system, according to Schaffer et al. (2005), needs to move away from the fact fetish to ways of stimulating thought. In a similar vein, Gee et al. (2005) state that "traditional academic disciplines - were derived from medieval scholarship and constituted within schools developed in the industrial revolution - a new model of learning through meaningful activity needed to be developed".

If Shaffer is correct, then we need to use Epistemic games to equip learners as professionals to compete and be employable in the new knowledge economy.

Educational gaming

The use of educational gaming in economics could be the key to "the longstanding goal in education of how to promote situations where a person is motivated to learn, is engaged in the learning act, is willing to go to great lengths to ensure learning will occur, and at the same time finds the learning process (not just the outcomes) to be satisfying and rewarding" (Rieber et al., 1998, p. 5).

The traditional lecture has led "students come to think of knowledge as a packet of content waiting to be transmitted" (Venter, 2001, p. 89). The lecture becomes the delivery vehicle of factual subject knowledge to the students. This minimalist learning environment encourages passive and rote learning, leaving little room for problem-solving or exploration of facts (Wilson, 1995).

Under this system of learning " we are forced to learn by rote that is in no way connected to anything important in our lives ... being alien to our own life experiences outside the academic setting, they slip easily off our shoulders ... and vanishes" (Gruender, 1996, p. 21).

This drive to create a new model of learning, through meaningful activity led Gee et al. and Shaffer (2005) to the promotion of Epistemic games as a solution. In these games, which are not just about knowledge but knowledge in action, players learn to work and think as innovative professionals.

Ellington (1998) captured the need for learners to be able to adapt their knowledge to diverse experiences in the following quote: "We live in a complicated and messy world in which work for most of our graduates is a continuous stream of 'problems' that have no simple or unique solutions" (p.1).

Therefore, our students need to think creatively to solve problems and this can only occur in active learning environments which could be created by utilising games and simulations. This is supported by Amory and Seagram (2003) who suggest that games can provide a learning environment which:

- affects cognitive functions and motivations;
- stimulates curiosity through challenges;
- provides novelty and complexity;
- promotes goal formation and competition;
- intrinsically motivates learners to be active.

Games provide an ideal educational opportunity to engage students actively thereby enhancing the learning process at academic institutions.

As such the re-introduction of games into formal academic tuition is built on sound educational principles. For instance, the Game Achievement Model developed by Amory and Seagram (2003) aims at designing educational games that simultaneously challenge learners to actively participate in the learning process while achieving particular educational outcomes.

Therefore, part of the diversification process to enhance the learning process could be found in introducing educational games into formal learning time.

Review of games in use in economics and business education

The use of games to provide interactive learning environments occurs across a wide variety of disciplines and educational contexts. The aim of this section is to show the relevance of games as a platform for effective learning in different disciplines as well as the discipline of economics.

The words "game" and "simulation", in the context of this argument, are interchangeable as they tend to be

merged into one concept when being used to create interactive learning environments.

Cooper and Kagel (2003), in looking at lessons learned from games applied in economics, based their experiments on an entry limit-pricing game. They noted two important features: firstly, the growth in "sophisticated learners" who are able to correctly anticipate the impact of their opponents' decisions; and secondly, the growth in the number of these thinkers with experience.

They stated that these results "provide clear evidence that can facilitate the positive transfer between related games" (Ibid, 2003, p.205). Further they note that the meaningful context not only speeds up learning, but can change the nature of the subject's reasoning process.

Pratt (2004), in implementing the use of macroeconomic simulations in the teaching and learning process of economics, found that these increased student motivation, engagement and performance. He also aligned the simulation with the required outcomes of the course and then introduced a rubric to measure the performance of the students during the games.

Woltjer (2005) developed an interactive game that shows the relationship between company decisions and macroeconomic dynamics. In this real-time computer simulation players get to see the short-term and long-term macroeconomic consequences of their decisions.

Davis (2009) in examining the results from the questionnaire of the students' perceptions towards the game being used as method of teaching in economics, found a response to the literature reviewed (Motahar, 1994; Gremmen and Potters, 1997; Mason and Fabritus, 2000; Woltjier 2005) which concluded that students responded positively to this teaching intervention and believed it assisted their learning. The majority of the students stated that the game: "emphasizes the theory in a practical way that made it easier to understand / an easy way to understand the Law of Diminishing Returns".

Not only can games and simulations improve the quality of learning, but when blended with real world technology used in the workplace it can equip students with employable skills. An example of this comes from the accounting field where students use SAP (Systems, Applications and Products) as part of a simulation to analyse a case study. According to Ragan et al. (2009) "These case studies are of significant importance as it integrates and reinforces accounting concepts, SAP, and has the look and feel of a student working in the real world".

Ragan, J. et al. (2009) commented that from their survey results and comments by students that the students affirmed the outlook for SAP and enterprise resource systems, validating that they are an integral part of the accounting curriculum along with an invaluable learning experience, which they can use to their advantage after graduation.

Games and simulations combined with real world technology have the potential not only to improve the quality of learning, but also to narrow the gap between academic study and real world application.

Conclusion

Baer (2005), in calling for a new model of learning, says this will require collaboration between educators and game designers to research how games are best aligned with the targeted learning environment and needs.

The incorporation of games will require realistic assessment of the current structure of education so that "students' ability to participate in complex social practices; learn new knowledge and perform well in novel, changing situations needs to be considered valuable learning" (Squire and Jenkins, 2004, p. 31).

All of these attractive features of learning applications from games require us, as educators, to seriously consider games as part of the solution to the puzzle of learning and need to be incorporated into the formal academic learning time of students.

The Summit on Educational Games (2006) also summarises what educational games could teach:

- higher-order thinking skills (strategic thinking, management of complexity, learn to compromise and trade-off);
- practical training skills;
- high performance situations;
- developing expertise;
- team building.

In conclusion then, perhaps it is time to integrate games and simulations into the formal lecturing process not only as a method of teaching but also evaluation, where in the game real world features are included (i.e. economic modelling, data analysis and interpretation) so as to narrow the gap between theory and application thereof in a complex dynamic world.

References

Harnessing the power of video games for learning. (2006). Paper presented at the Summit on Educational Games.

Amory, A., and Seagram, R., 2003. "Educational game models: conceptualisation and evaluation", South African Journal of Higher Education, 17(2), pp.206-217.

Baer, L., 2005. "The Generation gap: bridging learners and educators", The International Digital Media & Arts Association Journal, 2(1), pp. 47 - 52.

Caine, G., and Caine, R., 1990. Understanding a brain based approach to learning and teaching. educational leadership, 48(2), pp. 66 - 70 (Excerpts).

Cooper, D., and Kagel, J., 2003. "Lessons learned: generalizing learning across games", The American Economic Review, 93(2), pp. 202 - 207.

Cranton, P., 1994. In understanding and promoting transformative learning: a guide for educators of adults. San Fransisco, CA: Jossey-Bass.

Davis, J., 2009. Students' perception of gaming as part of a first years economics' topic unpublished master thesis, University of KwaZulu Natal.

DeYoung, R., 1993. „Market experiments: the laboratory versus the classroom", Journal of Economic Education, 24(4), Autumn, pp.335 - 351.

Dirkx, J., 2000. Transformative learning and journey of individuation. ERIC Digest, 23.

Ellington, H., and Earl, S., 1998. "Using games,simulations and interactive case studies - a practical guide for tertiary-level teachers", Paper presented at the SEDA Paper 101.

Gee, J. et al., 2005. Video games and the future of learning, Unpublished working paper. WCER.

Gremmen, H., and Potters, J., 1997. "Assessing the efficacy of gaming in economic education", Journal of Economic Education, 28(4), pp.291-303.

Gruender, C., 1996. "Constructivism and learning: a philosophical appraisal", Educational Technology, May - June 1996, 21 - 29.

Klassen, J., and Drummond, D., 2000. "Human resources skills: Learning through an interactive multimedia business simulation", International Journal of Educational Technology, 2(1).

Lorsbach, A. and Tobin, K., 1997. Constructivism as a referent for science teaching, Institute for Inquiry, Exploratorium,San Francisco, CA: http://www.exploratorium.edu/IFI/resources/research/constructivism.html

Mason, P. And Fabritius, M., 2000. "Using student data to teach utility maximising behaviour", Classroom Expernomics, p.9.

Motahar, E., 1994. Teaching modeling and simulation in economics: A pleasant surprise, Journal of Economic Education, 25(4).

Ortmann, A., 2000. Bertrand price undercutting: A brief classroom demonstration.

Pratt, G., 2004. Use of simulations in economics instruction. from http://www.mdl.dist.maricopa.edu/mlx/slip.php? item=1389

Ragan, J., Leahan, Z., Malonoski, R., and Savino, C., 2009. STARLEDGER: A business activity model using SAP R/3 as a classroom tool to measure learning outcomes. Paper presented at the EABR & TLC Conference, Prague, Czech Republic.

Reimann, N., 2004. "First-year teaching-learning environments in economics", International Review of Economics Education, 3(1), pp. 9 - 38.

Rieber, L., 1996. Seriously considering play: Designing interactive learning environments based on the blending of microworlds, simulations and games. Educational Technology Research and Development, 44(2).

How epistemic games can solve the coming crisis in education. In (Vol. 2005 - 7): Wisconsin Centre for Education Research.

Shaffer, D., and Gee, J., 2005. Video games and the future of learning. In (Vol. Working Paper 2005 - 4): Wisconsin Centre for Research.

Squire, K., and Jenkins, H., 2004. "Harnessing the power of games in education", Insight, 3(1), pp. 5 - 33.

Stapleton, A., and Taylor, P., 2003. "Why videogames are cool and school sucks. Paper presented at the annual Australian Game Developer's Conference Melbourne, Australia November 2003.

Sylwester, R., 1993/4. "What the biology of the brain tells us about learning", Educational Leadership, 31 December/January, pp. 46 - 51.

Venter, E., 2001. "A constructivist approach to learning and teaching", South African Journal of Higher Education, 15(2), pp.86 - 92.

Wilson, B., 1995. Metaphors for instruction: Why we talk about training environments? Educational Technology (September - October), pp. 25-30

Woltjer, B., 2005. "Decisions and macroeconomics: development and implementation of a simulation game", Journal of Economic Education, 36(2), pages 139-144.