

The Use of Economics Games as a Participative Teaching Strategy to Enhance Student Learning

Micheal M. van Wyk

*Department of Curriculum and Instructional Studies School for Teacher Education
College of Education University of South Africa Pretoria, South Africa
E-mail: vwykmm@unisa.ac.za*

KEYWORDS In-class Simulated Games. Phenomenographic Approach. Semi-structured Interviews. Quota Sampling

ABSTRACT Research studies reported that playing games in the classroom does not solve all educational challenges but games and simulations are useful tools to actively involve students in their learning. This study explores the educational value of economics games on student learning in economics education. A quota sampling of fourteen Economics education students were identified and selected for the semi-structured interviews. An interview schedule was used to obtain data. Findings revealed those students' viewed in-class simulated games as a valuable tool which contributed to their learning which implies that student achievements were enhanced by the in-class structured activities. Economics games enhanced their academic performances, interpersonal relationships and linked to real-life experiences on how markets operate. They acquired and improved their social skills and gained confidence in their ability to apply the skills effectively during the games in the classroom. Lastly, the economics games motivated students to take responsibility for their own learning.

INTRODUCTION

One particular teaching strategy which perhaps is seldom used is the simulated games in teaching and learning situations. To encourage this development, learning activities become important. As an example of one approach, this study investigated the advantages of using simulation games as an experiential teaching strategy to encourage, create interest, develop critical thinking and reflective skills in economics education. Simulations and games are a formidable combination. Simulated micro-teaching and experimental teaching sessions used to train student teachers in our faculty immediately spring to mind. The researcher favoured simulated experiments because it places students directly into real economics situations where they will be required to make choices based on specific incentives. These experiments provide a powerful link between economics theory and direct experience. The researcher argues for the sake of the quality of teaching and learning, we need to design and use more effective teaching strategies to enhance student learning in the subject. We can empower students in these participative teaching methods to develop and empowering students' cognitive, psychomotor and affective learning skills especially during teaching practice sessions. Incidentally, these student teachers are now obliged to teach the un-

derlying principles of the new national curriculum for South African schools. Economics teachers are expected to comply with policies that call for effective and efficient teaching strategies. The next paragraph explains the conceptualization of social interdependence theory.

Social Interdependence: A Theoretical Framework

A theoretical framework is a collection of interrelated concepts, like a theory but not necessarily so well worked-out. A theoretical framework guides your research, determining what will be measured and what statistical relationships will be sought (Costello and Osborne 2005). Theorizing on *social interdependence* began in the early 1900s. Kurt Lewin did substantial research work on Koffka's notions of social interdependence theory. Lewin states that (1) the essence of a group is the interdependence among members creating by common goals, which results in the group being a "dynamic whole". He further argues that a change in the state of any member or subgroup members changes the state of any other member or subgroup social dependence. Furthermore Lewin posit that an intrinsic state of tension within group members motivates the group to move toward the accomplishment of the desired common goal. In the late 1940s, one of Lewin's graduate students, Morton Deut-

sch, extended Lewin's reasoning about social interdependence and formulated a theory of co-operation and competition. Deutsch's theory was extended and applied to education by the authors at the University of Minnesota (Johnson and Johnson 1992). The latter authors' work has been extended and applied to business and industry (Tjosvold 1986). Social interdependence exists when individuals share common goals and each individual's outcomes are affected by the actions of the others (Johnson and Johnson 1994; Johnson et al. 1998). The rationale for using simulated-based games as an experiential teaching approach in Economics education stems from the fact that it is a widely used and broadly applied teaching strategy in both Social Sciences and Economics and Management Science. In recently published studies, the simulated-based experimental (SBE) approach was used for a variety of applications, including an in-class sim-

ulation game to assess student learning (Klassen and Willoughby 2003). Another study reported that students' learning and instructors' teaching performances were enhanced by introducing experimental games in the finance education (Cabula and Toma 2002). The researcher contend that a simulated-based experimental approach is effective, relevant and applicable for this study which investigates the advantages of using simulated games as an experiential teaching approach in economics education. In recent years, several attempts have been made to enhance student learning experiences by increasing their motivation, by attempting to focus their attention, and by helping them to construct meaningful and permanent records of their learning in economics education (Van Wyk 2007). Seven simulated economics games were played during the contact sessions (see Table 1).

Table 1: In-class simulated games played during the contact sessions

<i>Games played</i>	<i>Outcomes of the game</i>	<i>Time allocation</i>	<i>Participants</i>	<i>Gains or rewards</i>
Baseball cap auction	Students demonstrate the ability to use the decision-making model for allocating a scarce resource. PACE teaching strategy.	15 minutes per contact session	Students highest bidding process	Highest bidder for cap auction
The quality book factory	Students understand the supply chain and through specialization of scarce resources how to produce a quality product. Produce a quality book through one piece of A4-paper+paper clip+ ruler +pen	55 minutes per contact session X 3 rounds (3 hours/ 15min)	Small groups of five members	CASS-marks total # books produced in set time + M and M's
Dairy farmers versus food retailers	Students participate in a simulation and demonstrate how the forces of supply and demand determine price and how changes in the price of a product and service affect the quantities demanded and supplied. Example of consumers/producers	55 minutes per contact session X 3 rounds (3 hours/ 15min)	All students participate as buyers and sellers	Individual score cards. CASS-marks
The market never stands still	Then they predict the effects of changes in demand and supply on market prices and quantities traded.	55 minutes per contact session X 2 rounds (2 hours / 20min)	Individual students	CASS-marks (grades scores) + M and M's
Markets interact	Students analyze how changes in determinants of supply or demand affect market prices and quantities exchanged. Students analyze how changes in one market affect other markets.	55 minutes of one period	All students: Individual accountability	Individual score cards. CASS-marks + Cert
Economics quizzes (Van Wyk 2008)	Students participate in Economics quizzes of 25 questions of 2 sessions each covering learning units 1-4 of the module. One member pastes answer to correct number on economics score card	50 minutes x 3 rounds	Randomly select small groups of four members	Group CASS-marks (grades) + Certificate + Pen set
Fiscal policy; A Two -Act play	Students understand the effects of expansionary and contractionary fiscal policy of the Reserve bank	110 minutes	Group playing different roles	Group CASS-marks (grades)

* Continuous Assessment (CASS)-marks: counts for 50% of final mark for promotion in the course work

Emanating from the above, the research question is: *Do simulated games as an experiential teaching strategy result in benefits (gains) for student teachers in economics education?*

RESEARCH METHODOLOGY

Research Paradigm

A phenomenographic approach was applied for this research which explores PGCE Economics education students' views of simulated games as a teaching strategy. Marton (1994) defined phenomenography as "the empirical study of the differing ways in which people experience, perceive, apprehend, understand and conceptualise various phenomena in any aspects of the world around us". The goal is to adopt an unbiased approach in order to be able to observe patterns and consistencies that may be emerging from students' experience, and understand, by describing various phenomena in the students' experiences of in-class economics games.

Sampling

PGCE Economics education student teachers participated in the study. Only one hundred and twenty nine PGCE students who were registered for the module, were selected as the proportional stratified sample for the study. Eighty one percent (81%) of the sample size was made up of female students (N=9) and 19% were males (N=5). Both groups were taught by the researcher during contact sessions of 55 minutes per week for the first semester.

The Setting and Procedure for Playing the Games

Seven simulated games were played in relatively large lecturer rooms. The instruction sessions were conducted in both Afrikaans and English. Ninety Afrikaans speaking and 39 English speaking students played the seven games. The classrooms were large enough and provided suitable space in which to accommodate all the students who participated in the games. Dates for economics quizzes were diarized in the study guide. Students were randomly selected and divided into small groups to play the three

quizzes. Other simulation games such as *The Quality Book Factory* on productivity and *Markets Interact* were explained and demonstrated by the lecturer in the classroom and then played by the students. Rules, criteria and outcomes of each simulated game were clearly communicated to students. Students were compelled to adhere to the rules and criteria of each game. They were penalized when failing to do so. The times allocated for the respective games varied between fifty-five minutes (55 min) and three hours and fifteen minutes (3 hours and 15 min) per game. Specific continuous assessment marks (grades) were allocated to each game as part of the final mark for the module (see table 1). The researcher acted as instructor (lecturer), observer, judge and quality controller during contact sessions.

Research Instruments

A quota sampling of ten percent (N=14) was identified and randomly selected for the interviews by using student numbers. Open-ended questions were designed to obtain data. Semi-structured interviews (N=14) were conducted and the responses recorded. The interviewees accepted the official invitations and 20 minute interview session were conducted directly at the end of the twelve week period of the semester module.

Data Analysis Procedure

For the qualitative data, the content analysis method was used, as explained by Leedy and Ormod (2001). The data was coded, themes were analyzed, and the data organized and defined according to the codes and themes. Then, interpretations were made of these themes. This particular process is described by Miles and Huberman (1994) as "data reduction," "data display," and "conclusion drawing and verification".

RESULTS

The results from the interview responses of the quota sampling (N=14) were recorded, analyzed and reported. Interviews were conducted on a face-to-face basis. From the analyses of participants' responses, four themes emerged. An analysis and discussion of interviewees' responses are outlined below:

Lecturer's Professionalism Enhance Student Motivation to Participate in Economics Games

Students were positive, motivated and alluded to the lecturer's professionalism with regard to Economics lessons preparations and planning, presentations of simulation games, facilitation and the use of relevant assessment activities during class sessions (Van Wyk 2009). Moreover Durkin and Barber (2002) conducted a study by using computer games as a pedagogical tool to support students' adolescent developmental skills. Another study conducted by Butler et al. (2001) reported that through simulated games active learning within a lecture increased the impact of short, in-class writing exercises. In this study some respondents were of the opinion that economics simulation games were well planned, designed and professionally presented to give students ample opportunities to learn and practice during contact sessions. Students also indicated that their personal relationships improved and that they developed professionally in terms of interdependence and personal interaction. There was an improvement in their socialization with fellow students through support during the classes. Some of the key extracts from the interview-transcripts are:

Two students alluded how professional the lecturer acted: *Our lecturer was highly motivated when presenting the games. I was also motivated to participate. Further, we were impressed by how the lecturer executed his roles and responsibilities during our sessions. He was absolutely professional in his lesson planning, always on time to present a lesson. He was really helpful and gave us support.*

One respondent mentioned: *We gained valuable and constructive criticism after our simulation game. It was an excellent way to reflect on one's own teaching practice. The more we practiced, the more our professional confidence grew. Our lecturer was accessible and available and we were able to consult with him if we struggled with parts of our assignments.*

Another student replied: *I was really impressed with how motivated the lecturer was and the highly practical skills he demonstrated when using the Economics simulation games. The Economics quizzes were value-added experiences for us.*

Pertaining to socialization, one female student noted: *The group I was in for the simulation of The Book factory on productivity which was diverse group. We had to be sensitive when using examples concerning specific career opportunities. We made provision for differences and accommodated other group members in our simulation game. By the way we became good friends!!.*

Empowers Students to Execute Business Management Competency and Ethics Skills

A particular study that was conducted proved that economic games are effective in positively changing students' perceptions of ethics in business (Glass and Bonnici 1997). The seven games played in this study have a set of rules, criteria and codes of conduct. Students must adhere to rules such as honesty, completion of tasks on time, how to conduct a fair deal as a business person otherwise being eliminated from the game and forfeiting CASS marks (Keys and Wolfe 1990; Van Wyk 2008). Students received constructive feedback from the lecturer as well from fellow classmates on how to improve on their specific task. These feedback sessions help them to understand and change their attitudes positively in dealing with how markets operated in terms of the simulated game theory. Research studies done with market and business games generally included business ethics skills activities and these games had positive effects on student learning (Gredler 1996; Coyne 2003). In this study interviewees indicated that business ethics in Economics games enabled them to practice decision making skills that called for ethical standards and their consequences in the classroom. They believed that through these experiences of in-class games an awareness of and appreciation for the complexity of ethical decision making during their teaching practice.

A male student noted about in-class games: *I refer to 'The Book Factory' game. It enhanced my understanding of how productivity impact the economy. In practice one takes decisions that have serious consequences on one's actions. You must play the game in accordance with ethical business rules. You must be honest in dealing with other role players in the market otherwise you will be caught for dealing unethically. I like the lecturer role which acted as market referee controlling business opera-*

tions, like government inspectors. On the other hand male student responded: *I appreciated the way the lecturer acted as an instructor, observer, referee and judge during our games. I believe there must be "checks and balances" in the markets or there must be government involvement. Otherwise, markets will collapse. I must take full responsibility for my decisions in terms of ethical considerations when dealing with business contracts.*

Developing Social Skills and Collaborative Learning

The effectiveness of the games enabled students to acquire and improve their social skills. These social skills were interpreted as interpersonal situations such as the abilities to bargain, persuade, collect and categorize information in a manner that facilitated decision making, problem solving, competition, cooperation and command. Research studies reported that positive effects such as positive interdependence, face-to-face interaction, sharing, caring and support developed among students when they played together (Strasburger and Donnerstein 1999; Prensky 2001; Durkin and Barber 2002; Rosas et al. 2003). Interviewees expressed positive sentiments regarding the application and effectiveness of teaching with economics simulation games. They indicated that this teaching tool enhanced their ability to master the application of the strategy for effective teaching. A positive comment expressed by a female student in this regard set out the gains of such a teaching tool. This female student reflected on the economics games played as follows: *The games we played enhanced my knowledge of the application of the economics simulation games in the Decision-making: Baseball cap auction game. I preferred this experiential strategy because it enhanced my confidence in understanding economics concepts and content, for example the Fiscal Policy: A Two-Act play. I enjoyed the role play through collaborative learning. We helped and supported each other in the Book Factory activity. If you cheated in the production process, the team would forfeit valuable continuous assessment marks for the module.*

Three respondents mentioned that a specific method namely the Think-Pair-and-Share technique used by the lecturer enhanced their ability to grasp the teaching tool, Economics con-

tent and concepts positively: *Every third class session, we moved to a different group for the economics quizzes. We learned from each other, we learned about diversity. We work together to solve our different tasks and make decisions on mutual agreement. In doing so we shared, cared and supported members working on each task. This in turn improved my social interdependence skills such as communication, effective debating of economics issues and defending our position in: "Market in Wheat Trading, How Markets Interact and The Market Never Stands Still.*

Providing Opportunities for Students' Collective and Contextualized Learning

Research studies conducted revealed increased contextualized learning that improved the "spatial representation," "iconic skills," and "visual attention" of students (Greenfield et al. 1994; Subrahmanyam et al. 2001). The games played in this study provided opportunities for students to explore how in-class economic games as a social laboratory providing opportunities to contextualized learning experiences. Interviewees experienced that they through their own actions and observed reactions of other participants in the in-class games help them to learning collectively by advancing their economic knowledge and skills. All the information gained through in-class games support and test principles, theories, and business-, economics-, and financial relationships during contact sessions played. These games exposed students with relatively simple inside games scenarios compared to those in the real world economic activities. Respondents noted that the application of relevant and contextually used economics simulation games must be brought in line with the realities of the South African situation: *The examples used in the study guide must be representative of our country. Some students were using examples which were not relevant to South Africa economics issues. One student used economic data from the United States and Botswana instead of South Africa's economy which is more applicable when explaining the markets of your simulation game.*

Students indicated that more opportunities for practical sessions for students during contact sessions should be provided. One respondent noted: *I proposed more sessions per stu-*

dent for presentation in our classes. I believed more practical sessions will strengthen our teaching skills.

The effectiveness of applying simulation games depends on the availability and relevance of specific topics pertaining to new concepts and content within the students' frame of reference. Knowledge and skills then have to be applied to relevant simulation game situations which in turn will add value to their personal and professional development in the subject (Van Wyk 2009).

DISCUSSION

The results of this study are encouraging and add to the body of information of other research studies in this regard for introducing simulated games as an experimental teaching strategy (Cebula and Toma 2002; Klassen and Wiloughby 2003; Kumar and Lightner 2007; Kaplan 2007; Tsigaris 2008; Van Wyk 2009). The researcher contends that the use of simulations and games for economics education was an appropriate experimental approach utilized in exploring the gains for students' learning for this particular study. One study conducted by Tsigaris (2008) reported on a number of benefits that accrued to the instructor for using simulation games in economics education that offer further support for previous findings of similar research studies that applied an experiential approach. Brauer and Delemeester (2001) point to a number of benefits that accrue to the students from using experimental classroom games such as a break from routine, motivation, fun and repetition of Economics. From the interviews it became clear that students were positive, motivated and alluded to the lecturer's professionalism with regard to Economics lessons preparations and planning, presentations of simulation games, facilitation and the use of applicable assessment activities during class sessions. Lastly, the assessment instruments used for the seven games were transparent, fair and reliable. Cole (1996) reported that playing games had a positive effect on students' learning on the long run (Subrahmanyam et al. 2001). Another study conducted by Rieber (1996) on students' learning revealed that critical thinking and problem solving skills were enhanced by using simulations and games in the blending of micro-worlds. Rieber (1996) reported that, through debriefing and

feedback, learning by doing, learning from mistakes and cooperation contributed to student learning after each game. The seven simulated games (see Table 1) played helped students to have fun and enjoy themselves in the classroom. The effectiveness of these simulated games promoted engagement, interactivity, and active participation of students in the economics education classroom. The researcher argues that the simulated economics games provide a great deal of highly interactive feedback, which is crucial to learning. Economics games also provided the students with a variety of decision making situations which are frequently encountered in the real world. Some students gave other students first hand advice since they had been confronted with identifying problems and were able to construct real life solutions to these problems while playing these games. According to Rieber (1996), simulated games elements are linked to enjoyable activities that promote effective learning of students. Thus, gaming activities have the potential to engross the student into a state of flow and consequently cause better learning through focus and pleasant rewards. Gredler (1996) states that intellectual skills and 'cognitive strategies' are acquired during academic games. On the other hand, Subrahmanyam et al. (2001) confirmed that games have cognitive development effects on visual skills including 'spatial representation', 'iconic skills' and 'visual attention'. Students have the opportunity to use decision making, problem solving and communication skills previously learned and refine them into marketable skills. Students experienced real life forces via cooperation and collaboration learning while developing problem solving skills in teams. Practice being honest while playing the game and making a transaction with other role players in the market. Dishonesty and breaking the rules will result in getting caught for unethical and unfair business practices. The economics games became a bridge that linked students to real-life market operation experiences. The simulated games used during the contacted sessions motivated students and increased students' conceptual and concentration levels (Rieber 1996). Malone (1980) and Malone and Lepper (1987) mentioned four characteristics of games that increase motivation and eagerness for learning. These are challenge, fantasy, curiosity, and control. This allowed the students to explore new concepts and ideas without fear of

repercussions. Students demonstrated their individual abilities in an environment different from the traditional lecture room setting. The games effectively enabled students to acquire factual and conceptual knowledge and retain the knowledge and acquired skills. The experimental games enable students to acquire and improved social skills and gained confidence in their ability to employ those skills effectively during the games in the classroom. The value of teamwork was not overlooked. Students learned the importance of working together and of cooperative learning.

CONCLUSION

This paper presented evidence about the educational value accrued to students' learning as a result of playing different simulation-based economics games. Findings revealed those students' viewed in-class simulated games as a valuable tool which contributed to their learning which implies that student achievements were enhanced by the in-class structured activities. Economics games enhanced their academic performances, interpersonal relationships and linked to real-life experiences on how markets operate. They acquired and improved their social skills and gained confidence in their ability to apply the skills effectively during the games in the classroom. Lastly, the economics games motivated students to take responsibility for their own learning. Most of the literature reviews attempt to measure the effect of experimental games that accrue only to student learning in terms of academic performances. Student teachers were exposed to the simulated games which enhanced students' motivation by supporting and caring about their learning in enabling environment. The games played during the sessions were provided opportunities for students' collective and contextualized learning. It would seem that these games enhanced the teaching and learning capacity of those who presented and participated in the experimental games. Despite the positive results in support of these seven experimental games to enhance active learning of students, only a few studies conducted in teaching economics education existed currently. In conclusion, the simulated in-class economic games increased academic performance, social skills and reflective skills of the student teachers.

RECOMMENDATIONS

Despite the positive results in support of these seven experimental games, only a few studies were conducted in teaching economics education at universities of faculties of education exist. Further research needs to be conducted by employing more experimental games in teaching and learning environments. Research needs to be conducted by employing more experimental games in teaching and learning environments amongst diverse student populations which will ultimately reveal different results. The application of in-class economics games on students' decision making, problem solving and communication skills as a means to cultivate critical and creative skills should be explored.

ACKNOWLEDGEMENTS

The author is in debt to the critical reviewers for constructive feedback. The author acknowledged the financial contributions made by the National Research Foundation of South Africa (NRF) for Grant funding (69092) Ref No: TK2008043000005. Acknowledgement is given to the EEE 112 modular students and the research assistant, who voluntarily participated in this research study. Lastly, the quality of language revision work done is acknowledged. Any opinions, findings, and conclusions expressed in this paper are those of the author and do not reflect the views of the NRF or the Department of Curriculum and Instructional Studies.

REFERENCES

- Akilli GK 2007. Games and simulations: A new approach in education? *Games and Simulations in On-line Learning Research and Development Frameworks*. David Gibson, Clark Aldrich and Marck Presky.
- Allgood S, Bosshardt W, Van der Klaauw W, Watts M 2004. What students remember and say about college economics years later. *American Economics Review*, 94(2): 259-265.
- Butler A, Phillmann KB, Smart L 2001. Active learning within a lecture: Assessing the impact of short, in-class writing exercises. *Methods and Techniques*, 28(4): 257-259.
- Cabula R, Toma M 2002. The effect of classroom games on student learning and instructor evaluation. *Journal of Economics and Finance Education*, 1(2): 1-10.
- Can G, Cagiltay K 2006. Turkish prospective teachers' perceptions regarding the use of computer games with educational features. *Educational Technology and Society*, 9(1): 308-321.

- Costello AB, Osborne JW 2005. The best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation*, 10(7): 23-27.
- Council on Higher Education (CHE) 2007. National Review: Progress Report: ACE (Mathematics Education), B ED (Pre-School and Foundation) and PGCE (FET). Report November 28, 2008 of High Education Quality Assurance Committee.
- Coyne R 2003. Mindless repetition: Learning from computer games. *Design Studies* 24(3): 199-212.
- Durkin K, Barber B 2002. Not so doomed: Computer game play and positive adolescent development. *Applied Developmental Psychology*, 23(1): 373-392.
- Faria AJ 1998. Business simulations games: Current usage levels-An update. *Simulation and Games*, 29(3): 295-303.
- Franklin S, Peat M, Lewis A 2003. Non-traditional interventions to stimulate discussion: The use of games and puzzles. *Journal of Biological Education*, 37(2): 79-83.
- Gredler ME 1996. Educational games and simulations: A technology in search of a (research) paradigm. In: D Jonassen (Ed.): *Handbook of Research for Educational Communications and Technology*. Washington, DC, USA: Association for Educational Communications and Technology, pp. 521-540.
- Gredler ME 1994. *Designing and Evaluating Games and Simulations: A Process Approach*. Houston: Gulf Publication Company.
- Greenfield PM, deWinstanley P, Kilpatrick H, Kaye D 1994. Action video games and informal education: Effects on strategies for dividing visual attention. *Journal of Applied Developmental Psychology*, 15(1): 195-123.
- Glass R S, Bonnici J 1997. An experiential approach for teaching business ethics. *Teaching Business Ethics*, 1(1): 183-195.
- Glynn SM, Price T, Aultman L, Owen AM 2005. Motivation to learn in general education programs. *The Journal of General Education*, 54(2): 150-154.
- Hake RR 1998. Interactive-engagement vs. traditional lecture method: A six-thousand-student survey of mechanics test data for introductory physics course. *American Journal of Physics*, 66(1): 64-74.
- Johnson DW, Johnson RT 1992. *Structuring Cooperative Learning: Lesson Plans for Teachers*. New Brighton: Interaction Books Co.
- Johnson DW, Johnson RT 1994. *Learning Together and Alone: Cooperative, Competitive and Individualistic Learning*. 4th Edition. New Jersey: Allyn and Bacon.
- Johnson DW, Johnson RT, Smith KA 1998. Making cooperative learning work. *Theory into Practice*, 38(2): 6-72.
- Keys B, Wolfe J 1990. The role of management games and simulations in education and research. *Journal of Management*, 16(2): 307-336.
- Kiili K 2005. Digital game-based learning: Toward an experiential gaming model. *Internet and Higher Education*, 8(1): 13-24.
- Klassen KJ, Willoughby KA 2003. In-class simulation games: Assessing student learning. *Journal of Information Technology Education*, 2(3): 1-11.
- Kumar R, Lightner R 2007. Games as an interactive classroom technique: Perceptions of corporate trainers, college instructors and students. *International Journal of Teaching and Learning in Higher Education*, 19(1): 53-63.
- Leedy PD, Ormrod JE 2001. *Practical Research: Planning and Design*. 7th Edition. New Jersey: Merrill Prentice-Hall.
- Leonard D 2003. Live in your world, play in ours: Race, video games, and consuming the other. *Studies in Media and Information Literacy Education*, 3(4): 1-9.
- Miles MB, Huberman AM 1994. *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd Edition. Thousand Oaks, CA, USA: Sage.
- Molenda M, Sullivan M 2003. Issues and trends in instructional technology: Treading water. In: M Molenda (Ed): *Educational Media and Technology Yearbook 2003*. Englewood, CO, USA: Libraries Unlimited, pp. 3-20.
- National Council on Economics Education 2005. *Train the Trainers Programme 2005-2007: Seminars A, B, C and D*. Economics International. New York.
- Prensky M 2001. *Digital Game-based Learning*. New York: McGraw-Hill.
- Price RV 1990. *Computer-aided Instruction: A Guide for Authors*. Pacific Grove, CA, USA: Brooks / Cole Publishing.
- Reuben BD 1999. Simulations, games and experience-based learning: The quest for a new paradigm for teaching and learning. *Simulation and Gaming*, 30(4): 498-505.
- Rieber IP 1996. Seriously considering play: Designing interactive learning environment based on the blending of microworlds, simulations, and games. *Educational Technology Research and Development*, 44(2): 43-58.
- Rosas R, Nussbaum M, Cumsille P 2003. Beyond Nintendo: Design and assessment of educational video games for first and second grade students. *Computers and Education*, 40(1): 71-94.
- Ruohomaki V 1995. Viewpoints on learning and education with simulation games. In: JO Riis (Ed.): *Simulation Games and Learning in Production Management*. Springer Publishers, pp.34-45.
- Subrahmanyam K, Greenfield P, Kraut R, Gross E 2001. The impact of computer use on children's and adolescents' development. *Applied Developmental Psychology*, 45(2): 85-115.
- Tjosvold D 1986. The dynamics of interdependence in organizations. *Human Relations*, 39(2): 514-540.
- Tsigaris P 2008. Is there a double dividend from classroom experimental games? *American Journal of Business Education*, 1(1): 23-36.
- Van Wyk MM 2009. Students' Reflections Regarding the Use of Cartoons as a Teaching Technique in the Economics Classroom. Paper presented at EASA International Conference, Illovo Beach, Durban, South Africa 13-16 January.
- Van Wyk MM 2007. *The Use of Cooperative Learning in Economics in the Further Education and Train-*

- ing Phase of the Free State province*. Ph.D Thesis, Unpublished. Bloemfontein, University of the Free State.
- Van Wyk MM 2008. *Module EEE 112: Elementary Economics Study Guide for Bachelor of Education: Foundation and Intermediate Phase*. Bloemfontein: University of the Free State.
- Welfield T 2007. Game theory approaches to grading: An experiment with two incentive point systems. *Toyo University Keizai Ronshu*, 32(2): 33–43.