‘Involvement’ and ‘Fun’ as Potential for Deep Learning: Unusual Suspects in a Higher Education Economics Programme

Jason Stratton Davis
Suriamurthee M. Maistry

Abstract

While games have much potential as pedagogical tools, there is limited empirical evidence that indicates the extent to which they might be successful in a higher education Economics programme. This prompted an investigation in the form of a qualitative case study at the Durban University of Technology (DUT), utilising a sample of first-year Economics students who had participated in a series of games incorporating key micro-economics topics.

Northcutt & McCoy’s Interactive Qualitative Analysis (IQA), a unique, structured and rigorous methodological approach that advocates strong participant involvement in the research process, provided the foundation for the research. Focus group discussions, individual semi-structured interviews and reflective journals provided the data for the study, which revealed that the use of games was a key catalyst in stimulating learning. Of note is that students firmly placed ‘involvement and fun’ at the core of the learning process, which resulted in deeper learning of economic concepts. This has implications for education in re-evaluating what is meant by the terms ‘involvement’ and ‘fun’ with regard to an enhanced learning experience within the classroom.

The findings highlight the potential for learning that judiciously selected economics games might have for student learning in a re-imagined teaching and learning space.

Keywords: deep conceptual understanding; games; involvement; fun; higher education; real world

Electronic ISSN: 2519-5476; DOI: https://doi.org/10.29086/2519-5476/2017/v24n2a3

Introduction

A review of International literature has shown that there is growing interest in the use of games as an instructional strategy to improve learning in the classroom, as games are considered to be an effective means for developing knowledge and skills in students. Although much has been documented about the potential of games to facilitate engagement, motivation and student-centered learning, there is 'little consensus on the game features that support learning effectiveness, the process by which games engage learners and the types of learning outcomes that can be achieved through game play' (Guillén-Nieto & Aleson-Carbonell 2012: 435). This suggests the need for more fine-grained analyses of the enabling and inhibiting factors that might influence the teaching and learning encounter when games are adopted as a key resource for teaching and learning, the very focus of the study being reported on in this article.

According to Wideman *et al*. (2007) and further substantiated by Mayer (2014), major gaps exist with respect to research into the gaming process and the way in which its design elements contribute to effective learning. They note that it 'will require new methods and tools for unpacking the complex processes at play in gaming and for investigating the wide range of possible outcomes in the educational process' (Wideman *et al*. 2007: 6). They argue that an ' understanding of game play and its relationship to the cognitive processes it evokes in users is essential' as it is likely to provide valuable insights into the reasons for the success or failure of games for teaching and learning, especially as it relates to game attributes, processes of learning, and its products or manifestations (Wideman *et al*. 2007: 8).

In the quest to foster deeper conceptual understanding and engender passion for the Economics module taught at the Durban University of Technology (DUT), a programme employing an economics gaming intervention was introduced into the 1st year curriculum. The games that were chosen for the intervention related specifically to microeconomics concepts which have historically proven to be challenging for students to comprehend due to their abstract nature. Such topics included market equilibrium, price ceiling and the law of diminishing returns.

A Brief Overview of Games in Teaching and Learning

Games are pedagogical learning tools that create an active learning environ-

ment which enhances student motivation and interest. By being actively involved in the gaming process, according to Najdi and El Sheikh (2012), students retain more information; improve cognitive abilities; deepen the conceptual understanding of topics learned; engage in collaborative learning; and improve the transfer of knowledge to other topics. Van Eck (2006) notes that games create a meaningful context within which students are enabled to apply, practice and demonstrate knowledge in the gaming environment. Therefore, as they are able to 'experiment with various decisions and analyse their consequences' (Dobrescu, Greiner, & Motta 2015: 1), the learning becomes meaningful. Furthermore, Feller (2006) states that games are a means to teach students the 21st century skills that the modern economy is seeking, namely analytical thinking, team building, multitasking and problem-solving**.**

However, according to Hays (2005) and Wouters *et al*. (2013), the usage of games is not a panacea in all situations because they are only effectual if they are related to the subject and have clearly defined learning outcomes. According to Hays (2005), an educational game cannot be a stand-alone instructional method, but it must rather be linked directly with the outcomes of the instructional programme so that students understand what happens in the game and how it relates to the outcomes, through feedback and debriefing. The effectiveness of games is enhanced when used in conjunction with other teaching methods. By games being embedded in the curriculum with content which is precisely defined, students not only exhibited a higher level of interest, but their attitude towards the subject improved (Randel *et al*. 1992; Hays 2005; Vogel *et al*. 2006; Wouters *et al*. 2013).

Games have also been introduced into the educational setting as a means of increasing student motivation and promoting effective learning. International studies have found that the efficacy of using [1]games/experiments across disciplines have consistently promoted learning and reduced the amount of time necessary to grasp the essence of a topic (Van Eck 2006). Constructivism and experiential learning provide the theoretical backdrop for the use of games in an educational setting. In brief, constructivism explains how people construct their own understanding and knowledge of the world through experiencing things and then reflecting upon those experiences

[1] In researching the efficacy of games in the teaching of economics, authors often alternate between the term 'game' and 'experiment'. In this paper, both terms will be utilised, depending on the sources used as reference.

(Micheletto 2011).

Constructivism advocates active learning techniques such as games/experiments to create knowledge and reflect upon what has been learned. The introduction of games into the formal learning environment has the potential to change the current instructivist paradigm which is characterised by passive learning, into one which is interactive and student-centered (Davis 2011).Classroom games/experiments have the potential to change the role of the student in the lecture from a passive recipient of knowledge to an active constructor of knowledge (Bergstrom 2009).

The seminal work of John Dewey (1916) recognized that learning relies on active involvement and that knowledge emerges from situations in which students have to extract ideas from experiences that have meaning and importance to them. Interactive materials such as classroom games/experiments provide rich, engaging learning experiences for students. By actively participating in an experiment or games, students are likely to be better equipped to develop deep conceptual knowledge. However, Micheletto (2011) cautions that participation in the experiment is not enough, as post-game discussion and reflection is likely to create opportunities for high-level thinking skills and meta-cognition, a process of thinking about one's thinking (and learning) processes. The implication is that there is a need to move beyond constructing students as note-takers, towards creating active learning environments which enable students to work in small groups. For example, to analyse, criticise, solve problems and 'actively experiment, test and apply what they have learned in other and more complex situations' (Zapalska *et al*. 2012: 164). This ensures that students remain the most important element in the process of learning.

Many studies have provided evidence that using educational games/experiments have resulted in higher student achievement; better retention of course material; higher student motivation, as well as improved attitudes towards a variety of subjects when compared with traditional 'chalk and talk' pedagogy (Emerson & Taylor 2004; Dickie 2006; Ball *et al*. 2006).

Classroom games/ experiments have, according to Carter and Emerson (2012), become a popular active learning approach for economics and have even been found to benefit weaker students with lower grades overall (Emerson & Taylor 2004). Additionally, research undertaken by Tsigaris (2008) indicated that classroom games/experiments not only increased the performance of students, but resulted in more favourable evaluations of lecturers.

Apart from finding that a game had a positive and significant impact on student performance, Davis (2011) discovered that the students themselves rated games as definitely beneficial to their learning of economics, increasing their interest in and attitude towards economics as a subject. This, in turn, highlights the motivational effect of introducing classroom games/experiments on student learning. Gremmen and Van den Brekel (2013) provided further confirmation on the motivational aspect of gaming by studying student behavior. They noted that students showed increased effort and persistence with respect to their study of economic concepts.

The use of games/experiments has been successfully introduced to teach other subjects. For instance, according to Boyle *et al*. (2014), games, animations and simulations create educational environments within which there is a move from passive (chalk and talk) to active teaching and learning contexts. They argue for learning activities to be 'active, situated, problem-based, interactive and socially mediated' (Boyle *et al*. 2014: 2). Their research uncovered consensus on the positive role played by digital games, animations and simulations on learning in research methods and statistics. Skills include strategies for logical and scientific reasoning to critical thinking and the use of evidence and argument to data analysis, interpretation of results and evaluation skills. In addition, they provide the added benefit of making research methods and statistics more interesting, enjoyable and engaging (Boyle *et al*. 2014).

Li and Tsai (2013) posit that when used in the science context, games were a beneficial tool for testing, applying and visualising scientific knowledge in action. In this way, students were able to gain an authentic experience which they could relate to 'real world' application. Furthermore, games encourage the development of a community of practice where students are in a 'risk-free' environment that encourages collaboration. In other words, students are free to make decisions and draw their own conclusions without the constraints of academic pressure. As a result, they are able to 'harness their curiosity' and enjoy the subject (Li & Tsai 2013: 889).

According to Rastegarpour and Marashi (2012), games have the potential to bridge the gap between theory and practice, as they practically demonstrate the theory in action and provide opportunities for hands-on experimentation. This process of active engagement 'caters for a wider range of intelligences among students from audio to visual to linguistic to kinesthetic to interpersonal and intrapersonal intelligence, while enabling them to recall more' (Rastegarpour & Marashi 2012: 598). They conclude that educational

games had a positive impact on student learning; interaction with their peers, enabling them to benefit from the experience of others; improvement in concentration; the ability to actively experiment through trial and error while testing theories; and the creation of an enjoyable environment in which they were actively involved.

However, while extant literature supports the efficacy of introducing games/experiments into the classroom, there is a paucity of information on 'how and why' students actually learn from games. It must be noted that research into gaming has been dominated by experimental studies that were guided by positivist principles as they apply to educational research. This has been at the expense of qualitative research designs. This article reports on a qualitative study of a gaming intervention undertaken at the Durban University of Technology (DUT) amongst first-year Economics students.

Three games were chosen to address micro-economics topics which were traditionally difficult to understand due to the abstract nature of the theory. Drawing on 15 years of lecturing experience at DUT, the author searched for and adapted non-computerised games which he believed would provide students with a tangible, concrete experience that would contribute to a deeper conceptual understanding of the topics, namely Equilibrium (Trading in a Pit Market[2]); Price Ceiling (Landlords and Renters[3]); and the Law of Diminishing Returns (the Widget Game[4]).

As each of the games had been designed for smaller groups of participants, they had to be adapted for use in larger classes of more than 100 students. This meant that the game had to be played in groups and each phase repeated so that every student had an opportunity to participate. Again, it must be noted that no game comes as a perfect fit and games must be adapted according to the learning outcomes that one requires, taking into consideration the characteristics of one's students.

Time had to be taken into consideration as each lecture period at DUT is only 50 minutes long. Consequently, the game design had to fit within these parameters. As a result, the author had to carefully consider what learning objectives could be achieved within this time-period and adjusted the game

[2] Trading in a Pit Market – C. Holt (1996).
[3] Market Forces and Price Ceilings – J.B. Kruse, O. Ozdemir, M.A. Thompson (2005).
[4] Widget Production – J. Neral (1993).

accordingly. In addition, the game intervention had to take place within the lecture venue, which in itself provided unique challenges.

The methodological protocol, namely Interactive Qualitative Analysis (IQA), is outlined in the section that follows.

Interactive Qualitative Analysis as a Methodological Strategy

Most of the research undertaken into the cognitive (i.e. improved student performance) and motivational benefits of using games have used controlled experiment methodology - a quantitative approach. However, not much has been written about the way in which students learn from games and why (the cognitive and learning processes) – a qualitative approach. IQA was chosen as the means for uncovering 'how and why' students learn from games as it provides a rigorous framework and enables the researcher to map out the causal relationships between the various factors (affinities) of learning during the playing of an educational game. Furthermore, it emphasises the role of the participants and reduces researcher bias.

The IQA protocol, as conceived by Northcutt and McCoy (2004), differs from traditional qualitative analysis as the researcher takes on a less intrusive facilitator role. IQA advocates for participants to be integral to the data generation process, as well as in the analysis and interpretation stages of the research process. As such, the researcher is no longer the sole analyst and data interpreter. Instead, the researcher guides participants through a systematic process. IQA prescribes the documentation of a rigorous audit trail through a process that comprehensively addresses the issues of trustworthiness, dependability and confirmability in qualitative research (Tabane & Human-Vogel 2010).

IQA aims to ensure that participants have a shared understanding of the phenomena by collectively developing and looking at the relationships between the themes (affinities) as defined and refined by the students. The outcome of this process is the development of a System Influence Diagram (SID), which is a graphic illustration of the phenomena and the inter-relationships between the various themes (affinities). A randomly selected group of fourteen students were chosen from the class that participated in the economics gaming intervention to join the focus group discussions, which were then followed by individual semi-structured interviews. In the first step

of the IQA process, the students in the focus group discussions developed and refined the affinities. Thereafter, they determined the causal relationships between these affinities, which were then recorded in the Affinity Relationship Table (ART). These affinities and their causal relationships were further enriched through individual semi-structured interviews with each of the focus group participants.

The ART formed the basis for the development of the Inter-Relationship Diagram (IRD). Here, through applying IQA protocols, the author decided upon the relationships to be included in the SID and identified the role played by each affinity: whether it was a driver or an outcome. According to IQA, a driver is an affinity that affects other affinities. A primary driver has a direct effect on other affinities, but is not affected by any of the affinities in return; a secondary driver has a relative causal relationship with other affinities whereas outcomes are the effects of a causal relationship. The secondary outcomes are affected by the secondary drivers and, as a result, influence or affect the primary outcome. The latter is purely a result of the interactions (ie causal relationships).

Two systems influence diagrams were constructed, depicting the relationships between the drivers and the outcomes (within the diagram below, colours have been designated to each outcome and driver for ease of identification). The first systems influence diagram to be constructed was a Cluttered SID, which showed all the possible relationships between the affinities. Because it was saturated, this picture was too rich in data and difficult to interpret. Therefore, a process of rationalization was utilised (according to IQA protocols) which culminated in the uncluttered SID (Figure 1), as shown below.

Key Findings

'Use More Games' (7) emerged as the Primary Driver of how students learned from the Economics gaming intervention. Students indicated that the use of games was the catalyst for creating a dynamic, vibrant learning environment which was conducive to deepening and internalising their conceptual knowledge. Two crucial components emerged as secondary drivers, namely students' 'Involvement/ Experience' (5) and 'Fun/ Enjoyment/ Excitement' (6).

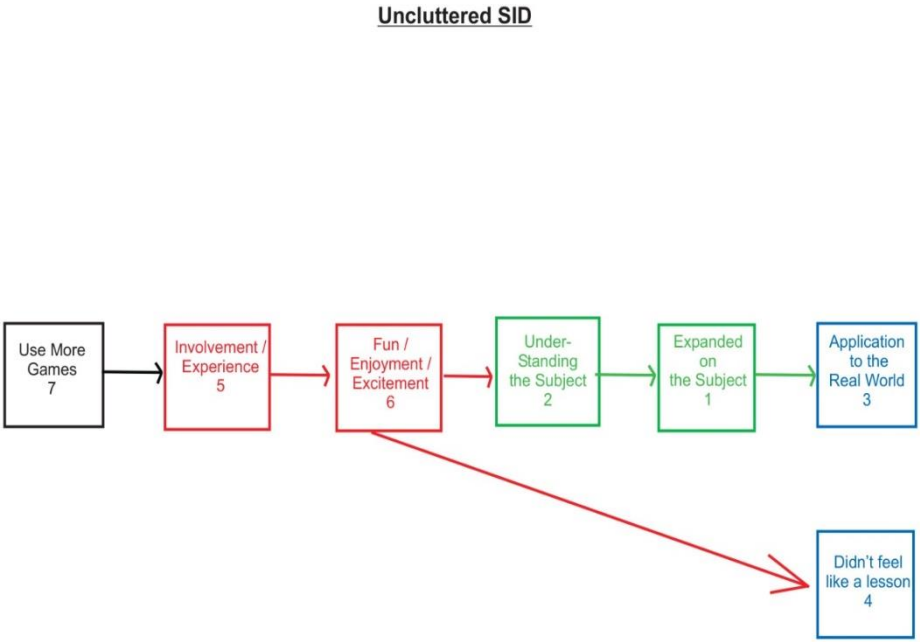

Figure 1: Key
Black: Primary Driver – Use More Games (7);
Red: Secondary Driver(s) – Involvement/ Experience (5); Fun/ Enjoyment/ Excitement (6)
Green: Secondary Outcome(s) – Understanding the Subject (2); Expanded on the Subject (1)
Blue: Primary Outcome(s) – Didn't Feel Like a Lesson (4); Application to the Real World (3)

Figure1: Uncluttered SID

This 'Involvement/ Experience' (5) was directly responsible for introducing the element of 'Fun/ Enjoyment/ Excitement' (6) into the economics classroom. The vibrancy and interactivity resulted in students becoming more engaged in the lesson; more interested in Economics topics;

and ultimately, able to remember more of what they had learned. This, in turn, led to greater understanding of the subject (2), a secondary outcome. The internalisation and assimilation of knowledge gave students the confidence to interpret and explain the economic concepts in their own words, as the concepts now had meaning and purpose. By expanding on the subject (1), a secondary outcome, the students were placed into a context where they could see the theory in action. This brought meaning and substance to otherwise abstract concepts.

A primary outcome of the gaming intervention was that students were now able to relate these economic concepts to the Real World (3) (i.e. they had taken the theory from the abstract to concrete reality and were now able to see real life application of economic concepts). In addition to the above-mentioned primary outcome, 'Fun/ Enjoyment/ Excitement' (6) in the classroom was directly linked to a separate primary outcome, namely, 'Didn't Feel Like a Lesson' (4). Here, the emphasis was on the disruption of the traditional lecture format, a deliberative pedagogical move via the gaming intervention. This brought about a learning environment in which students felt unencumbered by traditional classroom constraints, able to interact with each other, personalise their learning and naturally retain what they had learned. Although, there were two separate primary outcomes, they possessed a common thread, namely, that in both cases the students' conceptual knowledge was deepened.

In this new learning space introduced by the game, students were empowered to visually and tangibly engage with the economic theory in a meaningful manner. This enabled them to see how the economic theory could be de-constructed and re-constructed into a coherent argument. By being able to understand (2) and expand (1) on the subject, students were able to clarify economic concepts and transfer their knowledge beyond the classroom.

> I understood the topic covered by the game very well because the revealed components made it easier for me to understand the topic – like having one fixed tool makes production increase at first, but when there's additional workers, it starts to decrease.

> Well, while the subjects get expanded, we gain more experience. Like you know some kind of thing you didn't know before and while subjects continue expanding, you gain more knowledge and more experience and you do it outside the class.

> The whole market is understood, [what] the whole market is doing and so these are the means of suppliers and these are the means of buyers. So, only when I understood the subject could I really match it that, okay, that I can call this term in a real world, demand, and I can call this one supply.

Expanding on the Secondary Drivers – Unusual Suspects in Deep Learning

The authors discovered that the holistic learning experience was driven by one primary and two secondary drivers: the primary driver – 'Use More Games'(7), created an environment which acted as a catalyst for a deeper conceptual understanding of the economic concepts; as well as two secondary drivers – 'Involvement/ Experience' (5) and 'Fun/ Enjoyment/ Excitement' (6).

'Use More Games' (7) was the primary driver of the learning process, which was dependent on a number of complementary facets to provide the necessary support. The first of which was 'Involvement/ Experience' (5).

First Suspect: Involvement

From the semi-structured interviews, it emerged that a key aspect of the learning process was student involvement in the lesson. Students were unanimous in their agreement that without involvement there would be no learning. This aspect added a different dimension as it triggered a self-reflection of the pedagogic process, resulting in a re-conceptualisation of the level and type of involvement which should occur in the economics classroom. Researchers such as Astin (1999) and Lee *et al*. (2010) have shown that there is exponential growth in learning when there is a high level of student involvement.

Involvement, however, extends beyond mere active participation and interaction as it encompasses the elements of autonomy, competence and relatedness in order to create self-determined students who are intrinsically motivated to learn. Ryan and Deci (2000), the authors of the self-determination theory, put forward the idea that intrinsically motivated learners are committed to the learning process, remain involved and continue to delve deeper into the subject. Games engender student involvement by creating an environment

within which there is a high degree of autonomy where individual, self-determined choices have to be made in order to reach the pre-determined learning outcomes. This has led to comments such as *'you are really there'*, *'actually doing'*, *'being hands on*' and feeling like *'an adult'*. In other words, students are in control of the learning experience, with little external control being exerted on the learning process by the lecturer.

> By allowing us, students, to interact with each other as consumers and producers, we got a chance to feel and experience price bargaining, making profits and losses.

> Yes, I was involved. It felt like something real. It didn't feel like Sir was teaching us what to do. It felt like it was happening for real, like in real life.

For autonomy to be achieved, there has to be a decrease in external control: in this case the transformation of the traditional lecturing environment from 'filling the brain' with the lecturer in control, to that of a game space where students become the co-creators of knowledge, with the lecturer as a game host guiding the process and the students being free to make their own choices.

The second part of self-determination theory takes into consideration the element of competence. This is where the student feels 'efficacious about performing learning activities' (Kerssen-Griep, Hess & Trees 2003: 359). However, this must be simultaneously linked to autonomy to facilitate intrinsically motivated learners who need to attain a feeling of satisfaction that the learning challenges are accomplished. In terms of this research, many students could recall their progress through the game as they moved towards linking the game outcomes with the economic concepts.

For example, in the Pit Market Game, the student experiences the frustration of trying to negotiate with others as a buyer or seller to make a trade versus the joy of making the trade and then reflecting and trying to make a better trade in the next round. In the Price Ceiling game, students experience the rush of renters to take advantage of the maximum legislated price and the resultant lack of supply of rental accommodation because at that price many of the landlords could not rent out their properties and break even.

Being intrinsically motivated, the students became emotionally invested in the outcomes of the games. This resulted in a situation of intense immersed involvement which led to the triggering of 'aha' moments for students as they worked their way through the games.

> One of them was where we used a stapler which was one object and the more workers we had, the more it became unbearable to use one stapler. So, then you realise you're not going to make that many products with just one of the same objects. So, for me that was like okay, 'now I understand it better'.

> … while I was writing my test, I remembered what happened there. I remembered equilibrium and everything. Price floors was there. I remembered how renters wanted lower prices. Landlords wanted much higher prices to maximise their profits. I remembered everything, I was there. Yes, it helped me so much. I didn't even have to (like) read because I remembered the games.

The games offered a level of challenge that the students felt they could achieve, as well as a level of curiosity to entice their participation. This fits in with Csikszentmihalyi's (1990) theory of flow where 'flow is being completely involved in an activity for its own sake' (Bizzocchi & Paras 2005: 2). In other words, games offer a state of optimal engagement that results in a student's whole-hearted commitment to the gaming process. 'Flow explains a phenomenon that many people find themselves experiencing when they reach a state where there becomes a perfect balance between challenge and frustration, and where the end goal becomes so clear that hindrances fall out of view' (Bizzocchi & Paras 2005: 2). This optimal engagement results in a feeling of competence garnered during the playing of the game.

> The landlord and the renters, Yes! So, in fact, it was being taught using this light [in this way] … it explained a lot. I didn't understand a thing [before], but then while we were playing that game and using the landlord and the renters - using it as a game, I completely understood it. Completely understood it.

> ... can I say, the more you have experience, it can even [make you] able

> to create a game for that thing you're doing 'cause you have the experience. You have been involved and you have seen some things happen, so you [now] know more and you are able to create more games or useful games.
>
> And then, I just couldn't wait for the next one and actually, I just realised that after the first game, that's when I actually started reading my notes.

Therefore, when a learning context is able to generate a sense of autonomy and competence in students, it results in a deeper involvement in the learning task which in turn leads to deeper conceptual understanding.

According to Ryan and Deci (2000), the third step towards facilitating an intrinsically motivated student is the concept of relatedness, which involves 'the development of secure and satisfying connections with others' (Kerssen-Griep, Hess and Trees 2003: 359). Introducing a gaming intervention into the classroom catalyses the inter-relationships between students, allowing for them to interact with one another, sometimes for the first time as the formality of the traditional classroom is not conducive to social interaction. This relatedness, according to Ryan and Deci (2000), is an essential component of their self-determination theory as feeling connected with others has a direct relationship to competence. Not only is a relationship developed, but a community of practice is also developed where the students collaborate and are inducted into an economic way of thinking.

> As much as you're learning through the games, you don't feel like it's a lesson. It's much more enjoyable because you're interacting with other people. In the class, normally we don't even interact because we're such a big group.
>
> Then, I got that experience of how it is to be involved with other persons, discussing and teasing each other [while you are playing the game] … [saying] you are so weak in the point, you are weak there so, ja and then it is, hence it was a game.
>
> We usually argue when someone is coming [up] with the wrong answer, then the other one is suggesting [something] else, so it was cool.

Once autonomy, competence and relatedness is reached, self-determined students are able to accomplish the learning outcomes which were pre-determined by the lecturer when choosing the game because they are now highly motivated. These students have become goal-orientated, focused and persistent in pursuit of the answers to the posed challenges of the game. This motivation makes their involvement organic and spontaneous.

Second Suspect: Fun

The two secondary drivers, 'Involvement/ Experience' (5) and 'Fun/Enjoyment/ Excitement' (6), work hand-in-hand in the active classroom. The more intense the level of involvement, the greater the fun aspect of the learning encounter. According to students, 'Fun/ Enjoyment/ Excitement' (6) were pivotal elements in facilitating deeper conceptual understanding and transforming the normally 'dry' economic theory into meaningful, tangible applications which they could relate to in everyday life.

> Okay, this one's easy. If you're having fun and enjoying something and you're excited, you're gonna wanna learn more and know more about the subjects, so ja.

However, the words 'fun', 'enjoyment' and 'excitement' are not usually synonymous with the traditional academic learning process. In fact, positive emotions are not taken into consideration as they are regarded as momentary and transient and therefore of no use. According to Abe (2011), most research has focused on negative emotions and the role they play in coping with situations which cause anxiety or fear.

By introducing the element of 'fun' into the classroom, a new appreciation of the relevance of economic theory was fostered as students were exposed to new ways of learning through the playing of games. According to Fredrickson's (1998) 'broaden-and-build' theory, positive emotions play a prominent role with respect to problem-solving, paying attention and reflection. However, positive emotions are more than mere feelings and, in fact, cultivate an environment where students become fully immersed in the learning experience. Students noted that boredom diminished as they migrated from a passive learning environment into one which was vibrant, active and filled with fun and exciting possibilities.

> INTERVIEWER: Did you ever think you would have fun in the classroom?
>
> INTERVIEWEE: No I, didn't really. You know the first game, I thought it was going to be so boring, I almost went out. So, I sat down. Really, I am being honest. And then I sat down and I got involved in the games. I actually went to the front when Sir wanted to invite people to volunteer. So, I went to the front and it was so much fun. It was and the experience was like it was...I felt like it was happening for real. You know...Yes it did.

Students unanimously agreed that the games made understanding economic concepts easier. By being involved, the elements of fun and excitement were positive unintended outcomes. This gave students the freedom, confidence and ability to explore the learning material at a deeper level and even create their own examples for further clarity. Fun, as a driver, pushes the boundaries of exploration and learning, leading to the student being able to make the connection between the learning material of the game and the real world.

> When something is so much fun, you have to do it again. You have to apply it to the real world. It was fun, I promise you, it was.
>
> Wow! I had so much fun in understanding this subject. You know in understanding it makes you do so much more. [You can] Even make examples because of what you understand.

The move from a passive learning environment to one which is vibrant and active changes the way in which students are masters of their own learning, with goals to attain as well as appraisal of their own accomplishments. In other words, they are in control and place value on the learning experience. This, according to the control value theory proposed by Pekrun *et al*. (2011), intrinsically and extrinsically motivates the students. Dettmers *et al*. (2011) further proposed that autonomy-supported learning environments in which students enjoyed their lessons created a situation in which they were motivated to excel.

Emotions in the learning process are not usually taken into account when preparing courses. However, positive emotions may be one of the untapped resources that exist within the educational sphere, which lecturers can exploit to create skilled students who are able to enter the 21st Century workplace capable of creative and flexible thinking, with an openness to new relationships and experiences.

Reflections on IQA

Although IQA provides a means of identifying and mapping out causal relationships between the affinities that yield unique insight into 'how and why' students learn from games, there are drawbacks to the process. The foremost hurdle to overcome is the amount of time needed to conduct the first phase of IQA, namely the focus groups within which the affinities and their causal relationships are developed. As each focus group takes 2,5 – 3 hours to complete, this makes it quite difficult to fit into the daily routine. Students' timetables have to be compared so that a mutually agreeable venue and time can be arranged, in order to put the students at ease and not rush the process.

Another drawback is the linear nature of the causal relationships as depicted in Figure 1. This over-simplifies the relationships and as a result, is an under-play of the complexity of the interactions due to the uncluttering of the SID. Although this is a good reference point highlighting the factors (affinities) which have roles to play within the causal relationships, it is not a true reflection of the possible interplay between the affinities and the effects they have on each other. This emerged from the in-depth semi-structured interviews of each of the research participants where they could elaborate and reflect on the affinities and their interplay.

Discussion and Conclusion

The current landscape of South African higher education continues to be dominated by the traditional 'chalk and talk' lecture method – a situation where the student is a passive note-taker and not a co-creator of knowledge. However, the 21st Century needs graduates who have the ability to problem-solve, possess critical thinking skills and are able to collaborate with others. This means that the higher education environment has to change from cognitive

loading to 'cognitive apprenticeship' (Collins *et al*. 1991) – a move away from the traditionally passive form of education to an active learning environment. Involvement and fun in the classroom have proven to be powerful elixirs in the remedy of providing learning that is real, tangible and meaningful.

By embedding games into the curriculum, one can engender change as they create autonomy-supported learning environments that bring together the emotional and cognitive aspects of learning (total involvement) while simultaneously binding students together in a community of practice and, as stated by Rastegarpour and Marashi (2012: 600), 'could move our system of education beyond the traditional disciplines, and towards a new model of meaningful learning' – cognitive apprenticeship.

This process of embedding games into the curriculum comes at an opportunity cost to the lecturer in the form of time allocated for finding the games; their adaptation to meet the needs of the students, learning outcomes which are to be achieved within the game, selecting the level of difficulty (not too easy… not too hard) and fitting the game into the logistical constraints of the facility at one's disposal; planning the deployment of the games; as well as, monitoring that the games meet the pre-determined learning outcomes.

By placing students in an authentic learning environment, where they are co-creators of knowledge, they then get to apply their learning under the watchful eye of the lecturer – a situation similar to that of the traditional apprenticeship undertaken by artisans. This means that their learning environment evolves from a de-contextualised and abstract setting into one where knowledge is tangible, meaningful and applicable.

The effect of this transition results in the creation of an intrinsically motivated, self-directed student who has enjoyed being in the classroom, who is driven to know more and who is able to transfer skills and knowledge beyond the classroom. This is a student who is able to solve problems, critically reflect and apply the learned knowledge to real world situations. In addition, one sees the creation of a community of practice within the classroom where students have the opportunity to develop relationships with their peers and now have common ground to engage in conversations about the subject(s), thereby encouraging collaborative and peer-learning.

This shift in focus from outcomes-based learning (objects and facts) to the creation of learning spaces that facilitate deeper conceptual understanding (activity) is a necessary outcome. But, one fears it will meet with great inertia, as students and lecturers have become comfortable with the lecture format and

assessment: the lecturers are safe behind their PowerPoint presentations and the students are safe with their rote knowledge. The danger is that if the status quo remains, universities will produce graduates who are outdated, without the requisite skills to be employed in the knowledge economy.

References

Abe, J.A. 2011. Positive Emotions, Emotional Intelligence, and Successful Experiential Learning. *Personality and Individual Differences* 51,7:817-822.

Astin, A.W. 1999. Student Involvement: A Developmental Theory for Higher Education. *Journal of College Student Development* 40,5:518-529.

Ball, S.B., C. Eckel & C. Rojas 2006. Technology Improves Learning in Large Principles of Economics Classes: Using Our WITS. *The American Economic Review* 96,2:442-446.

Bergstrom, T.C. 2009. Teaching Economic Principles Interactively: A Cannibal's Dinner Party. *The Journal of Economic Education* 40,4:366-384.

Bizzocchi, J. & B. Paras 2005. Game, Motivation, and Effective Learning: An Integrated Model for Educational Game Design. International DiGRA Conference June 16-20, Vancouver, British Columbia, Canada.

Boyle, E.A., E.W. MacArthur, T.M. Connolly, T. Hainey, M. Manea, A. Kärki & P. Van Rosmalen 2014. A Narrative Literature Review of Games, Animations and Simulations to Teach Research Methods and Statistics. *Computers & Education* 74,May:1-14.

Carter, L.K. & T.L. Emerson 2012. In-Class vs Online Experiments: Is there a difference? *The Journal of Economic Education* 43,1:4-18.

Collins, A., A. Holum & J. Seely Brown 1991. Cognitive Apprenticeship: Making Things Visible. *American Educator: The Professional Journal of the American Federation of Teachers* 15,3:38-46.

Csikszentmihalyi, M. 1990. *Flow: The Psychology of Optimal Experience*. New York: Harper and Row.

Davis, J.S. 2011. Games and Students: Perceptions and Evidence from A DUT Case Study. *International Business & Econommics Research Journal* 10,10:1-15. doi: DOI: 10.19030/iber.v10i10.5975.

Davis, J.S. 2017. *First Year Economics Students' Learning Experience in a Gaming Intervention.* Unpublished Thesis, University of KwaZulu-Natal.

Dettmers, S., U. Trautwein, O. Ludtke, T. Goetz, A.C. Frenzel & R. Pekrun 2011. Students' Emotions During Homework in Mathematics: Testing a Theoretical Model of Antecedent and Achievement Outcomes. *Contemporary Educational Psychology, Special Issue* 36:25-35.

Dewey, J. 1916. *Democracy and Education: An Introduction to the Philosophy of Education*. New York: Macmillan.

Dickie, M. 2006. Do Classroom Experiments Increase Learning in Introductory Microeconomics? *The Journal of Economic Education* 37,3:26 -288.

Dobrescu, L.I., B. Greiner & A. Motta 2015. Learning Economics Concepts through Game-play: An Experiment. *International Journal of Educational Research* 69:23-37.

Emerson, T.L. & B.A. Taylor 2004. Comparing Student Achievement across Experimental and Lecture-Oriented Sections of a Microeconomics Course. *Southern Economic Journal* 70,3:672-693.

Feller, B. 2006. Video Games can Reshape Education. Available at: http://www.usatoday.com/tech/gaming/2006-10-17-gamingeducation_x.htm. (Accesssed on 21 July 2015.)

Fredrickson, B.L. 1998. What Good Are Positive Emotions? *Review of General Psychology* 2,3:300-319.

Gremmen, H. & G. Van den Brekel 2013. Do Classroom Experiments Increase Student Motivation? A Pilot Study. *European Scientific Journal, Special Issue*, 2. Available at: https://eujournal.org/index.php/esj/article/view/1347. (Accessed on 11 October 2017.)

Guillén-Nieto, V. & M. Aleson-Carbonell 2012. Serious Games and Learning Effectiveness: The Case of It's a Deal! *Computers & Education* 58:435-448.

Hays, R. 2005. The Effectiveness of Instructional Games: A Literature Review and Discussion. Orlando, FL.: Technical Report, Naval Air Warfare CenterTraining Systems Division.

Holt, C.A. 1996. Classroom Games: Trading in a Pit Market. *Journal of Economic Perspectives* 10,1:193-203.

Kerssen-Griep, J., J.A. Hess & A.R. Trees 2003. Sustaining the Desire to Learn: Dimensions of Perceived Instructional Facework Related to Student Involvement and Motivation to Learn. *Western Journal of Com-*

Communication 67,4:357-381.

Kruse, J.B., O. Ozdemir & M.A. Thompson 2005. Market Forces and Price Ceilings: A Classroom Experiment. *International Review of Economics Education* 4,2:73-86.

Lee, T.-H., P-D. Shen & C-W. Tsai 2010. Enhance Low-achieving Students' Learning Involvement in Taiwan's Higher Education: An Approach via E-learning with Problem-based Learning and Self-Regulated Learning. *Teaching in Higher Education* 15,5:553-565. doi: 10.1080/13562517. 2010.506999

Li, M. & C. Tsai 2013. Game-Based Learning in Science Education: A Review of Relevant Research. *Journal of Science Education and Technology* 22:877-898.

Mayer, R.E. 2014. *Computer Games for Learning: An Evidence Based Approach.* Cambridge: MIT Press.

Micheletto, M.J. 2011. Conducting a Classroom Mini-Experiment Using an Audience Response System: Demonstrating the Isolation Effect. *Journal of College of Teaching and Learning* 8,8:1-13.

Najdi, S. & R. El Sheikh 2012. Educational Games: Do They Make a Difference? *Procedia - Social and Behavioral Sciences* 47:48-51.

Neral, J. 1993. Widget Production in the Classroom. *Classroom Expernomics* 2,1:7-8.

Northcutt, N. & D. McCoy 2004. *Interactive Qualitative Analysis: A Systems Method for Qualitative Research.* Thousand Oaks, California: Sage Publications.

Pekrun, R., T. Goetz, A.C. Frenzel, P. Barchfeld & R.P. Perry 2011. Measuring Emotions in Students' Learning and Performance: The Achievement Emotions Questionnaire (AEQ). *Contemporary Educational Psychology* 36,1:36-48.

Randel, J.M., B.A. Morris, C.D. Wetzel & B.V. Whitehill 1992. The Effectiveness of Games for Educational Purposes: A Review of Recent Research. *Simulation Gaming* 23,3:261-276.

Rastegarpour, H. & P. Marashi 2012. The Effect of Card Games and Computer Games on Learning of Chemistry Concepts. *Procedia - Social and Behavioral Sciences* 31:597-601.

Ryan, R.M. & E.L. Deci 2000. Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology* 25:54-67.

Tabane, R. & S. Human-Vogel 2010. Sense of Belonging and Social Cohesion in a Desegregated Former House of Delegates School. *South African Journal of Education* 30:491-504.

Tsigaris, P. 2008. Is There a Double Dividend From Classroom Experimental Games? *American Journal of Business Economics* 1,1:23-36.

Van Eck, R. 2006. Digital Game-Based Learning: It's Not Just the Digital Natives Who Are Restless. *EDUCAUSE Review* 41:16-30.

Vogel, J.J., D.S. Vogel, J. Cannon-Bowers, C.A. Bowers, K. Muse & M. Wright 2006. Computer Gaming and Interactive Simulations for Learning: A Meta-Analysis. *Journal of Educational Computing Research* 34,3:229-243.

Wideman, H.H., R.D. Owston, C. Brown, A. Kushniruk, F. Ho & K.C. Pitts 2007. Unpacking the Potential of Educational Gaming: A New Tool for Gaming Research. *Simulation & Gaming* 38,1:10-30.

Wouters, P., H. van Oostendorp, C. van Nimwegen & E. van der Spek 2013. Meta-analysis of the Cognitive and Motivational Effects of Serious Games. *Journal of Educational Psychology* 60,1: 412-425.

Zapalska, A., D. Brozik & D. Rudd 2012. Development of Active Learning with Simulations and Games. *US-China Education Review* A 2:164 -169.

Jason Davis
Department of Public Management and Economics
Durban University of Technology
jasond@dut.ac.za

S.M. Maistry
School of Education, Edgewood Campus
University of KwaZulu-Natal
Maistrys@ukzn.ac.za