

# Games as an Engaging Teaching and Learning Technique: Learning or playing?

Deborah Kirkland  
Griffith College Dublin  
[deborah.kirkland@gcd.ie](mailto:deborah.kirkland@gcd.ie)

Fiona O’Riordan  
Griffith College Dublin  
[fiona.oriordan@gcd.ie](mailto:fiona.oriordan@gcd.ie)

## Introduction

One of the greatest challenges facing educators today is that of engaging a wide and diverse group of students. Students come to the learning experience with varying degrees of motivation, commitment, ability, and learning styles or approaches. Azriel et al (2005, p9) say ‘regardless of age or economic, ethnic, or social background, people understand the language of play’. Games offer a medium for students to explore and interrogate information in a fun and interactive way. This type of animated learning environment is critical for engaging students in the learning given the prominence of iPods, game boys, play stations and a wide variety of highly entertaining and Sci-fi television in young people’s lives today. A passive learning environment will not stimulate them as they are used to greater pace and interactivity in life in general and so it is natural that they will need excitement and interactivity to support their learning. Biggs (2003, p. 79) says; ‘Being active while learning is better than being inactive’.

When we consider how infants and children learn we can appreciate the effectiveness of games as a learning tool. Children love to learn, they see it is as fun, a journey of exploration and excitement. Games play a huge part in that exciting journey, from learning how to count, how to interact with families and people, learning colours and shapes and much more. So if it is an effect and engaging learning tool for children, there is no good reason why it should not work for engaging and developing learning in adults. The aim of this paper is demonstrate how the application of games with Post Graduate Marketing students secures greater student participation and interaction. Furthermore the paper explores the impact of games as a weekly revision tool on student progression.

Dewey (1944) pioneered the concept of games as a teaching methodology and there has been much experimentation and research done with regard to their application since. The types of games discussed in this paper are the traditional non computer type games that rely on props and teams and the creation of an entertaining learning environment. Examples of the different types of games can be any adapted versions of the popular TV game shows such as Jeopardy, Blankety Blank, Weakest Link, Who wants to be a Millionaire and Karaoke. Other examples include the use of traditional board games such as Scrabble to teach languages, a modified version of Monopoly was used to illustrate the principles of capitalism and socialism (Shaw, 2003), crossword puzzles and regular class quizzes. Light and Cox (2001, p.105) supports the notion of 'expanding the learning matrix...[to include] a more active or interactive approach [which] opens up the possibility for developing learning dimensions'. The learning dimensions which can be developed with an expanded learning matrix, which includes interactive methods of teaching, include personal, social and practical dimensions of learning. Games as a teaching tool work in expanding the learning matrix to include social and practical dimensions of learning.

### **Games as a motivating learning tool**

Why do games work? Games are enjoyable and interactive and learners respond naturally to this type of learning dynamic. If learning is to occur, students must be motivated to learn (Calahoun, 1980). Maslow (1943) identified a hierarchy of five levels of needs (Brooks, 2006). These needs are represented in a pyramid to indicate a thinning out of needs with progression through the pyramid. Maslow claims that individuals will only be motivated by the next unattained level. Thus when all the base level physiological needs are met individuals are then motivated by safety needs. Games have the effect of offering learners safety in numbers when the games run on a paired or grouped basis. The next level which will motivate learners is social or affiliation needs and games naturally offer a medium for developing and satisfying student's social needs. They are naturally drawn together and bond in the comfortable competitive environment of the game, it is almost impossible to sit passively and not become involved in games, particularly when they are entertaining. Ruben (1999) substantiates the authors claim that

games can motivate students to learn from a social or affiliated need when he claims that games offer an opportunity to promote collaboration and fosters active learning. The comfortable competitiveness of the game offers a motivating incentive for students at the next level of Maslow's theory, ego or self esteem. Mann (2001) discusses how students may feel alienated from the learning based primarily on rigid teaching practices. Games can work on integrating students and fostering a creative and social learning environment.

Phil Race (2006) talks about students who ideally 'want' to learn - these are the intrinsically motivated students that will learn in almost any environment. They are motivated by learning for the sake of learning and are the easiest students to work with. Games can create a want to learn environment when it is not naturally there.

Games can satisfy the learning needs of the pragmatic, active and reflector learners ([www.learningandteaching.info](http://www.learningandteaching.info)). Even the theorist (Honey and Mumford's fourth learning style) can find themselves been drawn into the enjoyment of games. Games meet the needs of all learners identified in Flemming's learning styles model VARK ([www.vark-learn.com](http://www.vark-learn.com)). Games can, if designed accordingly, meet the needs of the Visual, Audio, Reading and Kinaesthetic learners. Corno & Snow (1986) say to successfully educate a diverse group of students the educator must be able to respond the different needs of the learners, and games offer an opportunity to meet the different needs and learning styles and approaches.

### **Value added benefits of games**

Not only do games motivate students in a fun way offering interactive competitive learning environments, they also provide many other positive features. Games lighten the mood and this facilitates greater creativity and boost student morale and interest (Shatz & Loschiavo, 2005). Wycoff and Pryor (2003) say that a lightened mood can negate communication apprehension.

Another key spin off from using games as a teaching methodology is the formative assessment element. Students are in a position to monitor their own progress and understanding of the subject material in a non-invasive manner. Games provide instant feedback for students and guidance in terms where to focus their learning effort and time. Shanahan et al (2006) note that 'Games [also] provide immediate feedback on student learning sufficiency prior to, rather than after, an exam'. In addition to students receiving instant feedback on their learning, teachers are also able to see clearly where learning gaps exist and allow this to inform their next class or revision sessions.

### **Application of games**

Shanahan et al (2006) identify five key characteristics, based on research, of effective in-class games. These include the game must relate to the learning outcomes; teacher and students must quickly understand how to play the game; the game must not become more important than the learning; the game must motivate students to perform better; and finally students must be able to provide feedback to the teacher on the game. In terms of this paper the researchers were cognisant of these five characteristics when planning and implementing both games. All questions in both games related directly to the module learning outcomes and content. The game was used for the last twenty minutes of tutorials once a week, thereby ensuring the game never took precedence over the learning and content. Analysis of student results and qualitative feedback from the students supports student improved performance. Student feedback from the first game experience informed the second game application.

The two games used in this research were Karaoke Jeopardy, based on a combination of the popular trivia game show Jeopardy and the music game Karaoke. The idea for Karaoke Jeopardy came from research by Shanahan et al with Marketing Students in the University of Texas and Missouri State University. The second game was based on another popular TV show Who Wants to be a Millionaire and was called Who Wants to be a Sweetie and the idea for using this approach came from a colleague in Griffith

College Dublin, Caroline Connolly, who demonstrated use of this game approach during a Lecturer Training Course which the researchers participated in.

### **How each game works**

Karaoke Jeopardy was based on a popular US television show where contestants were quizzed on a range of topics from history to pop culture. In this case, the game focused on testing students' knowledge of marketing concepts linked to the overall module's learning outcomes. Approximately 25 questions were needed for a 20 minute quiz. The game rules were straightforward. First, the class was broken into two teams and a student chosen at random from each. The first student was shown a question on the overhead projector with a set of corresponding multiple choice answers. If the student got the question correct, he or she wins a point and play passed to the next team. The game continued until a student gave an incorrect answer. The student was then given a choice. He could either forfeit a point to the opposing team, or sing a song. Given the competitive nature of postgraduate students, in almost all cases students opted for the second option. They were then required to sing the opening bars of a popular song selected by the instructors (lyrics can be easily be found for this purpose at websites such as lyrics.com or azlyrics.com). All members of the team were expected to sing, though naturally some students tend to be more vocal than others. In the spirit of the game, the lecturer must sing when a team gets all questions correct!

Who Wants to Be a Sweetie was also based on the popular television show Who Wants to Be a Millionaire. Two students were chosen at random to come to the front of the class and participate in the quiz. This time, we decided to choose students in pairs. As discussed above, Maslow's theory of motivation influenced the researchers in terms of the importance of addressing student safety needs. It was not the purpose of the game to make students feel threatened in any way by being 'put on the spot', but rather to engage the class in a safe and supportive learning environment. The game was developed using PowerPoint with multiple choice questions displayed on the overhead screen. Questions were based on key concepts of the course with questions becoming more challenging at each stage of the game. Also similar to the TV version, students had access to three life

lines. They could ask an expert (anyone present in the class), go 50/50 (two incorrect answers taken away), or ask the audience (classmates were required to hold up a letter corresponding to what they feel is the correct answer). Instead of winning cash prizes, the students competed for sweets, winning a maximum of 75 sweets if they answered all questions correctly.

## **Methodology**

An experimental design was adopted to test the effectiveness of the games at improving performance and enhancing the learning experience. As noted, two different in-class games were employed. The first, Karaoke Jeopardy, ran in the September 2007 semester. The second, Who Wants to Be a Sweetie ran during the January 2008 semester. For comparison purposes, students in each case were enrolled in The Fundamentals of Marketing class.

We devised three hypothesis that we wished to test through our research process. The first was to measure whether games actually improved student performance:

H1: Students who participated in in-class games will demonstrate greater knowledge of the subject matter than students who did not participate in an in-class game.

We also wanted to evaluate how students perceived game playing in class, in other words, do they see game playing an engaging teaching and learning technique and a positive use of class time. This led to our second hypothesis:

H2: Students will perceive in-class games as an engaging learning activity as evidenced by higher module evaluations from the treatment group versus the 'no games' control group.

Finally we wanted to examine whether students might have a preference for one game format over another. In other words, would one of the games receive higher overall ratings than the other. This resulted in our third and final hypothesis:

H3: Students will rate the two games; Karaoke Jeopardy and Who Wants to Be a Sweetie equally.

To test our first hypothesis, whether students who participate in in-class games demonstrate greater subject knowledge we determined that the best measure to use was

the end of term examination score. As mentioned, our treatment samples were students enrolled in the Fundamentals of Marketing course in September 2007 (n=33) and February 2008 (n= 17). The first cohort played the Karaoke Jeopardy game and the second played Who Wants to Be a Sweetie.

The researchers compared final exam scores of these two treatment groups with corresponding cohorts from the previous year. In other words, a control sample of students who took the Fundamentals of Marketing in September 06 was used to compare the effectiveness of Karaoke Jeopardy and a control sample of students who took the Fundamentals of Marketing in January 07 was used in the case of Who Wants To Be a Sweetie. It should be noted that it would have been preferable for the control and treatment samples to be drawn from the same group of students but small class sizes limited the researcher's ability to do this. That being noted, the game versus no-games format was the only difference received by the treatment versus the control sample. All other factors, including the lecturer, study notes, text books and exam format remained constant.

#### Results:

Results for H1 are shown in table 1. We found that in both cases, the class that was exposed to the game out performed those who did not. In the case of Karaoke Jeopardy, the average score for students was 5% higher. In the case of "Who Wants to Be a Sweetie" the gap was smaller but positive nonetheless, with game players scoring on average 2% more than the control group. One of the shortcomings of the research however was the small sample sizes, particularly in the case of the January 08 cohort. When we went on to perform paired t tests we found that while the results would imply that the games were effective, they were not proven to be statistically significant.

**Table 1:**

<b>Karaoke Jeopardy End of Semester Examination Result</b>	<b>Control( September 06)  49%</b>	<b>Treatment (September 07)  54 per cent</b>
<b>Who Wants to be a Sweetie End of Semester Examination Result</b>	<b>Control (January 07)  49%</b>	<b>Treatment (January 08)  51 per cent</b>

The researchers next tested hypothesis two, students perceive in class games as an engaging learning activity. It was determined that the overall module evaluation rating was a good measure to use and by employing a control group, module evaluation comparisons of game players versus non-game players could be made. At the time of writing this report, module evaluation scores were only available for students who played the Who Wants to be a Sweetie game. Both the treatment and the control group (in this case the September 06 “no games” cohort) were given a module evaluation form in the final weeks of the semester. The form asked the students to rate the course (on a scale of 1 – 4) across a range of content and delivery measures. The average module score given by the treatment group was 3.57/4 versus a score of 3.3/4 given by the control group. In other words, the treatment group gave the module an equivalent score of 89 per cent versus an 82 per cent given by the control group. The results were again supportive of the positive contribution of in-class games. In addition much qualitative evidence was received from students in support of the game (see table 2 below). These comments were gathered in a second evaluation instrument focused exclusively on seeking student feedback regarding their game experience. Table 2 below shows answers to the question; “Do you have any general comments with regards to how the game may have influenced your learning, either positively or negatively?”

**Table 2:**

Who Wants to be a Sweetie	Karaoke Jeopardy
<p>“It encourages us to see and to recall our notes to join in with this program”</p> <p>“I can learn and review the [content]”</p> <p>“This activity helps me to remember”</p> <p>“Thanks to the game, I remember what I learned in the past week”</p> <p>“It is an interesting way to study”</p> <p>“It helps us to review the knowledge we learned in class”</p> <p>“It facilitates learning and helps me to recap the previous topics”</p> <p>“Positively influenced by the rewards”</p> <p>“Quite motivating and fun”</p>	<p>“It was really positive”</p> <p>“Yes I suppose it was fun and forced me to look through my notes”</p> <p>“Let us know something about the exam”</p> <p>“It reminded me and helped me review what we learned”</p> <p>“It helped me review”</p> <p>“Yes it has influenced me positively”</p> <p>“It was fun”</p> <p>“The game method has positively influenced our studies. It’s actually a source for revising the lectures made in class”.</p> <p>“It was very nice that you worked out this learning tool with us. It was really great. Thank you...”</p>

Many of the students rated the games as a good study tool which helped them “to review the knowledge learned in class.” There was also much supporting evidence of the motivational and fun aspects of the games. This qualitative and quantitative feedback all lends credibility to hypothesis 2, that students do perceive in class games as an engaging learning activity. No negative comments were received, although there were several recommendations for future use of games. For example students recommended that the rewards should be varied to keep the game fresh and that they be allowed influence the music choice

The final hypothesis was to assess whether one game was more popular with students. To test this hypothesis the researchers asked students to rate each game. Both games scored well, with Who Wants to Be a Sweetie receiving slightly higher scores – 8.7/10 versus

8.1/10. Statistical analysis was conducted and a t-test performed to establish if the higher ratings were significant. Again, the results from the t-test showed that there was no significant difference in student ratings. This supports hypothesis 3 that students have no particular preference for one game versus another. This would suggest that it is the interactive and engaging nature of games in general that is important as opposed to the actual choice of one game over another.

### **Discussion:**

The analysis provided suggests that in-class games do have a positive impact on students. Students who participated in the games did perform better on average in exams. In addition, students who participated in the games appear to be more engaged in the learning process. This was supported by the higher scores given in overall module ratings and also by the abundant positive comments provided in the student evaluation forms. In addition, the games themselves each received ratings of 80% and above adding further credibility to the findings. As already noted, playing games has been shown to lighten the mood and facilitate greater creativity and boost student morale (Shatz & Loschiavo, 2005). In this case, it is hard to deny that the experience was also both creative and fun supporting the finding that it is the entertaining element that is important as opposed to the choice of any one particular game. Again, qualitative comments support this assertion. In addition, the authors received several requests from students to run the quiz in other modules.

Having said this, it is important to acknowledge that while the student grades did improve, the results were not found to be significant. Somewhat more troubling is the fact that the overall grades still remained well below what the lecturer would have wished for -- a score of 54% still leaves considerable room for improvement. In other words it appears that much of the student engagement is around surface learning. The challenge for the authors moving forward is to design the questions to engage students at a deeper level in preparation for the final assessment and examination. This means exploring the possibilities such as fewer questions requiring greater student analysis and evaluation, or tying the quiz material to case studies or academic writings.

As with most phenomenology studies, this research is indicative only of the phenomenon that it was studying i.e. the module and level students were studying at. Thus, continued ongoing research is necessary in order to explore how this approach could be designed to develop deeper learning, and to see could this approach be applied to different groups of students, studying at various levels across other disciplines. This further work can contribute to the advancement and promotion of fun and interactive learning and teaching methods – never forgetting that teaching and learning is a dynamic evolutionary discipline that will always benefit from further study and research.

## References

Azriel, J., Erthal, M., Starr, E., *Answers, Questions, and Deceptions: What Is the Role of Games in Business Education*. Journal of Education for Business, Sept/Oct 2005, p.9-13.

Biggs, J. (2003) *Teaching for Quality Learning at University*, Open University Press, Berkshire.

Brooks, I. (2006). *Organisational Behaviour; Individuals, Groups and Organisation*, Pearson Education, Essex.

Calhoun, C. (1980). *Managing the learning process in Business Education*. Wadsworth Publishing Company, Belmont, CA.

Cochrane, Jame (2005). *Can you Really Learn Basic Probability by Playing a Sport Board Game?* Amercian Statistician, 59 (3), p.266-272

Corno, L., and Snow, R. (1986) *Adapting Teaching to Individual Differences among Learners*. In M.C. Wittrock (Ed.), *Handbook of Research on Teaching* MacMillan, New York.

Dewey, J. (1944). *Democracy and Education*. MacMillan, New York.

Gibbs, G. (1995), *Teaching Students to Learn: A Student-Centred Approach*, Open University Press, Buckingham.

Light, G. & Cox, R. (2001). *Learning and Teaching in Higher Education*. PCP, London.

Mann, S. J. (2001). *Alternative Perspectives on the Student Experience: alienation and engagement*. Studies in Higher Education, 26 (1), p.7-19.

Race, P. (2007) *The Lecturer's Toolkit: A Practical Guide to Assessment, Learning and Teaching* Routledge, Taylor and Francis Group, London

Ruben, B. (1999) *Simulation, games and experience-based learning: The quest for a new paradigm for teaching and learning*. Simulation and Gaming, 30(4), p.8-12.

Shanahan, K., Hermans, C., Haytko, D. (2006) *Overcoming Apathy and Classroom Disconnect in Marketing Courses: Employing Karaoke Jeopardy as a Content Retention Tool*. Marketing Education Review, 16 (1), p.85-90.

Shaw, L. (2003). Five educational philosophies.

Shatz, M. and Loschiavo, F. (2005) *Learning Through Laughter*. Industrial Engineer, IE, 37 (9) p.66

Simmonds, D. (2003) *Designing and Delivering Training*. CIPD, London

Wingfield, S., Black, G. (2005) *Active Versus Passive Course Designs: The Impact on Student Outcomes*. Journal of Education for Business, Nov/Dec 2005, p.119-123.

Wycoff, E. and Pryor, B. (2003). *Cognitive Processing, Creativity, Apprehension and the Humorous Personality*. North American Journal of Psychology, 5 (1), p.31-45.

[www.learningandteaching.info/learning/experience.htm](http://www.learningandteaching.info/learning/experience.htm)

[www.vark-learn.com/english/index.asp](http://www.vark-learn.com/english/index.asp)

[www.eclipsecrossword.com](http://www.eclipsecrossword.com)

[www.spintop-games.com](http://www.spintop-games.com)