

# Interactive Games for Business Training

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## Foreword

Roger Martin, Professor of Strategic Management and Dean of the Rotman School at the University of Toronto, has explored the disruptive concept of “qualitative intelligence” in business and other areas of human endeavor. My thoughts in this paper are congruent with Dr. Martin’s thesis, that a new approach to learning is needed now. Games are a vital ingredient of that new approach, a perfect fit.

With apologies to my scholarly friends in the IT Forum, I have excluded footnotes from this paper and focused instead on rhetoric. The paper is not so much a treatise as an exercise in persuasion. I believe strongly in the virtue and strength of game play for learning, and want as many of you as possible to know why. Perhaps some of you will then carry the flag. An invitation to do just that is included at the end.

The paper is based on my reading of scholarly research on game-based learning, collegial interactions with scholars and expert practitioners, 25 years of experience in the design of games, simulations and other forms of e-learning for business, and — I hate to admit it — convictions that spring as much from the heart as from the head.

My paper is dedicated with thanks to Professors Ian Bogost and Sigmund Tobias.

## Out of the Classroom

Games are commonplace in classroom training for business. They take the form of breakout activities in courses that primarily consist of lecture, discussion, practice or problem-solving exercises, and assessment.

Such games are additive, but rarely considered training per se. Venerable business educators such as Jeremy Hall, Richard Teach and Sivasailam Thiagarajan have long championed additive games facilitated by teachers or subject-matter experts, requiring the live interaction of players.

By definition, additive games illustrate and reinforce learning objectives that are attained in other ways. They allow players to demonstrate or apply newly acquired competencies in a mode of creative pretense.

This is how traditional simulation works. Simulation is by far the most esteemed type of game for business, but students don't play to learn. Instead they hone their skills by practicing what they already know.

In contrast, contemporary e-learning games are core rather than additive, requiring no coupling with other instructional deliveries; no teacher, facilitator or subject-matter expert either. Rather than performing a supporting role by reinforcing what was learned through traditional pedagogies, these web and computer-based games deliver an original, authentic learning experience that completes itself. In this way students don't play to practice, they play to learn in the first place.

As games surge beyond their niche role in the classroom and become training per se on the web, computers, mobile devices and even TV consoles, they face resistance from corporate training managers who seemingly have everything to gain by them, and nothing to lose. Why this resistance?

## Serious Business

I first encountered resistance to games while brainstorming a disruptive e-learning initiative for a major financial services company. My clients wanted to train tens of thousands of employees in uniquely engaging ways. But how?

I recommended game play, suggesting that "fun" was the missing ingredient in their learning strategy. Employees must enjoy themselves for training to overcome resistance or indifference and change perception and behavior.

My recommendation was met with silence, so I pressed the point: "Uh, you do think employees should enjoy learning, don't you?" A manager impatiently replied that employees need not enjoy themselves. They just need to "do what they're paid to do."

He continued: "*I have fun when I'm home. I come here to work. Same goes for employees. Let's not waste time and money on cute stuff.*"

I looked wide-eyed around the room, waiting for others to break out laughing and slap me on the back, shouting "Gotcha! You should see the look on your face." Nobody did. My clients were serious about not having fun with learning.

I went on to design an interactive scenario — a multimedia game with a social network extension named *Call to Service* that thousands of employees learned from and liked, and which helped produce measured business results. But I never forgot that naive imprecation against having fun while learning.

For many managers fun is suspect, business is serious. Hence the oxymoron that formally categorizes games that teach: **serious games**.

## Want to Play?

Ordinary games merely entertain, whereas serious games improve players by going "beyond entertainment." This was not supposed to be a dichotomy: games with a higher moral purpose did not suddenly lose their obligation to entertain, did they?

After all, there are serious forms of entertainment across our culture, and across the entertainment industry. Labeling games that teach as "serious" was supposed to make them deeper and larger in scope rather than limit or diminish them. Players could have fun while they learned, that was the whole point.

The reason why it rarely works that way is because the case for serious games is fueled by a sophism, that entertainment is incongruous with learning. Entertaining is Dionysian, teaching is Apollonian. There is no basis for this dichotomy in history, science or the arts, but it seems to dominate the semi-professional community that creates business training.

Yet games must be played. Unlike other forms of training they are not read, attended, watched, studied or memorized. Games are played. A game that isn't played is not a game at all.

Play by definition is "to engage in activity for enjoyment and recreation rather than a serious or practical purpose." If games are meant to be played, it is easy to appreciate

resistance to them among managers of business training. After all, to play is goofing off, fooling around, zoning out, having fun. Ergo to play is not to learn; it is oblivious or even contrary to learning.

Well, not quite. There is more to the notion of play than mindless fun. It turns out that to play is to learn, and not only among adults who require training to do their work. The earliest childhood experience of methodical or structured learning is a mode of play called creative pretense. Kids imagine an engaging situation that doesn't actually exist, and work out a problem to emerge a winner or try again until it comes out right.

This is precisely what adult training games do, only the situation and the problem are imagined by a business analyst or instructional designer rather than the player. It's still up to the player to make the game come out right. As that happens, swift and deep learning occurs — more often than not.

Creative pretense helps children learn, but it doesn't stop helping when they grow up. It also helps adults — for example in business case studies, role plays, scenarios and simulations. All are based on a core of creative pretense. Each is a kind of sandbox for grown ups.

These hallowed learning strategies use creative pretense, what the poet Samuel Taylor Coleridge called “the willing suspension of disbelief.” When airline pilots approach a runway in a flight training simulator, or bioinformaticists fuse virtual proteins, or executives answer “what if” questions in enterprise scenario planning, they are all “playing” and, by virtue of the joy and freedom of play, they are learning from experience: not what the teacher told them, not what the textbook says, but what they discovered and comprehended by playing games.

## Game On

To play a serious game is to learn and become more competent. It is also to be entertained and enjoy a contest or challenge for its own sake: to solve make-believe problems in an unreal situation, without a serious or practical purpose.

There is no dichotomy here, no Hegelian dialectic of opposing forces. The bipolar interplay between learning and enjoyment - Apollo and Dionysius - can produce a thrilling liberation for training designers and managers who grasp its implications.

Freed from the constraints of not being fun in order to achieve a serious purpose, designers of e-learning can be inspired, instructed and mentored by their peers in the

entertainment industry and still confidently address lofty or difficult learning objectives. They must be so inspired in order to design games that are core and not merely additive.

## Play What?

Precisely what is a business training game? A business game is an episode of play with these essential ingredients:

1. Exposition that defines a pretend situation
2. Sequence of goal-oriented activities
3. Surprising challenges as the sequence unfolds
4. Consequences at each turn
5. Rewards attained through competence, intuition, persistence or luck
6. Competition for rewards
7. Punishment for failures
8. Rules that govern play
9. Limited duration of play
10. A conclusion that resolves the situation

There are just four pillars of game design for corporate e-learning. This basic taxonomy is my invention rather than the product of scholarly research, but it aids the understanding of how business training games work:

1. **Puzzle.** Problem-solving play that spawns and develops competencies
2. **Scenario.** Stories in which players join and learn from others' experience
3. **Simulation.** Exploration in which players learn from their own experience
4. **Immersion.** Play enriched with affective and conative aesthetics.

Puzzle and scenario games are usually behaviorist. Interactions are shallow though they may be lengthy. Content and flow are prescriptive, program code is compact and repetitive. These games are basic but nonetheless improve the competencies of players — especially those whose learning occurs at the bottom or middle rungs of Bloom's Taxonomy.

In contrast, simulative or immersive games are constructivist. They have deeper, more dynamic and complex interactions that may be powered by artificial intelligence and computer modeling of context, situation, environment, process, objects or people. Simulation and immersion support more estimable learning objectives that occur on the higher rungs of Bloom's Taxonomy.

The greater time and cost of developing high-fidelity simulation and immersion have deterred businesses from developing more sophisticated games. Most training managers don't see the ROI in a costly sim — not because it isn't there. The math is not compatible with myopic planning horizons.

But barriers are coming down thanks to increasing capability, lower cost of development tools and appliances, the propagation of very fast fiber optic networks — and of course the catastrophic failure of entrenched pedagogies with younger students.

Riding the coattails of the entertainment game industry, which is investing in cinematographic and 3D game designs, it is reasonable to expect that simulative and immersive games will pervade business training in a few years. Tangible barriers of cost and technology will have vanished in the meantime, as the vocal demand for engaging content continues to increase.

## Does Playing Work?

There is considerable research on the efficacy of e-learning games in general, much of it defensive in posture. Investigators by and large report positively on the impact of games on learning, and at the same time question the validity of their findings.

This dissonance was neatly reflected by Janis Cannon-Bowers: *“Simulations. We have plenty of empirical studies about simulations over the last 25 years. We know simulations work. We know simulations improve performance. We know simulations improve learning. Yet, I challenge anyone to show me a literature review of empirical studies about game-based learning. There are none. We are charging head-long into game-based learning without knowing if it works or not. We need studies.”*

Coincident with this warning, Simon Egenfeldt-Nielsen published a review of research on the educational use of video games, where he concluded: *“It can certainly be said that video games facilitate learning, but the evidence for saying any more than this is weak. Few current studies compare video games with other teaching styles, which is the ultimate test. [...] The question is: what is it that video games offer that sets them apart from existing educational practice?”*

Egenfeldt-Nielsen answered his own question through the lens of four popular learning theories, three of which are compatible with the design of corporate e-learning: behaviorism, cognitivism and constructivism. He found support for all three in game play, noting that e-learning games tend to improve learning across all dimensions. He did not discover any innate characteristics of game play that impede learning, with one possible exception: the polarity between learning and entertainment.

## How to Make It Work

Unlike entertainment games, the design of effective game-based e-learning may be guided by instructional systems design (ISD), though it rarely is. ISD is a generally accepted framework and methodology for creating effective training.

ISD is theory-, strategy- and technology-independent. It is a dynamic process that guides rational, coherent decision making for the analysis, design, development, implementation and evaluation of any and all training — including e-learning games.

Though not a rule book or blueprint, ISD is a reliable tool for ensuring the efficacy of training games before they are designed. Although it is uniquely suited to learning applications and does not enhance the creation of entertainment, it doesn't impede the design of entertainment either. The two design disciplines can co-create the same game.

To create training games without ISD is to invite problems — not because the training is entertaining, but because it may be poorly made strictly from an instructional systems perspective. Hence the criticism that sometimes greets training games: gimmicky, superficial, not serious. This is almost always a reflection on inferior instructional design rather than game play.

## Assess the Impact

Research on the efficacy of training games is not widely understood. However the structures for incentivizing and measuring the efficacy of corporate learning — which includes game-based training — are well established.

I hate to say it, because it ignores so much of value, but the efficacy of training is always deemed a function of performance, impact and results. Not whether the employee enjoyed the training, not what the employee learned, but what difference the trained employee makes at work in a business organization or process.

These three measures of efficacy — performance, impact and results — are operationalized in the classic five levels of training evaluation (Kirkpatrick and Phillips) that apply to games just as they do to other pedagogies:

- Level 1. Did players appreciate the game and feel it was relevant and helpful?
- Level 2. Did players acquire new competencies by playing the game?
- Level 3. Did players evince their new competencies to job performance?
- Level 4. Did operations improve as a result of that performance?
- Level 5. Did the game generate a return on the investment of its sponsor?

Note that the three measures of training efficacy and five levels of evaluation are *extrinsic*. They assess the after effects of games rather than intrinsic qualities of the games themselves.

Thanks to this outward-turned and longer-range perspective, the measures and levels ignore parameters such as fun, technical sophistication and aesthetics. Such parameters are not measurable unless they increase the cost of training development and delivery — in which case the impact is measured on level 5.

This is just the opposite of the way entertainment games are evaluated by consumers, who attend primarily to *intrinsic* properties such as originality, realism, cleverness, complexity, style, excitement, technical wizardry and surprise. Consumers don't expect to learn or profit from entertainment — though they don't object to that either. They object to “serious” only if it interferes with fun.

Do students of e-learning likewise object to entertainment? There is no research indicating that they do. Symmetric with consumers, students object to fun only if it interferes with learning.

## Look Back

Measures of training efficacy and levels of training evaluation don't dwell on fun. That's probably as it should be, because fun does not itself produce results.

Fun may excite attention, spur enjoyment and increase the conscious arena. It may promote engagement, stimulate the appetite for knowledge and bolster resilience and persistence, ultimately teaching players *how* to learn.

So what? Corporate training managers by and large couldn't care less about how employees learn. They are accountable only for what is learned and the difference it makes after the training itself has been forgotten.

It is hard for researchers to establish *what* players can learn from games in contrast to other training methods, partly because games have been examined as a unique genus of learning. Thus on one hand there are games, and on the other there are pedagogies that may be compared with games.

This contradistinction is stupid. It is smarter to view training games not as a genus, but as a species of e-learning with a few distinct affordances such as deep interactivity, rich multimedia content and the requirement to be played. Though training games are rarely if ever classified as e-learning in research studies, that is exactly what they are. They are very rarely "video games" (the most persistent moniker).

Am I quibbling about semantics? Does it even matter? Yes, very much. While research on the efficacy of business training games is embryonic, research on the efficacy of e-learning is mature and abundant. Everything that has been revealed about the impact of high-quality e-learning may be associated with — and demonstrated by — good interactive games because most of those games are just a species of e-learning.

The confirmed affordances of high quality e-learning that training games can claim are:

- Lower cost of training delivery and curriculum/course ownership.
- Faster and easier delivery of instruction and learning
- Higher test scores and longer retention
- More adaptive instruction
- Higher-fidelity job task simulation
- More meaningful forms of interactivity and diverse instructional strategies
- Student control of learning and intelligent branching
- Pinpoint skills assessment coupled with remediation
- More varied styles of assessment
- More consistent quality of instruction across numerous deliveries

Setting aside the false dichotomy between training games and e-learning in general, the case for game-based business training can be made more confidently. The research has

been done, the failure is in our limited interpretation of it. Meantime, the anecdotal and qualitative research on games is also encouraging. Here are a few pertinent highlights from my reading thus far.

### *Seriously, Not Serious*

Enjoyment, escape and social affiliation — but not concentration and epistemic curiosity — predict an intention to play games. Thus training games should retain the engaging and motivating properties of games in general. If they are truly fun to play, they will be more effective.

My purpose in this paper is to defend those intrinsic properties of games in corporate learning. While play enriches learning experience, the robust methodologies of ISD and training evaluation will ensure that instruction produces desirable results. The game play itself doesn't have to bear that responsibility, and in fact should not.

### *Self-Directed Learning*

Like couch potatoes in front of a television, people spend huge amounts of time playing games. Even when games are moronically repetitive and crude, players don't weary of them. People are more persistent in game play and more cognitively committed and immersed in games, compared with other styles of entertainment.

The same may be vouched for instruction. A more important point for business training is that, in view of the popularity of games and the many hours devoted to voluntary game play, employees may stay with training games longer, and get more involved in their learning experience, without being forced by assignments and grades.

There are huge financial and operational benefits associated with this difference. It shows how to keep the ultimate promise of all e-learning — available “on demand” where, when and how the student wants and needs to learn.

Game play ups the ante not by teaching better or forcing students to study harder, but by increasing student receptivity to their own wants and needs. Every professor and trainer who has stood at a lectern, facing a forbidding army of blank stares, appreciates the value of this difference. Students who play are incentivized both to stay in the game and come back often to improve.

## *Learning from Experience*

Games involving simulation are classified as experiential learning. Players learn through discovery, practice and feedback, rather than absorbing information. They more easily transfer competencies they acquire from experience to real job tasks.

But not all games are simulations. That does not mean that non-simulative games are not experiential. Given the space, I would argue that *all games are experiential* - those that simulate and those that use other forms such as puzzle, scenario or immersion.

The reason why simulations work well is not because they simulate per se, but because they deliver some of the key affordances of e-learning - in particular user control of nonlinear instruction, high fidelity and intense interactivity.

Games must be played and therefore they must be experienced. They cannot be read or watched. That is the key cognitive, affective and conative rationale for all training games including those that simulate.

## *Surpassing Experience*

*In a well-known study of medical game-based training, the amount of past video game experience successfully predicted laparoscopic proficiency scores. Traditional long term indices of surgical proficiency, such as years of training and number of laparoscopic surgeries performed, were unrelated to demonstrated laparoscopic skill, while game playing, which is of relatively short duration, was reported to be related to that skill. After only three trials of six tasks each, laparoscopic surgical novices approached the performance of experienced laparoscopic surgeons on a virtual reality surgical simulator.*

Though this insight concerns a professional rather than business training mission, it suggests that, under some circumstances, learning from experience in a game may be a more reliable predictor of competence than experience in life.

The insight may seem surprising at first glance, but a similar principle is evident in training for airplane pilots, who continue to train on flight simulators for their entire careers in the air. Flight simulators augment flying experience that pilots actually have, with virtual experience that increases their competencies to otherwise unattainable levels. Flight simulators also make critical training missions less expensive, more convenient, and safer from the consequences of trainee errors.

Recall what I said earlier about additive versus core training, and what I said later about the elusive ROI of game-based training to myopic planners. The case for the efficacy and

cost efficiency of game-based learning has been established in some professions and industries. More will inevitably follow. There are fewer and fewer reasons to oppose it.

### *Equal, Better, Best - Who Cares?*

The superiority of games for instruction over other kinds of e-learning has not been established, as indicated in research I have reviewed so far. But the superiority of highly interactive e-learning compared to other styles of instruction has long been established, across several dimensions of value.

Since games are among the most highly interactive styles of e-learning, it is reasonable to expect that findings from research on e-learning apply to games as well.

Does it matter whether games are equal, better or best compared with other pedagogies? Probably not, because whatever the case, it makes good business sense to train with games — or more generally, with highly interactive e-learning — compared to training with human instructors, which is usually not game-changing or cost effective.

### *Platform Plethora*

Interactive games are played on the web, computers, mobile devices, and TV consoles. They are also played in blended deliveries — for example augmented reality in which virtual and real world ingredients intermingle and interact.

Each of these platform choices implies a different suite of development tools, a different array of audience characteristics and expectations, different economies and different levels of integration with corporate learning management. Yet observers typically refer to learning games as though they were just one genre.

Because my focus is games in business training, I chose to treat all training games as e-learning. However, at lower levels of game design, development and implementation, platform should be taken into consideration when planning and assessing the efficacy of game-based e-learning.

A rose is a rose, as Gertrude Stein wrote, but e-learning is not m-learning is not social gaming is not video gaming is not ARG.

## *Fidelity*

High fidelity simulation or immersion has been shown to kindle student engagement. It has likewise been shown to impede concentration and epistemic curiosity, as game play detaches from and overwhelms instruction.

Apart from the obvious remedy of keeping instructional design and game design in balance, I have noticed two recent trends in game aesthetics that are worth mentioning here.

One is the emergence of cinematographic games on TV consoles. These games exploit advanced technologies to render with hyper realism. The result is a gorgeous playing field and a platform for extremely compelling storytelling.

The second is the opposite: a reaction against technology and cinéma-vérité and a return to more rudimentary gaming of yesteryear. This reaction delivers two potential benefits to training games: greater “authenticity” from being not slick, seeming not manipulative; and greater efficiency from being less costly to create and deliver.

There is a role for both higher and lower fidelity courses, depending on learning objectives and the outcomes of a cost benefit analysis. For example, I want nuclear reactor operators and investment bankers to train with high-fidelity simulation, and I am comfortable with sales associates at the mall training with scenarios. The ends and the students themselves justify the means.

## *First Person, Third Person*

My earlier discussion of creative pretense claimed that pretending something, as in a game, is a step towards learning it. A related point to keep in mind is that some research on game-based learning shows that first-person play, in which the player is represented by an avatar in a pretend situation, is more effective than third-person play where an omniscient player manipulates other characters. Clearly, this is an important finding for instructional as well as game design. The control of learning belongs with the student, and it is likely to increase with personal involvement in the challenges.

## *How, Not What*

*Participants who were expert computer game players had faster response times than novices. Playing action games also improved strategies for keeping track of events at multiple*

*locations. In general, more skilled video game players had better developed attention skills than less skilled players.*

This finding is similar to a popular perception that gamers are more responsive and have more sensitive receptors by virtue of game play. A sarcastic inference is that games train people to become better game players, and that is all.

Research I have read so far suggests that games equip students with keener powers of perception and capacity to use information. By virtue of the play itself, their ability to personally engage with content increases along with their powers to organize and use random information.

Gamers learn how to learn and that may be why they become better at other games with more play experience. This is an extremely important finding for business and industry, where metacognition and adaptive learning are key to success in higher order jobs and careers.

### ***Competition versus Cooperation***

I include *competition* in my definition of training games. Professors have questioned *the overall effectiveness of using competitive motivation in training. Although it may facilitate the performance of some individuals, it interferes in the performance of others with negative attitudes towards competition, resulting in little overall performance improvement.*

I believe this concern is irrelevant to business training games, because evaluation criteria in business are by definition competitive. Most employees can never be successful in absolute terms, only in relative terms. There is always competition for the brass ring and the bar is getting ever higher. Since competitiveness is a factor in almost all business job performance, it must be a factor in corporate training as well — whether or not players are comfortable with it.

Research also shows that players with negative or relaxed attitudes towards competition become more competitive as they play, and this is beneficial. By becoming more competitive in a game, players acquire a competency that may not be mentioned in a learning objective, but which has a huge bearing on their ability to perform and have an impact and deliver results.

Constructivist approaches which currently dominate educational practices emphasize collaboration in communities. Clearly, the balance between competition and cooperation in games is a vital ingredient of successful instructional design and game design.

## Afterword

The genesis of this paper was a gracious invitation from Sigmund Tobias and John Dexter Fletcher to write a chapter about business training for their book, *Computer Games and Instruction* (Information Age Publishers, 2011). I started, but was unable to finish in a way that satisfied me or my editors. Though their book will appear without my contribution, I highly recommend it as a thorough and conscientious review of the state of our art.

Inspired by Sig, I recently formed a research and writing collaboration with Richard Teach, emeritus professor of marketing at Georgia Tech and long-time advocate of games for business education. Dick and I are writing not one chapter, but several that together comprise a new book about games and simulation for business education and training.

Our research will be shared online in a wiki (à la Cluetrain). Members of IT Forum are invited to participate in the conversation as our narrative plops on the wheel and takes shape. To connect with the authors and receive updates and invites to collaborate, feel free to follow me online with the links provided below.

## About the Author

I studied English literature at New York University (BA, MA), the University of Reading (PhD) and the University of Pittsburgh (Mellon Postdoctoral Fellowship). As an assistant professor of English at Emory University and scholar with an international research program (still active), I became enchanted by the potential of computers to assist and improve discourse and learning. I left teaching in the mid 1980s for full-time employment as an interactive multimedia designer, and 10 years later started Becker Multimedia in Atlanta as an e-learning and learning management consultancy. I will complete the move of my business and home to Chicago in 2011.

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