

Knowledge Area Module VI:
Game-Based Learning for Teaching Business

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Abstract

As a further deepening of understanding Game-Based Learning, this work provides an analysis of the design, and results of research related to video game-based learning theories. Within this paper, business games and game genres are examined for similarities and differences. The use of games as a way to effectively to teach business concepts is several decades old. In particular, as technology improves, business simulation games, are increasingly being used as an instructional methodology in the business programs at schools and colleges.

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INTRODUCTION

As business, education, and learning theory continue to grow and evolve, educators seek new and more effective ways to teach. In the past several decades, business games, particularly business simulation games, have increasingly been used as an instructional methodology in the business programs at schools and colleges (Walters & Coalter, 1997, p. 170). Business simulation games were first used at the university level in 1957, and a recent survey of the Association to Advance Collegiate Schools of Business (AACSB) member schools by A.J. Faria states that 97.5% of respondents used at least one business simulation game in their business curriculum (Black, 2001, p. 6). One survey found that over 200 simulations were in use in the USA in over 1700 business schools, and such simulations have been claimed to be more realistic than alternative learning methods (Doyle & Brown, 2000, p. 331).

These games have been shown to be grounded in solid learning theory, providing experiential learning and enrichment opportunities for a variety of students (Doyle & Brown, 2000, p. 331). Game theory provides many of the components vital to good learning practice (Gee, 2004, p. 199). Whether a role-play, paper-based simulation, or a computer-based game, these activities are useful components in business instruction, providing enhancement of classroom lecture, real soft-skills training, and opportunities for application in a virtual business environment (Walters & Coalter, 1997, p. 172). They can even be used as introductory instructional tools (Ganzert & Helms, 1998, p. 53). Given their value and widespread use, a significant body of research exists regarding games that teach business concepts, their use and effectiveness. This work seeks to provide a deeper understanding of this body of research.

LEARNING THEORY

There have been many significant developments in learning theory in the past few decades. For example, in today's classrooms there is an increased emphasis on real-world learning, or learning by doing, than in traditional classrooms (Barab, Barnett, & Squire, 2002, p. 533). Called experiential learning, this methodology emphasizes students' undertaking a process of discovery, whereby they develop their own concepts and understanding through experiencing and practicing activities (Gee, 2004, 91). Unlike passive learning, where the instructor lectures or students read from a book, memorize concepts and facts, then repeat them for evaluations and exams, experiential learning emphasizes application rather than memorization (Haywood, McMullen, & Wygal, 2004, p. 88).

Games, particularly simulation games, have provided a useful tool for many types of experiential learning. In addition to offering "a structured environment for learning complex problems," players report that "simulations were stimulating and enjoyable," a generally accepted prerequisite for successful learning (Doyle & Brown, 2000, p. 331). "Learning in simulation games occurs on many levels... Players learn from the contextual information contained in the dynamics of the game, the process of playing the game, through risk taking and weighing up the risks, benefits, costs, outcomes and rewards resulting from decision making" (Doyle & Brown, 2000, p. 331). Games further stimulate a cycle of probing, evaluating, and reprobating found by many to be one of the most effective learning methods (Gee, 2004, 91). Unlike the conventional teacher-based teaching model, the business game model makes participants actively engaged in their own learning process, which in turn enhances the effectiveness of their learning

experience (Hoffjan, 2005, p. 63). By creating an environment where the student can participate, the student is able through this probing and evaluating process to build acquired experiences into a system of understanding, and further use such systems to extend understanding of future experiences (Barab et al, 2002, 77). The student moves, in business simulation games, from an isolated individual who needs to receive knowledge and facts to a “situated learner” who develops their own understandings (Barab et al, 2002, 81).

Passive Learning

According to Black (2001),

... it is generally perceived in the U.S. that college business programs have failed to adequately prepare students of the needs of business... graduates in general lack the necessary skills to apply theory to practical business situations, are deficient in the application of technology in business, are unfamiliar with the structural features of a business entity and lack the global perspective to do business in today's economy (p. 4).

Much of business education has not kept up with changing business practices, and so “it is currently not relevant to the business world, and is loaded with theoretical blunders” (Brawer, 1997, p. 3). In addition, schools have continued to teach from a passive learning concept, although today's students are no longer geared to learn effectively from a passive methodology (Beck & Wade, 2005, p. 49). Learning is moving, mostly due to changes in technology, from an acquisition-based model to a participation-based model (Barab, Barnett, & Squire, 2002, p. 532). Students no longer

expect to simply absorb information from their instructors, but to experience and develop concepts and knowledge for themselves (Barab, Barnett, & Squire, 2002, p. 533).

Many business schools, however, rely on teacher-based, passive learning. Anselmi and Frankel (2004) cited “an extensive body of literature” and concluded that typical instructors “allocate too much time to disseminating information and too little time to developing student skills” (p. 169). In such environments, students may encounter and even memorize a great deal of content, but are often unable to apply this knowledge in real-world situations. Faced with a passive learning environment, many students become “predisposed to want to memorize a correct answer to a situation and parrot it back to the instructor” (Haywood, McMullen, & Wygal 2004, p. 88). Concepts and practices are removed from a relevant, contextual situation and presented as a series of facts, which students are expected to be motivated to “learn” for the test (Barab et al ,2001, p. 52). Such formal instruction has little use in today’s rapidly changing business environment, and is boring to the “Game Generation” who are used to activities such as fast-paced computer games and MTV (Prensky, 2000, p. 58). Members of the game generation are used to being active participants in their own learning experience, and therefore tend to be unengaged when restrained to a role of passive observers (Prensky, 2000, p. 55). The focus on telling students content, rather than discussing and thinking through situations, further bores and disengages today’s students (Prensky, 2000, p. 145). In addition, when they do employ business simulation games, educators from such a mind-set often see the games as a “break from the routine lecture class” rather than the valuable learning tool they are (Robinson et al, 2000, p. 86).

Experiential Learning

Some educators now recognize that experiential learning is a more effective paradigm for higher education, shifting emphasis from instruction to learning (Anselmi & Frankel, 2004, p. 169). For example, Doyle and Brown (2000) cited a 1983 study by Martin and Ramirez, which concluded that experiential learning “aims to enhance the capabilities of people in everyday situations to investigate, understand and if they wish, to change those situations in an ongoing fashion with a minimum of external help” (p. 331). Although such research has existed for several years it still applied today.

Experiential learning opportunities such as business games encourage participants to practice a higher order of learning by personalizing content and relationships (Anselmi & Frankel, 2004, p. 169). This learning experience further enables the student to contextualize more complex content and relationships (Anselmi & Frankel, 2004, p. 169). Students are able ground their understandings and new discoveries within their own previous concrete experiences, allowing the student to test the environment, then “actively construct ideas and relationships in their own mind” (Barab et al, 2002, p. 77; Prensky, 2000, p. 162). Computer-based games, for example, “combine visual dynamism with an active, participatory role for the learner,” and present the student with opportunities to take meaningful actions and the consequentially then experience of the results of their actions (Prensky, 2000, p. 55). Students experience their own dynamic learning process when playing business games rather than looking to the instructor for all the right answers to a defined situation (Barab et al, 2002, p. 77).

The challenge, interest and fun of playing business games leads to a highly engaged and therefore motivated learner (Anselmi & Frankel, 2004, p. 170). Because of

the high level of engagement common in such games, the more difficult or challenging games are often more popular than simpler or easy ones (Gee, 2004, p. 6). Students reported that games that “make you think versus memorizing,” were “thought-provoking,” and “got the whole class to participate” were highly popular (Haywood, McMullen, & Wygal, 2004, p. 98). Engaged learners are more committed to playing a game (or learning material necessary to play the game) and therefore benefit from noted components of effective learning: practice and constant reinforcement (Brawer, 1997, p. 3). This gives students repeated “experience” in “applying the concepts, theories, and practices presented in class to real-world situations,” provides “discovery and involvement for students,” and allows them to “become full partners or collaborators in the learning process and assume responsibilities for their own decisions” (Anselmi & Frankel, 2004, p. 169).

ELEMENTS OF GAME-BASED LEARNING

Several elements of productive learning are inherent in good game design.

Content and experiences of the business environment are presented in a context similar to the real-world (although usually somewhat simplified) which enhances learning (Gee, 2004, pp. 27-29). This environment further reinforces a cycle of learning, which allows the student to probe deeper into the material experienced, and gain more complex understanding of basic business concepts (Gee, 2004, p. 70). This moves the learner from a passive, individual perspective to a social, situated one, also allowing a greater understanding, personalization, and internalization of methods and ideas (Barab, Barnett, & Squire 2002, p. 494). The student in a game-based learning situation further is able to experience the learning opportunity as a member of some sort of community in which he or she has an identity which may be different from their actual identity, freeing the learner from many of the potential downsides of trying something new and increasing the learner's engagement with the activities (Gee, 2004, p. 65). This engagement provides a powerful base of motivation, which stimulates the student to continue to try and remain motivated (Haywood, McMullen, & Wygal, 2004, p. 90). This, in turn, leads to increased retention, and simply better, more effective learning (McClatchey, & Kuhlemeyer, 2000, p. 208).

Context and Semiotic Domains

Although games can be played individually, with other individuals in a competitive situation, or in a team model, all students learning in a game-based construction develop an environment of sorts with others who participate in the game (Gee, 2004, p. 27). The common understandings they share, such as the game rules and

objectives, restrictions of the learning environment, and general context creates a virtual world, which Gee (2004) calls a semiotic domain (p. 24). Once an individual learner has become indoctrinated into a semiotic domain, he or she has a context into which new material and learning experiences can be situated. When presented with a new learning experience, students must learn the construct of whatever domain is inherent to the learning experience; otherwise, they will be unable to learn effectively within that domain (Gee, 2004, p. 17). If students are not able to become part of the semiotic domain of the learning experience, their learning opportunities are limited by a lack of context (Gee, 2004, p. 24). Understanding of the semiotic domain then influences future conclusions and understanding, which the student uses to more fully construct the domain, and so on (Gee, 2004, p. 29). Gee (2004) calls this "a cycle of automatization, adaptation, new learning, and new automatization" (p. 70). Today's students must function as active learners in a rapidly changing world, which requires mastering new semiotic domains quickly and effectively (Gee, 2004, p. 70). He further contends that games, particularly computer or video games, are "quite adapt at creating and sustaining this cycle" (Gee, 2004, p. 70).

For example, the computer-based business game *Industry Giant II* provides a simulation experience where the learner builds an empire of various business enterprises (JoWood, 2005). However, the game begins at the turn of the last century, 1900, with the player given a substantial amount of money for the time (JoWood, 2005). The most successful players must bring some business and historical understanding to the game, or learn such through trial and error. Until this semiotic domain is established, the player lacks an appropriate context for their business decisions, and is unable to truly understand

the reasons and factors leading to the outcome of such decisions (Gee, 2004, 24). While students are often unwilling or unable to make the commitment to a traditional learning experience required to establish a functional semiotic domain, the fun and engagement of game-based learning activities motivates them to continue until they are situated within the domain where they can function and achieve success (Hoffjan, 2005, p. 63). As “students are much more likely to be familiar with playing and observing games than they are with the realities of the workplace,” games have a further head start on domain construction (Haywood, McMullen, & Wygal, 2004, p. 90).

Community and Affinity Groups

Students participating in such domains, even if they do so as individual players against a computer, experience community or participate in an affinity group (Gee, 2004, p. 27). Affinity groups are collections of individuals, whether they know each other or not, who are connected to a semiotic domain in similar ways, in this case as game players. The players share a common undertaking, and even in individual player situations knowledge can be distributed among members of the group through internet sites about games, conversations, or other communication means (Gee, 2004, p. 27). In games that seek to teach business concepts, community collaboration is becoming increasingly more important (McCarthy, 2002, p. 45). In team-based games in particular, or where players regularly interact with other players as is typical of most games used as a part of formal business instruction, peers can also provide emotional support and interactive feedback in a way not possible in a traditional classroom model (Dickey, 2005, p. 68).

The new understanding of effective learning, specifically experiential learning, requires such a community view of the learning experience (Gee, 2004, p. 8). Barab, Barnett and Squire (2002) summarize from a number of recent research studies that there is a definite shift from learning theories based on individual learners in isolation to “theories that more fully acknowledge the role of the physical and social context in determining what is known” (p. 494). The social understandings and groups of the learners within a semiotic domain directly influence the meaning, understanding, and learning activities of the community or group members, providing a norming effect across the domain (Gee, 2004, p. 180). For example, in a recent study involving groups of students from France, Ireland, and the US, the French teams were horrified that the American and Irish teams simply and quickly closed poorly functioning or unprofitable manufacturing plants, with little consideration for the impact on workers (Doyle & Brown, 2000, p. 334). The social understandings of appropriate business practice differs significantly between these countries, and therefore changes the learning experience for students from each, even though they are participating in the same game (Doyle & Brown, 2000, p. 334). More and more, therefore, learning is looked upon as a social activity, shaped by the social environment of the learners involved and the semiotic domains they are and have been member of (Gee, 2004, p. 8).

A community perspective is, according to Squire and Steinkuehler (2005), a given in the design of most computer-based game construction (p. 39). Barab, Barnett and Squire (2002) call such relationships communities of practice, as they first connect individual game players or members of the game affinity group to the community, after which the community in return legitimizes the player’s actions and participation (p. 31).

The more time and interaction an individual has with the community, the more of a core community member he or she becomes (Barab, Barnett, & Squire, 2002, p. 495). As the individual moves towards a more core place in the community, he or she becomes more closely identified with the group and therefore more motivated to act for the benefit of the community (Barab, Barnett, & Squire, 2002, p. 495). This creates a situation where the group member becomes socially interdependent with other group members, and the domain strengthens the mutual definitions of understanding and practices (Barab, Barnett, & Squire, 2002, p. 495).

Identity

The individual's identity within these groups is therefore an important component of the learning experience. In many business games, the player assumes an identity different from their own, a specific role or job within the company (LoPiccolo, 2005, p. 4). While initially appearing to be very different, this new identity is similar in the context of learning to the created identity many players of entertainment games create (Gee, 2004, p. 120). Gee (2004) holds that this assumed identity and the player's real-world identity combine to create a projected identity, which frees the individual from many of the limitations or restrictions he or she might have, allowing learners to refashion themselves in the way most conducive to learning within that opportunity (p. 120). The player can take and try risks without the real-world consequences that would typically follow, creating an environment for enhanced experiential learning (Gee, 2004, p. 62). Simulation games "provide environment wherein participants experience realities of the business world that are risk-free and are specifically designed to eliminate certain

costs and extraneous details inherent in the typical manager's operation environment (Brawer, 1997, p. 3).

Engagement

One of the most profound advantages of learning in a game environment is the stimulation of students' interest in the subject matter and their consequential increased participation in the classroom (Haywood, McMullen, & Wygal, 2004, p. 90). Hoffjan (2005) contends "business games stimulate students and motivate them to participate to a greater degree than in a conventional classroom situation" (p. 63). Haywood, McMullen and Wygal (2004) similarly found that "students were motivated to spend more time in preparing for class on days when games were to be played than at other times" (p. 90). Prensky (2000) argues that good game-based learning, particularly on a computer or video-game platform, provides high levels of both engagement and learning (p. 150).

The question for many educators and researchers is why game-based learning is so much more engaging to today's students than traditional instructional models. Prensky (2000) finds that games are usually considered fun activities, particularly in comparison to listening to a lecture, and this motivates students to invest in the learning experience (p. 147). Games are also varying experiences, both compared to other types of learning and compared to each other, and each provides a new and novel way for the player to experience learning (Prensky, 2000, p. 147). This uniqueness further motivates the learner to both learn and succeed within the domain provided by the game (Gee, 2004, p. 62). As interactive experiences, games progression and outcome change with the players' decisions and actions, both empowering the learner and encouraging him or

her to discover the business content and principles that underpin the game in the context of a real, contextual business situation (Prensky, 2000, p. 147).

Retention

Business games have also been shown to provide a greater long-term retention of fact and practice than traditional book or lecture-based learning (Hoffjan, 2005, p. 63). Critical thinking, or the ability to apply various concepts to new and different situations, is also a retained skill enhanced by learning in a business simulation model (Haywood, McMullen, & Wygal, 2004, p. 88). “Business games increase the ability to recall factual knowledge and appear to improve problem-solving skills” (Hoffjan, 2005, p. 63). For example, if presented with a lecture on the impact of a number of political, cultural and economic changes to the business environment in the early 1900s, most students would be unlikely to remember the majority of the teaching weeks or months later. However, if the students experienced the impact of such events while playing a game such as Industry Giant II, perhaps sustaining heavy losses or enjoying a high level of success, they are likely to remember the game experience and the underlying concepts it provided. McClatchey and Kuhlemeyer (2000), in reviewing a number of research studies on active learning and retention, conclude “students learn more when they are active participants in creating knowledge, students learn what they practice,” and experiential learning provides better long-term retention in most students (p. 208).

TYPES OF BUSINESS GAMES

Business simulation games follow two basic models. The first, and historically most widely-used, is a role-play game (Walters & Coalter, 1997, p. 170). In this model, students assume various roles or jobs within a company and are given a specific time and task that would be typical of such a company's functioning (Walters & Coalter, 1997, p. 171). Changes in the business situation are then supplied by the instructor in some manner, and students must respond in such a way that will most greatly benefit their company (Walters & Coalter, 1997, p. 171). These games typically feature branching situations, where the players' actions affect the progression and outcome of the game (Dickey, 2005, p. 73). With increases in technology, computer-based versions of such games and new business simulations constructed specifically for a computer-learning environment are enjoying an increased popularity (Alvisi, Narduzzo, & Zamarian, 2003, p. 612). No longer are such gaming platforms the domain of teenage boys interested in shooting as many enemies as possible (Alvisi, Narduzzo, & Zamarian, 2003, p. 616). Computer-based business simulation games provide all the benefits of traditional simulation games when used appropriately, but allow for a greater number of variables and complexity within the game model (Brawer, 1997, p. 3). Both game constructs can provide an orderly environment for learning and ensure that environment generates a fun and rewarding experience (Orbanes, 2002, p. 4). Given the huge number of business simulation games available, this literature review considers a few representative games from both non-computer-based and computer-based product sectors.

General Simulation Games

As stated above, most non-computer-based simulation games operate on a role-play model (Walters & Coalter 1997, p. 170). These role-plays may feature one individual, operating as an independent entrepreneur and competing against entrepreneur classmates in a given business construct, or may involve a team or larger number of players, who work for the same company in different capacities (Dickey, 2005, p. 73). “The use of a business game in a business policy course gives students the opportunity to implement strategic concepts with some degree of realism,” an important learning opportunity not typically available in other areas of the business instruction curriculum (Walters & Coalter, 1997, p. 172). Games also have the potential to “provide students with opportunities to practice and develop evaluation skills,” and “develop of workplace competencies, fostering an awareness of the global business climate, and providing relevant business technology skills” (Brawer, 1997, p. 4; Black, 2001, p. 3). Unsuccessful game experiences are usually attributed to lack of instructor involvement or competency, or an over simplification or over complexity of the simulation model (Black, 2001, p. 3).

A game based on individual role-play, the Extended Buying Center Game (EBCG) “integrates marketing course concepts, theories, and practices; develops skills valued by industry; and is adaptive to course design” (Anselmi & Frankel, 2004, p. 169). In this simulation game, students take on the role of buyer or vendor, providing opportunity for development of negotiating and decision-making skills. Students typically play in one role one semester, then switch to another role in the next, giving them valuable insight into a larger viewpoint of company buying functions (Anselmi &

Frankel, 2004, p. 169). Although primarily designed to enhance marketing instruction, the EBCG is can also be used as an experiential teaching tool for operations, purchasing, and management (Anselmi & Frankel, 2004, p. 169). Students learn [in EBCG] through involvement and discovery, “applying marketing knowledge in a game that they self-report as unique and challenging, creative, fun, inventive, enjoyable, relevant, and important to continue” (Anselmi & Frankel, 2004, p. 170). Operating on a similar individual role-play model, the Ethics Bingo Game was designed to augment often-dry textbook exercises, also important since “classroom coverage usually does not emphasize the responsibilities accountants have in ethical dilemmas (Haywood, McMullen, & Wygal, 2004, p. 85). This game assists accounting students in experiencing and dealing with the complex business dilemmas common in the real world that may affect the lives of literally millions of stakeholders (Haywood, McMullen, & Wygal, 2004, p. 85).

Two team-model simulation games that have been shown to be successful learning opportunities are Corporation and Calvados. Corporation: A Global Business Simulation was developed by Smith and Golden in 1994 and simulates the continuing operations of a multidivisional, multinational corporation (Walters & Coalter, 1997, p. 171). The corporation’s main customers are the industrial users, and it produces hardware and software products and services specific to different areas of the industrial sector (Walters & Coalter, 1997, p. 171). Players are placed on different teams within the company and are responsible for making all the various decisions that would affect the future of such a company in real life (Walters & Coalter, 1997, p. 171). In contrast, Calvados is a non-computer role-play game, which uses “the production of French apple brandy and considers relevant costs, opportunity costs, and in particular, the

determination of the optimal internal transfer price” (Hoffjan, 2005, p. 63). Instead of all working for the same company, student teams in this simulation are all involved in the same product. For example, one team of students is the apple farmers who supply product to the Calvados company, but are not directly employed by the firm (Hoffjan, 2005, p. 64). This provides students with an opportunity to not only see the effects of their decision and actions within a company, but on the business environment as a whole (Hoffjan, 2005, p.72).

Computer-Based Games

Computer-based business simulation games also offer “sufficient insight into the actual operations of a business so that participants can later transfer the simulation model strategies into real-life situations” (Brawer, 1997, p. 3). They do so with a complexity that is rarely possible in non-computer-based games. First, computer-based games offer learning opportunities across a vast array of business topics. For example, a game called Royal Flush helps students learn to consider and deal with cross-cultural issues that impact business decisions (Robinson et al, 2000, p. 85). Stock-Track, a well-known investment game, allows investment management students to practice “trading in bonds, options, futures, mutual funds, and spot contracts” (McClatchey & Kuhlemeyer, 2000, p. 208). Industry Giant II, a business building simulation game previously mentioned, forces students to consider both macro and micro impacts on the growth and expansion of a number of different industries (JoWood, 2005).

The Business Strategy Game (BSG) is a widely-used business simulation featuring international athletic shoe companies (Doyle & Brown, 2000, p. 332). Students work in small groups to control an independent shoe company that is in competition with

other student-run shoe companies. The presence of other, hostile companies forces students to take risks, to develop aggressive and effective strategy, and to anticipate their competitors' strategies (Doyle & Brown, 2000, p. 330). As competitors in a fiercely competitive industry, students must "make numerous decisions regarding product pricing, production, marketing and all aspects of company operations in numerous decision periods" (Doyle & Brown, 2000, p. 332). This gives the students experience in "developing strategies, decision making, team building and core marketing skills" (Doyle & Brown, 2000, p. 330).

EFFECTIVENESS AND USE OF BUSINESS GAMES

Business games, particularly those that are computer-based, are effective because they provide an enhancement and forum for practice of learned material, offer increasingly complex situations that stretch players' learning experience, and provide an opportunity for development of skills needed in the business world but not possible to be effectively developed in the classroom. As Osbanes (2002) contends,

... in many ways, workplaces are like games: both can be structured to avoid controversy and even to sweep us up in exciting rhythms of activity, both can engage us in challenging tasks while supporting rich experiences off the board, and ultimately, a great game and a great workplace can produce the same sentiments (p. 8).

In short, if learners are challenged at school or at work in a non-threatening ways, they will invest time and talent in a high-quality outcome, and look forward to repeating the process (Orbanes, 2002, p. 8). Beck and Wade (2005) see games as particularly effective teaching tools, in part because they “automatically teach two things about perspective: first, that a little distance is not just useful but normal: and second, that your point of view is a choice—and choosing correctly matters” (p. 51).

As Enhancement

A number of researchers have concluded that simulations are best used to augment, rather than replace, traditional business instruction (Brawer, 1997, p. 4; McClatchey & Kuhlemeyer, 2000, p. 216; Haywood, McMullen, & Wygal, 2004, p. 92). Doyle and Brown (2000) conclude from a review of available literature that games are best and therefore most typically used in tandem with lectures rather than to replace

them, as the information from lectures deepens a student's understanding of the game, which in turn reinforces the content of the lecture (Doyle & Brown, 2000, p. 331). For example, a simulation game called Dino Park Tycoon was used in an elementary school environment, combined with age-appropriate business lectures and in-class demonstrations (Ganzert & Helms, 1998, p. 54). The school principal later stated the game "gave students real reasons for writing, calculating, estimating and organizing their thoughts" which led to noticeable benefits in many areas of classroom work (Ganzert & Helms, 1998, p. 54). A game such as Industry Giant II, for example, could be used to both teach business concepts and provide experiential learning in history, politics, and economics. JA Titan, a free business simulation game available online, allows high school students to become CEOs of their own manufacturing firm in the year 2030 (Anon, 2005). The game can be adapted by teachers to "create a series of economic scenarios such as a full business cycle; recession only; product introduction phase; or, most challenging of all, product obsolescence" which forces students to consider a variety of factors and their effect on businesses and society (Anon, 2005). It is used by instructors to both support other instruction in business principles and across the curriculum (Anon, 2005).

"Real-World" Exposure and Application

Students both appreciate and value simulation games because they perceive the games improve their understanding of business and helps to develop the skills necessary for success (Anselmi & Frankel, 2004, p. 170). Business situations are often hugely complex, and games allow students to experience and work through such situations in a safe environment, learning to "sift through complex information and use critical-thinking

skills to see the situation from the viewpoint of all interested parties” (Haywood, McMullen, & Wygal, 2004, p. 88). In *Industry Giant II*, for example, a player can gamble in a variety of risky business propositions, try and retry various strategies, and never lose more than their virtual shirt. The budding entrepreneur in this and similar games can practice various strategies and experience their impact on business as a whole. This integrated view of business provided by simulation games cause participants to view decisions as relating to the entire company rather than just one’s own department, and increase coordination across the firm (Hoffjan, 2005, p. 63). Barrese, Scordis and Schelhorn (2003) further encourage instructors to use games to “develop the merits of alternative business strategies” and consider their impact company-wide (p. 48).

Games further incorporate the happenings of luck and chance, a real but often neglected component of business instruction (Orbanes, 2002, p. 6). For example, considerations such as weather can be vital to some companies, but beyond their control (Ganzert & Helms, 1998, p. 54). Games allow learners to develop “a feel for the interaction of management decisions and market stress” not available in typical classroom learning activities (Barrese, Scordis, & Schelhorn, 2003, p. 43). Just like in a typical work environment, players of computer-based or leveled simulation games find that as they master one level of expertise, they are asked to move to more difficult scenarios (Gee, 2004, p. 121). Gee (2004) finds that a successful game “adapts to the level of the player, rewards different players differently (but rewards them all), and often stays at the edge of the player’s regime of competence” (p. 121). Players may end up bankrupt (in which case they can start over), or may achieve remarkable success, but all

usually enhance their business acumen and learn to consider the broad indicators and impact of business life (Ganzert & Helms, 1998, p. 54).

To Develop Soft-Skills

Finally, simulation games develop teamwork skills, offer a risk-free environment for learning, lower fear of failure, and provide quick and relevant feedback to participants (Doyle & Brown, 2000, p. 331). Since business games typically require cooperation with other students, participants must be open to the exchange of opinions within the group and be ready to compromise or make trade-offs when faced with opposing goals (Hoffjan, 2005, p. 63). In existing companies, Orbanes (2002) reports that business simulation games can build relationships and increase social capital across an organization, increasing “camaraderie, mutual understanding, and cooperation” (p. 8). For example, the managerial game *Income / Outcome* has been shown to increase participant appreciation of the importance of different departments working together to achieve success (Orbanes, 2002, p. 8). Similarly, transfer pricing is for many firms an ongoing source of internal tension; however, as participants work through a game of *Calvados*, they begin to recognize that the success of the entire company depends upon the successful resolution of conflicts between the different business units and entities (Hoffjan, 2005, p. 64). The *Extended Buying Center Game* mentioned previously “covers a broad spectrum of topics with the intent of exposing students to a number of basic activities or skill sets – such as problem solving, verbal and written communications, and interpersonal skills – that they are likely to use in an introductory employment setting” (Anselmi & Frankel, 2004, p. 174). Further, games help managers consider complex issues and avoid “assigning the best project manager in the Houston

office to a client in Winnipeg at the same time that the manager is planning her Texas wedding (Orbanes, 2002, p. 6). Development of such negotiation, communication, and other soft skills is nearly impossible in a traditional classroom, but all are skills highly prized by and needed in business. In short, “business training makes one a better game player, and game playing also trains one for better business judgment” (Orbanes, 2002, p. 8).

References

Alvisi, A., Narduzzo, A., & Zamarian, M. (2003). Play Station and the Power of Unexpected Consequences. *Information, Communication & Society*, 6(4), 608-627.

It has been suggested that research business strategy is like studying specimens on a wall. By examining successful stories, one can easily identify the strategic factors responsible for such a success, and the greater the success, the more evident those factors are. Timing, strategic positioning, pricing policies, lead-time - everything goes back to the place where it fits best, like a beautiful mosaic. Even competitors' mistakes become more evident, their dull misunderstanding of what the winner was planning as every successful move leads to an even more successful one. The case of Sony PlayStation, the most successful digital games console ever, is no exception and the temptation to explain the rationale behind such an achievement is almost irresistible. As this paper tries to suggest, sometimes ex- post rationalizations hide or avoid part of the truth. Despite PlayStation's success, Sony's strategic choices were, on more than one occasion, driven more by lucky coincidence than by long-range planning. Furthermore, this paper shows how some of the strategic factors behind PlayStation's winning run sprang from decisions taken by lack of alternatives, and that only in the very end was Sony able to understand their full profit potential.

Anon. (2004). Junior Achievement Program Turns Students into Business Titans. *THE Journal*, 32(2), 26.

Features the JA Titan, a Web-based business simulation program for high school-aged students. Goal of the program; Background on the school-based version of the program.

Anselmi, K., & Frankel, R. (2004). Modular Experiential Learning for Business-to-Business Marketing Courses. *Journal of Education for Business*, January/February, 169-175.

In this article, the authors present the Extended Buying Center Game (EBCG), an experiential exercise that integrates marketing concepts and theory with a strong emphasis on industry skills and that does so in an adaptive course design format. The focus of the EBCG is on organizational buying behavior, buyer-seller interaction, and marketing response. The EBCG structure provides students with cooperative and competitive role-playing opportunities, individual and group written assignments and presentations, and verbal skill challenges.

Barab, S. A., Barnett, M., & Squire, K. (2002). Developing an Empirical Account of a Community of Practice: Characterizing the Essential Tensions. *The Journal of the Learning Sciences*, 11(4), 489-542.

This article examines the potential of a learning-as-a-part-of-a-community approach, focusing on the participatory process of learning in a community-based, teacher education program; a Community of Teachers (CoT). CoT is a preparation

program for preservice teachers working toward secondary teacher certification in which they join an on-going community and remain a part of that community from 2 to 4 years. The entire process of learning as a member of CoT occurs fluidly through the reflexive relations among secondary school participation and university seminar participation, as well as through the active and reflective practices requisite for building one's portfolio of Program Expectations. In this study, 4 participant-observers used field notes, document analysis, and interview data to build grounded interpretations of community life. In this reporting of the data, we have framed these "experience-near" understandings in terms of core tensions (or illuminative dualities) and presented them in a manner that is likely to have "experience-distant" significance. By characterizing CoT life in terms of tensions or dualities, we hope to provide other educators-designers with an illuminative case study from which they can build petite generalizations-that is, use this discussion to more readily identify patterns occurring in their own interventions and navigate the challenges they face more intelligently.

Barab, S. A., Barnett, M., Yamagata-Lynch, L., Squire, K., & Keating, T. (2002). Using Activity Theory to Understand the Systemic Tensions Characterizing a Technology-Rich Introductory Astronomy Course. *Mind, Culture, and Activity*, 9(2), 76-107.

In this report of our research on a computer-based three-dimensional (3-D) modeling course for learning astronomy, we use the central tenets of activity theory to analyze participation by undergraduate students and instructors, illuminating the instances of activity that characterized course dynamics. Specifically, we focus on the relations of participant (student) and object (3-D models and astronomy understandings) and how, in our course, object transformations leading to scientific understandings are mediated by tools (both technological and human), the overall classroom microculture (emergent norms), division of labor (group dynamics and student-instructor roles), and rules (informal, formal, and technical). Through analysis of the data, we interpreted and then focused on two systemic tensions as illuminative of classroom activity. With respect to the first systemic tension, we examined the interplay between learning astronomy and building 3-D models. Results suggested that instead of detracting from the emergence of an activity system that supported learning astronomy, model-building actions frequently coevolved with (were the same as) astronomy-learning actions. With respect to the second tension, we examined the interplay between prespecified, teacher-directed instruction versus emergent, student-directed learning. Our results indicated that it was rarely teacher-imposed nor student-initiated constraints that directed learning; rather, rules, norms, and divisions of labor arose from the requirements of building and sharing 3-D models.

Black, W. (2001). *Benefits of Including a Capstone Simulation Course in Community College Business Curricula*. Retrieved June 22, 2005, from www.ebscohost.com. This article makes an argument for including a capstone, or end-of-term, business simulation course in community college business curricula. The International Business Practice Firm (IBPF), a worldwide virtual business network, is proposed

as a foundation for such a course. The author argues that, in general, graduates of college business programs lack the necessary skills to apply theory to practical business situations, are deficient in the application of technology in business, are unfamiliar with the structural features of a business entity, and lack the global perspective to do business in today's economy. The objectives of a capstone simulation course are in line with recent policy statements from the Policies Commission for Business and Economic Education on the direction community colleges should be taking in their business programs. Benefits of a capstone simulation course include the development of workplace competencies, fostering an awareness of the global business climate, and providing relevant business technology skills. A course of this nature should be flexible to address the needs of career, transfer, and continuing education students. The advantage of an IBPF format for a community college over typical published business simulation games is the ability to integrate hands-on business skills with the managerial decision-making aspects of running a business.

Brawer, F. (1997). *Simulation as a Vehicle in Entrepreneurship Education*. Retrieved June 22, 2005, from www.ebscohost.com.

A literature review explored answers to questions about the relationship between the business world and entrepreneurship education, including the question of whether models of reality actually mirror real-life situations. The review showed that between 1979 and 1994, entrepreneurship education grew phenomenally, whereas business education did not experience such growth and did not change to stay relevant to the current business world. It was suggested that computer simulation in entrepreneurial education could alleviate problems of business education stagnation by offering both situational approaches and theoretical models. Based on real-life situations, gaming and simulation approaches help students formulate their own ideas about engaging in an existing business or creating a new venture. Two types of business simulations, models of reality, exist: one is computer-based and the other is behavior-based. Computer simulations can provide insight and skill practice that later can be translated into real life situations. At the same time, simulations are not an answer for everything. They are not meant to replace conventional methods of instruction but to augment them, and they cannot be too realistic in order that students not be confronted with too many issues, problems, or situations at once. They should be part of a larger process of entrepreneurship and business education.

Bray, H. (2004, April 28). Entertainment with a Learning Curve. *The Boston Globe*. Just ask Kurt Squire. As a high schooler, Squire astonished his history teacher with an intimate knowledge of the 17th-century Caribbean, derived entirely from playing Pirates!, a primitive digital game of the 1980s. Later, as a researcher at the Massachusetts Institute of Technology, he used another computer game, Civilization III, to teach history to low-income youngsters in Boston. After 18 one-hour sessions with the game, the kids "had a base-level understanding of a variety of concepts ranging from monarchy to monotheism," said Squire, "things they'd never heard of before."

Clements, D. H., & Sarama, J. (2004). Building Abstract Thinking Through Math. *Early Childhood Today*, 18(5), 34-40.

Presents an article on building children's abstract thinking through mathematics. Importance of abstract thinking in children's learning process; Rules and principles to be abstracted by children during their preschools; Simple mathematical activities for families for the development of children's abstract thinking skills.

Doyle, D., & Brown, F. W. (2000). Using a business simulation to teach applied skills - the benefits and the challenges of using student teams from multiple countries. *Journal of European Industrial Training*, 25(6), 330-336.

The Business Strategy Game is a PC-based simulation that gives the players experience in developing and implementing strategies. The students run their company in a competitive market setting against other teams. This forces them to take risks and anticipate competitor strategies. This paper is based on an international simulation game involving five teams of postgraduate business students from universities in Ireland, France and the US. The game was run in a "virtual environment" using e-mail and videoconferencing. The attempt was made to simulate realistic competitive conditions as much as possible so that the concepts learned and solutions generated could be transferred from the classroom to the outside business environment.

Gee, J. P. (2004). *What Video Games Have to Teach Us About Learning and Literacy*. New York: Palgrave Macmillan.

Good computer and video games like System Shock 2, Deus Ex, Pikmin, Rise of Nations, Neverwinter Nights, and Xenosaga: Episode 1 are learning machines. They get themselves learned and learned well, so that they get played long and hard by a great many people. This is how they and their designers survive and perpetuate themselves. If a game cannot be learned and even mastered at a certain level, it won't get played by enough people, and the company that makes it will go broke. Good learning in games is a capitalist-driven Darwinian process of selection of the fittest. Of course, game designers could have solved their learning problems by making games shorter and easier, by dumbing them down, so to speak. But most gamers don't want short and easy games. Thus, designers face and largely solve an intriguing educational dilemma, one also faced by schools and workplaces: how to get people, often young people, to learn and master something that is long and challenging--and enjoy it, to boot.

Haywood, M. E., McMullen, D. A., & Wygal, D. E. (2004). Using Games to Enhance Student Understanding of Professional and Ethical Responsibilities. *Issues in Accounting Education*, 19(1), 85-99.

Given recent corporate scandals, the credibility of the accounting profession has been called into question. In order to restore public trust, accounting educators need to devise ways to convey the importance of ethics in our profession to our students. An alternative approach to using a traditional lecture to teach ethics is to use games. The purpose of this paper is to introduce a game strategy to teach ethics and professionalism to students. Using games makes learning more fun and

also helps to maintain student interest and involvement in the learning process. Student feedback has been positive and encouraging on the use of this format to teach ethics and professional responsibilities.

Hoffjan, A. (2005). Calvados - A Business Game for Your Cost Accounting Course. *Issues in Accounting Education*, 20(1), 63-80.

The simple business simulation Calvados is presented, with descriptions of the game, how it can be used in the typical course, and overall learning objectives and outcomes. The author contends student motivation, learning in context, recall of information, teamwork and social skills are all improved through use of the game.

JoWood. (2005). *Industry Giant II*, 2004-2005, from www.jg2.jowood.com.

This company website provides an overview of the various features and options available for Industry Giant II. Links to game information and other websites that feature the game are included.

Orbanes, P. (2002). Everything I Know About Business I Learned from Monopoly. *Harvard Business Review*, March, 3-8.

Phil Orbanes, one of the world's foremost board-game designers, reflects on the objectives of his profession and their similarities to the goals of business management. In addition to his career as a game designer, Orbanes has spent more than 20 years as an executive at Parker Brothers, where he led the research and development (R&D) team, and at Winning Moves Games, the company he founded in partnership with three other game designers. Over the course of his career, Orbanes has developed a set of principles of great game design that deal with structure and entertainment. They include make the rules simple and unambiguous, don't frustrate the casual player, establish a rhythm, focus on what's happening off the board, give 'em chances to come from behind, and provide outlets for latent talents. Orbanes argues that many design challenges have their equivalents in the art of management and suggests that game playing can train for better business judgment.

Pape, S., Bel, C., & Yetkin, I. (2003). Developing Mathematical Thinking and Self-Regulated Learning: A Teaching Experiment in a Seventh-Grade Mathematics Classroom. *Educational Studies in Mathematics*, 53, 179-202.

Mathematics educators have found sociocultural models of teaching and learning to be powerful in their ability to describe and support the pursuit of instruction based on recent standards documents (e.g., National Council of Teachers of Mathematics [NCTM], 1989, 2000). These models of instruction, however, have been criticized for their lack of explicitness. Detailed descriptions of cognitive processes within self-regulated learning (SRL) and attribution theories (e.g., Borkowski et al., 1988; Butler, 2002; Zimmerman, 2000) lend support for and provide examples of explicit instruction embedded within sociocultural models of mathematics instruction. Self-regulated learners are active participants in their own learning, are able to select from a repertoire of strategies and to monitor their progress in using these strategies toward a goal. In this article, we describe the collaborative efforts of a seventh-grade mathematics teacher and a university

faculty member to develop students' mathematical thinking and self-regulation within one middle school classroom. We argue that implementing mathematics instruction consonant with NCTM (1989, 2000) standards documents makes the development of self-regulated learners possible and is at the same time dependent upon some degree of self-regulation within the community of practice. Several factors are crucial to this development: multiple representations and rich mathematical tasks; classroom discourse; environmental scaffolding of strategic behavior; and varying needs for explicitness and support. This work constitutes beginning efforts to describe contexts that support the development of mathematical thinking and SRL in the middle school mathematics classroom.

Prensky, M. (2000). *Digital Game-Based Learning*. New York: McGraw-Hill.

This book considers many aspects of computer and video-game learning, beginning with learning theory and progressing through types and components of games, with emphasis on their learning potential. The author further describes the creation and development of games.

Squire, K., & Steinkuehler, C. (2005). Meet the Gamers. *Library Journal*, April 15, 2005, 38-42.

The article profiles computer games and computer game players. Why pay attention to games? For starters, games are the "medium of choice" for many Millennials, with broad participation among the 30 and under population. Although part of a web of new media, technology, and social shifts, games are the quintessential site for examining these changes. Game cultures promote various types of information literacy, develop information seeking habits and production practices (like writing), and require good, old-fashioned research skills, albeit using a wide spectrum of content. In short, librarians can't afford to ignore gamers. Knowledge seeking and creation is common in digital spaces. Groups of people from around the world solve problems with an array of information, digital tools, resources, screen shots, and arguments. Commercial developers, doctoral students, and 16-year-olds in Nebraska play, think, and learn together. Research is a core component of game play. Gamers find and interpret data to determine where the best hunting is, for example. They also publish results through game forums (official sources) and clan forums (unofficial sources) and build spreadsheet models to compare the effectiveness of strategies. For a generation raised with the Internet, instantaneous access to both information and the social networks for which that information is relevant is the norm. How can librarians respond to this gamer world? One option is to develop a deeper understanding of emergent digital literacies and find ways to put library cultures into conversation with gaming cultures.

Walters, B. A., & Coalter, T. M. (1997). Simulation Games in Business Policy Courses: Is There Value for Students? *Journal of Education for Business*, 72(3), 170-174. Focuses on the importance of business policy as a capstone course and examines the role of individual differences and satisfaction with a business game as a learning tool. Theory development; Methods used in the study; Results of the study on the used of business game by business policy students; Implications of

the study.