A Study On Concepts Of Blended Learning Simulations In Multiplefields

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Abstract: This paper explores the concepts of Simulations in multiple fields. The act of simulating something generally entails representing certain key characteristics or behaviours of a selected physical or abstract system. It is used in many contexts, such as simulation of technology for Production and Manufacturing, performance optimization, safety engineering, testing, training, education, and video games. It is also used for scientific modeling of natural systems or human systems to gain insight into their functioning. It can be used to show the ultimate real things of alternative environment and courses of action. This paper also focuses on blended benefits of simulation in various fields even a number of challenges to address such as critical decisions around simulation components, human-computer interface issues, developing authentic and relevant training scenarios, and integrating appropriate instructional materials for worker-oriented training still it provides benefits to both trainers and trainees.

Key Words: Blended Learning Simulation, Entertainment, Industry, Motivation, Production and Manufacturing, Simulation in Training and Benefits of Simulations.

INTRODUCTION: Simulation is the imitation of some real thing available, state of affairs, or process. Simulation is also used when the real system cannot be engaged, because it may not be accessible, or it may be dangerous or unacceptable to engage, or it is being designed but not yet built, or it may simply not exist. A real world scenario normally does not allow room for error. The simulation allows the instructor to monitor each of which the decisions are made. It also allows for students to make mistakes and learn from these mistakes without the consequences one would receive in a real situation. The role of the mentor has been to provide individuals with experience, knowledge, wisdom, skills and influence to support and promote career development through an interactive relationship.

They help the student to learn to navigate the world of work, provide advice and instruction about jobs, career planning and guidance, orientation to an industry, direction regarding interpersonal development, role modeling, feedback, and guidance to enhance the learner’s growth (Abate & Eddy, 2008, p. 363). According to Powell (2001), for a simulation to be successful, the following elements must be key components of the design: (a) authentic and relevant scenarios, (b) applied pressure situations that tap users’ emotions and force them to act, (c) a sense of unrestricted options and (d) replay ability. When applied to the social systems of current organizations, simulations assist participants in developing a greater intuitive understanding of how different factors interact (Adkins, 2004; Foreman, 2004; Powell).

Simulation is used in different fields developed largely independently. There are three types of simulations. Physical simulation refers to simulation in which physical objects are substituted for the real thing. These physical objects are often chosen because they are smaller or cheaper than the actual object or system. Interactive simulation is a special kind of physical simulation, often referred to as a human in the loop simulation, in which physical simulations include human operators, such as in a flight simulator or a driving simulator. A computer simulation is an attempt to model a real-life or hypothetical situation on a computer so that it can be studied to see how the system works. By changing variables in the simulation, predictions may be made about the behaviour of the system.

One of the first noted uses of games for education and development were the simulation war games of Wei-Hai which were developed in China about 3000 BC (Keys & Wolfe, 1990). Some early examples of the simulations used by the military for training applications are Sparta’s war games used by the Prussian military (Bozeman & Wright, 1994). These simulations were used to practice combat skills or to see how an individual would function when placed in invented simulations (Bozeman & Wright). Simulations have also been used in a wide variety of industries as a way to allow individuals to assume roles and practice competencies that would otherwise have to be experienced in real life (Bozeman & Wright; Picket, 1992). The ability to rehearse strategies and test the status quo is a fundamental driver for the use of simulations (Keys & Wolfe, 1990; Scherpereel, 2005).

In the 1950s, RandCorporation’s simulation, Monopologs, was used to simulate the US Air Force industries management supply system. Monopologs was modified by business in order to provide decision-making experience to entry-level managers without delegating real responsibility, thus creating a safe place to make mistakes and gain experience (Faria, 1987; Keys & Wolfe, 1990).

DEFINITION OF SIMULATION: Jones (1982, p. 5) defines a simulation as reality of function in a simulated and structured environment. This definition shows three essential elements in simulations: Reality of function Simulated environment and Structure.

Participants must step inside the function mentally and behaviorally in order to fulfill their duties and responsibilities in the situation (Jones, 1982, p. 5). The most important part of simulations is having participants accept the reality of function (role and duties) fully, not thinking as
students but taking the role; otherwise the simulation simply will not work.

Acceptance of the reality of function means that a participant who has the function of communicating effectively to do the job. The role of students in simulations, therefore, is (1) taking the functional roles such as reporter, survivor, or customer as a participant, (2) stepping into the event, and (3) shaping the event, carrying out their duties and responsibilities.

In simulations, a provided environment must be simulated. In order to fulfill the essential condition of being a simulated environment, there must be no contact between the participants and the world outside of the classroom. It can provide realistic situations that have functional resemblance to the outside world of the classroom and lead learners to create real communication by offering those roles in which to function.

A SIMULATION
• imitates something real, but
• is not real itself, and
• Can be altered by its users.

A Simulation Imitates Something Real:
Imitating something real is what distinguishes simulations from games. Sometimes people call quizzes simulations, perhaps because it sounds more sophisticated. But if students are just being tested on what they know and not replicating some real behavior or decisions, then the so-called simulation is really just a test or a quiz.

A Simulation is Not Real
Simulations are used to practice at something, not replace actual experiences. The author Rose Tremain wrote, “Life is not a dress rehearsal”. It is also true that a dress rehearsal is not life. Dress rehearsals are like the live performances, but if person make a mistake during a dress rehearsal there are no costs–he just repeat the scene until he get it right. The same is true for other kinds of simulations. Simulations are simplifications of real things. Contrary to what inexperienced simulation developer’s claim, simple simulations are usually better than complicated ones. Complicated simulations make it difficult for the user to extract the handful of valuable lessons that the it is trying to teach because the user gets lost in the detail. Simulations can be better than experience because they compress time and removes extraneous details. Unlike life, simulations are optimized for learning.

A Simulation can be altered:
Simulations are active. Passive lecturing is often easier for instructor and learners– but less productive. Simulations force passive learners into more active learning. Cognitive psychology professor Salvatore Soraci has shown that people are better at remembering things they learn after a mental struggle.

BLENDED LEARNING:
The simulation is blended with other curriculum components of training courses and supports small group learning. A majority of trainees reported simulation trainings as useful learning tools with numerous advantages that support a participatory, blended learning curriculum, and raise awareness of potential work site risks and hazards. Trainers reported that the simulation advanced training impact. Evaluation results indicate that the simulation successfully supports small group learning activities. As Learning Circuits said earlier that “The idea behind blended learning is that instructional designers review a learning program, chunk it into modules, and determine the best medium to deliver those modules to the learner.” Typically this involves mixing various forms of classroom and internet-based training. The cognitive models that students employ in understanding and evaluating technical concepts. This will provide the research community with vital insight into the design of computer simulations for improving higher-order cognitive skills.

ONLINE LEARNING THROUGH SIMULATION
Simulations are also useful in online learning. Online learning has changed the way we impart knowledge to participants all over the world, but it has also created some unique problems. Online learning is highly effective in so many situations, especially if users target audience is spread over a wide geography. Online learning can also have the effect of putting learners out there completely alone, with no interaction with fellow learners or the facilitators. In some cases this is fine, but in some cases a simulation would be an excellent way to go against the norm of isolating learners.

The focus of using a simulation in online learning is to continue the knowledge process and to continue application of that knowledge. Alternatively, user can use the online simulation as the learning experience itself. One way to create an online simulation is through games and live interactions in a team environment. People play games online. Online learning is not to overuse the technology or swing completely to one side of it. One way to balance is to use an online simulation as reinforcement to classroom or seminar-type training interventions. This way, when participants go back to the real world they can continue to apply the knowledge they’ve acquired. But the biggest consideration in using online simulations is to avoid moving interventions into the online environment when they should be live or in the classroom.

SIMULATION IN ENTERTAINMENT
Computer and video games - Simulation games, as opposed to other genres of video and computer games, represent or simulate an environment accurately. Moreover, they represent the interactions between the playable characters and the environment realistically. These kinds of games are usually more complex in terms of game play. Simulation games have become incredibly popular among people of all ages. Simulated business games are found to be an effective learning tool (Zwikael & Gonen, 2007). They identify that the major advantages of simulated business games as a training method are:
 games are stimulating and enjoyable;
 games develop team working skills;
 games offer a risk-free environment;
• participants can try out new behaviours which they would not readily attempt at work;
• games allow people to see the consequences of their decisions (experiential learning).

However, a substantial time commitment is required from participants in order to be effective learners (Anderson & Lawton 2009).

Beginning in the early 1960s, business simulations and games were adapted to mainframe and later PC based computer systems (Keys & Wolfe, 1990; Ng & Ng, 2004). This trend has continued with the application of business games to PC and WEB based systems. The pressures and increasing complexity of today’s workplace are placing greater pressure on individuals and organizations to learn and grow as social systems (Kritz, 2003; Ng & Ng).

Computer based simulations provide a myriad of advantages to the user. First, it can allow a user to participate in an immersive experience in smaller blocks of time (Foreman, 2004; Fritz, 2003). Second, computer-based simulation allows a user to test multiple contents and rehearse strategies leading to success. This opportunity to adjust the reality of a simulation to improve outcomes gives the participant the ability to rapidly practice and reinforce successful strategies (Boser, 2002; Foreman).

INDUSTRY SIMULATION

The current business environment is more complex than ever. The people in organisations, however, remain the same: they are not properly equipped to handle such complex and ill-structured problems. Simulation is an effective technique of business education (Chapman & Sorge, 1999; Wolfe & Luethge, 2003). It can provide rewarding experiences and intelligence, planned decision making and promote the integration of theory and practice (Wolfe & Luethge, 2003) and assist students in integrating the various functional business specialisations (Stephen, Parente & Brown, 2002).

Experience the key business drivers and challenges for each of the key industries below. Participants will learn, practice and apply the principles, behaviors and skills necessary to manage or connect with an industry for success. These simulations are ideal for managers and employees or sales organizations and account teams with major clients in the industry.

MOTIVATION IN SIMULATION

Motivation plays an important role in improving forthcoming ability. If someone is motivated to learn something, it usually produces a positive outcome. Cao (2004) summarizes the distinction between intrinsic motivation and extrinsic motivation based on Deci & Ryan’s work (1985). Intrinsic motivation refers to doing something because it is inherently interesting or enjoyable while extrinsic motivation refers to doing something because it leads to a specific outcome (Cao, 2004, p. 19). Motivation is inherent in a simulation (Jones 1982, p. 10). It is self-generated since motive arises out of function, the duties, the responsibilities and the circumstances in which the participants find themselves (Jones, 1982, p. 10). When people are intrinsically motivated, they not only experience interest and enjoyment but also feel competent and self-determining (Deci & Ryan, 1985, p. 34).

According to Deci & Ryan (1985, p. 256), being intrinsically motivated to learn improves the quality of learning and that those conditions that are autonomous and informational will promote more effective learning. In addition, intrinsic motivation also lowers anxiety (Gottfried, 1982, cited in Deci & Ryan, 1985, p. 256). Since there is no teacher in simulations, learners participate in the activity without trying to please the teacher or worrying about being correct. As Jones (1982, p. 11) states, motivation from function and duty is an essential ingredient in a simulation. Therefore, no effort to motivate learners will be necessary as long as learners accept the reality of their functions. Motivation may also come from the emotional satisfaction or the pleasure of power to make decisions and the enjoyment of interactive excitement.

The simulation environment also provides the benefit of consistent, constant, and immediate feedback. If the simulation is designed to offer feedback at various points throughout the timeline, participants can take the feedback, make corrections, and move forward. Plus, if they have truly made costly mistakes, the immediate feedback helps them right away and not when it’s too late. The best part of immediate feedback is that it leads to immediate application of knowledge. Application is, like experience, a major component of effective adult learning. A well-designed simulation can be an enjoyable, exciting experience for both the participants and the moderator. This benefit essentially serves two purposes. First, user can use the enjoyable application of knowledge as a marketing and promotional tool for the training program and the training organization.

PRODUCTION SIMULATION

Simulations of production systems are used mainly to examine the effect of improvements or investments in a production system. Most often this is done using a static spreadsheet with process times and transportation times. For more sophisticated simulations Discrete Event Simulation (DES) is used with the advantages to simulate dynamics in the production system. A production system is very much dynamic depending on variations in manufacturing processes, assembly times, machine set-ups, breaks, breakdowns and small stoppages. There are lots of programs commonly used for discrete event simulation.

SIMULATION AND MANUFACTURING:

Manufacturing represents one of the most important applications of Simulation. This technique represents a valuable tool used by engineers when evaluating the effect of capital investment in equipments and physical facilities like factory plants, warehouses, and distribution centers. Simulation can be used to predict the performance of an existing or planned system and to compare alternative solutions for a particular design problem.

The Manufacturing Simulation is a 1-Day experience featuring a highly engaging board simulation of a manufacturing company operating in a competitive environment. Participants work together as teams to design, sell, produce and distribute products and follow-on services for their simulated company. They experience realistic situations and make decisions that directly impact company performance. Participants learn, practice, and apply the
behaviors and skills that will enable them to manage a business more effectively and efficiently. Participants receive feedback at the end of each simulation round. Their success is based on how well they meet Growth, Earnings per Share, Customer Satisfaction, and Employee Satisfaction objectives.

SIMULATION IN TRAINING:

Simulation is often used in the training of civilian and military personnel. This usually occurs when it is prohibitively expensive or simply too dangerous to allow trainees to use the real equipment in the real world. In such situations they will spend time learning valuable lessons in a "safe" virtual environment yet living a lifelike experience (or at least it is the goal).

Training Simulations typically come in one of three categories. "live" simulation (where actual players use genuine systems in a real environment); "virtual" simulation (where actual players use simulated systems in a synthetic environment), or "constructive" simulation (where simulated players use simulated systems in a synthetic environment). Constructive simulation is often referred to as "war gaming" since it bears some resemblance to table-top war games in which players command armies of soldiers and equipment that move around a board. In the past, the mention of training simulations brought pictures of modern arena mock-up and controlled burning buildings to mind.

But in today’s environment, a training simulation can occur in a classroom or online with just about any line of professionals. We know that simulations in highly technical or dangerous situations are necessities, but why should we consider using simulations in various aspects of business training, such as strategy, operations, or even leadership. Many times, even in our own professional lives, we find that knowledge is extraordinary but that implementation and function of knowledge is a little further out of reach. Prevailing executive can be trained in the classroom and even on the job, but their aptitude to executive complex strategies is a power that isn’t often tested. If the execution is not quite right, trainees can go back and try again, which is most often impossible in the real world.

Another reason to use simulations in organization is to aid people learn about new processes and new strategies, as well as to help them understand what their goals and objectives really are. If organization is changing direction, as many have during tentative economic conditions, a simulation can help personnel move through the change virtually – and in far less time than in real life. In terms of strategy, consider an organization that has acquired or been acquired. The cultural and operational perspectives of a consolidation are quite large and the organization could take years to adjust to the change.

Trainees can examine their decision making skills, operational knowledge, and even leadership qualities during a well-planned simulation. Another reason to use simulations is the team-building aspect, especially with new teams or organizations. As group members begin to deal with a real-life situation right away, they are able to learn about their team members’ strengths and opportunities and work together for a common goal. Imagine consolidating the “storming” phase of team development into a few days or weeks, versus a few years. And, as we’ve seen recently, organizations must be able to turn quickly and without much fuss if they want to stay competitive.

BENEFITS OF SIMULATION:

When user take the time to consider the methods for implementing a simulation, such as online, written, gaming, group participation, or individual, it’s easy to see that simulations can fit with any type of program. Participants in a simulation are able to learn through performing an action in order to get to a certain outcome. In regular training interventions, and in the overall intervention to which the simulation belongs, all are governed by the outcomes. But the outcome from a simulation is one that comes from experience and not just reading, discussion, and testing.

One of the essential bases of adult learning theory is the experiential component, so user know that adults learn better through experience.

- improved ability to connect learning to real-world situations
- freedom to experiment with new behaviors in a risk-free environment
- opportunity for immediate feedback from decisions
- enhanced ability to teach teamwork and leadership

Experts who cite anecdotal evidence generally assert that students learn more effectively because students find simulations engaging. Students expend more effort when using simulations and more persistently pursue simulation goals because

- Simulations are enjoyable to play, interesting, and build confidence.
- Games involve iteratively playing through analysis-decision-result cycles that provide instant and accurate assessment of performance throughout the exercise.

SIMULATIONS EVALUATIONS:

Typically, a business simulation is just one part of a complete e-learning program or workshop. Preparation, summarization, and testing are essential to help learners interpret and structure their experiences from the simulation.
Knowledge paced sequences are good when the simulation needs to handle students with different backgrounds or skill levels. Students can advance to the level they find challenging. Students can play multiple times at one level.

EXPLORATORY SIMULATIONS

Exploratory simulations are good for educating employees about major company changes or to provide an experience to students. The simulations are intended to provide users with an opportunity to experience what the future might be like for the company or organization.

CAPABILITY DEVELOPMENT CYCLE

It indicates where simulations and scenario-based learning would sit within a learner journey focused on capability development. They are mainly brought to bear within phases two and three of the process, as it is envisaged here. However, there is no reason why learners could not also benefit during phases one and four as reference and refresher learning, or continuous improvement.

CONCLUSION:

The main purpose of using simulations for learning to communicate is to provide an environment where learners have ample opportunity for creating communication. Debriefing after simulation activities is very important. Debriefing is not just summing up the event; in fact, it is the most critical stage of the simulation process. Jones (1982, p. 47) suggests that it would be a good idea to start the debriefing by asking each participant to explain briefly what s/he did and why. Students will have better learning experience if exposed to both simulation and industry mentors in the project management classroom.

There were a number of challenges to address such as critical decisions around simulation components, human-computer interface issues, developing authentic and relevant training scenarios, and integrating appropriate instructional materials for worker-oriented training. Such challenges were effectively met through cross-disciplinary team development. The computer-based simulation provides a number of benefits reported by both trainees and trainers. It offers safety that is often too expensive or impractical to build into hands-on training, and supports small group activity-based learning. Integrated with the existing successful training...
curricula and methods, the computer simulation has supported a blended learning experience that has enhanced and expanded learning and teaching processes.

In situations where the objective of instruction is to learn the facts without application or transfer, method of instruction is not a significant factor. However, if the educational goal is for students to transfer and apply the knowledge to real-world problems, then simulations integrated into the class structure may be an effective learning strategy. Also, these activities should be based on guided exploratory learning and be designed to stimulate students' thinking processes.

It is recommended that further research be conducted to evaluate the effects of using guided-discovery instructional strategies on enhancing the problem-solving ability of students with different achievement levels, using different academic subject material.

References:

3. In the words of the Simulation article in Encyclopedia of Computer Science, "designing a model of a real or imagined system and conducting experiments with that model".