Opportunities in blended learning - how can simulations boost training programs?

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Abstract: With an ever-changing and developing technological environment, we are provided with various new opportunities in education. Using new methods is no longer considered to be a competitive advantage, as participants' expectations are also growing at the same time, but simulations are something that both educators and participants can benefit from.

How can simulations be useful for educational programmes? As an interactive platform, simulations boost motivation for active participation, and the knowledge absorption level gets higher as participants learn by doing; therefore, users can more easily connect practice to theories and concepts.

New approaches open new dimensions in the field of education. A wide variety of simulations are available for trainers and teachers in different focus areas. These allow us to use infinite variations of case studies, or even provide distant learning programs. Along with geographical location, language is also a barrier which has been broken down with the development of online tools.

So how can a new technology make a difference in education? What are the hidden benefits compared to traditional learning methods? In this paper we present examples of how simulations can contribute to the learning process. To demonstrate the advantages of these platforms, we are going to show opportunities through a real life example, SimTeam, a web-based business simulation.

Keywords: blended learning, education, serious games, simulations, knowledge transfer.

1 About blended learning

Education has had many faces throughout the centuries of development, and it has different approaches with their own characteristics. Currently there are three main types of education: instructional or face-to-face learning, distributed or distance learning, and the mixture of these two, so called blended learning.

1.1 Instructional education

Face-to-face education is the education method when both the teachers and students are in one physical location, and during a class the teacher is speaking while the students are listening and taking notes. Currently this method is the most widely used around the world, as

to graduate from most courses there is a need to have contact teaching hours – even during correspondence learning courses, where there are personal meetings among the teachers and participants usually at least once a month.

Instructional education method has some sub-categories, too. One of them is frontal instruction, also called teacher-centred education. This is the most common method of teaching, when the teacher stands in front of the class and the students are listening and taking notes. On the other hand, there are also education methods where students are more in the centre, and these are usually called participatory learning where students can learn in groups and in a more interactive way. The latter method is used as a complementary exercise for instructional teaching, when students can discuss certain topics and solve questions and tests together.

1.2 Distributed learning

The second main type of education system is distributed learning, where students gain access to learning material regardless of their location or current time zone. Learning materials are typically text-based, but it is not limited to this format, as videos, sound recordings, multimedia-rich presentations, and other interactive forms are also emerging. Distributed learning also gives us the opportunity to interact with the students in online forums or chat boards, and they can interact with each other as well; thus the new technology gives more interactivity for the classes and encourages discussion among course participants. The key of distributed learning is that every student can gain access to new knowledge even from home – which is an especially big advantage for people with physical disabilities or travelling issues.

There are virtual learning environments provided both by universities and public educational institutions or online course websites like Coursera, Khan Academy, or TED. These environments provide online communication opportunities among participants and even educators, thereby creating a community with cohesive influence. Moreover, students can see archived documents, videos, and other materials related to the courses, which makes knowledge absorption, understanding, and organization even easier. Education in distributed learning systems is usually self-paced, which means students can progress at their own tempo.

1.3 Blended learning

The third main type of education is blended learning, which is a mixture of both the above learning methods, that is, frontal instruction combined with elements of distributed learning. But there is no consensus about the exact definition of blended learning – the method varies from institution to institution, and there is no fixed ratio of the methods. Blended learning can mean multiple things based on how one utilizes it [1].

It can mean any of the following:

- Mixing education tools, for example: using presentations, videos, etc. in classrooms during courses.
- Mixing educational methods, like group sessions, computer labs, internships. This, in other literature, belongs to the category of instructional education.
- Mixing traditional classroom practices with web-based learning or other digital technologies.

Our paper focuses on the last definition, which is the most widespread interpretation of blended learning these days. This type of learning consists of frontal instruction and different web-based (or more precisely, technology-based) tools, for example, online document management, online seminars and exams, simulations, or other e-learning methods and tools.

Education is also affected by the improvement of technology in our days, and new devices and digital methods can perfectly complement traditional face-to-face education. Still, however, human interaction and instruction is necessary to provide instant feedback and to answer students' questions. As a research points out, "The real test of blended learning is the effective integration of the two main components" which are face-to-face and Internet based technology [2], as "it represents a fundamental reconceptualization and reorganization of the teaching and learning dynamic." As each training session or course has different characteristics, no two blended learning designs are identical. For every purpose we need to find the mix of tools.

1.4 Current trends and reception

It is important to note that the current technological development is not a new trend. It has been ongoing for decades now, but the new technologies and devices are released faster than ever, and the time interval to adapt to these changes in order to gain competitive advantage is becoming so short that using new technologies is no longer considered to be an advantage, instead it prevents you from falling behind in the market.

Current trends in development show that demand for interactive technologies is rising, as it is easier to have more effective courses with these methods and tools. As new technologies appear, the end-users—in our case, the course participants—and students in general have higher standards and expectations, too, as well as developing new learning styles and methods. According to Dr. Edward Westhead of the University of Massachusetts "Traditional schooling provides very little compared to the rest of the students' world, so it generally isn't that this generation's students can't pay attention, it's that they choose not to. New generations crave interactivity" [3]. If we want to adapt to this new, selective way of student involvement, we can use interactive methods such as group sessions, computer labs, games, or simulations—some of which were not available in the earlier years of education. Therefore, student engagement can be increased, and students are more likely to convert the learning material into practical knowledge.

Teachers can utilize the given class hours to make more effective lessons. Students can prepare for the classes in advance by downloading the necessary material from an e-learning system, read it through, and even fill out an online quiz to test their understanding of the topic. Then during classes they can focus on the topics which are hard (or even impossible) to understand without a teacher's proper explanation; and they can spend more time practicing, experimenting, and discussing the topics with fellow students and the teacher.

In higher education, utilizing e-learning tools is becoming widespread, mainly because it is easier to have organized learning materials, but currently available virtual learning environments can even provide the opportunity to test students via online exams (at home, or in a computer lab under the supervision of the teacher). There are examples of high schools using similar online learning systems, too. If students can prepare for classes in advance, there is more time to learn how to convert theories into practice. For teachers it is not necessarily easier to prepare for classes. Actually, blended learning methods require a longer preparation

period, but considering the increased student involvement and activity, incorporating these tools can be very rewarding.

Blended learning's huge trend is not limited to academic areas, as it is getting more and more popular among corporate training and development programs, too. In the corporate sector blended learning methods are applied in Assessment / Development Centres, in talent development and in future leader programmes.

2 Educational simulations

2.1 About game-based approaches in education

There are various tools and methods to make courses interactive. Apart from group sessions, presentations, or other individual challenges, teachers or corporate trainers can create game-based activities in order to make classes more fun and engage students so that they pay attention to the teacher's words.

When they face game-based educational tools, participants experience a pleasant way of learning. In addition it also means the easier understanding of new topics in a practical way. During the exercises, they can be inspired by competition. There are multiple kinds of game-based exercises, including board games and other group activities. During these exercises participants play a certain role and use their skills and knowledge to solve upcoming problems. Using these activities as a learning method goes back centuries, when it was used to improve military strategic thinking and planning. The military was very interested in simulating the battlefield and also in using games as training mechanisms for the thousands upon thousands of soldiers and others that it had to train every year [4]. Since then, games and simulations have made their way into different sectors of education, like business and medical courses.

These activities follow a game-thinking approach, which means they let participants experience new material and knowledge by means of game play, which, if applied in the correct way and for a suitable audience, encourages active participation and enhances knowledge absorption levels with learning-by-doing methodologies.

At this point let us investigate game-thinking in general. As Richard N. Landers et al. at Old Dominion University point out in their chapter titled "*Gamifying, Recruitment, Selection, Training, and Performance Management: Game Thinking in Human Resource Management*", there are two major forms of game-thinking [5].

The first is **gamification**, that is, using game elements in non-game contexts, while the other is **serious game**s, defined as games used for a primary goal other than entertainment. Popular examples of gamification are leader boards, while serious games are often used for recruitment, assessment, training, and education purposes. There are serious games in medical education, too: medical students often use artificial bodies to practice operations or CPR.

Serious games are generally used for recruitment, assessment, training, and other education purposes. The utility of a serious game is highly dependent on what it was designed for. The user should carefully set the targets of a serious game.

2.2 Simulation as a serious game

We have chosen simulations as the main topic for our paper because it is an emerging trend in blended learning, especially with recent technological developments and the advent of the digital world. Simulations are among the most engaging and emerging means of blended learning.

Simulations typically have a definite beginning and ending, but the nature of simulations means that there are several possible outcomes. Educational simulations are typically group exercises during which participants have individual responsibilities and make their own decisions with immediate effects on the simulation's outcome.

All games and simulations are there to fulfil common purposes, like practicing acquired knowledge (thus connecting theory with practice) or highlighting those areas where the participant needs improvement. They can also be used as an extra activity to motivate learning for students or for corporate training participants. Simulations are also widely used by companies to assess employees.

In education, practice-oriented courses can be extended with simulations, providing a means to test the acquired knowledge in lifelike situations. A simulation can be a learning activity where both educators and participants benefit. The interactive elements of simulations motivate people to more active participation. During these sessions the knowledge absorption level gets higher as participants learn by doing; therefore, users can more easily connect practice to theories and concepts. If applied correctly, simulations can enhance course effectiveness and participant motivation. But simulations should not necessarily take up the whole length of the course: sometimes they are better used as a complement to traditional learning methods, to practice skills after gaining the theoretical knowledge during classes.

Teachers and trainers can instruct participants by practical exercises where the emphasis is on learning by doing. Teaching may become more effective as participants engage with the simulation platform and pay more attention to the class and understand the topic better. The efficiency of the course can even be improved by providing certain incentives to them, like encouraging competition among participants or challenging them with situations they usually don't face.

As Jeremy J. S. B. Hall highlights in his paper „*Why use business simulations*", there are multiple reasons why the application of simulations might be useful and there can be several targeted outcomes that could be targeted by using simulations [6].

There are various **skills, which can be practiced** via simulations. These skills include analysis and diagnosis, decision-making, problem solving, teamwork, presentations, or any combination thereof, and extended with specific focus topics like strategic management, change management, or crisis management.

Simulations create an **atmosphere of competition** and enhance **motivation** and **engagement**. Participants can get enthusiastic about—even carried away with—simulated environments. Business simulations in particular generate excitement (the thrill of competition!) among the participants as the teams vie against each other.

Simulations are a great way **to assess and evaluate** participants in both academic and corporate environments. During educational courses, simulations provide continuous feedback to check whether participants grasp the course material and can put it into practice. In corporate environments, verifying employees' capabilities before promotions or

development programmes is crucial, and a business simulation provides a customizable toolkit which can be tailored to the particular position's requirements and challenges.

Studies show that different learning approaches have different retention rates. If we apply a practice-by-doing approach via simulation, we can see retention rates of about seventy-five percent [7]. When combined with traditional learning methods, business games increase efficiency of learning and help students make the connection between theoretical knowledge and professional challenges which they will probably face in the real world.

2.3 New opportunities in using simulations

Simulations have gained ground with improvements in technology. Computer-based simulations give us a wider spectrum of usage areas and a higher level of customizability. Adapting to current generations, digital simulations have proven to be a more interactive and engaging platform for participants who feel comfortable using the newest digital tools. We can define some additional advantages of advanced technology in education beyond the ones previously mentioned:

Immediate feedback and tests: With web-based learning environments, teachers can evaluate students in real time and in easier (often automated) ways. There are possibilities for different kinds of tests, quizzes, and tasks that can help students understand the material and get prompt evaluation. On the other hand, teachers also benefit from these tests, as they can get an overview of student performance in different sub-categories of the course and at various difficulty levels; therefore, they can manage class time more effectively and focus on more problematic areas.

Multiple languages: with online platforms it is easy to customize content for international end-users, therefore you can provide learning environments in different languages at the very same time, taking education to the next level. While translating the whole learning material can be a timely and costly procedure, providing an education environment framework in the participant's own language is still a major progress. If the main language of the course is English, there should not be a problem with the learning environment's accessibility, still it can give something extra to participants if they can access main content in their own languages.

Distance learning: Virtual learning environments only need a web browser to be accessed, so you can log in from any corner of the world where you have a computer and an internet connection. Distance learning is becoming a more popular learning method for various reasons. Some students don't have time to visit school because they work. Some would like to visit a university or a course on the other side of the country. Some may not go because they are struggling with disabilities and simply can't.

Online platforms provide opportunities for **gamification tools**, for example leader boards or competitions and challenges among participants, which makes learning even more engaging, therefore knowledge absorption levels could further increase when participants are actively involved. Game-thinking is an emerging approach, as it enhances involvement and the efficiency of knowledge transfer.

3 SimTeam – An example of a successful simulation platform

SimTeam is designed for trainers, business school teachers, and HR managers for various education, assessment, and development purposes. The simulation is web-based, so the only thing our users need is a computer with a browser and an internet connection. SimTeam is an online business simulation platform with a wide variety of customizable options so that it can adapted to almost every need.

During the simulation the participants are divided into teams of three or four people who manage virtual companies. SimTeam simulates a competitive market in which each company tries to win projects on the project market, and they generate revenues by successfully completing these projects. The competing companies can influence clients' behavior by offering lower (or higher) project prices and earlier (or later) deadlines, and the companies gain and lose know-how and image ratings that also affect their appeal to clients. In order to successfully complete projects, the virtual companies need human resources. New employees can be hired on the labour market, where the same competition among teams applies.

During the execution of the projects, teams need to match both the professional preferences and the experience of their employees to each project's work requirements and deadline. The teams can also take risks like assigning employees with insufficient experience or capabilities to a project. But taking too many risks can result in unexpected events that may affect completion of the project—or even the operations, finances, and future of the company.

Participants must manage the company's finances as well. They should calculate expected cash flows request for credits or loans if necessary. They are encouraged to interpret and evaluate financial results, and they are supported with automated business reports and financial statements—although effective participation is not dependent on special financial knowledge.

Via the real-time control panel, the simulation's story and the available human or client resources can be altered at almost any time during the simulation. With this flexibility, elements like a lack of resources or an increase in time pressure can be easily built into the simulation.

Some of SimTeam's functions that make the platform highly adaptable to current trends and needs:

With a **flexible** simulated market, it is always possible to change the simulation scenario (projects and human resources appearing on the virtual markets). Therefore SimTeam simulation can be configured with hard-to-predict situations that require participants' full attention in a fun way. Possible challenges you can provide to participants include, but are not limited to, the following examples:

- **Missing or unmatched resources:** Current employees' abilities do not match the needs of the projects, or there are no potential employees on the labour market with the necessary orientations.
- **Changing market trends:** You can create a situation where students must adapt their companies to new circumstances. They can assign their virtual employees to corporate education courses to gain new competencies.
- **Dissatisfied employees**: If workers are bored or underpaid (a unique trait of SimTeam), they might leave the company. SimTeam emphasizes intellectual assets like know-how, experience, and employees' competencies and preferences.

- **Time pressure**: The teacher can impose deadlines to create more exciting experiences for students and to see how they react when quick decision-making is necessary.
- **Budgeting**: Participants are also required to plan the virtual company's budget. If they want to keep the company viable and profitable, they need to calculate expected incomes and costs.

SimTeam combines the advantages of instructional and distance-learning methods. It is an engaging program for students, and they receive continuous feedback and new knowledge from teachers. SimTeam integrates game-thinking, and as an educational and training tool it is a serious game concentrating on business skills, e.g. leadership, teamwork, decision-making, strategy creation, and financial analysis. It is available in multiple languages.

As we mentioned earlier, serious games are designed for certain knowledge areas. SimTeam has more than ten pre-determined focus topics, and participants can approach these subjects from different perspectives. The simulation is suitable for knowledge transfer in a number of focus topics, which include but are not limited to the following:

- Strategic management and strategy formation: Participants lead a virtual company, where the strategy is based on complex decisions among the corporate functions. Participants can develop their long-term thinking and consider the company as a whole as opposed to concentrating only on their specialty.
- Change management and crisis management: Students and trainees can learn how to adapt to changes that affect their company's operation, even if those changes are drastic and require immediate action.
- Team building and team dynamics: Whether for corporate or academic training, team building can enhance collaboration and communication among participants.
- Various human-resource-related exercises: SimTeam can be used for assessment or talent development, therefore it is suitable for corporate use.
- Financial management: Participants can improve their understanding of the fundamentals of accounting, financial statement analysis, controlling, planning and forecasting, cash flow management, and corporate valuation.

SimTeam encourages competition and allows the deep involvement of participants, which results in enhanced knowledge transfer and a positive training atmosphere.

3.1 Experience of SimTeam

How have blended learning's benefits become reality in simulations, particularly in SimTeam? As we have already discussed in the previous sections, blended learning has competitive advantages over traditional education methods. These included the following, as highlighted by Jeremy J.S.B. Hall:

- Motivation and engagement
- Skills development and practice
- Assessment and evaluation
- Enhanced learning
- Exploring and challenging knowledge

What are the experiences of participants? The literature on game-thinking and serious games has divided opinions, and there is no comprehensive knowledge on digital serious

games, so we consider ourselves lucky to have first-hand experiences from SimTeam simulation's participants. SimTeam has been used for different purposes; it is widely used for education, training, and different HR related exercises like assessment or development centres.

So what are our experiences with simulation training?

- The software has been already used internationally among different cultures, and regardless of their culture of origin, participants enjoyed the training and got carried away with the tasks and exercises that came up during the session.
- There are some differences among participants based on gender. Although men are usually more open to competition, this does not mean that women do not participate actively in a SimTeam-based training session.
- People who are less familiar with computer technology may not feel as comfortable using the platform, but most of the participants easily understand the environment.
- Based on feedback, the motivation of the participants is usually higher than in traditional training and educational events.

As SimTeam is an online platform, it is easy to join from a remote location via a web browser. At the same time the participants also need some kind of communication tool. For example, if teams are in separate locations but have a Skype connection, or the training organizer publishes a live webinar for the event, they could easily compete with other teams from a distance while still getting information from the trainer.

Automated financial functionalities allow participants to examine cash flows and financial effects of the simulated corporate operation. SimTeam has a general ledger, a balance sheet, a profit-and-loss account, a cash flow overview, and graphical annual reports, which help in understanding the financial situation.

SimTeam simulations can engage up to three dozen people in the same event. Multiple simulations can be held simultaneously, too. With different scenarios or configurations, SimTeam can be ideal for short- and long-term programmes; it can actively engage participants even during multiple-day programmes.

4 Summary

As technological development constantly opens up new opportunities, innovation is becoming more prominent in education, too. There already were methods which could enhance learning efficiency and participant engagement in both academic and corporate fields of education, but recent developments give us the chance to utilize digital simulations with unlimited variations to create an engaging, interactive means of education or training.

One of the biggest benefits of a simulation is its engaging content that makes participants get involved. With programmable digital simulations, there is a wide variety of customization of variables in the course of the activity.

With the simulation that we used as an example, participants manage virtual companies, and they compete in teams, coping with challenges and difficult situations in both the project market and the labour market. Trainers, teachers, and HR managers can use ready-made business scenarios and can also customize a bunch of variables like training difficulty, market situations, and financial situations if needed.

Simulations enhance motivation and engagement by introducing a competitive atmosphere. The learning-by-doing methodology increases knowledge absorption for participants as they can connect theory with practice via realistic situations. Simulations are great tools for assessing and developing skills both on corporate and academic environments.

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