The Broad Value of Simulation Across Pedagogies to Enhance Student Capability in Post-Secondary

Business Administration Education

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Abstract

This paper is set within the context of my intersecting personas as educator in a post-secondary business school, student in a Master of Education program, successful marketer and a former Bachelor of Business Administration student. Each formative section of my life either exposed me to the benefits of simulation for business learning or deepened my belief that these teaching tools are valuable to students and educators. I argue that business school educators can use well-structured simulation options within their learning tools regardless of their pedagogical philosophy and that the inclusion of these tools improves student learning outcomes. As instructors are more likely to select tools which fit their pedagogical philosophies, assessing the fit of simulations with high frequency of use pedagogies assists in understanding its broad value. The ability of students to achieve deep learning is linked both to the attitude of the student and the instructor approaches to challenge at higher levels in Bloom's Taxonomy (Anderson & Krathwohl, 2001), so identifying tools that deliver on both is critical to maximize potential outcomes for students. The implication of these two benefits is that simulations should be used more broadly within business schools and courses. This assertion assumes that well-structured simulations exist to support the learning objectives and that students can reflect on their experiences to fully embed and understand their learning outcomes. Beyond in-class outcomes, simulation may also afford post-secondary business schools the ability to offer certifications or advanced standing in post-graduate programs to better reflect real world learning experiences.

Keywords: simulation, business administration, post-secondary, pedagogical fit, student comprehension, student capability, assessment

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Chapter 1: Introduction

The use of simulations in undergraduate and post-graduate business administration programs is widespread and longstanding (Tanner et al., 2012). They have persisted in use even as other teaching techniques may ebb and flow due to the general belief that the challenges help students internalize and apply multiple concepts concurrently. Simulation programs attempt to contextualize the complexity of the real-world challenges of managing companies (Naylor, 1971 as cited in Schmuck, 2021).

Background

Simple business simulators were introduced in 1956 (Cohen & Rhenman, 1961, as cited in Tanner et al., 2012) by the American Management Association and over time expanded to simulations as defined later in this article. Their use in business schools has grown in popularity since that time for a variety of reasons including the view by faculty that they are an efficient use of time and effective teaching tools (Tanner et al.) and are well accepted by students (Lainema & Lainema, 2007). There are a wide variety of pedagogical approaches used in higher education today (Sepp, 2021; Hammad et. al, 2020) and there is significant research supporting the use of simulations where outcomes can be well aligned to the pedagogical goals. Further, simulations appear to fit well for both students and faculty in both a synchronous and asynchronous delivery method pointing to its broad and multifaceted value as a teaching tool (Chandna & Newaz, 2023; Anderson and Dron, 2011; Maher & Hughner, 2007).

Simulations and games are terms that are often used interchangeably, and while they are similar, they are not quite the same. Narayanasamy et al. (2006), drawing on ideas from Sauvé et al. (2005), assessed games, simulations and simulators across seven identification characteristics. The only material difference between a game and a simulation is the end state. Games have a pre-defined and known end state while simulations may, in theory, run for as long as the participants wish to engage in the

simulation. For this paper, business simulations are defined as computerized reenactments of real-world situations which allow participants to set distinct strategies and adjust the inputs of the business to match those strategies with the goal of outperforming a defined opposition. As supported by Narayanasamy et al., complex simulations involve competition with others while simple business games, such as Lemonade Stand (coolmathgames.com, n.d.), do not have the vector of competition nor of multiple strategic inputs to adjust to fit strategy and are excluded from the analysis.

My Business Education Journey from Student to Teacher and Back Again

During my undergraduate business degree at Wilfrid Laurier University, I was focused on understanding the interactivity of business processes across various areas of study. With a long-term goal of becoming a corporate lawyer, the need to understand this interactivity appeared to be a critical knowledge base to be able to effectively assist and instruct corporations in negotiating the intricacies of the legal landscape and to implement the decisions of company leadership across the entirety of an organization. While this did not become my ultimate career path, it did prepare me to become a marketing strategist at major international packaged goods companies. While attending university, I also began my training as a teacher through my work as a teaching assistant for the introductory business course. Early in my career, training and development became an important requirement of the work I was conducting. Developing, *i.e.* teaching, the skills my direct reports needed to succeed was a requirement to move upwards in the organization. I was able to translate this growing skill into the opportunity to teach within the Marketing and Behavioural Science division at a highly rated business school. Discovering, through this teaching work, that I enjoyed working in the classroom far more than in the boardroom, I have expanded the scope of my teaching responsibilities over the last seven years. To solidify my bona fides at the school and to expand my understanding of the underlying reasons for the approach I took to teaching, I reengaged as a student to complete a Master of Education at Thompson Rivers University. I have focused my learning journey at TRU on both the philosophical underpinnings

and practical tools to help advance the learning experience and outcomes for my students. Through the experiences of learning about various pedagogical approaches, and the reinforcement of this learning through multiple different classes in the program, I have been able to generate a comprehension of my own teaching approaches including an understanding of why simulation as a teaching tool speaks so clearly to me. Learning about Dewey (1916/2024) and the modern educational philosophers who base their thinking on his foundations has assisted in understanding why I value doing and practice with a practical application to the real world as a critical deliverable in my classes. Further, the understanding generated in various M.Ed. classes about the opportunities, challenges and limits of technology in delivering exceptional student learning experiences has made me more cognizant of how to optimally deliver simulation tools for my students' context.

Simulation as an Important Tool in my Strategic Marketing and Teaching Career

The first seminal learning experience I had at Wilfrid Laurier University was in a second-year course in Managerial Decision Making. The purpose of this course was to help students understand the interoperability of the four core business functions of marketing/sales, finance, operations, and human resources. The major portion of this course was a 10-round competitive challenge using a simulation game called Markstrat. This program required students to manage a business and make critical and interrelated decisions around brand positioning, sales strategy, research and development and advertising. Teams submitted their decisions to a central hub and a computer program took the inputs from 5 different teams in an industry to determine which was doing the best job in fulfilling consumer needs. This challenging project provided an eye-opening understanding for me on a variety of aspects of business operations, but most relevant to my personal journey, helped me to understand the value of a distinct business strategy along with a clear understanding of the needs of consumers and how meeting those needs with excellence provided a path to business success. Moreover, the work with other skilled and capable business students demonstrated the value of team work to achieve greater results than any

individual on their own. This learning began a critical reassessment of my expected career path and pushed me towards a more formal and active business management role which focused on using these interrelated tools to achieve real world business success. As would be expected based on the learning foregrounded in the literature review of this paper, I experienced this simulation as both a tremendous approach for integrating learning from various vectors while also achieving an improved perspective on the value the course instructor was providing to students.

When I returned to the formal classroom as an educator, I was keen to integrate simulation into the instructional approach I pursued. In classes covering marketing analytics, marketing strategy and business development, I have been able to find simulations, including the current version of Markstrat, that support my learning objectives and allow students with various learning styles to apply their learning to a real-world situation. I see students reacting to the inclusion of simulation in the same way I did, as an eye-opening path to understand how learning across various functional areas can come together for business success and that schoolwork can be fun.

Importance of the Topic

To assess the importance of the topic, it is important to return to the *raison d'etre* for most business schools. Canada's leading (Macleans, 2024) business school, UBC Sauder, articulates its mission:

> "as part of one of the world's finest public universities, we pursue excellence in research and teaching to inspire and educate responsible leaders who improve business, drive innovation, and advance well-being in British Columbia and throughout the world." (UBC Sauder, 2023)

Embedded in this mission is excellence in teaching. Learning regarding optimal teaching approaches centered on the student experience evolves over time (Kinshuk et al, 2016) but pedagogies across the spectrum of options all contain a goal of students achieving a desired learning outcome even if they differ on the approaches or expected applications of same (Lozano et al, 2017). Consequently,

understanding the various tools available and how they can advance or detract from those learning outcomes is an important opportunity for educators to enhance their classroom approach.

In the case of business schools, the overarching, if unstated, goal of the program is to make money for the university. As with a consumer-facing business, this is achieved when a buyer associates a high level of value with the product you are selling (Aaker, 2004). By ensuring that current users, students, are happy with the product and that they can be seen using it effectively, the seller, the school, increases the likelihood that future buyers will also purchase the product. Educators who do a better job of delivering these learning outcomes will have greater success in, and for, their schools.

The Thesis for Business Simulation Inclusion in Business and Administration Programs

In this article, I argue that the use of simulation games should be expanded in business and administration post-secondary programs and used wherever strong simulation programs exist to advance learning objectives. Through the literature review, I will show that this is because business simulations are a strong fit with most pedagogical approaches seen in leading business schools, particularly those pedagogies that are descended from Dewey's (1916/2024) concepts. When *doing* is a key aspect of a pedagogical approach, simulation, particularly when combined with case study, is a strong fit on a pedagogical basis (Sepp, 2021; Hammad et al., 2020). Further, the use of business simulation leads to improved achievement of student learning objectives with a strong linkage to occasions when instructors are seeking to deliver more challenging objectives according to Bloom's Taxonomy (Anderson & Krathwohl, 2001). Instructors are constantly challenged to elevate their learning objectives in the areas of including analyzing (Schmuck, 2021; Lainema & Lainema, 2007), evaluating (Chandna & Newaz, 2023; Schmuck 2021) and creating (Wollscheid & Skjelbred, 2021; Ben-Zvi & Canton, 2007). In each of the previously noted papers, business simulations are shown to forward the noted objectives. Additionally, students report deeper engagement with materials and concepts, which contributes both to superior completion of learning objectives as well increased student perception of teaching quality (Arizzi et al,

2020; Maher & Hughner, 2007). While teaching effectiveness is a secondary consideration for many faculty, the use of the tool does improve these scores. Finally, success in simulations is not tied to intelligence or personality but rather concept understanding and hard work (Wollscheid & Skjelbred, 2021) which allows instructors to separate exceptional students from the balance of the class. Beyond the rational for the use of simulation I will add colour by showing how these approaches have useful application to my own teaching and demonstrate some important implications for universities and the wider community for using the outcomes of simulation exercises for improved grading and hiring.

Counterarguments

This argument is contestable on two fronts. First, there remain educators focused on a behaviourist (Mechlova & Malcik, 2012) approaches to instruction and that this pedagogy is a poor fit with the personal and constructivist (Mattar, 2018) approach required to build a credible learning experience using simulation. Second, that barriers such as access to hardware and bandwidth may limit student access and create barriers to learning that other tools do not create (Educause, 2021). While these can be acknowledged as limitations to be addressed by educators when considering simulation, they do not rise to the level of exclusionary rationale. In fact, given the prevalence of use of simulation in business school teaching, it could be argued that the acceptance of simulation in one class should lead to the strong consideration of inclusion in others if the simulations are rated similarly.

Summary

Simulation models and modules are a valuable tool for educators in a business school environment who approach student learning from a progressive lens. I have had success with these tools as a student, a business professional and as an instructor teaching business concepts. Because simulation can be applied across a broad range of teaching styles and philosophies with success and due to the improved nature of student outcomes using simulation it can and should be utilized across a broad range of business school classes where capable models have been developed.

Chapter II - Literature Review

The literature supporting the use of simulation clusters around four general areas which will be expanded on here. The first is the value of simulation to various pedagogical approaches, the second is the depth of knowledge transfer students achieve when from simulation when used with other learning approaches, the third is the learning outcomes achieved by students with the use of simulation and the final is learning supporting why simulations work to achieve their stated goals. While there are countering views either questioning the value of simulation as a whole or in relation to other teaching tools, this work is limited in scope as compared to the volume of work supporting its use. Consequently, it seems clear that the balance of the literature supports the use of simulation in a business administration teaching environment across a broad range of pedagogies and subject matter areas.

Overview of Major Pedagogies and Linkage to Simulation Use

The use of simulation in a particular business course is driven by the fit between pedagogical approach of the instructor and the availability of a strong tool to fit with the subject matter at hand. Given the shifting nature of topics to be covered in business programs, this paper will not attempt to understand the quality and fit of various available resources but rather examine how the literature suggests a fit between pedagogical approaches. As far back as Dewey (1916/2024), education philosophers have looked to experience paired with understanding of concepts as a process to maximize benefits to students. In a more modern setting, Hammad et. al (2020) identified multiple pedagogical approaches used in higher education including constructivism and active learning, behaviourism, direct instruction, cognitivism and social learning theory and connectivism. Each of these, as covered below, are connected back to Dewey's constructs in one form or another.

Constructivism

Within constructivism theory, learners are believed to learn in a holistic way by understanding their external environment through the previous experiences they have had (Mattar, 2018). Essentially,

this theory supposes that all learners are unique and learn in a unique way and that all learning is scaffolding to future learning. Learners either assimilate new information into existing cognitive structures or they accommodate it by modifying those structures. (Hammad et al., 2020). Simulation is a strong fit with this type of pedagogical approach as it is iterative in nature. That is, the student receives feedback from each choice they make via the outcomes provided by the simulation. Using that feedback, they modify or adapt their theory of success and make new decisions.

Direct Instruction

Direct instruction uses a highly prescriptive approach with a precise order of materials and is somewhat at odds with inquiry-based learning (Datchuk, 2017). While the learner is not at the focal point of the learning process, the emphasis on practice within the approach lends itself to using simulation to generate that practice. It also has value as an assessment tool that permits the instructor both close observation and feedback.

Cognitivism

A replacement theory to behaviorism in the 1960's, cognitivism focuses on using mental approaches to explain behaviour. Under the umbrella of cognitive learning falls sub-theories of constructivism and developmentalism (Hammad et al., 2020). As an objectivist view, cognitivism imputes that information and knowledge exists beyond human comprehension, unchanging (Harasim, 2012). This links with using simulation as an approach as it allows the user to seek to comprehend the system in which they are operating and attempt to understand and deconstruct it to their advantage during play.

Social Learning Theory

Social learning theory suggests that learning and knowledge are generated through social processes (Bates, 2019) and that "learners learn from observing and interacting within social and cultural contexts, e.g. social learning environments." (Hammad et al, 2020) Social learning is an offshoot of cognitivism because it assumes that individuals can learn and reason for themselves. Simulation is

effective in this type of pedagogical approach because the simulation is, itself, a social environment where interaction with other teams is fundamental to both the learning experience and success in the game.

Connectivism

Connectivism emerged in the last 10 years in response to the proliferation of social media networks and other on-line engagement tools. The theory centers learning around technology and organizations within a data rich environment (Siemens, 2018). While there are multiple tenets to the construct, for the purpose of this analysis two from Siemens are highlighted which can be linked to the use of simulations to promote learning within the theory:

1. Learning may reside in non-human appliances. For example, the simulation itself may possess the knowledge and assist in transferring it to the student.

2. The ability to see connections between fields, ideas and concepts is a core skill. This is an important learning deliverable for most complex simulations.

Learning by Doing

Perhaps the most obvious and directly descendant theory from Dewey (1916/2024), learning by doing is an extension of experiential learning theory. It suggests that when learners perform the tasks they are learning on their own, the learning is deepened and more meaningful (Feng et al, 2013). It is one of the few learning approaches that has been validated to deliver superior results in specific situations (Leyer et al., 2014), particularly those where knowledge is created by the personal transformation of the experience itself (Feng et al.) which is consistent with the use of simulation.

Other Theories

When these main pedagogies are not primarily used, other technology focused pedagogies were identified by Sepp (2021) including Gamification and Game-Based Learning, and Place-Based and Mobile Learning (also Traxler, 2007). These secondary approaches all linked to, or value, a doing orientation

model for learning. While the focus is more specific to sustainability, Earle and Leyva-de al Hiz (2021)

argue that simulation can pair with most pedagogies to assist in the education of wicked problems which

are generally more complex and require "system-level problem solving" (Earle & Leyva-de al Hiz, p.582).

This type of thinking is required for most upper-level business courses. Loon et al. (2015) argues for

simulation as a pedagogy unto itself and while this is appealing for its simplicity, it ignores the work of

authors such as Tanner et al. (2012) and Lainema and Lainema (2007), who both concluded that

simulation was a strong partner within other pedagogical approaches.

Summary

There are multiple pedagogical approaches identified as active within the higher educational

learning environment and, by extension, the business schools within those organizations. Because each

of those approaches have a doing or active experience component to them, the use of simulation will be

a fit with the teaching approach most comfortable for the instructor. Table 1 identifies an overview of

each theory and assesses the fit with simulations as opportunities for passive and active learning tools

relative to the theory.

Table 1

Pedagogical Approaches and Fit with Simulations (from Hammad et al., 2020 and Sepp, 2021)

Pedagogy	Key Focus	Simulation Use	
		Passive Use	Active Use
Constructivism	Holistic, learners make sense of their environment; meaning depends on internal experience	Some value to start learning process	Strong value to demonstrate understanding of meaning and test meaning options
Direct Instruction	Presentation, reflection, practice, assessment. Practice is a key focus	Yes, for presentation	Yes, for practice and assessment stages. Strong ability to leverage in practice stage

Cognitivism	Learners make meaning out of new information and experience	Yes, to demonstrate theory	Yes, to make meaning from the theory and understand factor impacts
Social Learning	Learning as a social process, construction through social interaction	Limited value	Strong value in team-based classes where students learn from one another
Connectivism	Learning from diverse opinions; learning is about understanding how to know rather than knowledge itself.	Limited value	More value, opportunity to learn through student results and studying the results of others; current
Learning by Doing	Learners perform tasks to demonstrate and deepen understanding; useful in laboratory studies and where applied learning needs to be demonstrated	Some	High value of being able to practice the skills taught directly and to assess the impacts of links and changes within the environment
Gamification	Applying game elements to existing learning activities	Limited, no student outcome	Some, depending on simulation
Game-based learning	Designing learning activities that are inherently game-like	Yes, to show how	Yes, to practice the skills and theories taught
Place-based/Mobile	Opportunity for students to learn outside normal spaces	Limited	Deeper, while not strictly "place-based", simulations are immersive in a way that aligns with the theories goals

Comparative Understanding of the Use of Simulations to Support Knowledge Transfer

The literature is generally aligned that knowledge transferred using simulation tools is equally or more readily available for deeper learning and comprehension than other business education tools such as lecture, case study, project work or reflection (Loon et al., 2015). Surveys of educators across the globe summarized in Schmuck (2021) indicate a high level of alignment with the idea that using

simulations delivers a higher level of concept comprehension. In a meta-study conducted by Wollscheid and Skjelbred (2021), they concluded that simulations across marketing and business administration courses performed well at sharing financial and marketing concepts. They also relate learning from multiple studies which showed that general course concept comprehension increased as the simulation progressed, indicating the tool is valuable for translating and communicating ideas in unique ways. This concept is also supported by one of the three conclusions about simulations from Ben-Zvi and Canton (2007), namely that simulations "provide students an opportunity to immediately apply classroom concepts to real management problems" (Ben-Zvi & Canton, p. 15). In his comprehensive research summary on business simulations, Schmuck found multiple studies which supported this conclusion when comparing the use of simulations in business classes to lecture, individual work or group work, but particularly focuses on the "depth of learning of decision-making skills and interpersonal communication skills" (Schmuck, p. 557) rather than general business knowledge where simulations perform on par with other teaching methods. Lainema & Lainema (2007) shared a perspective on why business simulations advance business knowledge acquisition including the concepts of learning by doing, empowerment, authenticity, intensity and complexity. The rationale for this increased learning comprehension may be found in the motivation of students. Buil et al. (2019) compared both the intrinsic motivation levels and competence levels of students who participated in business simulations and found positive correlations between both. As students are more excited to participate in business simulations, they are concurrently more interested in understanding the course-based knowledge to allow them to succeed.

Impact of Simulation Use on Student Learning Outcomes

Business simulations can be valuable to instructors who are looking to achieve a variety of learning outcomes. Bloom's Taxonomy (Figure 1), as revised in 2001 (Anderson & Krathwohl, 2001) has become a gold-standard in higher education for assessing the type of learning outcome instructors are interested in achieving. A myriad of studies have concluded that instructors can achieve desired learning

outcomes, particularly those targeted at the top of Bloom's Taxonomy such as analyzing, evaluating and creating. Learning from multiple sources conclude that simulations allow students to demonstrate capability in analyzing strategies (Schmuck, 2021; Ben-Zvi & Canton, 2007; Lainema & Lainema, 2007) and evaluating complex systems (Schmuck; Wollscheid and Skjelbred, 2021; Lainema & Lainema). While the basis of simulation is applying concepts to solving problems, (Wollscheid & Skjelbred; Ben-Zvi & Carton; Lainema & Lainema) they also allow students to apply practices for working with others (Schmuck; Chandna & Newaz, 2023; Wollscheid and Skjelbred) and both apply and evaluate the use of leadership skills in a group context (Schmuck; Chandna & Newaz). At the basis of simulation technology is the creation or evolution of a business entity within the context of the simulation and the development of a deeper understanding of the workings of the simulation as it would apply to the business world. Both support upper-level goals of Bloom's Taxonomy.

Figure 1

Bloom's Revised Taxonomy (Gerta, 2023)
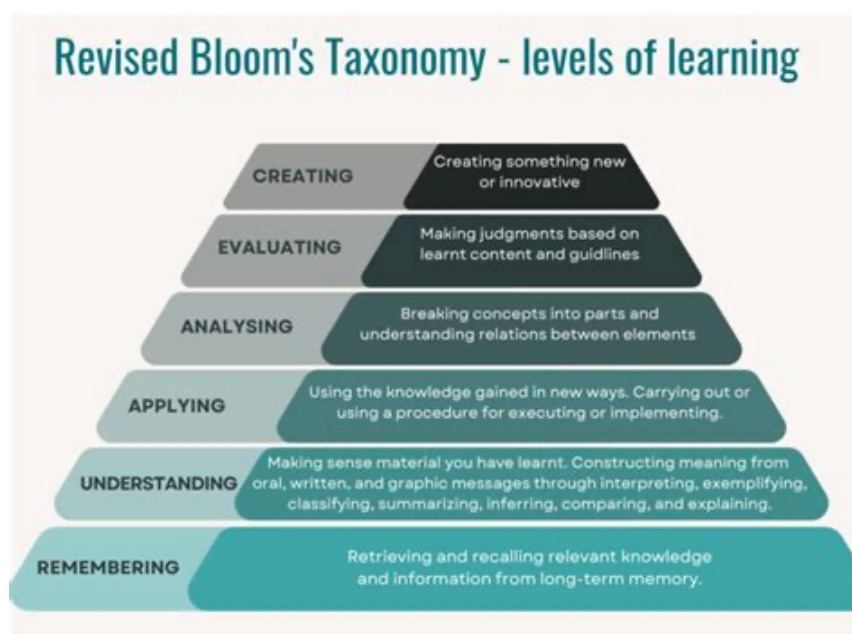
Summary of Learning on Why Simulations Work

There is substantial literature which supports multiple reasons why simulations deliver on both learning outcomes and knowledge transfer. While they are not unanimous in their thesis and understanding of the methods of action, they provide an emerging understanding of the drivers of student motivations. Building off the perspectives from Lainema and Lainema (2007), additional research has pointed to improvements in student engagement (Wollscheid and Skjelbred, 2021; Maher & Hughner, 2007), particularly Schmuck's (2021) comparison to other teaching approaches which showed that students have a clear engagement preference for simulations over most other vehicles other than case studies, which had parity engagement. Schmuck also discovered that simulation leads to improvements in student perceptions of self-efficacy and capability. This leads to deeper engagement as recounted in both Arizzi et al., (2020) and Maher & Hughner (2007). A final telling factor, though students may not realize it in the moment, is that the success outcomes in simulations are not based on intelligence or personality (Wollscheid & Skjelbred, 2021). Business students who may have previously been stymied by the more behaviouralist pedagogical approaches taken in early and foundational classes can see superior results relative to their expectations and better engage with both the material and the pedagogy in a simulation environment.

Arguments Against the Inclusion of Simulations

There are two arguments to be made that simulation may be inappropriate for learning in a business environment within higher education. The first is when an instructor is pursuing a pedagogy of behaviourism, which focuses the student on learning based on a stimulus and response approach to teaching (Mechlova & Malcik, 2012). Students learn information and are stimulated to share it back but not necessarily to derive their own connections and contexts for the information or apply it to new situations (Hammad et al. 2020). This is antithetical to the use of simulation. In business schools, where this approach is used, it is generally in very large introductory classes where the sheer volume of

students may auger against simulation as an effective training tool in any event. Secondly, the use of simulation generally adds costs to students who participate in classes with the tool. Beyond the cost of the program itself, which is passed onto the students either through a direct fee or higher tuition costs, students are required to have a computer and internet access to participate. This potential impact of the digital divide between have and have-not students (Educause, 2021) should cause educators to consider whether simulation is equally benefiting all students before they implement the program.

Literature Review Summary

As educators assess their choice of teaching tools, they start by filtering their options based on their preferred pedagogical approach. On nearly all fronts, except for behaviourism, simulation is a good to strong fit with the main pedagogies used in business schools. Next, instructors assess the learning objectives they desire from a course of study. Given that higher education instruction is targeted at the upper portions of Bloom's Taxonomy (Anderson & Krathwohl, 2001), simulation is shown to be a strong fit with these objectives. Students are seen to learn as well or better when using simulation than all other approaches within a business school teaching environment. Instructors can be confident about using simulations as they create superior engagement with students and allow them to engage in the deep learning that keeps them focused on the program at hand. Provided instructors are cognizant of the potential cost implications on students which may limit their ability to participate, the literature on the topic is strongly supportive of the inclusion of simulation in a post-secondary business school environment.

Chapter III – Personal Applications

Personal Experience in the Classroom

Simulation and game-based play has been a learning approach from which I have always found great personal benefit. I can remember as far back as my grade school days being challenged to accomplish a task of writing a computer program game, a maze generator, in my case. We were then tasked with solving the game to both better understand how the programming worked to deliver the experience and to challenge the programmers to make the game more fun and complex without making it more complicated. This early exposure and the love of games that was inculcated into me by my parents was foundational in my approach to the use of games as a teaching tool.

When I was in grade eight, rather than participating in a regular English class, I was invited to be part of the Hobbit Club wherein students read the four, primary, J.R.R. Tolkien books that cover the time of Hobbits in Middle Earth. Instead of standard assignments, the students were given a variety of tasks to complete, including essays, but also challenged to develop a board game based on the books which was the most fun and interesting of the assignments. These games from the various students were played to see how compelling they were and whether they brought you into the "magic circle" (Huizinga, 1955 as cited in Juul, 2008). Within this magic circle, anything within the rules was possible and it was through this expression of possibility that the Hobbit Club students were able to push boundaries, assess whether various strategies were effective at winning the game and evaluate whether the game was perceived as fun.

In high school, I was involved in one of the most ubiquitous team academic games in Canada, Reach for the Top. This quiz game for students was, at the time I was involved, played in over 300 schools across the country. It permitted students like me with a love of learning to bring the knowledge they were imbibing both in the classroom and beyond, pair that comprehension with fast reaction times, and outduel other likeminded students across a 30 to 40-minute game challenge. My team was good, but we

became so through both practice and developing appropriate strategies. As a four-person group, we were not just tasked with bringing up our knowledge quickly, but also knowing when someone else on the team should take the lead as the individual with the greatest acumen in the topic area. We experimented with and honed these strategic skills over two school years and found ourselves as the National runner-up in 1992.

When I arrived at Wilfrid Laurier University later that same year, I was excited to see what the challenge of post-secondary education would hold for me. I was thrilled, in my second year, to discover that a simulation was part of the required course curriculum. I was further delighted to find that the game would require a strong understanding of the rules of the game and how the game was played but also of the interaction between the various aspects of the game itself. Strategy played a critical role in the ability of our team to succeed. Analysis would also be important as the ability to gather data and break it down to understand its meaning would allow teams to accelerate their success. Team dynamics were also important. There was far too much work for one person to manage effectively so working collectively was required for excellent outcomes. The results achieved were very good for our group, winning our industry and demonstrating to ourselves that these characteristics of strategy, hard work, data analysis and team cohesion would be important aspects of success in future work in the real world. Moreover, I found the class to be fun and engaging and used that information to advocate with wavering students to take the class as soon as possible.

In summary, games and simulations have had a foundational impact on my learning journey. It is from this perspective that I have built out my own approach to using simulations, but it has not always been successful when the quality of the simulation and the ability of students to effectively reflect on the process misses the mark. However, when it works, the student feedback is always universally positive about their learning outcomes and this positive student response is both personally motivating and helpful to secure continuous assignments from the university.

Experience with the Use of Simulation to Teach Marketing Strategy

For the past seven years, I have been using the Markstrat[1] simulation from StratX as a core tool

to teach students the practical applications of the learning objectives for a marketing strategy class in a

diploma program at the business school. This is the same simulation I used in my undergraduate class,

though it has been meaningfully upgraded over the past 25 years. Gone is the requirement to hand in a

3.5" floppy disk to a teaching assistant for each round of the game after fighting through a clunky and

challenging user interface. Now, students use an elegant web-based program to make their selections

across a range of over 75 variables to adjust within the marketing, sales, operations, research, and

development functions of the organization. Students are still provided with a tremendous volume of

data that describes how consumers view the products of the company and the broader market, the

company and market financial results along with information about the other competitive companies,

the results of research and development projects and the outcomes of any marketing test markets they

have executed. Generally, the simulation is run over 10 rounds that each take between 4 and 7 days for

the students to complete and the program runs for the full term of the course.

Context

There are three key concepts that simulation allows the instructor to bring into sharp relief for

students. Given that the core deliverable of the course is for students to understand the concepts of

marketing strategy, it is first crucial that they be able to apply strategic concepts to the game. Teams are

required to create a strategy as they enter the game, adapt it as they move through the game and reflect

on its effectiveness as they conclude their work. This allows students to work in the upper levels of

Bloom's Taxonomy (Anderson & Krathwohl, 2001). If their strategy is effective and they apply it with

vigour they generally perform effectively. Teams that do not develop effective strategies can adapt as the

game progresses and achieve reasonable results. Teams that develop poor strategies and do not adapt

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[1] https://web.stratxsimulations.com/simulation/strategic-marketing-simulation

score weak results. These expected outcomes are judged to be consistent with the real world and help students understand how their behaviour will impact their business and personal success. If they use the data effectively, they can understand how consumers are moving in the market, the product attributes they are most interested in buying and the prices they are willing to pay to purchase those products. It is that ability to see around the corner to the future which separates the good teams from the best teams. Further, the simulation requires teamwork to maximize success metrics. It is, in my experience, the quality of this teamwork that permits teams who have clever ideas to exceed the outcomes of other competitors.

Classroom:

Markstrat is used as a framing device for the broader discussions of marketing strategy and marketing data analysis. Students are provided with a variety of models for their strategic thinking and the instructor shares the positive aspects and major drawbacks of each. This is an important aspect of the learning objectives, namely that there is no one best way to conduct strategy development. As a teaching tool, this is a critical lesson as, in my experience, the world of business writing, as separate from academic writing, is fraught with perspectives that tout themselves as the solution to all problems. A major early challenge in the game is for students to decide on the strategic framework they are going to employ and to provide a rationale to the instructor as to both why it was selected and the strategy they will use to attempt to succeed in the game. This provides the instructor with an opportunity to assess student understanding of the concepts and their ability to apply them and provides an early opportunity for feedback to challenge the students to go deeper if they are operating at a surface-level. This review happens during the practice rounds of the simulation so that students can apply the feedback prior to the main portion of the simulation exercise. The use of practice is also an important aspect of student engagement with the game. Because of its significant complexity, students are encouraged to play with the game in a way that doesn't give away their strategy but allows them to understand how the various

levers and options work and interact. This practice session has been identified through student feedback as an important tool for students to get the most out of the actual game play. Since one of the valuable outcomes is that students increase their enjoyment of the class through simulation (Wollscheid and Skjelbred, 2021; Maher & Hughner, 2007) and deepen their learning (Arizzi et al., 2020; Maher & Hughner) this is more likely to occur if students are focused on decisions and outcomes rather than basic gameplay.

Outcome

The use of Markstrat as a simulation tool in my classrooms has been roundly met with praise and approval from the students who have participated. These students are primarily adults who are pursuing continuing education, and they provide feedback that the simulation brings together their learning from across the six courses within the program. While they consistently indicate that each decision set is a fair amount of work to complete they are, nonetheless, keen to understand their results each week and will resist starting the class until they have been provided with a status update from the previous decision and permitted to engage in some competitive banter amongst themselves. The team that receives the highest cumulative score in the simulation is provided with a very large trophy at the end of the term and the images of this trophy and what it means for the students is shared broadly across social media platforms with a focus on LinkedIn, indicating that the students believe that their success is an indicator to others of their professional competence. Consistent with the learnings from Wollscheid and Skjelbred (2021), the students who succeed in the challenge are not always the most intelligent but rather the ones who put in the work and are prepared to take just enough risk to stand out from the crowd. I have also seen that the teams that are successful also have the highest peer mark average, though it is difficult to say if this is what helps generate success or if the success generates positive assessments of peer work.

One of the critical steps in securing the learning for the students, regardless of their results in the simulation is a post-challenge reflection and presentation provided by each team. Consistent with the learning by doing and constructivist approaches I take in my classes, this reflection allows stronger teams to deepen their understanding of why the strategies they applied work effectively in the simulation market. Conversely, it allows teams with weaker results to look back and see where they made errors in judgement, strategy or execution. These learnings can be valuable for future, real-world, decision making. In truth, the learning may be more valuable for teams with weaker scores, as reflected in the higher quality and deeper understanding these presentations often generate when compared to the teams with greater in-game success.

Experience with the Use of Simulation to Teach Negotiation in the Business Development Context

Since 2021, I have used a simulation called REVMANEX[2] to challenge students in a senior-level undergraduate business development class to see if they can conduct sales calls and negotiations with a variety of buyers in a business-to-business context. The simulation asks the students to individually negotiate the sale of three different tiers of a product to two different organizations, representing six buyer meetings. Using questions, cues, emotional input and background data the students are challenged to maximize three company metrics. Revenue and market share represent short-term deliverables while client satisfaction represents the longer-term brand equity for the organization and indicates the potential for repeated sales over multiple years. In addition to the results calculated within the simulation itself, students are provided with an opportunity to reflect on their performance in the game and assess where they did well and where they have opportunities for improvement in their future sales and negotiation approaches. To teach and run the simulation, students are generally given a 45-minute training lecture then provided with unlimited practice attempts between the training lecture and the following class. In that following class students are given the option to continue their practice or

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[2] https://web.stratxsimulations.com/simulation/sales-and-negotiation-simulation

engage in tackling the six sales calls. As 80 minutes is generally insufficient to complete all six

interactions, students are given an additional week to finish the calls on their own time before writing

their reflection exercise.

Context

The learning outcomes that students pursue through this simulation include their ability to use

both their analytic and emotional sensors to guide a sales call, their ability to understand how business

targets impact selling strategies and the need for flexibility in approach when engaged in selling

activities. Students are encouraged to set a strategy in advance of each call based on the information

provided in the game, their learning from previous calls within the simulation and background dossiers

of each buyer they encounter. They are also provided with immediate feedback on the core metrics they

are attempting to achieve so they understand on a round-to-round basis how they are performing

relative to target. Students who use their in-game feedback to adapt and adjust their approach to the

context in which they operate in each new call tend to perform better than those who find an effective

strategy in early rounds but do not adapt as the buyers become more challenging and sophisticated.

Classroom

The REVMANEX simulation has proven to be a more challenging simulation to use for students

than Markstrat despite its simplified approach and much shorter duration. Because a critical factor in the

ability to exceed expectations is the emotional response of the buyer to the actions taken within the

simulation, students must be mindful of how emotions are progressing. For example, if the student

consistently makes offers where the price is too high, the buyer may start to indicate anger or

frustration. However, these emotions are represented by emoticons within the game rather than by a

more immersive approach where they might be interpreting language, tone or body language cues to

understand how their counterpart views the negotiation. To counter this challenge, students are

provided with three routes to gain understanding both prior to and during the game, as follows:

1. The instructor provides a thorough briefing on the game prior to the students making any attempts to use the simulation. All the key variables are discussed, including the emotion indicators, and the class engages in a conversation about what they might mean and how they could be both interpreted and used within the context of the game. While the instructor should not give away all the secrets of the game as their discovery is part of the learning process, this is an opportunity to drop breadcrumbs for the students to follow.

2. The students are provided with unlimited practice round opportunities. With each practice round taking seven to ten minutes apiece, this stage provides the students with an easy and low stakes opportunity to fully understand the simulation functionality and gives them a chance to become adept at using the game to give them the information they need once real gameplay starts. Students are also encouraged to seek clarification and perspective from the instructor during this phase of learning to be sure they are clear about the game functions and outcomes. This support is not provided once the simulation is active.

3. The game provides a coaching module once it is active to ensure the students are seeing and understanding the most germane data points each interaction is attempting to communicate. Because the game is laddered, with the first two rounds being substantially easier than the two final rounds, this is a valuable tool when the students use it correctly, to improve performance over the course of the live game.

After the game is complete the students are asked to write a two-page reflection about the simulation experience where they are challenged to assess their initial strategy, how they reacted within the game as new data was received and their key takeaways from the work including a perspective on how they would change their approach or decisions looking back with current knowledge. They are also asked to provide feedback to the game designers on what is working effectively and what could be improved about the game. This higher level meta-cognitive review of their experience helps to solidify

their understanding of why they are using the game in addition to understanding the outcomes of the game itself.

Outcome

The results of using REVMANEX have been more mixed for my students than the generally positive outcomes seen with Markstrat. While there are always students who have great success in both games, the spread of outcomes in REVMANEX is much broader than with Markstrat. Some of this difference is attributed to the individual nature of the simulation as opposed to the team nature of Markstrat. In an individualized assignment, the level of preparation, understanding and effort provided by each student is obvious. In a team environment like Markstrat, there is a risk of free-riders or of the strongly motivated or comprehending student bringing others along for the ride. However, all students share in both success and challenge which provides opportunity, particularly in bad times, to be collectively supportive. As this is not the case in an independent study, it can lead to frustration and lower motivation from students using REVMANEX. When they fail to have early success, they have only themselves to fall back on for support. The course does provide tools to help manage that failure. It is a course about business development and so managing the "ocean of rejection" (Pink, 2012, p. 97) experienced by sales people is an aspect of the learning objectives for students. If these tools are not independently applied students can flounder. This is consistent with the intrinsic motivation development learning from Buil et al. (2019). The reflections provided by students demonstrate this motivation clearly. Those with the greatest success in the simulation have the strongest reflections while those who were most challenged seem to take less away from the work. It is for the reason of diverse success and low student motivation that I paused the use of the simulation in my 2024 course while I seek a better sales simulation or revamp the section of the course where Revmanex is used to generate greater success in achieving student learning objectives.

Understanding Why Simulation is a Personal Fit

When I arrived in the Master of Education program, I knew that I enjoyed teaching and training. This was clear from my time working in various marketing leadership roles to my work as a mentor to younger marketers and from my early time as a teaching assistant to my later role as a post-secondary instructor at a prominent business school. What I lacked, as I arrived in the program, was an understanding of why that was the case. What was it about teaching that was a motivator and why did I approach teaching with a focus on case study, simulation, reflection and class discussion and a general aversion to examination and testing? These were the questions I was hoping to answer through my work in the program and some strong philosophical and practical answers were found in the various courses I undertook over the last 16 months. Through courses including The Philosophy & History of Education and Curriculum, Teaching and Learning, I was exposed to both the philosophical thinking that tied to my personal beliefs and the conceptual frameworks for better implementing these ideas. Various courses on Leadership and the perspective gained from Diversity: Constructing Social Realities further expanded my thinking about how to implement my approaches in ways that enhanced student accessibility while building my own learning through my students. While it was unclear to me how these would come together, it was through my more focused work thinking about technology in the classroom within Contemporary Issues in Technology Enhanced Learning that these vectors focused my thinking on the comparative reasons why simulation has held a pre-eminent place in my view of how classes are best executed in a post-secondary business school environment. The following section summarizes these fit points with learning outcomes, personal teaching philosophy and to the personal and structural incentives of the post-secondary environment.

Fit with Learning Outcomes

As has been demonstrated in the above sections both from my own experience and the research conducted in the field, simulations can challenge students at the higher levels of Bloom's Taxonomy

(Anderson & Krathwohl, 2001). As the courses I am teaching are designed to be more challenging either because they are for continuing education or are upper year courses within the undergraduate program, this is appropriate for the students. Practical application of concepts is always a focus for me as I prepare my students to matriculate to working environments where they are expected to be able to increase their performance levels because of their education. Simulation provides these students with both the challenge of practice rather than conceptual discussions and an opportunity for safe failure as compared to the demands of the working world. It also allows the most successful students to tout their capabilities as they search for their first job or seek to upgrade from their current employment.

Fit with Personal Teaching Approaches

Lecture, when used as a one-way delivery of information from instructor to student owes its place in higher education to the behaviourism movement of the mid-20th century. As was clearly covered in my work in The Philosophy & History of Education course, this approach permitted universities to instruct a much larger cohort of students, and weed out those unable to make broader connection, but left the issues of comprehension to the student to both diagnose and treat if the stimulus and response approach (Mechlova & Malcik, 2012) was not working for them on a specific topic or general course. While I can learn in this fashion, I always perceived it as boring and less motivating, as did later thinkers who advanced education pedagogies to a more engaging and reciprocal approach. I have always been drawn to a conversational, Aristotelean (Gutek, 2015a) approach to breaking down subjects into their components and then reassembling them to see if a more fulsome understanding can be created for both the teacher and the pupil. As I worked my way through the M.Ed. program, philosophies based on Dewey (1916/2024) and his descendants including concepts like learning by doing (Gutek, 2015b) and constructivism (Mattar, 2018) have resonated. It is, therefore, unsurprising that the structure of my courses focuses on shorter and more cogent reading which leads to class discussions, cases which challenge students to apply the concepts discussed to a practical problem, and simulations which allow

them to apply multiple concepts simultaneously to solve a problem in a relatively low-risk environment. Simulations are, like their sister the case study, the training-wheels of concept cognition relative to real-world application. Whether the student succeeds or fails, they are not risking their own or someone else's economic well-being.

Linking to Personal and Structural Incentives

As demonstrated clearly by Maher & Hughner (2007) and Tanner et al. (2012), students who participate in courses which use simulation have a stronger perception of the quality of the class and the quality of the instructions they received in that class. This leads directly to incentives for instructors like me to use well-functioning simulations. As an adjunct professor, I serve the university on a term-to-term basis. There is no tenure to protect me, there is only my ability to interact successfully with both my peers and my students to deliver the goals of the program in which I operate. The key measure of that success is the Student Experience of Instruction survey conducted for every course and section within the business school. While students do assess items like preparedness, command of the concepts, speed of grading and general assistance in learning, the key metric that administration uses is the overall assessment score provided by the students. Because students are likely to have a higher score in this section if I use simulation than if I do not, I am spurred to find a strong simulation that students will enjoy. The other incentive I have as an instructor to use simulation is to ensure that my course is full each year. Courses with insufficient registrants are cancelled, and so is the contract of the adjunct professor teaching that class. That previously understood student enjoyment has an additional knock-on effect to future classes. Students talk about the courses they like and the professors they enjoy. They enroll in courses where they are likely to have a good outcome and fulfilling class experience. This reality expands my desire to use effective simulations to protect my tenuous hold on my teaching role.

Summary

I am fortunate to teach in an environment where I can both set my own syllabus to support the learning needs of students and determine the best approaches to deliver those needs. Having had significant and positive experiences with games and simulation in my own formative years, I was keen to understand why using an active think/do (Lozano et al., 2017) approach to instruction and education resonated with me. I have had success using simulation in both an undergraduate and adult learning/diploma environments when the simulation program is of high quality. However, when the program is of lower quality it does not permit the same levels of value. Of note, the success or challenge of the underlying simulation quality and approach can be magnified with the use of reflection to lock in understanding. Having discovered the teaching philosophies of Dewey (1916/2014) and his descendants, including articulations around Constructivism (Mattar, 2018) and Learning by Doing (Gutek, 2015b), I now better understand why I have gravitated towards these instructional models and why they link effectively with both my personal and structural incentives.

Chapter IV - Conclusion

In an undergraduate or post-graduate setting, business simulation is the strongest learning tool an instructor can employ to ensure that they meet learning objectives. These simulation tools must be well vetted against the learning objectives and supported with deep knowledge of both the subject matter and the parameters of the simulation in use to maximize student outcomes. When these key criteria are met, the tool enables students and instructors to succeed.

Overview of Key Conclusions from the Literature Review

Business simulations are a valuable tool that instructors can utilize to support a variety of pedagogical approaches and desired learning outcomes. Simulations can be used across most business and administration subject areas and, because they are a fit with most pedagogies, they can be seamlessly added to most course content structures and continue to contribute to the learning outcome goals targeted by the course. In fact, the only major pedagogical choice where simulation is not a fit is the behaviourist (Mechlova & Malcik, 2012) approach which is waning in use in all but the most simplistic introductory business courses where the volume of students processed and sorted is a larger focus than the quality of student understanding. While the fit level does fluctuate across the remaining pedagogies, there is a role for simulation to play in each that supports the instructional approach. There is little, from a pedagogical approach, that should create barriers to the use of simulation.

Simulations are a valuable tool to promote content and concept understanding. They increase concept comprehension at levels that exceed tools like lecture, case study, project work or reflection (Loon et al., 2015). Simulations also allow students to increase their comprehension of concepts as the game progresses, scaffolding students to higher levels. They allow students to apply their concepts to real world problems which provides both alternate learning opportunities and the chance to fail in a low-risk situation. Students are also more excited and self-motivated to learn and participate when using

simulation tools (Buil et al., 2019), which is an asset to help build important learning outcomes. It is this depth of learning benefit that should excite business school professors to enhance their use of the tool.

Business simulations assist students in creating deeper learning on key course topics and allow them to apply skills at the more complex levels within Bloom's Taxonomy (Anderson & Krathwohl, 2001). There is significant research across multiple types of student learning outcomes at this higher level including analyzing, evaluating and creating (Schmuck, 2021; Wollscheid and Skjelbred, 2021; Ben-Zvi & Canton, 2007; Lainema & Lainema, 2007) while also allowing them to practice leadership and cooperative skills (Chandna & Newaz, 2023). These tools work effectively because students look positively on their inclusion in course materials. This is based on their higher levels of engagement and their increased perception of both self-efficacy and capability (Schmuck, 2021).

Argument Success

It is with confidence that I have connected three important aspects of instruction to the selection and use of simulation in business administration programs and the post-secondary level using a broad body of research in the literature review. First, I have demonstrated that there is a good to strong fit with the main pedagogical approaches in use at the post-secondary level and simulation as a teaching tool. Secondly, I have demonstrated that students who use simulation to learn about and demonstrate mastery of specific concepts do so at higher levels and with deeper comprehension, per Bloom's Taxonomy (Anderson & Krathwohl, 2001), than using other tools. Lastly, I have shown that students have a higher personal satisfaction with the use of simulations in class and thus a higher engagement with materials. As it is better for learning, better for students and, by extension, better for instructors, simulation is a tool that all business administration instructors can utilize with confidence.

Connecting My Thinking

Games and simulation have provided me with both significant joy and tremendous learning in my personal, education and instructional journey as outlined in the introduction chapter of this paper.

The bias inherent in that understanding for the reader is that the analysis and writing collected in this paper tends to favour games and simulation in its analysis. However, the rational for pursing this area of thinking, which was demonstrated strongly in the literature review section, comes from a deep-seated desire to provide my students with the strongest possible learning experience. The literature not only validated that the tool can be used across a preponderance of business administration courses but that doing so benefits both the student and the instructor. While this outcome was edifying, the value of the understanding becomes valuable when it can be extended to broader theory and practical application.

Theoretical Implications

The major theoretical implication this paper contributes to is the discussion around measuring student success. There is much discussion in the literature, particularly around business administration education, about separating measurement of theory understanding from the ability to apply that theory with excellence in a shifting and inconsistent world. While no simulation is likely to mirror the complexity of how business is conducted in the real world, students who are successful within its constructs are demonstrating links between the theoretical and the application of theory. They are also demonstrating the ability to work hard and, often, collectively, to achieve a goal (Wollscheid & Skjelbred, 2021). This grit (Duckworth et al., 2007) may be applicable to hiring choices of firms as the ability to parse resumes becomes more challenging in our achievement-oriented university culture.

A key area for future research would be the impact on the professional outcomes of students linked to their performance on simulations while in school. There is a thread of this idea in Wollscheid and Skjelbred (2021) that could be expanded through longitudinal comparative studies that examine the performance of students who have experienced simulation-based learning versus those who have not, later in their career. This could be further supplemented by sub-setting the simulation experience group based on their success within the simulation. This could help recruiting businesses understand if specific simulations and their results point to the potential for success in employment. In my own case, I saw

that students who were successful with Markstrat in my university cohort were strongly correlated with those that had success in their business careers. Similarly, students in my current classes who succeed with the same simulation are seen later taking top-tier jobs out of their undergraduate degrees or achieving promotions in their daily jobs while taking the diploma program.

Practical Implications

An important practical implication of this paper is the potential for universities to use simulation to implement Practical Learning Assessment and Recognition (Harris & Wihak, 2018) approaches in two unique situations. First, it could be used for certification purposes when referencing self-taught or long-term experience individuals. As a financial tool for universities, these certifications would require payment to the school which generates revenue without the institution having to bear the cost of their education. Second, it could be valuable when assessing potential entrants to post-graduate programs either for comparative purposes to decide on admissions or for advanced standing to acknowledge current comprehension levels. This would represent a win for both the student and the school.

Final Thoughts

The basis of this paper starts from a place of deep influence that games and simulations have had on my learning and teaching journey. From some of my earliest memories of formative education experiences to the challenges placed in front of me in public, secondary, and post-secondary education, simulations have played an important role in both allowing me to test the limits of my understanding as well as demonstrate knowledge competence. For those reasons, I have used simulation in my own teaching and training programs where excellent models have existed. The pedagogical reasons explaining why I was using these tools were not in my comprehension when I started my M.Ed. journey. It became clear as I understood the think/do approaches forwarded by Dewey (1916/2024) and others in his philosophical tree. When examining the preponderant pedagogical approaches used in business administration teaching at the post-graduate level it follows that simulation fits effectively with all but

the most behaviourist approaches and should be adopted by instructors to both expand the depth of student learning and to enhance the student experience of learning in the classroom. While I have not had unqualified success with all the simulations I have used when instructing students, those that are well designed and which allow the students to reflect effectively on the ways they achieved success or the roadblocks they faced provide a safe learning path and one that separates hard work and comprehension from raw brain power.

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