

Why Don't You Play the Game? Evaluating the Use of Gamification in an Undergraduate Finance Course

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Abstract

The board game *Monopoly* is used as a gamification tool in an undergraduate finance course in a private business school in the Philippines. The use of *Monopoly* as a gamification tool is evaluated using Han's (2015) adaptation of the spiral curriculum and Landers's (2015) theory of gamified learning. According to Han, the spiral curriculum "is the circular model best suited to gamification as pedagogy because it allows students to learn and practice basic skills in order to master advanced tasks." Meanwhile, Landers's theory of gamified learning posits that "gamification affects learning via moderation when an instructional designer intends to encourage a behavior or attitude that will increase learning outcomes." In the undergraduate finance course, the *Monopoly* board game is used as (i) a means to teach basic principles of financial statement analysis and financial forecasting, consistent with the spiral curriculum and (ii) a moderating tool to help influence key attitudes brought about by prior experiences and preconceived notions on the subject, consistent with Landers's theory of gamified learning. Findings obtained via a qualitative explanatory approach from 101 undergraduate business students suggest that the use of the *Monopoly* board game is effective as a gamification tool, as seen in students' ability to proceed to more advanced topics in the finance course and new opinions on finance as expressed at the end of the course. Recommendations for future study include using a control group, conducting studies at the beginning and end of the course, applying quantitative methods, and addressing exogenous factors that may affect the results.

Keywords: Finance Education, Gamification, Gamified Learning, Moderation, Spiral Curriculum

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Introduction and Review of Related Literature

The study revolves around evaluating the use of gamification in a finance course for undergraduate business students. The gamification tool used is the board game *Monopoly*, which is used as a learning medium for financial statement analysis and financial forecasting. The research evaluates the use of gamification in an undergraduate finance course using two major frameworks: (i) Han's (2015) adaptation of the spiral curriculum and (ii) Landers's (2015) theory of gamified learning. The use of gamified learning is evaluated via a qualitative explanatory approach. The research concludes with suggestions on future research on the subject matter.

Gamification is defined as “using game design elements in non-game contexts to motivate and increase user activity and retention” (Deterding et al., 2011).

In the context of learning, Landers (2015) defines gamification as “the use of game elements, including action language, assessment, conflict/challenge, control, environment, game fiction, human interaction, immersion, and rules/goals, to facilitate learning and related outcomes.” For Dichey and Dicheva (2017), gamification in education refers to “the introduction of game design elements and ‘gameful’ experiences in the design of learning processes.” In the context of this study, gamification of learning is used interchangeably with gamified learning, game-based learning, gamified pedagogy, and other variants of the term.

Substantial research has emerged on the evident benefits of gamification for learning and education. Tasnim (2012) states that “the use of non-traditional interventions, such as games” are “valuable teaching methods.” Shubik (2002) argues that games “help to raise questions relating to the relationship between a game and the reality the game represents.” Similarly, Cruz et al. (2018) identify the ability “to relate theoretical content to practical reality” as a key benefit of gamification.

A key benefit cited in previous research was influencing learners' attitudes, activities, and behaviors, such as increasing motivation or improving engagement among learners. Caponetto et al. (2014) posit that gamification “has been adopted to support learning” and “[has been adopted] to address related attitudes, activities, and behaviors.” Dichey and Dicheva (2017) believe that gamification is “a developing approach for increasing learners' motivation and engagement by incorporating game design elements in educational environments.” Buckley, E. Doyle, and S. Doyle (2015) refer to gamification as a “pedagogical innovation that may increase student engagement and enhance learning.” Similarly, Meesuk and Srisawasdi (2014) posit that “developing game-based learning could enhance students' motivation, perception, and learning outcome.” For Tasnim (2012), games that include a prior or post-game analysis “promote greater involvement of classes, therefore causing a lasting effect on learning.”

Findings on the efficacy of gamification in learning are mixed. Buckley, E. Doyle, and S. Doyle (2015) suggest that gamified learning may “suit some students and their learning styles better than others.” Dichey and Dicheva (2017) state that there is “still insufficient evidence” that gamification “produces reliable, valid, and long-lasting educational outcomes, or does so better than traditional educational models.” Bauer, Callan, and Landers (2015) admit that “many potential pitfalls of gamification implementations are not yet well explored.”

Gamification has been identified as a “valuable teaching method” for business and entrepreneurship classes, where the three most applied teaching methods are lectures, case studies, and group discussions (Tasnim, 2012).

Board games have been identified as an effective device for gamification. Educational board games are said to encourage students’ learning motivation (LeBlanc & Bearison, 2014); to increase learning achievement (Hou & Lin, 2015); and to enhance students’ motivation, perceptions, and participation of learning in the classroom (Chen et al., 2020). In a study conducted by Chen et al. at a junior high school in Northern Taiwan, students that participated in gamified learning via board games were found to show “marginally reduced math anxiety.” Chen et al. suggest that “students’ engagement in the gamification instructional activity leads to their better learning performance.”

Tasnim (2012) highlights that a board game “is inexpensive, easy to adapt both indoors and outdoors, and with proper debriefing, becomes a valuable tool for fun and experiential learning.” Cruz et al. (2018) similarly highlight the affordability of board games as learning devices. Chen et al. (2020) cite the wide implementation of card games and board games—collectively known as “unplugged games”—for subjects like chemistry, creative thinking, environmental chemistry, and mathematics.

There is a dearth of literature that tackles the use of gamification in business education at the undergraduate level. Almirall, Romero, and Usart (2011) cite how game-based learning “has been of great efficacy to practice the concepts and procedures learnt” in an undergraduate finance course. deCos (2015) offers a tangential remark, though not in the university setting, suggesting that “banks could use gamification as an effective way to promote their brand and grow their customer base by delivering financial education to children.” A previous study worth noting is that of Cruz et al. (2018), who used the *Monopoly* board game in three classes on “Investment Analysis.” *Monopoly* is a classic board game that involves the buying, selling, development, and leasing of properties. According to Cruz et al., results obtained in the classroom were “very positive” after the use of *Monopoly* as a teaching tool.

Methodology

This section begins with a discussion of the two major theoretical frameworks used, followed by a discussion on how gamified learning was implemented for undergraduate finance courses in a private business school in the Philippines. The two major frameworks used are (i) Han’s (2015) adaptation of the spiral curriculum and (ii) Landers’s (2015) theory of gamified learning.

Theoretical Framework: Spiral Curriculum

The first major theoretical framework used is the spiral curriculum as adapted by Han (2015). Initially conceptualized by Jerome Bruner (Gibbs, 2014), the spiral curriculum involves students revisiting a topic several times and achieving mastery learning. With the spiral curriculum, “the complexity of the topic is increased with each visit so the new learning is connected to the old learning.” As such, “curriculum and content build upon one another, supposedly in skill growth as well as content complexity and depth.”

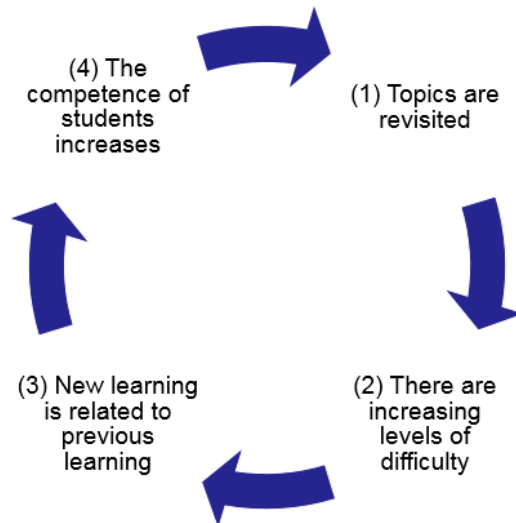


Figure 1: Key Features of Spiral Curriculum

Han argues that the spiral curriculum “is the circular model best suited to gamification as pedagogy because it allows students to learn and practice basic skills in order to master advanced tasks.” According to Han, “students may become more self-motivated learners interested in learning more from the course content and from each other” with a gamified pedagogy.

Theoretical Framework: Landers’s Theory of Gamified Learning

According to Landers’ theory of gamified learning (2015), gamification “affects learning via moderation when an instructional designer intends to encourage a behavior or attitude that will increase learning outcomes by making pre-existing instruction better in some way.” Through what Landers refers to as a “moderating process,” the relationship between instructional design quality and outcomes is strengthened.

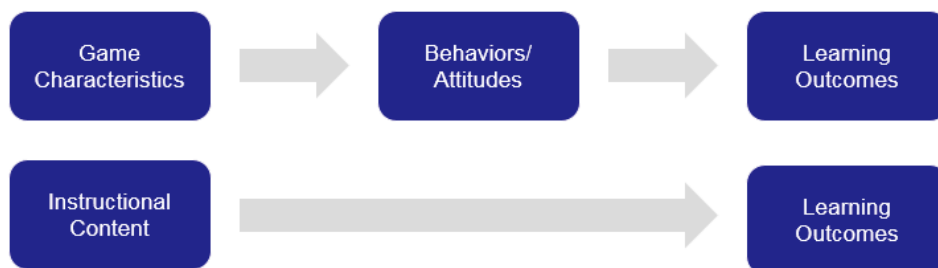


Figure 2: Illustration of Landers’ Theory of Gamified Learning (2015)

Landers’s theory has four propositions: that (i) instructional content influences learning outcomes and behaviors; (ii) behaviors/attitudes influence learning; (iii) game characteristics influence changes in behavior/attitudes; (iv) game elements affect behaviors attitudes that moderate instructional effectiveness; and (v) the relationship between game elements and learning outcomes is mediated by behaviors/attitudes.

#	Proposition	Landers's Explanation
1	Instructional content influences learning outcomes and behaviors.	The goal of gamification cannot be to replace instruction, but instead to improve it. If the instructional content does not already help students learn, gamification of that content cannot itself cause learning.
2	Behaviors/attitudes influence learning.	Gamification that provides rewards for high-quality notes or allows learners to control the frequency of meta-cognitive reminders is likely to improve learning.
3	Game characteristics influence changes in behavior/attitudes.	In the context of gamification, any behavior or attitude can be targeted because this behaviour or attitude is the outcome of the gamification effort. The degree to which gamification efforts can effectively create or increase such behaviors and attitudes remains an unanswered empirical question.
4	Game elements affect behaviors/attitudes that moderate instructional effectiveness.	The goal may be to increase student effort (behaviors) or simply to convey to students that assignments are fun (an attitude). By gamifying this course, the instructor likely hopes students will complete more assignments and with greater enthusiasm. The inclusion of a game element would have no effect on learning if the instructional design was not already sound.
5	The relationship between game elements and learning outcomes is mediated by behaviors/attitudes.	In the theory of gamified learning, for game elements to be effective via the mediating process, game elements must cause the target behavior and the target behaviour must increase learning. For example, if gamification successfully created an impression of fun in students, but that fun did not affect learning, the game elements would ultimately have no effect on learning.

Figure 3: Propositions of Landers' Theory of Gamified Learning (2015); Explanations Directly Quoted from Landers

Gamified Learning in an Undergraduate Course

The board game *Monopoly* is used as a gamification tool in an undergraduate finance course in a private business school at a Philippine-based university. In this business school, students typically take two courses (six units) of accounting prior to taking the finance course (three units) in discussion. The two accounting courses are (i) financial accounting, which covers introductory accounting concepts, financial statements, and financial ratio analysis; and (ii) managerial accounting, which covers cost-volume-profit analysis, variances, budgeting, and capital budgeting. The finance course tackles financial statement analysis, financial forecasting, time value of money, capital budgeting, fixed-income, and equities.

Financial Accounting	Managerial Accounting	Finance
Introduction to Accounting		Financial Statement Analysis
Journaling, Ledger, T-Account, Trial Balance, Adjusting Entries	Cost-Volume-Profit Analysis	Financial Forecasting
Balance Sheet	Variances	Time Value of Money
Income Statement	Budgeting	Capital Budgeting
Cash Flow Statement	Capital Budgeting	Fixed-Income
Ratio Analysis		Equities

Figure 4: Topic Coverage of Accounting and Finance Courses

The syllabus of the finance course where gamified learning was applied is structured as follows: It begins with financial statement analysis, transitions to financial forecasting, proceeds to time value of money, then concludes with applications of time of value of money such as capital budgeting, fixed-income, and equities. Instruction for the course is delivered both synchronously through live lectures and asynchronously via online modules and pre-recorded lectures. The course assessments include long exams, essays, presentations, and a capstone project; there are assessments done individually and assessments done with learning teams. The capstone project involves the analysis and valuation of a publicly-listed company; the capstone project is divided into smaller tasks, including the recording of historical financial statements, analyzing macroeconomic and industry trends, analyzing company strategy, generating financial forecasts, and valuating the publicly-listed company.

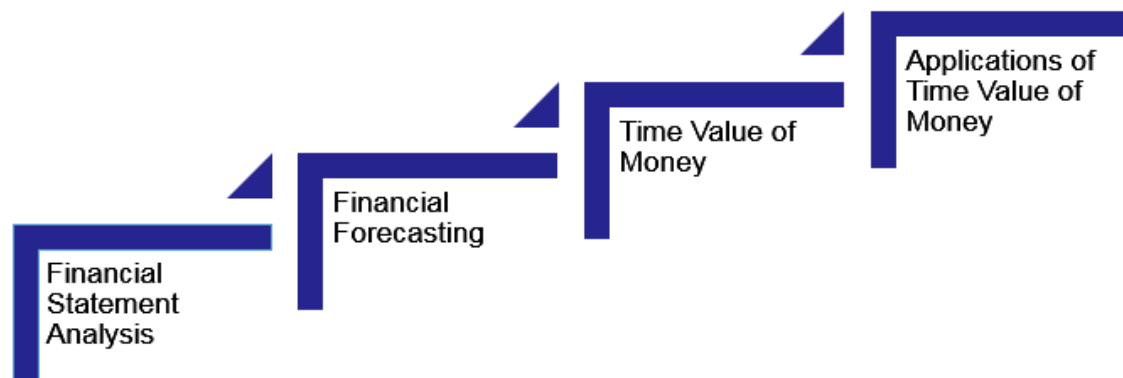


Figure 5: Finance Course Structure

In this finance course, the *Monopoly* board game is used to moderate learning in (i) financial statement analysis and (ii) financial forecasting. Students are instructed to play three one-hour rounds of *Monopoly* and record their transactions while doing so. They are tasked to develop the financial statements (income statement, balance sheet, and cash flow statement) in a Microsoft Excel file and construct a short write-up explaining key trends seen in their financial statements. The relevant financial accounts in this assessment include cash; property, plant, and equipment; equity; rental revenue; rental expense; non-recurring items

(e.g. Chance, Community Chest); and tax. The students are then tasked with extending their financial statements into financial forecasts.

Description in *Monopoly* Gameplay

1. Each Monopoly round is like one calendar year. Meaning, you continue where you left off in the previous round. That **means the starting balances of your balance sheet for the new round are the ending balances of the previous round.**
 2. For the Microsoft Excel file with your financial statements, use formulas to generate net/total amounts (e.g. total assets, net income). **Do not hardcode computational items!**
 3. Place the item breakdown for your revenue, costs, and properties in the input tabs (Revenue, Costs, PPE). Then link the resulting totals or net values to the balance sheet, income statement, and cash flow statement.
 4. **Be careful when classifying accounts.** It is tempting to lump all payments and negative cash flows as operating expenses--double-check the nature of transactions arising from Chance and Community Chest cards! Some are loans, capital stock, etc. and should be correspondingly classified in the right accounts.
 5. Suppose a player landed on a property and did not buy, Monopoly rules call for a bidding process to see who gets ownership of the property. If you bought a property for an amount above or below its market value (the price on the board), make sure to note these as **capital gains/losses.**
 6. Assume **straight-line depreciation.** Assume the following useful lives and zero salvage value.
 - Property - 30 years
 - Railroads - 20 years
 - Utilities - 40 years
 7. If a player runs out of cash, he/she has the following options to avail of cash:
 - Mortgage - subject to normal Monopoly rules
 - Short-term loan - maximum of 80% of fair value of most expensive property, to be charged interest rate of 2.5% per round
 - Long-term loan - maximum of 200% of fair value of most expensive property, to be charged interest rate of 6.0% per round
 8. Make sure to place the photographic proof of your end-fiscal year balances in the Pictures tab. Label them accordingly.
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Figure 6: Rules of the *Monopoly* Assessment



Figure 7: Students' *Monopoly* Gameplay (in-person format)

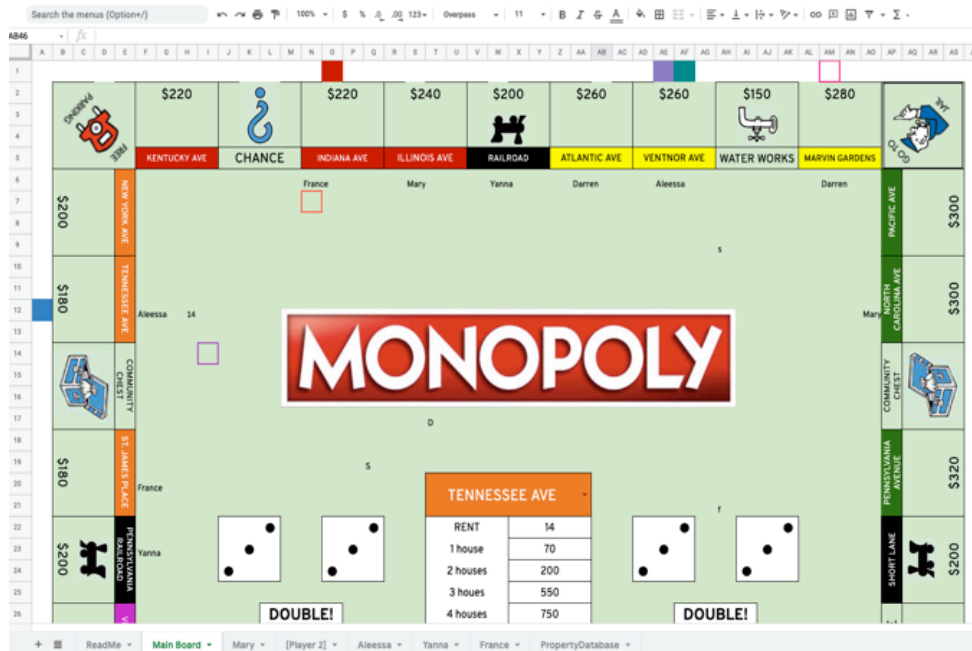


Figure 8: Students' *Monopoly* Gameplay (online format via Google Sheets)

Landers (2015) identifies nine elements that define game-based learning, namely action language, assessment, conflict/challenge, control, environment, game fiction, human interaction, immersion, and rules/goals. The table below identifies the various elements, as defined by Landers, in the *Monopoly* gameplay in the finance course.

Element	Definition	Description in <i>Monopoly</i> Gameplay
Action language	The method and interface by which communication occurs between a player and the game itself	Students play either the <i>Monopoly</i> board game either in-person or virtually via video conferencing facility. The action language is defined by the <i>Monopoly</i> board and its corresponding elements.
Assessment	The method by which	Students are tasked to record their

	accomplishment and game progress are tracked	transactions then generate financial statements based on their <i>Monopoly</i> gameplay, with an accompanying short write-up explaining the key trends in their generated financials. Students then extend their financial statements into financial forecasts.
Conflict/challenge	The problems faced by players, including both the nature and difficulty of those problems	Students encounter challenges that put pressure on their financials throughout the gameplay, such as lacking cash to pay rent or being thrown in jail.
Control	The degree to which players are able to alter the game	The rules are fixed; however, students are able to make certain decisions on acquisitions, capital structure, taxes, etc.
Environment	The representation of the physical surroundings of the player	Real life businesses are business owners are represented in the <i>Monopoly</i> gameplay. Students assume the role of a landlord overseeing investment properties. Each <i>Monopoly</i> round is equivalent to one fiscal year.
Game fiction	The fictional game world and story	
Human interaction	The degree to which players interact with other players in both space and time	While the assessments are individual, the gameplay is done within learning teams, resulting in human interaction.
Immersion	The affective and perceptual experience of a game	Students interact with their peers within the learning team, as well as with the fictional world created by the gameplay.
Rules/goals	Clearly defined rules, goals, and information on progress	On top of the standard <i>Monopoly</i> gameplay rules, the instructor provides rules on the assessments with clearly defined criteria.

Figure 8: Elements of Gamified Learning in the *Monopoly* Assessments

Worth noting is that the gamified assessments that use *Monopoly* are both done after the relevant instruction has been delivered for financial statement analysis and financial forecasting. The finance course was structured in such a way that students learn financial statement analysis and financial forecast first, before proceeding to do the *Monopoly* gameplay and assessments.

Individual Assessment: The Monopoly Simulation

✦ TASK

In line with the attitude of beginning with the end in mind, allow me to start the module by discussing the outputs I will be expecting from you at the end of the module. There will be two major assessments for Module 2, one individual and one group.

For the individual assessment, you will be building your own financial statements from scratch and writing an analysis based on [Monopoly: The Board Game](#).



Mechanics

The idea is to play Monopoly with the members of your respective learning teams for three 50-minute sessions (combined total of 150 minutes). You will record the corresponding transactions and events in each turn, then build the financial statements. After which, you will do common size analysis and ratio analysis then produce a one-page write-up providing commentary on your performance as a player.

Note that while the game will be played in learning teams, the output is **individual**.

Kindly coordinate with your respective learning teams on when to schedule your Monopoly play time.

End-Output

The end-output of this module is to produce financial statements from your Monopoly turns. The financial statements **will be presented in Excel format**, with the following tabs:

1. Balance sheet
2. Income statement
3. Cash flow statement
4. Revenue
5. Costs
6. Property, plant and equipment
7. Common size analysis
8. Ratio analysis
9. Pictures (for your cards and cash at the end of each 50-minute round)

Figure 9: Excerpts from Online Canvas Course Showing *Monopoly* Assessment Instructions

The topics of financial statement analysis and financial forecasting are revisited in future topics and assessments, the most notable of which is the capstone project involving the analysis and valuation of a publicly-listed company. The ideal trajectory for students taking the course would be to master the basic principles of financial statement analysis and financial forecasting first before extending the topic applications to their capstone project.

Results

The results are based on a qualitative explanatory approach, with the sample covering three finance classes: one class of 23 students from School Year 2019-2020 (August to December 2019), one class of 39 students from School Year 2020-2021 (August to October 2020), and one class of 39 students from School Year 2021-2022 (August to December 2021). All 101 students covered are management engineering students or business students majoring in operations research and with a quantitative focus. Students' feedback were collected via consultation sessions and feedback forms at the end of the course.

Han's adaptation of the spiral curriculum can be seen in how *Monopoly* was used as a means for students to learn the basic principles of financial statement analysis and financial forecasting before proceeding to higher-order applications (in the case of this course, the capstone project). On the other hand, Landers's propositions on gamified learning can be seen in how *Monopoly* gameplay and *Monopoly*-related assessments serve a moderation role in improving motivation toward learning finance and encouraging engagement in more advanced finance topics.

Applying the Spiral Curriculum

Han's adaptation of the spiral curriculum can be seen in how the students were able to proceed to higher-order applications in the course following the *Monopoly* assessments. These higher-order applications include (i) capital budgeting; (ii) financial forecasting for a publicly-listed company; and (iii) valuation of a publicly-listed company—all of which require a fundamental understanding of financial statements and financial forecasts.

The application of the spiral curriculum is straightforward: the *Monopoly* assessments provide a means for the students to learn basic principles before proceeding to more advanced topics. As mentioned, the topics of capital budgeting, fixed-income, and equities all require a prior understanding of financial statement analysis and financial forecasting.

Financial Statement Analysis	Financial Forecasts	Time Value of Money	Capital Budgeting	Fixed-Income	Equities
Financial statements	Financial statements	Financial statements	Financial statements	Financial statements	Financial statements
Ratio analysis	Ratio analysis	Ratio analysis	Ratio analysis	Ratio analysis	Ratio analysis
	Modelling / forecasting	Modelling / forecasting	Modelling / forecasting	Modelling / forecasting	Modelling / forecasting
	Macroeconomics	Macroeconomics	Macroeconomics	Macroeconomics	Macroeconomics
	Industry analysis	Industry analysis	Industry analysis	Industry analysis	Industry analysis
	Company strategy	Company strategy	Company strategy	Company strategy	Company strategy
		Discounted cash flows	Discounted cash flows	Discounted cash flows	Discounted cash flows
			Capital budgeting metrics	Markets	Markets
				Interest rates	Relative valuation

Figure 10: Illustrating the Spiral Curriculum Throughout Course Topics

Qualitative feedback from students point to the *Monopoly* assessments as a significant tool that helped ground lessons on financial statement analysis and financial forecasting and allowed them to proceed to higher-order topics in the course. Noteworthy feedback on the *Monopoly* assessments that enforce its role in the spiral curriculum include the following:

- “Helpful”
- “Course requirement allowed [us] to get a better sense [of the lesson].”
- “With the *Monopoly* activity, [I was able to] really grasp why [financial] ratios are lower or higher.”
- “Learning by doing”
- “With the *Monopoly* activity, I was able to do financial modelling.”
- “It was a good way to understand how the business works.”
- “Good practice”
- “*Monopoly* was a great way to tackle the very complex topic of financial modelling.”

Applying Landers's Theory of Gamified Learning

As for the application of Landers's theory of gamified learning, two key observations must be made first to contextualize how students' attitudes when entering the finance course in discussion. First, students enter the course following the two prerequisite accounting subjects, with most students recounting unfavorable experiences while learning the accounting subject matter and therefore "scared" to engage finance topics. In an article from *Schoolbag: The Education News Site* (2019), Republic Polytechnic School of Management and Communication Senior Lecturer Ella Siu acknowledges that "people find accounting difficult" and that "even adults are intimidated by the subject." Second, most students enter the course with an impression that finance centers heavily on numbers and budgeting, implying that the subject matter is mechanical and not interesting. The researcher believes that these two considerations are roadblocks to achieving learning in the finance course.

With the use of *Monopoly*, students are intentionally placed in an environment that challenges their preconceived notions of finance. Such an environment involves gameplay with peers within students' respective learning teams, which the researcher views as a foil to the otherwise intimidating and mechanical initial impressions. The gameplay environment is intended to be enjoyable—this is consistent with the views of Bisson & Luckner (1996), who argue that board games "seem fun to play with, thus making an impact to the environment of the player to aid in learning" and Tasnim (2012), who believes that a board game can "become a valuable tool for fun and experiential learning."

The aforementioned are consistent with students' inputs on the *Monopoly* assessments:

- "Fun doing the game with the group"
- "Therapeutic"
- "Stress reliever"
- "Felt like a break, playing and having fun"
- "Fun assessment"
- "Childhood game applied to real life"

In majority of students' end-course feedback forms, students remark that they exit the finance course with a view on finance highly different from their initial impressions, most of which associated finance mainly with numbers and budgeting and conceived the subject as boring. Among the common realizations cited by students when they exit the course are (i) how narrative is important in the discipline of finance and (ii) how finance goes beyond numbers and budgeting. The researcher believes that the course instruction, with the aid of the *Monopoly* activities as moderating tools, helped drive these realizations. For example, the part of the gamified assessment was making a short write-up about key trends observed in the generated financial statements—this may have helped induce an attitude that placed importance on narratives in finance.

In summary, the *Monopoly* assessments in the finance course serve as a moderating tool meant to influence two attitudes: (i) students' apprehensions to learning finance due to unfavorable experiences learning accounting and (ii) students' preconceived notions of finance (i.e. mainly about numbers and budgeting). In influencing the two attitudes, students were observed to engage with other topics in the finance course with improved motivation and engagement. This is consistent with Landers' propositions in his theory of gamified learning, wherein he posits that gamification influences behaviors and attitudes, which in turn, moderate instructional effectiveness.

The Long View

On a more personal note, the researcher would like to note that several students who are part of the sample proceeded to engage in higher-order applications of finance via student competitions, internships, and job opportunities in the fields of investment banking, equity research, corporate finance, asset management, and management consulting among others. Qualitative feedback from students indicate that the finance course in discussion shifted several students' views on finance and made them consider future careers and opportunities in the field after previous apprehensions.

Bearing in mind the role the *Monopoly* activities played in the finance course, the researcher believes that the students' proceeding to these higher-order applications, beyond the extent of the course, are illustrative and supportive of both the spiral curriculum and Landers's theory of gamified learning.

Conclusion

Gamification as applied in undergraduate business education is relatively new, with limited existing literature. Existing literature on broader gamification in learning and education suggest multiple benefits, including improved motivation and engagement among learners. Gamification is used in an undergraduate finance course for business students in a private business school via the *Monopoly* board game. Students are tasked to generate financial statements, explain key trends in the financials, and develop financial forecasts based on *Monopoly* gameplay. This application of gamification is evaluated using Han's (2015) adaptation of the spiral curriculum and Landers's (2015) theory of gamified learning. Based on a qualitative explanatory methodology, the researcher concludes that (i) the *Monopoly* activities fit the spiral curriculum as a means to master basic principles before proceeding to higher-order applications and (ii) the *Monopoly* simulation influences key attitudes, namely fear due to accounting and preconceived notions on finance, which in turn drive better learning. Student feedback collected via consultation sessions and end-course feedback forms are supportive of the conclusions.

For future studies revolving around this topic, the researcher has four major recommendations. First, future studies may arrive at stronger conclusions with the use of feedback forms at the beginning and at the end of the course to formally test Landers's proposition of a change in attitude or behavior. The current research relied heavily on qualitative feedback from end-course feedback forms and consultation sessions to arrive at its conclusions. Second, the researcher recommends the use of a control group; one batch of students with the gamified *Monopoly* activities and another batch of students without the gamified activities. Landers (2015) had a similar recommendation and believes that "rigorous experimental and correlational tests of these paths and processes in differing gamification efforts and across contexts are needed next to establish a practical, comprehensive, and scientific understanding of gamification." Third, the researcher also recommends the use of quantitative methods for future studies, such as descriptive statistics and predictive statistics (e.g. ANOVA, regression), as opposed to the current study's purely qualitative approach. The last recommendation is to check for various exogenous factors that may affect the study, such as ensuring that the students in the sample had homogeneous accounting instruction or expanding the study to include students from other universities and degree programs.

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