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Capitalism Lab: A Simulation-Based Approach to Assessing and Enhancing Business Program Outcomes**

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ABSTRACT: Simulation is a process of replicating or imitating real systems to enhance users' comprehension of their behavior. It allows individuals to experience and interact with a simulated environment that closely resembles real-world scenarios, enabling them to practice and develop relevant skills in a controlled and risk-free setting. The importance of simulation lies in its ability to bridge the gap between theoretical knowledge and practical application. In the Capitalism Lab simulation, students practice according to predetermined scenarios, and their scores are monitored and evaluated. Over a 14-week period, students learn about the use of simulation and its connections with real-life business, integrating this theoretical knowledge with practical application. Since 2020, this course has been administered this course to a total of 371 students across three departments. The results obtained measure the level of achievement of program outcomes, and adjustments are made in the program accordingly. The most significant benefit of simulation-supported education for educators is its ability to measure the level of achievement of graduating students concerning the targeted program outcomes. The results obtained from these measurements provide data for making necessary adjustments to the program and improving the quality of education.

Keywords: *Business simulation, education, e-learning*
JEL Code: A39

Capitalism Lab: İşletme Programının Çıktılarını Değerlendirmeye ve Geliştirmeye Yönelik Simülasyon Tabanlı Bir Yaklaşım*

ÖZ: Simülasyon, kullanıcıların davranışlarını daha iyi anlamalarını sağlamak için gerçek sistemleri kopyalama veya taklit etme sürecidir. Bireylerin gerçek dünya senaryolarına çok benzeyen simüle edilmiş bir ortamı deneyimlemelerini ve bu ortamla etkileşime girmelerini sağlayarak, kontrollü ve risksiz bir ortamda ilgili becerileri uygulama ve geliştirmelerine olanak tanır. Simülasyonun önemi, teorik bilgi ile pratik uygulama arasındaki boşluğu kapatma becerisinde yatmaktadır. Capitalism Lab simülasyonunda, öğrenciler önceden belirlenmiş senaryolara göre pratik yapar, öğrencilerin puanları takip edilir ve değerlendirilirler. 14 haftalık bir süre boyunca öğrenciler simülasyonun kullanımını öğrenir ve gerçek hayattaki iş hayatıyla bağlantılarını kurarak teorik bilgiyi pratik uygulama ile bütünleştirirler. Bu ders 2020 yılından bu yana üç bölümde toplam 371 öğrenciye verilmiştir. Elde edilen sonuçlar program çıktılarının başarı düzeyini ölçmekte ve buna göre programda gerekli düzenlemeler yapılmaktadır. Simülasyon destekli eğitimin eğitimciler için en önemli faydası, mezun öğrencilerin hedeflenen program çıktılarıyla ilgili başarı düzeyini ölçme yeteneğidir. Bu ölçümlerden elde edilen sonuçlar, programda gerekli düzenlemelerin yapılması ve eğitim kalitesinin artırılması için veri sağlamaktadır.

Anahtar Sözcükler: *İşletme simülasyonu, eğitim, e-öğrenme*
JEL Kodu: : A39

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1. Introduction

Technological developments and the digital age require innovative approaches in education as well as in business life (Kim & Watson, 2017; Löffler et al., 2019; Beranic & Hericko, 2022). Higher education institutions are adopting innovative technologies and innovative teaching techniques. New techniques expand traditional methods and shift the main character of the learning process from the educator to the student. (Bach et al., 2020).

The generation that grew up with technology has a shorter focus time than previous generations. Gamification methods can increase the interest of this generation. It is thought that simulation-supported education practices may increase learning interest through gamification (Tanner et al., 2012). It is known that interactive technologies play a fundamental role in the learning process and therefore should be at the center of the learning process (Sedelnikova & Emelyanova, 2014). Moreover, today, graduates are expected to be qualified to meet the needs of the complex business world (Seethamraju, 2011). Problem-solving skills, leadership and innovative approaches in complex business environments are a set of skills considered important by businesses and employers. These skills are also known as 21st Century competencies. Simulation practices are one way to develop this (Clarke, 2009; Shaifai, 2019; Peterkova et al., 2022). Simulations offer a practical approach by simulating real business life (Buil et al., 2019; Beranic & Hericko, 2022). Simulation applications are a way to experience real business life without risk (Blazic & Arh, 2013). Simulation applications in higher education are an increasingly popular teaching method (Lohmann et al., 2019). Business simulation practices improve business administration students' abilities to analyze events by practicing in a business environment. These practices provide them the skills that are appropriate with expectations of business life (Pratikto et al., 2019; Grijalvo et al., 2022).

On the contrary, simulation-supported education has also some challenges. Firstly, students may have difficulty to adapt the pedagogical changes. Secondly, establishing the infrastructure of simulation-supported education may be difficult, and the preparation taking a long time. Thirdly, simulation-supported education has the high initial cost. In addition, it may be difficult to determine the role of the instructor and the degree of intervention in simulation-supported education and to provide the appropriate environment for simulation practices (Chang, 2003; Clarke, 2009; Bach et al., 2020). The lack of technical skills of educators and their unpreparedness for these types of practices also make the simulation practices difficult. (Dudziak & Stoma, 2020).

It is possible to divide business simulations into three types: Computer-based simulations generally simulate business management in a computer environment. An example of this is the Capitalism Lab game. Board games, on the other hand, are entrepreneurial games played physically through cards, boards or special gaming tools. Monopoly is an example of this. Behavioral simulations, on the other hand, are role-play simulations that require making decisions against events occurring within or around the business. Looking Glass Inc. are examples of such simulations (Summers, 2004).

Rogmans (2016) stated that simulation can be used at three different levels in international business management education. Simulation games can be used by integrating them into lessons for the purpose of diversity in teaching methods at the first level. At the second level, simulation applications can be associated with learning outcomes and used to facilitate learning. Thus, learning motivation can be increased. At the third level, models and scenarios can be created by instructors and an application can be made for this, and then these models and scenarios can be discussed. In this way, critical thinking skills can be improved (Rogmans, 2016). De Smale et al. (2015) stated that the simulations used for educational

purposes must meet three basic features in order to meet the learning objectives. The simulation applications used should be specific, appropriate to the course content, and the instructor's guidance and intervention should be well defined (De Smale et al., 2015).

Simulation applications can be adapted to different learning objectives in supply chain, marketing and business strategies education. Simulation selection can be made for the relevant educational field and thus aligned with learning objectives (Blazic & Arh, 2013). The ability of simulation applications to provide repeatable applications is also thought to be effective in learning business concepts better (Warren et al., 2021).

The aim of this study is to reveal how simulation-supported education can contribute to the targeted program outcomes in business education related programs. To this end, Business Simulation course implemented in three undergraduate programs of the Faculty of Economics and Administrative Sciences at Çağ University and how the outcomes obtained from this course can be used in program development are explained. The main research question is whether simulation-supported teaching techniques can be used in program development and improvement. As can be seen in the second section of this article, studies in the literature generally focus on the effects of simulation-supported education on students. In this study, unlike the studies in the literature, how simulation-supported education can contribute to the development and improvement of programs is examined. The contribution of the data obtained from simulation-supported education to reveal the aspects that need to be developed in the program and to provide the necessary changes in the program is examined. Thus, it is thought that this research will contribute to the literature by revealing a different benefit of using simulation-supported teaching techniques.

In the second section of the study, a general summary of the literature on simulation-supported education is presented. In the third section, design and evaluation criteria of the Business Simulation course are explained in detail. In the following section, results obtained from these implemented courses and how these results are used are explained, and in the last section, the results obtained from the study are discussed.

2. Literature Review

Several studies have been conducted in the literature on the use of simulation games in education. In this section these studies and results will be mentioned. The results obtained in these studies have generally been positive and indicate that using simulation provides beneficial results. It has also been seen that simulation games can be used in different fields of education.

Vos (2014) studied about the effects of using simulation games as supportive tool in marketing education from the student and instructor perspectives. Students indicated that it was difficult to find a simulation game suitable with learning outcomes. Simulation games are an effective and enjoyable learning method. However, instructors stated it was difficult to find a simulation game suitable with learning outcomes of the course and it was a compelling instruction process.

In another study by Williams (2011) that simulation-supported education increased student concern and promoted learning. Simulation games are beneficial for students, because these games force the students to make real decisions. Additionally, simulation games improve the students' analysis skills. Furthermore, simulation games enable them to take a role in a situation.

Seethamraju (2011) remarked that simulation-supported teaching methods contributes thoroughly learning and these games positively affects the students' skill development.

Ranchhod et al. (2014) emphasized that simulation games have strong effects on cognitive understanding and improves the students' learning experiences. Likewise, according to Mohsen et al. (2018) simulation games improve students' notional understanding and

positively affect students' skill development and learning experiences.

Rogmans and Abaza (2019) indicated that simulation games increased student participation. On the contrary authors stated that it may change depending on the students' characteristics. Likewise, Sedelnikova & Emelyanova (2014) stated that business management students evaluated simulation supported education as exciting and challenging, and that students' motivation and attention increased with simulation practices. It has also been understood that simulation applications develop students' decision-making abilities under different conditions and increase their creativity.

Loon et al. (2015) concluded that simulation supported education and simulation games are stimulating and attract students' attention, so that games increase students' productivity.

Kesse (2023) stated that simulation practices encourage students' participation and increases students' motivation. Additionally, the author emphasized that complicated theoretical models can be learned more easily with simulation practices. In another study conducted by Bamufleh et al. (2020) it was understood that the students' considerations were positive about the simulation games and students remarked that they intended to continue using simulation games.

Huang et al. (2022) stated that simulation games promote class participation and simulation games give positive results about learning. According to the study, there has also been more benefits of simulation supported education like improving problem solving skills, creativity and critical thinking. Kikot et al. (2013) similarly stated that simulation practices increase class participation and enhance the student skills. Therefore, it was understood that simulation games can be used as supportive tool in management and entrepreneurship education.

Ben-Zvi & Carton (2007) stated that simulation practices increase effective decision-making skills by linking up between real situations and business concepts. Ben-Zvi (2010) also stated that business simulation games are effective way of learning.

Kuttergina (2017) applied simulation supported education for public administration department students. According to the results of the study, students who participated in the simulation supported classes were generally more successful in the course.

Hoang et al. (2022), conclude that business simulation practices in education contribute to increase human-system interaction, creating sufficiency for students and these type of practices in education positively affecting the students' entrepreneurial ideas. Similarly, Chen et al. (2022), stated that simulation-supported education could improve students' entrepreneurial manner and self-efficacy.

Gatti et al. (2019) stated that simulation-supported teaching practices may be a useful technique in education. Simulation practices can increase cognitive and sensory skills and improve the students' analytical and critical thinking skills. Furthermore, it was understood that the simulation supported sustainability education increases the attitudes about sustainability.

Kim & Watson (2017) conducted a study with MBA students about simulation-supported education. Most of the MBA students gave positive feedback about the simulation practices. In addition, the MBA students stated that there is a risk-free environment to make decisions with simulation practices, and this increases the decision-making ability.

Shafiai (2019) stated that simulation practices may be an effective way to gain 21st Century skills, because they contribute to decision-making abilities.

Sanina et al. (2020) conducted a study about simulation-supported teaching practices and they concluded that the simulation practices in education may improve the students' general and professional skills.

Peterkova et al. (2022) stated that simulation applications may be a useful technique for students to establish connections between economic variables.

Simulation practices can also improve the students' teamwork skills. Birknerova (2010) stated that teamwork skills increased with simulation practices. Boikou et al. (2022) concluded that the business students' teamwork skills increased with simulation practices. Ceschi et al. (2014), applied a stock market simulation with students and it was understood that the simulation increased the students' teamwork skills. Students also stated that their decision-making skills were improved with simulation practices.

Dube (2015) compared the traditional teaching methods and simulation-supported education and stated that using traditional and non-traditional teaching methods together may create a synergy. With this synergy created, students' potential can be developed and their interests can be increased in this way. In addition, simulation-supported education can be a good teaching technique when used together with traditional methods.

Tanner et al. (2012) stated that simulations can be useful supportive learning tools for undergraduate students' education. Hauge & Riedel (2012) remarked that simulation practices are effective in achieving the targeted learning outcomes.

Huebscher & Lendner (2010) determined that complex educational goals that cannot be achieved with traditional methods can be achieved with the help of simulation games. Pasin & Giroux (2010) stated that simple decision-making skills can be gained through traditional teaching techniques, but decision-making skills under dynamic conditions can be taught more effectively with the help of simulations.

Vos (2015) conducted a study about the educators' perspectives to simulation-supported education. Educators stated that the purpose of using simulation is to provide students with the skills they will need in business life. Educators find simulations an effective way to evaluate students in multiple ways. It is also stated by educators that simulation is an effective way to integrate theoretical and practical knowledge. Educators also agree with the view that simulations improve teamwork skills.

Bach et al. (2020) found that 84% of the academicians who participated in their study were using or intending to use simulation applications. Academics have stated that the biggest benefit of simulations is that they increase student motivation.

Although studies in the literature generally show that simulation applications yield positive results, Martinez-Perez et al. (2018) reached a different conclusion. It has been stated that reward-oriented gameplay in simulation games is an obstacle to obtaining the full benefit that can be obtained from the simulation. The authors expressed this issue as a point that should be taken into consideration in simulation-supported education, but they still stated that simulations can be a useful teaching technique.

3.Methodology

3.1.Course Design

The data used in the study was obtained from the course called 'Business Simulation' taught to undergraduate students of three departments within Çağ University Faculty of Economics and Administrative Sciences. The Business Simulation course is compulsory for senior undergraduate students in the 100% English-medium departments of International Business Management, International Finance and Banking, and International Trade and Logistics. Since 2020, a total of 371 students from three departments have been taken this course. The data obtained from the evaluation results cover the evaluation results of 371 students. Capitalism Lab simulation game is used as a business simulation application in the course.

Capitalism Lab is a business simulation game that offers all functions of a business (such as marketing, finance, human resources, production, management) that can be used

together. The simulation includes 8 instructive tutorials that explain these functions separately. These tutorial sections also introduce the in-game menus and explain how to use business functions in the simulation. Business Simulation course covers a 14-week semester. These tutorials are explained in the 8-week part of the course. Theoretical information about the business functions examined in the relevant tutorial is also presented during the sessions. In addition, the real-life equivalents of the business themes covered in the simulation are also explained throughout the course. Tutorial themes are described below:

- *Tutorial 1:* Explains the interface of the game. It introduces basic menus and explains how to open a store in the simulation. It shows how to make a profit by selling products produced in these stores.

- *Tutorial 2:* Explains retailing sector. It shows how to sell produced products by other corporations in stores. It also introduces different store types (supermarket, discount megastore, electronics store, etc.) in line with the retailing theme. Explains the advantages and disadvantages of selling products in specialized stores.

- *Tutorial 3:* Shows how to produce your own products in simulation. It explains how to obtain raw materials, turn them into products, and sell them. It shows which units need to be established for production in the factory and how to establish the connection between these units.

- *Tutorial 4:* Explains the marketing function of the business. Explains the advantages and disadvantages of different branding strategies that can be implemented in the simulation. It explains concepts such as brand awareness and brand loyalty and emphasizes their importance in terms of competition.

- *Tutorial 5:* Explains the finance function of the business. Introduces the stock market and explains the impact of investing in other companies' stocks on building a business empire. It explains the financial information of firms and provides information about the use of this financial information.

- *Tutorial 6:* Explains the agriculture and livestock sector. It describes how to use this sector in the simulation, how to carry out agricultural production, the advantages of producing in this sector and the points to be considered in production. It emphasizes the advantages of producing in this sector because agricultural products can be used as input in a wide range of products. This tutorial states that producing in this sector can be an easy way to grow by creating a competitive advantage.

- *Tutorial 7:* Provides information about the Research and Development (R&D) function and its use in simulation. This tutorial points out that product quality must be constantly improved in order to create a competitive advantage, and the way to achieve this is R&D. Additionally, emphasizes the impact of employee training on productivity.

- *Tutorial 8:* Defines the management and human resources functions of the business. This tutorial emphasizes that establishing headquarters in business empires will ensure management efficiency. Explains top management positions and critical management functions. This tutorial also shows how raw materials (mines, oil, timber) used in industrial production can be produced in the simulation.

Each tutorial is taught in a 3-hour weekly lesson. The first 8 weeks of the course are spent explaining these tutorials and explaining the theoretical foundations of the topics covered. In the remaining weeks, practices are carried out according to the scenarios created by the instructors. One of these practices is applied in student teams of 3 or 4 people in order to improve students' teamwork skills. These teams are created by students. After the application in teams, the students are asked to write a report describing their experiences. Other simulation game practices are carried out as individual applications, with the same scenario given to each student. In the simulation, students are not competitors with each other.

In the simulation, there are competitors created by artificial intelligence, and students compete with artificial intelligence corporations in the simulation. However, even though the students are not competitors in the simulation, one of the evaluation criteria is the score obtained from the simulation. In the Capitalism Lab game, "the score" refers to a quantitative measure that measures students' success as a player based on many aspects of managing a virtual company empire. Therefore, students strive to achieve the highest score possible. Thus, simulation practices create a spontaneous competitive environment. The simulation gives instructors the opportunity to adjust the difficulty level. Thus, instructors can create scenarios at various difficulty levels. Figure 1 shows an example for scenario created by instructors and the goals that students are expected to achieve in practice.

3.2.Evaluation Criteria and Their Relationship with Program Outcomes

Students are not given a classical exam within the scope of this course. Instead, 9 evaluation criteria were created to correspond to 9 different program outcomes. These outcomes are established due to the "International Accreditation Council for Business Education (IACBE)". This accreditation supports business departments in improving the business education programs. Çağ University is one of the members of IACBE, and all departments that we implemented this course are included in the process. Therefore, program outcomes are created with the same outcomes for all departments. In this way, success levels are measured and data is obtained regarding the level of students' achievement of program outcomes in the evaluation made in this way. Program outcomes express the basic competencies that students graduating from each department are expected to gain as a result of 4-year education. The data obtained are brought together and a general evaluation is made in this way. If low results are obtained in a criterion that meets any program output, corrections and improvements are made accordingly in the program. For example, the first evaluation criterion is a criterion for improving written and oral communication skills. If a low result is achieved in this criterion, arrangements are made to improve oral and written skills in the courses within the scope of the program and they are integrated into other courses. These arrangements may take the form of homework submissions in the form of reports in other courses or oral presentations within the course. Table 1 shows the evaluation criteria applied in the Business Simulation course and the relationships of these criteria with program outcomes.

Figure 1: An example scenario created by instructors

Table 1: Business simulation course evaluation criteria and their relationship with International Business Management program outcomes

	Evaluation Criteria	Relation with Program Output (PO)
1.	Presentation & Writing Skills (10 points)	PO1: Produce reports and presentations to accomplish effective and professional communication in different business skills
2.	Simulation Score (20 points)	PO2: Demonstrate professionalism while using information technology tools in his/her field
3.	Definition of Major Business Concepts (10 points)	PO3: Define major business concepts within the traditional areas of business
4.	Social Responsibility (10 Points)	PO4: Carry out the ethical and legal principles when making decisions in global business environments
5.	Integration of Theoretical and Practical Knowledge (10 Points)	PO5: Combine the acquired theoretical and practical knowledge in the system that she/he lives
6.	Communication Skills (Teamwork – 10 points)	PO6: Use leadership, team working and interpersonal relationship abilities
7.	Use of Business Functions (10 Points)	PO7: Discuss the functions and relationship among the functions of business administration such as accounting, finance, marketing, management, and production
8.	Coordination of Management Functions Skills (10 points)	PO8: Coordinate functions of management such as planning, organizing, directing, and controlling in different business settings
9.	Analytical / Critical Thinking Skills (10 points)	PO9: Using analytical tools and critical thinking to solve contemporary business problems

The evaluation criteria in Table 1 are intended to measure student success in this course. The simulation score obtained from the simulation game application according to the scenario created by the instructors is an evaluation criterion. Students make an oral presentation in which they explain the strategies they use in practice to evaluate their oral communication skills, and at the end of this presentation, students are asked questions regarding the integration of theoretical-practical knowledge. Students also prepare a short report in which they evaluate the simulation game practice they made as a team, and their teamwork skills are measured with this practice and report. Other evaluation criteria are measured with a detailed final report prepared by the students.

In the final report prepared by the students, they are asked to explain the basic concepts of business theoretically. They are expected to integrate these theoretical explanations with the strategies they determine in practice. Thus, it is aimed for students to put the theoretical knowledge they have learned during their 4-year education into practice through simulation practices. Another benefit of simulation applications emerges here. This benefit can be explained as the integration of the information obtained in theoretical education with practice in business life.

4.Findings

Table 2 shows the number of students taking the Business Simulation course between 2020-2024. There are 371 students who took the Business Simulation course from 3 departments' 4th year undergraduate students of Faculty of Economics and Administrative Sciences.

Table 2: Number of students

Year	Number of Students
2020-2021	153
2021-2022	110
2022-2023	60
2023-2024	48
TOTAL	371

The evaluation criteria used to measure program outcomes are presented in Table 3 and Table 4. Changes have been made to the evaluation criteria in 2022. The purpose of making changes here is to better measure program outcomes based on the results obtained in the previously used criteria. In addition, according to the results obtained, it was seen that the weight of simulation scores in the total evaluation was high. It was understood that this situation did not provide full effectiveness in measuring program outcomes, and necessary changes were made to the evaluation criteria to better measure other program outcomes. As a result of these changes made in order to benefit more effectively from the simulation course, it was seen that program outcomes were measured more clearly and easily.

Table 3: Evaluation criteria used in 2020 and 2021 years

MAN 446 Business Simulation Rubric 20-21 & 21-22	
Department:	
Lecturer:	
Student ID:	
Student Name:	
Evaluation of the Simulation	
Criterion	Point
1. Simulation Score	45
2. Social Responsibility	15
3. On Time Paper Submission	1

4. Style and Tone	3
5. Use of References	3
6. Formatting	3
7. Analytical/Critical Thinking Skills	10
8. Written Communication Skills	10
9. Presentation	10
TOTAL	100

Table 4: Evaluation criteria used after 2022

MAN 446 Business Simulation Rubric 22-23 &23-24	
Department:	
Lecturer:	
Student ID:	
Student Name:	
Evaluation of the Simulation	
Criterion	Point
1. Presentation and Writing Skills	10
2. Simulation Score	20
3. Definition of Major Business Concepts	10
4. Social Responsibility	10
5. Integration of Theoretical and Practical Knowledge	10
6. Leadership & Teamwork	10
7. Use of Business Functions	10
8. Coordination of Management Functions Skills	10
9. Analytical/critical thinking skills	10
TOTAL	100

Table 5 shows the average results of students according to the evaluation criteria used in 2020 and 2021. The results show an increase in the first criterion, the simulation score. In an evaluation made out of 45 points, the average score increased from 28.17 to 30.27. Due to the COVID-19 pandemic, online education was switched to and the simulation application was also carried out as distance education. The simulation application was loaded onto the students' personal computers, so that students could access the simulation program at any time. In addition, the recordings of the courses conducted online were shared with the students, so that students had the opportunity to listen to the course again. As a result of these applications, an increase was observed in the average scores obtained from the simulation scores in 2021. The average scores obtained in the social responsibility criterion, another criterion, also increased in 2021. The concept of social responsibility, which is increasingly important for businesses today, was especially emphasized both in the simulation course and in other courses, and as a result of this emphasis, an increase was observed in the average scores obtained from this criterion. The criteria where the averages decreased compared to the previous year in 2021 were mainly related to academic writing rules that should be taken into consideration in the final report prepared by the students. Based on the results obtained here, the rules to be considered in academic writing were explained to the students and it was aimed to improve academic writing skills by increasing practices such as homework in other courses.

Table 5: Average results for the 2020-2021 years

Criteria	2020 average	2021 average
1	28.17	30.27
2	11.61	13.07
3	0.99	0.98
4	2.74	2.40
5	2.54	2.25
6	2.65	2.11
7	8.92	7.61
8	9.08	7.75
9	7.61	5.85
TOTAL	74.32	72.30

Table 6: Average results for the 2022-2023 years

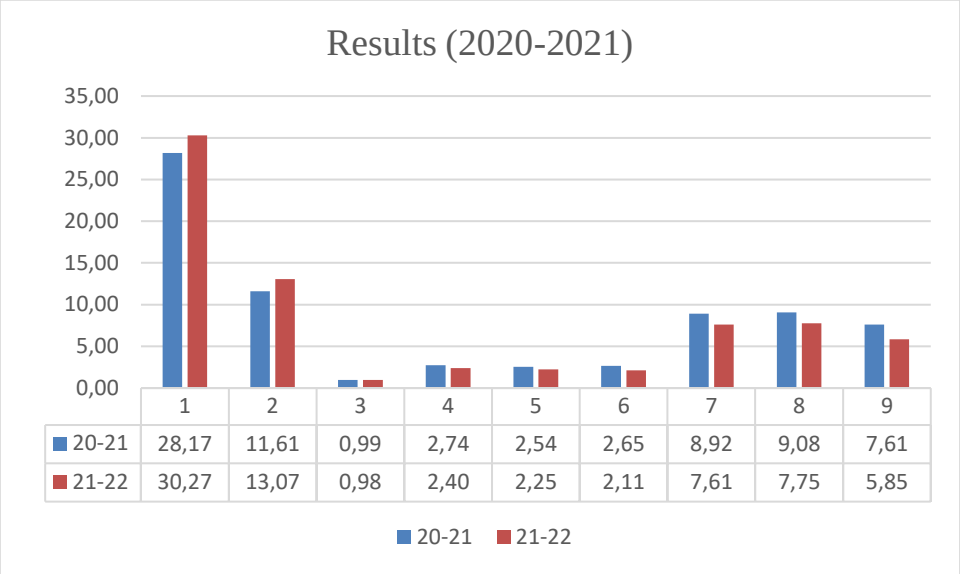
Criteria	2022	2023
1	6.97	6.23
2	13.33	10.85
3	7.43	7.88
4	8.10	7.88
5	7.53	8.10
6	7.82	8.06
7	7.48	8.25
8	7.27	7.52
9	7.93	8.08
TOTAL	73.87	72.85

In 2022, changes were made to the evaluation criteria in order to measure program outcomes more effectively and efficiently. Table 6 represents the results of the course after the changes were made. With the changes made, the weight of the scores obtained from the simulation score was reduced in the total. In addition, with the changes made, each criterion was arranged to measure a program outcome. The aim of the changes here is to measure program outcomes more efficiently. In addition, the criterion, which was determined only as oral presentation in previous years, was determined as written and oral communication. Thus, this criterion aimed to measure the level of reaching the program outcome, which expresses written and oral communication skills. The reason for the low average score in this criterion was that some students did not make oral presentations. It is thought that the reason for the low average score in the simulation score is due to the earthquake disaster experienced in the region in the spring of 2023, when the course was given. It was observed that there was a decrease in the success averages in the said period, not only in the simulation course but in general. When we look at the other criteria, the positive effects of the developments made in academic writing are seen based on the results obtained in previous years, and it is seen that the averages for these criteria have increased.

Graph 1 shows the results obtained from each criterion in 2020 and 2021. Graph 2 shows the results after the criteria were changed in 2022 and 2023. It can be seen from the graphs the first criteria which expresses the simulation score, had a high weight in the total grade in 2020 and 2021, and therefore affected the average scores significantly (45% percent). The results obtained here were evaluated and necessary changes were made to the criteria in order to measure the program outcomes more effectively. As a result, more balanced weights were created. When the results obtained after this change were examined, it was seen that the averages increased in 6 out of 9 criteria in 2023 compared to the previous year. When we look at 2021, year before the changes were made, it was seen that the average increased in only 2 criteria. When the results presented in Graph 1 and Graph 2 are examined, it is understood

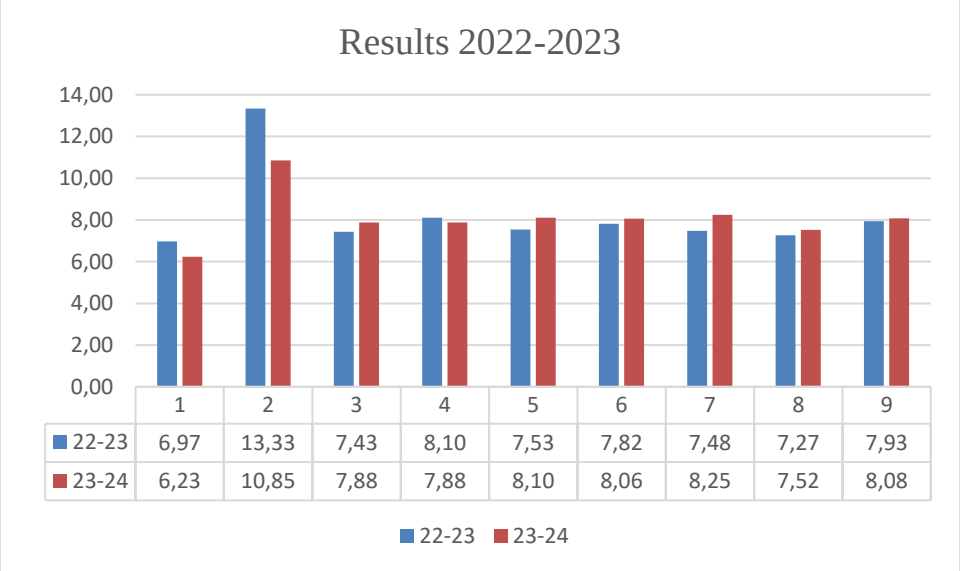
that the changes are effective in measuring the program outcomes. Graph 3 shows the average of the total scores obtained from the criteria. It is seen that the average of the total grades is above 70 even when the criteria are changed. Because of the COVID-19 pandemic, this course applied online. Therefore in 2021 average grades decreased. After the changes were made in 2022, average grades were higher again. In 2023, because of the earthquake disaster, this course was applied online again and average grades decreased in 2023.

Graph 1: Results 2020-2021



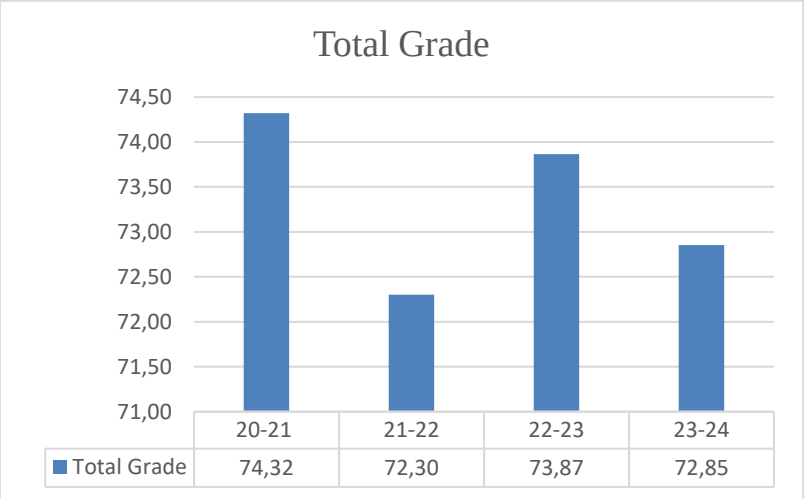
	1	2	3	4	5	6	7	8	9
20-21	28,17	11,61	0,99	2,74	2,54	2,65	8,92	9,08	7,61
21-22	30,27	13,07	0,98	2,40	2,25	2,11	7,61	7,75	5,85

Graph 2: Results 2022-2023



	1	2	3	4	5	6	7	8	9
22-23	6,97	13,33	7,43	8,10	7,53	7,82	7,48	7,27	7,93
23-24	6,23	10,85	7,88	7,88	8,10	8,06	8,25	7,52	8,08

Graph 3: Total grade point averages for all years



5.Conclusion

This study investigates the effectiveness of the results obtained from simulation-supported training in the Business Simulation course at Çağ University in measuring the level of reaching program outcomes. The results obtained from simulation-supported training provide data that helps measure the level of reaching program outcomes. Thus, the aspects in which students are more and less successful in reaching program outcomes can be determined according to the results they receive. The results obtained are used as data to make the necessary arrangements and developments in the programs. The arrangements and developments made are aimed at increasing program quality. Unlike the benefits emphasized in the studies in the literature, it is understood that simulation can also be used as a data provider to increase the quality of education in this study. Simulation-supported education can be useful for quality education, one of the sustainable development goals.

In the Business Simulation course, which is conducted entirely using a simulation program, the evaluation criteria are determined in a way that is compatible with the program outcomes. The outcomes obtained from this course provide an evaluation of the students' level of reaching targeted program outcomes at the end of 4-year undergraduate education from the educators' perspective. The outcomes obtained are evaluated by instructors and the necessary adjustments are made in the program according to these results. For instance, in cases where the average results in the written and oral communication criteria are low, written report and oral presentation assignments are added to the content of the courses in the program. Thus, efforts are made to improve the parts that are inadequate in reaching the program outcomes. Main issue addressed in this study is the contributions that simulation-supported education can provide in developing program outcomes. In this regard, the results obtained from the study are a practical example for the use of simulation-supported business education in program improvements. As explained in detail in the study, the evaluation criteria of the applied courses conducted using simulation programs can be matched with the program outcomes and the outcomes obtained from here can be used for the improvement of business programs. The method explained in the study and the results obtained offer a different path for educators and researchers alike to design courses and improve programs with simulation support. In this way, it is thought that the research contributes to the literature with its different perspective.

The research has some limitations along with its contributions. The results obtained in the study include only the evaluations of the lecturers who teach the course. A comparison can also be made by comparing the students' own evaluations and the evaluations of the

instructors with the help of a course evaluation survey to be applied to the students. Due to main subject of this research is how simulation applications can contribute to the development of program outcomes in business education programs, no comparison was made. A comparative evaluation can also be made in subsequent studies.

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Araştırmacıların Katkı Oranı Beyanı

1. yazar %70 oranında, 2. yazar %30 oranında katkı sağlamıştır.

Çıkar Çatışması Beyanı

Bu çalışmada herhangi bir potansiyel çıkar çatışması bulunmamaktadır

Genişletilmiş Özet

Literatür Özeti: Yeni teknikler, geleneksel yöntemleri genişleterek öğrenme sürecinin ana karakterini eğitimciden öğrenciye kaydırmaktadır (Bach vd., 2020). Teknoloji ile büyüyen neslin, önceki nesillere göre daha kısa bir odaklanma süresine sahip olduğu belirtilmektedir. Bu durum, oyunlaştırma yöntemlerinin bu neslin ilgisini artırmada etkili olabileceğini göstermektedir. Nitekim, oyunlaştırma yoluyla simülasyon destekli eğitim uygulamalarının öğrenme ilgisini artırabileceği öne sürülmektedir (Tanner vd., 2012). Etkileşimli teknolojilerin öğrenme sürecinde temel bir rol oynadığı ve bu nedenle öğrenme sürecinin merkezinde yer alması gerektiği ifade edilmektedir (Sedelnikova ve Emelyanova, 2014). Bunun yanı sıra, günümüzde mezunların karmaşık iş dünyasına uygun niteliklere sahip olması beklenmektedir (Seethamraju, 2011). Problem çözme becerileri, liderlik ve karmaşık iş ortamlarında yenilikçi yaklaşımlar, işletmeler ve işverenler tarafından önemli görülen beceriler arasında yer almakta ve bu beceriler 21. Yüzyıl yetkinlikleri olarak tanımlanmaktadır. Simülasyon uygulamaları, bu yetkinliklerin geliştirilmesinde etkili bir yöntem olarak öne çıkmaktadır (Clarke, 2009; Shaifai, 2019; Peterkova vd., 2022). Gerçek iş hayatını simüle ederek pratik bir yaklaşım sunan simülasyonlar, risksiz bir şekilde deneyim kazandırmanın bir yolu olarak değerlendirilmektedir (Blazic ve Arh, 2013; Buil vd., 2019; Beranic ve Hericko, 2022). Yükseköğretimde simülasyon uygulamaları giderek daha popüler bir öğretim yöntemi haline gelmektedir (Lohmann vd., 2019). İşletme simülasyon oyunları, İşletme Yönetimi öğrencilerinin gerçek bir iş ortamında pratik yaparak olayları analiz etme ve karar verme yeteneklerini geliştirmekte, böylece onlara iş hayatının beklentilerine uygun beceriler kazandırmaktadır (Pratikto vd., 2019; Grijalvo vd., 2022). Eğitimde simülasyon oyunlarının kullanımına yönelik literatürde birçok araştırma yapılmıştır. Bu çalışmalarda elde edilen sonuçlar genel olarak olumlu olup, simülasyon kullanımının faydalı sonuçlar verdiğini göstermektedir. Ayrıca, simülasyon oyunlarının farklı eğitim alanlarında da kullanılabileceği görülmüştür. Vos (2014), pazarlama eğitiminde simülasyon kullanımının öğrenci ve eğitmen perspektiflerinden etkilerini değerlendirmiştir. Öğrenciler, simülasyon oyunlarının etkili ve eğlenceli bir öğrenme yöntemi olduğunu ifade ederken, eğitmenler bu sürecin zorluğunu ve öğrenme çıktılarıyla uyumlu bir simülasyon oyunu bulmanın güçlüğünü dile getirmiştir. Benzer şekilde, Williams'ın (2022) yaptığı bir çalışma, simülasyon destekli eğitimin öğrencilerin ilgisini artırdığını ve öğrenmeyi teşvik ettiğini ortaya koymuştur. Simülasyon oyunlarının, öğrencilere gerçek kararlar verme, analiz becerilerini geliştirme ve olaylara aktif katılım sağlama gibi faydalar sunduğu anlaşılmıştır. Seethamraju (2011) ise simülasyon destekli eğitimin derin öğrenmeye katkıda bulunduğunu ve beceri gelişimini olumlu yönde etkilediğini belirtmiştir.

Yöntem: Bu çalışmada kullanılan veriler, Çağ Üniversitesi İktisadi ve İdari Bilimler Fakültesi'ne bağlı üç bölümün lisans öğrencilerine verilen 'İşletme Simülasyonu' adlı dersten elde edilmiştir. İşletme Simülasyonu dersi, Uluslararası İşletme Yönetimi, Uluslararası Finans ve Bankacılık, Uluslararası Ticaret ve Lojistik bölümlerindeki son sınıf öğrencilerine zorunlu ders olarak sunulmaktadır. 2020 yılından itibaren üç bölümden toplamda 371 öğrenci bu dersi almıştır ve çalışmada bu öğrencilerin değerlendirme sonuçlarına ilişkin veriler kullanılmıştır. Ders kapsamında Capitalism Lab simülasyon oyunu kullanılmaktadır. Capitalism Lab, bir işletmenin tüm fonksiyonlarını (pazarlama, finans, insan kaynakları, üretim ve yönetim gibi) entegre bir şekilde sunan bir işletme simülasyonudur. Simülasyon, bu fonksiyonları ayrı ayrı açıklayan ve oyundaki menülerin yanı sıra işletme fonksiyonlarının nasıl kullanılacağını detaylandıran 8 öğretici kılavuz içermektedir. İşletme Simülasyonu dersi 14 haftalık bir dönemi kapsamaktadır ve bu kılavuzlar dersin ilk 8 haftasında teorik bilgilerle birlikte öğretilmektedir. Geri kalan haftalarda ise eğitmenler tarafından belirlenen senaryolar çerçevesinde uygulamalar yapılmaktadır.

Uygulamaların bir kısmı, takım çalışması becerilerini geliştirmek amacıyla 3-4 kişilik öğrenci takımları tarafından gerçekleştirilmektedir. Bu takımlar, öğrenciler tarafından oluşturulmakta ve takım performansı sonrasında öğrencilerden bir deneyim raporu yazmaları istenmektedir. Diğer uygulamalar ise bireysel olarak yürütülmekte ve tüm öğrencilere aynı senaryo sunulmaktadır. Simülasyonda öğrenciler birbiriyle rakip değildir; bunun yerine, yapay zekâ tarafından oluşturulan rakiplerle rekabet etmektedirler. Ancak, simülasyondan alınan puan bir değerlendirme kriteri olduğu için öğrenciler yüksek puan almak adına bireysel bir rekabet ortamı oluşturmaktadır. Simülasyon, eğitmenlere zorluk seviyesini ayarlama fırsatı sunmaktadır. Böylece eğitmenler, çeşitli zorluk seviyelerinde senaryolar oluşturabilmektedir. Bu ders kapsamında öğrencilere klasik bir sınav verilmemektedir. Bunun yerine, 9 farklı program çıktısına karşılık gelecek şekilde 9 değerlendirme kriteri oluşturulmuştur. Bu şekilde, başarı düzeyleri ölçülmekte ve yapılan değerlendirmede öğrencilerin program çıktılarındaki başarı düzeylerine ilişkin veriler elde edilmektedir. Program çıktıları, her bölümden mezun olan öğrencilerin 4 yıllık eğitim sonucunda kazanmaları beklenen temel yetkinlikleri ifade etmektedir. Dersin final raporu kapsamında öğrencilerden işletmenin temel kavramlarını teorik olarak açıklamaları ve bu açıklamaları belirledikleri stratejilerle entegre etmeleri beklenmektedir. Böylece, öğrencilerin teorik bilgilerle pratik uygulamaları birleştirerek öğrendiklerini hayata geçirmeleri amaçlanmaktadır. Simülasyon uygulamalarının en önemli faydalarından biri de burada ortaya çıkmaktadır. Bu fayda, teorik bilgilerin iş hayatına entegrasyonu olarak açıklanabilir ve öğrencilerin iş dünyasına daha iyi hazırlanmasına katkı sağlamaktadır.

Bulgular: İktisadi ve İdari Bilimler Fakültesi'nin üç bölümünde, dördüncü sınıf lisans öğrencilerinden toplam 371 öğrenci İş Simülasyonu dersini almıştır. Program çıktılarının ölçülmesinde kullanılan değerlendirme kriterleri incelenmiş ve 2022 yılında bu kriterlerde değişiklikler yapılmıştır. Bu değişikliklerin amacı, önceki kriterlerden elde edilen sonuçlara dayanarak program çıktılarının daha etkili bir şekilde ölçülmesini sağlamaktır. Özellikle simülasyon puanlarının toplam değerlendirmedeki ağırlığının yüksek olduğu gözlemlenmiş ve bu durumun program çıktılarının diğer alanlardaki ölçümünü tam anlamıyla desteklemediği anlaşılmıştır. Bu nedenle, değerlendirme kriterlerinde gerekli düzenlemeler yapılmış ve değişikliklerin sonucunda program çıktılarının daha net ve kolay bir şekilde ölçüldüğü görülmüştür. Yapılan değişikliklerin etkisi, simülasyon puanlarında bir artış olarak kendini göstermiştir. 45 puan üzerinden yapılan değerlendirmede, simülasyon puanı ortalaması 28,17'den 30,27'ye yükselmiştir. COVID-19 pandemisi nedeniyle uzaktan eğitime geçilmiş ve simülasyon uygulamaları öğrencilerin kişisel bilgisayarlarına yüklenerek çevrimiçi bir ortamda gerçekleştirilmiştir. Ayrıca, çevrimiçi derslerin kayıtlarının öğrencilere sunulması, dersleri tekrar dinleyerek öğrenmelerini pekiştirme fırsatı yaratmıştır. Bu uygulamalar sonucunda, 2021 yılında simülasyon puanlarının ortalamalarında bir artış gözlemlenmiştir. Bir diğer önemli değerlendirme kriteri olan sosyal sorumluluk ortalama puanlarında da 2021 yılında artış kaydedilmiştir. İşletmeler için giderek daha önemli hale gelen sosyal sorumluluk kavramı, özellikle simülasyon dersinde ve diğer derslerde vurgulanmış, bu vurgunun etkisiyle öğrencilerin bu kriterdeki başarılarının arttığı görülmüştür. Bununla birlikte, 2021 yılında, bir önceki yıla göre ortalamaların düştüğü bir kriter olarak, öğrencilerin final raporlarında akademik yazım kurallarına uyum düzeyi dikkat çekmiştir. Bu durumun iyileştirilmesi için akademik yazım kurallarının öğrencilere daha kapsamlı bir şekilde açıklanması ve diğer derslerde ödev uygulamalarının artırılması gibi önlemler alınmıştır. Böylece, öğrencilerin akademik yazım becerilerinin geliştirilmesi hedeflenmiştir.

Sonuç: Teknolojik gelişmeler ve dijital çağ, iş hayatında olduğu gibi eğitim alanında da yenilikçi yaklaşımları zorunlu kılmaktadır (Kim ve Watson, 2017; Löffler vd., 2019; Beranic ve Hericko, 2022). Yükseköğretim kurumları, yenilikçi teknolojiler ve öğretim tekniklerini eğitim süreçlerine entegre etmektedir. Bu çalışma, Çağ Üniversitesi'nde verilen İşletme

Simülasyonu dersi kapsamında simülasyon destekli eğitimin program çıktılarının ulaşılma düzeyini ölçmedeki etkinliğini incelemektedir. Simülasyon destekli eğitimden elde edilen veriler, program çıktılarının hangi alanlarda başarıyla karşılandığını veya hangi alanlarda geliştirilmesi gerektiğini belirlemede önemli bir araç olarak kullanılmaktadır. Elde edilen sonuçlar, programların yeniden düzenlenmesi ve geliştirilmesi için bir temel sağlamaktadır. Yapılan düzenlemeler, programların genel kalite standartlarını artırmayı hedeflemekte ve öğrenci çıktılarında daha yüksek başarı oranlarına ulaşılmasına katkıda bulunmaktadır. Bu çalışmada, literatürde vurgulanan simülasyonun öğrenme çıktıları üzerindeki olumlu etkilerine ek olarak, simülasyonun eğitim kalitesini artırmaya yönelik veri sağlayıcı bir araç olarak da etkili bir şekilde kullanılabileceği görülmüştür. Ayrıca, simülasyon destekli eğitimin, sürdürülebilir kalkınma amaçlarından biri olan kaliteli eğitimi (4. Madde) destekleyebileceği ve bu bağlamda yenilikçi bir öğretim aracı olarak önemli bir potansiyele sahip olduğu sonucuna ulaşılmıştır.