

Gamification as a Tool to Enhance Engagement and Consistency in Accounting Education

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Abstract

Objective: To investigate whether gamification, as an innovative educational tool, may influence engagement and consistency in learning accounting.

Research Design & Methods: Critical review of specialist literature, survey research, and quantitative methods.

Findings: Gamification proves to be an effective tool for increasing engagement and consistency in learning accounting. Gamification elements, such as points, badges, leaderboards, missions, and challenges, influence students' motivation to learn, encouraging them to engage regularly and systematically in the course material. The results highlight the potential of gamification as a supportive tool in accounting education.

Conclusions: Implementing gamification into accounting courses offers numerous potential benefits, including enhanced engagement and consistency in learning, which may lead to better educational outcomes.

Contribution: The research study's findings contribute to the growing evidence proving gamification as an effective educational strategy. They confirm and expand the existing knowledge about the positive impact of gamification on education, emphasizing its potential to increase motivation, engagement, and consistency in learning. The research study further indicates the potential benefits of applying gamification in the specific context of accounting education, which can be a valuable contribution to the literature on gamification in business and accounting education.

Type of Article: original scientific research article.

Keywords: accounting, gamification, academic education

1 Introduction

Accounting education faces several challenges resulting from both the character of the discipline in question and a change in students' expectations and needs. As a key element in business education, accounting requires students to memorize complex rules and procedures and apply them in practice. The main problems related to students' engagement and consistency affecting efficient accounting education include the complex nature of the substance, traditional teaching methods, and problems with consistency.

Accounting is characterized by a high level of complexity (Tort 2012, Stępień, Pogodzińska-Mizdrak 2011) that can generate frustration and discouragement in students, as they are required not only to understand abstract

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notions but also to acquire skills in analyzing and interpreting financial data. Many students, especially during the initial stages of their education, may perceive that fact as a considerable barrier. The prevailing traditional methods of education, such as lectures and traditional classes, may not meet the expectations and preferences of students growing up (Michałowska 2016) in a digital environment. Younger generations of students expect more interactive and engaging forms of education that would be more suitable for acquiring knowledge (Stancheva-Todorova 2019, Raluca 2016, Drumlak, 2011). Accounting requires students to be systematic and to revise the material regularly. However, considering the multiplicity of academic and extracurricular duties students must handle, achieving can be challenging. The lack of consistency in learning results in gaps in knowledge, negatively affecting learning outcomes.

These challenges indicate an urgent need to search for new didactic methods and tools, increasing the engagement and consistency in accounting education. Gamification, namely the use of game elements in a context unrelated to games, is a promising solution that may contribute to the transformation in teaching and learning accounting by making these processes more engaging, interactive, and efficient.

The article aims to analyze gamification as an innovative didactic tool and its impact on students' engagement and consistency in learning accounting. In the context of the challenges identified in teaching accounting, the analysis is focused on evaluating the potential benefits of introducing gamification elements into the education process. The particular research objectives are:

- Analysing whether the introduction of gamification elements to the accounting courses affects students' engagement and whether the engagement in a game may depend on gender, type, and level of the studies and also on the fact whether students play or do not play any games.
- Analysing whether gamification may contribute to increasing consistency in learning accounting. The analysis is focused on evaluating whether students regularly engage in the course material and whether gamification contributes to maintaining continuity and regularity during the material revision and better managing time dedicated to learning.
- Understanding how students perceive the introduction of gamification elements to accounting education. The Authors are interested in whether gamification is perceived as motivating or provoking resistance.

In the article, the following hypothesis is posed: Gamification may be a valuable method of increasing students' engagement in the process of their education in the field of accounting.

The empirical research has been conducted to achieve the article's aim. A questionnaire survey has been applied to a purposefully selected sample during the research process. Quantitative methods were applied to analyze the results of the study. Furthermore, the critical analysis of specialist literature has also been applied as a research method.

2 Gamification in education – a literature review

Defined as the application of game elements in contexts that are not directly related to gaming, gamification has won considerable popularity as a method of increasing engagement and motivation in various fields, including education. Various authors have defined the notion of gamification. However, the first one who applied this term in the context adopted in 2002 was Nick Pelling (Burke 2014, p. 5; Christians 2018, p. 16). Pelling, a British programmer and game designer, applied the gamification term to describe a process of using game design elements and techniques in contexts other than gaming, such as education, marketing, public health, etc., to increase engagement and motivation in users. Nevertheless, even though Pelling contributed to the popularisation of the discussed term, the concept of gamification as the application of game mechanics in non-gaming contexts had already been explored and used before; however, it had not always been defined by this notion. Later, after 2010, when gamification won more popularity thanks to the studies presented by authors such as Jane McGonigal (2011), Kevin Werbach (Werbach and Hunter, 2012, and Yu-kai Chou (2015), the term became commonly recognized and broadly applied in various fields.

Scientific research indicates that gamification may significantly increase engagement in students. Deterding et al. (2011) define gamification as using game-designing elements in non-gaming contexts, arguing that such an approach may increase participant motivation and engagement. Considering an education context, Hamari, Koivisto and Sarsa (2014) provide a meta-analysis of scientific research on gamification, indicating that most research studies report a positive impact of gamification on students' engagement. This fact is also confirmed by the research studies presented by Núñez et al. (2023), Rodwald (2019), Skok and Harasimeczuk (2018), Niksa Rynkiewicz (2018), and also by Buckley and Doyle (2014). The research results indicate that gamification may increase students' participation, engagement and interest in science.

It is also observed that gamification has the potential to improve learning outcomes. Sailer et al. (2017) analyze how gamification affects motivation and learning outcomes in their research studies. They indicate that gaming

elements like score points, badges, and leaderboards may improve students' learning outcomes through increased internal motivation and engagement. However, they also emphasize the fact that the efficiency of gamification may depend on numerous factors, including game design, educational context and individual differences in students. This fact is also confirmed by the research studies presented by Hidayat (2017). Aimed at identifying a possible relation between higher education students' attitudes toward gamification and their learning outcomes, the research studies presented by Celis et al. (2023) indicate that there has been a significant relation between the attitude toward gamification and students' motivation. However, two correlations between the attitude and motivation and learning outcomes achieved within the scope of the analysed subject have turned out to be insignificant. The results emphasize the significance of applying new activities, such as gamification, to maintain students' motivation, but it is unrelated to their learning outcomes. According to the authors, there is a need for experimental research in the future that would allow them to evaluate the impact of those activities on students' learning.

Nyazi (2023) also provides some scientific research on the perception of gamification reported by students of the first-cycle studies. The research has aimed to learn about the opinions of BA students at the Taibah University in the Kingdom of Saudi Arabia on introducing gamification into academic courses. The results indicate that BA students at Taibah University positively perceive gamification and that there are statistically significant differences between students at the College of Law and Business Administration in favor of the College of Law. The author of the research study also observes that the obtained result is consistent with the results obtained in numerous research studies conducted in Saudi Arabia and other countries (Nyazi, 2023, p.103).

In the context of accounting education, the research studies on the impact of gamification are relatively less numerous. However, a growing interest in this topic implies its potential. The literature review indicates that some research refers to using board games in accounting education. The research results suggest that applying games provides an interesting and efficient approach toward motivating and engaging students in learning accounting (Silva, Rodrigues, and Leal 2021, Rosli and Khairudin 2019, Shah 2017). According to Jamaluddin, Junaidah et al. (2020, p.17), the lack of attractiveness and engagement in the conventional methods of learning and teaching accounting may lead to some difficulties in understanding the basic accounting notions and the entire accounting process and, consequently, to demotivation of students in their accounting learning. The authors suggest Accounting on the Block (AOTB), a gamification technique based on an accounting board game, applied to teach accounting based on published financial reports to students at the diploma level. Another solution to the problem of students' engagement in accounting lectures is suggested by Nkhoma C. et al. (2018). The authors present the benefits of gamification, flipped classrooms, quizzes, and feedback in their article.

A systematic review of scientific articles on the application of gamification in teaching accounting, published in periodicals on accounting education, includes a research article by Almuntsr et al. (2024). The article presents an analysis of literature comprising 17 publications available in the Web of Science and Scopus databases between 2017 and 2023. Based on the analysis, it has been observed that applying gamification in teaching and learning accounting has a positive effect. The authors state that in the analyzed scientific articles, most research studies focus on the impact of gamification on students' learning outcomes, academic achievements, and perception of teaching and learning with the use of gamification.

The literature review indicates that gamification can increase engagement and improve learning outcomes, including those achieved in accounting education. However, the efficient implementation of gamification requires diligent design and adjustment to the specific needs and educational context. Further research is needed to understand how various gamification elements affect various groups of students and how to maximize gamification's positive effects while minimizing any potential negative results.

3 Research methodology

The impact of gamification on engagement and consistency in learning accounting was analysed in two courses that the Author of this article gamified during the summer semester of the academic year 2022/2023, namely, a course in Basics of Management Accounting and a course in Management Accounting. The course in Basics of Management Accounting was conducted during the first cycle of studies, and the course in Management Accounting was conducted during the second cycle of studies. Both courses were run as seminars. In previous academic years, such seminars were conducted in a traditional form only and some difficulties were then experienced in engaging students into solving tasks and activating them more efficiently. Hence, the courses were transformed into a game to improve the situation. The game's plot was based on the Smurfs, a fairy tale students remembered from childhood. The students and the teacher were the game participants. The students were randomly assigned to the particular Smurf teams during the first classes. The game aimed to collect the highest number of Smurf berries and to rescue Smurf Papa from Gargamel. To complete particular tasks, students received Smurf

berries to fill the jar. The level of the berries filling the jar decided the final grade. Students were given basic and additional tasks to collect Smurf berries. The educational aims of the game were the students' attendance and active participation in seminars, systematic work during the entire semester, preparation for the seminars, and interest in the course.

Having completed the seminars, students participating in the gamified courses were asked to voluntarily fill in an anonymous questionnaire form to allow the Author to analyse the impact of gamification on their engagement and consistency in accounting education. The survey based on the questionnaire form was carried out in May and June 2023. The survey was conducted electronically and the questionnaire form was developed in the Microsoft Forms application. It consisted of 22 questions, including 4 personal questions about gender, age, type and level of the studies. The remaining 18 questions were divided into three groups. The first group included whether students played games, what games they played and whether they were familiar with gamification. The second group included questions about the plot and the game's rules. The third group of questions referred to the engagement and motivation to learn and the perception of gamification's usefulness in the education process. The form included both closed and open questions.

The respondents comprised 90 students from five groups majoring in Finance and Accounting at WSB Merito University in Gdańsk and Gdynia, who participated in the gamified courses. Hence, the selection of the research sample was purposeful. The characteristics of the surveyed students are presented in Figure 1.

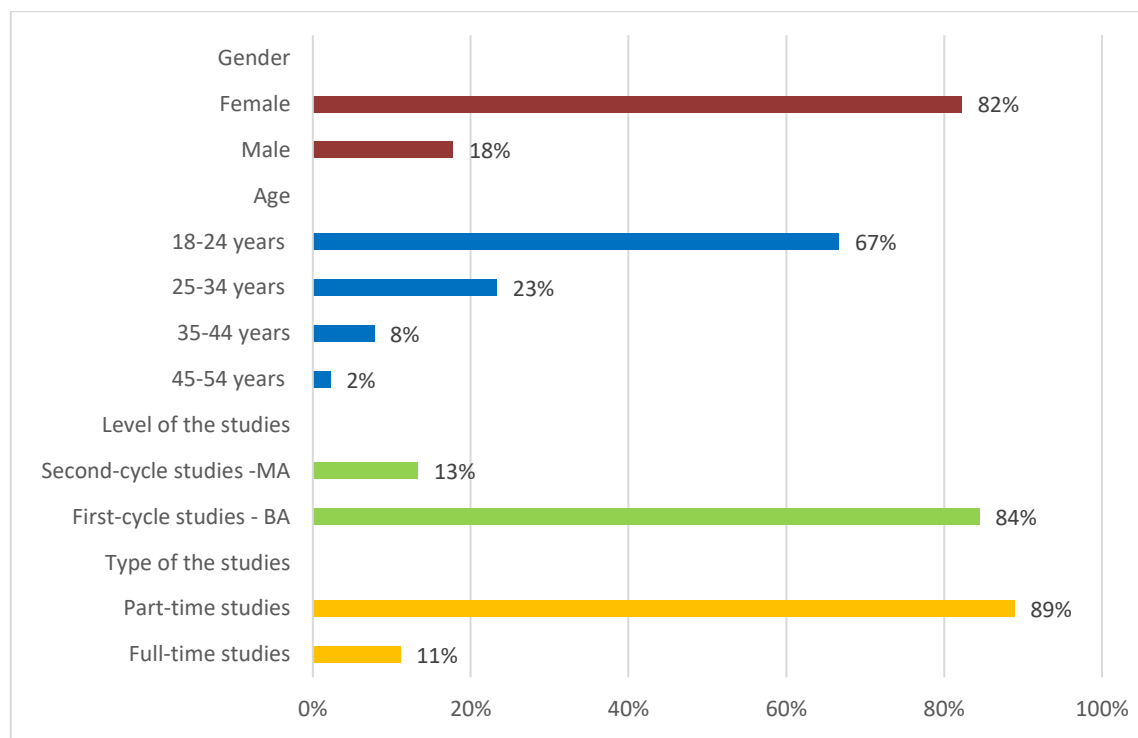


Fig. 1. Characteristics of the respondents
Source: The author's elaboration

Among 90 surveyed respondents, there were 10 full-time students (11% of all the respondents) and 80 part-time students (89%). In the group of the surveyed students:

- students of the first-cycle studies prevailed (76 students, 84% of all the respondents);
- women prevailed (74 students, 82% of all the respondents);
- students aged 18 to 24 prevailed (60 students, 67% of all the respondents).

4 Results of the research

As discussed in this article, scientific research studies on gamification in education indicate that it increases students' engagement and motivation. Therefore, the respondents were also asked to evaluate their engagement in the classes during their participation in the gamified courses, using a scale ranging from 1 to 5 (where 1 is the lack of engagement and 5 is very high engagement). The average evaluation was 4.41, so as indicated, the respondents

highly evaluated their engagement in the classes. Additionally, it was also analysed whether the engagement into the game depended on the gender and age of the respondents, the type and level of their studies and on the fact whether they played or did not play games. The Mann-Whitney U test was applied to verify whether the students' engagement in the game was different in various groups of respondents. Table 1 presents the test results, considering the students' gender, the type and level of their studies, and whether they played or did not play board or computer games. The test indicates significant differences in terms of gender and playing games.

Table 1. The results of the Mann-Whitney U test

Analysed group	Alternative hypothesis	Mann-Whitney U test
Women vs Men	Women evaluate their engagement as higher in comparison to men.	U=758.500, p=0.025
Full-time studies vs part-time studies	Significant differences exist in evaluating their engagement in the game between the students of full-time and part-time studies.	U=392.500, p=0.920
First-cycle studies vs second-cycle studies	There are significant differences in the evaluation of their engagement into the game between the students of the first-cycle studies and the second-cycle studies	U=522.000, p=0.906
Playing vs not playing games	The respondents who do not play games evaluate their engagement higher than the respondents who play games	U=452.500, p=0.025
Playing computer games vs playing board games	The respondents who play board games evaluate their engagement higher than the respondents who play computer games	U=204.500, p=0.191

Source: The author's elaboration

Table 2 presents the descriptive statistics related to the answers to the question about engagement into the classes depending on the type and level of the studies and the respondents' gender. The average indicates that the students evaluate their engagement as high, and, as indicated by the Mann-Whitney U test, the female respondents evaluate their engagement slightly higher than the male respondents. The respondents who do not play games also assess their engagement as higher than those who play games. However, the number of respondents who do not play games is too low to draw valid conclusions.

Table 2. Evaluation of the respondents' own engagement in the classes during the participation in the gamified courses

Descriptive statistics	Second-cycle studies	First-cycle studies	Woman	Man	Part-time studies	Full-time studies	Not playing games	Playing games
Number of the respondents	14	76	74	16	80	10	8	82
Mean	4.36	4.42	4.47	4.13	4.40	4.50	4.88	4.37
Standard deviation	0.84	0.72	0.73	0.72	0.76	0.53	0.35	0.75
Minimum	3.00	2.00	2.00	3.00	2.00	4.00	4.00	2.00
Maximum	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Source: The author's elaboration

Table 3 presents the descriptive statistics referring to the evaluation of class engagement, depending on the type of games played by the students. For further analysis requirements, the respondents playing computer games and playing board games were selected. However, the Mann-Whitney U test does not indicate significant differences in student engagement in these two groups. Still, the average engagement differs slightly, which may become a reason for further scientific research.

Table 3. Evaluation of the respondents' engagement in the classes during the participation in the gamified courses

	Computer games	Computer and board games	Board games	Board, computer and card games	Board, computer games, collecting Smurf berries	Board games, Xbox games	Board games, console games	Games played on the phone
Number of the respondents	14	29	34	1	1	1	1	1
Mean	4.29	4.17	4.62	5.00	5.00	4.00	4.00	3.00
Standard deviation	0.994	0.759	0.551					
Minimum	2.00	3.00	3.00	5.00	5.00	4.00	4.00	3.00
Maximum	5.00	5.00	5.00	5.00	5.00	4.00	4.00	3.00

Source: The author's elaboration

A Kruskal-Wallis test was carried out to compare the engagement in the classes among the students from 4 various age groups. Because there were only two respondents in the age group of 45-54, they joined the age group of 35-44 and formed a new age group of 35-54. This, however, did not affect the results of the test. The results appeared insignificant $H(2) = 2.548, p=0.280$; although the older respondents evaluated their engagement in the game as higher, the difference was statistically insignificant. The descriptive statistics referring to the answer to the question: *Evaluate your engagement in the classes during your participation in a gamified course* are presented in Table 4. The older respondents evaluated their engagement in the classes as higher. However, their number was too low to draw any valid conclusions.

Table 4. Evaluation of the respondents' own engagement in the classes during the participation in the gamified courses

Descriptive statistics	18-24 years of age	25-34 years of age	35-44 years of age	45-54 years of age
Number of the respondents	60	21	7	2
Mean	4.37	4.38	4.71	5.00
Standard deviation	0.78	0.67	0.49	0.00
Minimum	2.00	3.00	4.00	5.00
Maximum	5.00	5.00	5.00	5.00

Source: The Author's elaboration

Summing up the results mentioned above, it is possible to state that the respondents evaluate their engagement in the classes as high. The female respondents evaluate their engagement slightly higher than the male respondents. The respondents who do not play games to assess also their engagement higher than those who do. The evaluation of engagement does not depend on the respondents' age.

The answers to the open questions were analyzed to evaluate the impact of gamification on systematic learning. The first question was: *Has the gamified course given you additional benefits?* Out of 90 answers, almost half included phrases referring to consistency, such as on an on-going basis, regularly, and motivation to systematic learning. Table 5 presents some examples of the answers provided by the students confirming this fact.

Table 5. The examples of the answers to the following question: *Has the gamified course given you any additional benefits?*

No.	Answers
1.	<i>I was more motivated to learn on an on-going basis – not just before the exam.</i>
2.	<i>There was a chance to obtain a higher grade and to acquire knowledge systematically.</i>
3.	<i>It was possible to work throughout the course to get a better final grade – the distribution of the material divided into smaller parts is advantageous.</i>

4.	<i>Yes, because I regularly reviewed my notes and materials.</i>
5.	<i>How the classes were conducted required the students to be systematic and continuously prepared for the classes. The points we scored during each class motivated us to attend the course regularly and participate actively in what was happening there.</i>

Source: The Author's elaboration

The subsequent questions referred to the feedback, which is highly significant in gamification. First, the respondents were asked whether the feedback about the results they received on an ongoing basis affected their approach toward the tasks they had to perform. As many as 87 students (96.67% of all the respondents) decided that the feedback did affect their approach toward the tasks. Only 3 respondents (3.33% of all the respondents) declared otherwise. Next, the respondents had to answer an open question: *Why is quick feedback about the achieved results on an ongoing basis important?* In most answers, the respondents emphasized that it increased their motivation to learn. The examples of the answers given by the respondents are presented in Table 6.

Table 6. The examples of the answers to the following question: *Why is quick feedback about the achieved results on an ongoing basis important?*

No.	Answers
1.	<i>It gives more motivation for further activities.</i>
2.	<i>Because it improves motivation.</i>
3.	<i>It was possible to check yourself and your current progress, and it also showed if I understood everything going on during the classes correctly.</i>
4.	<i>More motivation and joy of the results I have achieved.</i>
5.	<i>It motivated me to learn. Seeing that I had already scored X points, I could also see that X points were still missing to achieve the first target – getting credits for the course. When I achieved the first target successfully, I decided to raise the bar higher and to keep fighting for a better result.</i>

Source: The Author's elaboration

As observed by the Author during the course, the students' systematic learning was confirmed by their regular logging into the e-platform and consistently completed homework assignments.

Summing up, the results indicate that gamification may efficiently support consistency in learning accounting by encouraging students to engage in the materials provided during the accounting course regularly.

Another research aim was to analyze the students' perception of gamification. In the survey, the respondents were asked whether they were already familiar with gamification. A dependency test run for Table 7, separately for each distinguished group, did not indicate any dependency between familiarity with the concept of gamification and belonging to any category within the particular groups – based on the table presented below, it is possible to state that the majority – namely: 74.44 % of the respondents have not been familiar with the notion of gamification before.

Table 7. Have you been familiar with the concept of gamification?

Gender			No	Yes	Sum
Woman		Quantity	57	17	74
		Share	77.03 %	22.97 %	100%
Man		Quantity	10	6	16
		Share	62.50 %	37.50 %	100%
Type of the studies	Part-time studies	Quantity	58	22	80
		Share	72.50 %	27.50 %	100%
	Full-time studies	Quantity	9	1	10
		Share	90.00 %	10.00 %	100%
Level of the studies	Second-cycle studies	Quantity	11	3	14
		Share	78.57 %	21.43 %	100%
	First-cycle studies	Quantity	56	20	76
		Share	73.68 %	26.32 %	100%
Age	18-24	Quantity	48	12	60
		Share	80.00 %	20.00 %	100%
	25-34	Quantity	13	8	21
		Share	61.90 %	38.10 %	100%

35-44	Quantity	5	2	7
	Share	71.43 %	28.57 %	100%
45-54	Quantity	1	1	2
	Share	50.00 %	50.00 %	100%
Sum	Quantity	67	23	90
	Share	74.44 %	25.56 %	100%

Source: the Author's own elaboration

Subsequently, the respondents were asked 4 closed questions about their perception of gamification. The questions and answers are presented in Table 8.

Table 8. The respondents' perception of gamification

Question	I do not know		No		Yes		Sum
	Quantity	Share	Quantity	Share	Quantity	Share	
Is the application of gamification at a higher education institution a good idea?	4	4.44 %	3	3.33 %	83	92.22 %	100%
Should gamification be considered at other courses?	9	10.00 %	3	3.33 %	78	86.67 %	100%
Did you like the plot of the game?	4	4.44 %	3	3.33 %	83	92.22 %	100%
Did you enjoy the gamified courses?	3	3.33 %	2	2.22 %	85	94.44 %	100%

Source: The Author's elaboration

As indicated in Table 8, even though most respondents have not heard about the notion of gamification before, gamified courses are evaluated positively – 85 students (94.44% of all the respondents) are in favor of this form of classes; 83 students (92.22% of all the respondents) believe that using gamification at a higher education institution is a good idea and 78 students (86.67% of all the respondents) think that such classes should be incorporated into other courses. Additionally, some open questions were posed to evaluate the perception of gamification. The first question was: *What are your impressions after completing a gamified course?* The prevailing number of answers referred to positive impressions. The examples of the answers given by the respondents confirming that fact are presented in Table 9.

Table 9. The examples of the answers to the following question: *What are your impressions after completing a gamified course?*

No.	Answers
1.	<i>Very positive. I think it's a great idea. The points we could score motivated us well. Also, I think our teacher did a great job with such an unusual way of running the classes. For me, it was awesome.</i>
2.	<i>It was a great experience, the course was much more pleasant.</i>
3.	<i>Very positive. It reflects the students' work and engagement throughout the entire semester.</i>
4.	<i>Higher motivation to attend and participate in the class activities; not everything depends exclusively on one examination but our work throughout the semester counts too, definitely in plus.</i>
5.	<i>Very good impressions. I hope that there will be more gamified courses during our next semesters.</i>

Source: The Author's elaboration

The next question was: *Did the gamified course offer you any additional benefits?* The main benefits mentioned by the students were higher motivation and no stress. The examples of the answers given by the respondents confirming that fact are presented in Table 10.

Table 10. The examples of the answers to the following question: *Did the gamified course offer you any additional benefits?*

No.	Answers
1.	<i>Yes, it did. Knowing that each activity increases the number of points, I was more willing to engage into these activities and homework assignments.</i>
2.	<i>Ease and less stress.</i>
3.	<i>Yes, it was possible to get credits for the course quicker and there was no stress before one big examination that would need to be taken to pass the course.</i>

4.	<i>Yes, it has surely forced me to become more engaged and thanks to that I learned more.</i>
5.	<i>No stress about passing the course. Learning on an ongoing basis for each class helped me understand the discussed problems. We weren't overburdened with the material at the end of the semester.</i>

Source: The Author's elaboration

The next two questions referred to the gamified course's best and worst elements. The best elements mentioned by the respondents most often referred to the plan of the game, points and homework assignments. Considering the question about the worst elements, the answers were *None. I don't know. It is hard to say*. However, some respondents mentioned that the worst elements were the game's plot (based on the Smurfs story) and working in random groups. The examples of the answers given by the respondents confirming that fact are presented in Table 11.

Table 11. The examples of the answers to the questions about the gamified course's best and worst elements.

No.	Answers	
	Best elements	Worst elements
1.	<i>We could interact with the course in many ways: teamwork, activities, and additional assignments. Thanks to all that I didn't get bored and I worked.</i>	<i>Working in random groups; groups were mixed too much and it wasn't possible to explain the tasks well.</i>
2.	<i>A systematic and gradual pursuit of our goal ... getting credits for the course.</i>	<i>I can't see any worst elements. But I think that for students who don't like attending classes, even just to be present there, it could be the possibility to get "a minus" for being absent.</i>
3.	<i>The best element was that all the students could receive credits for the course. Also, most assignments were optional, so it was only up to us how much work we wanted to put in.</i>	<i>You could lose most by being absent and unwilling to participate in activities.</i>

Source: The Author's elaboration

Summing up, the students present a positive attitude toward gamified courses in accounting.

5 Discussion and conclusions

The research results indicate that gamification considerably affects the process of learning and teaching accounting and, therefore, contributes to the increase in students' motivation and engagement. The introduction of various elements, such as points, leaderboards, missions, and challenges, provides additional sources of motivation for students. The motivation is twofold – external, related to receiving awards and distinctions and internal, resulting from students' personal engagement in learning and progress. By developing a sense of achievement and progress, these mechanisms may increase students' internal motivation for further learning and exploring problems. As a result, gamification contributes to developing a more motivating and involving educational environment. Thanks to applying gamification to her courses, the Author has observed an increase in students' engagement in learning. It results from their increased interest in the course material and active participation in assignments and challenges. By introducing elements of competition and cooperation, gamification fosters the development of a community of learners, which may also improve their engagement. Furthermore, regular feedback and the possibility of following one's progress in real-time motivate students to work systematically. Hence, the research results confirm the hypothesis that gamification can be an attractive method of developing students' engagement in the process of their accounting education. The results also fit into a broader context of the existing research studies on gamification in education.

Each scientific research study has its own limitations that can affect the interpretation of its results. Considering the research discussed in this article, the limitations are as follows:

- 1) the size and the composition of the sample (90 students coming from one university) – the survey carried out in one university cannot reflect the experience of students from other higher education institutions where learning conditions, academic culture, or available resources may be different;
- 2) subjectivity in the measurement of engagement and motivation – the methods of measuring engagement and motivation with the use of self-descriptive questionnaire forms may be subject to respondents' subjectivity;

- 3) confounding variables – in the research, it is possible to observe confounding variables that have not been considered and may affect its results. For example, differences in student's learning styles, their previous experience with gamification, or their individual preferences of learning methods may affect their perception and response to the gamified elements of the course;
- 4) short-term nature of the research study – the research focused on the short-term effects of gamification. Therefore, it does not allow the long-term sustainability of the observed outcomes to be assessed. It remains unclear whether the increase in engagement and consistency is maintained over time;
- 5) limited range of the applied gamification elements – the study employed selected gamification mechanisms (such as points, leaderboards, and badges), but different gamification strategies were not compared. As a result, it is difficult to determine which specific elements had the most significant impact on students' engagement.

These limitations require caution when interpreting the results of the research. Although the results may indicate the positive impact of gamification on engagement and consistency in learning, it is necessary to consider the limitations mentioned above in the generalization of conclusions. In the future, surveying a larger sample of students (including those from other universities) would be advisable. Also, the questions about playing games could be extended by asking about the frequency of playing games – the differences in the evaluation of engagement in students who play and who do not play frequently could lead to some interesting conclusions, as it seems difficult to find a larger sample of students who will affirmatively respond to the statement I do not play games. Furthermore, it would also be recommended that some older respondents extend the sample. Suppose the engagement in older respondents has proved to be higher after introducing gamified courses than in younger respondents. In that case, it may indicate that such classes can be interesting not only for the younger generation who play games daily and have been growing up playing games but also for learners who may seem uninterested in such a form of learning.

An additional direction for further research should also include a longer time horizon - it would be important to see whether the observed increase in engagement and systematicity is maintained over a long period of time.

It would also be worth considering a deeper analysis of the gamification mechanisms themselves - future research could compare different gamification strategies and elements to determine which are most effective in the context of accounting teaching.

Supplementing the methodology with behavioural data (e.g., analysis of students' activity in the e-learning system) could also help reduce the impact of subjectivity stemming from self-descriptive surveys.

Despite the limitations, the research study discussed in the article is an original contribution to the scientific research in applying gamification in accounting education. Although gamification does not come as a panacea for all education problems, it can be a valuable didactic tool, especially in fields requiring constant engagement and consistency in learning, such as accounting.

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