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# Enhancing motivation, soft skills and perceived learning in accounting using game-based approach

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**ABSTRACT**

Employers often perceive accounting graduates as lacking motivation and soft skills. The research proposes that game-based learning (GBL) will enhance students' motivation, teamwork, critical thinking, communication skills, and promote learning. Research instruments include academic motivation scale (AMS) utilized to measure motivation, skills assessment scale (SAS) for soft skills, and a test instrument for perceived learning. GBL kit and instruments were validated by experts in accounting. All the research instruments are fit for use with Cronbach Alpha values above 0.9. Using a quasi-experimental design, before the experimental phase, both experimental and control groups did a pre-test for perceived learning. Upon completion of the experimental phase, they did a post-test and answered the AMS and SAS instruments. Regression analyses show that GBL contributed positively and significantly toward the experimental group's intrinsic and extrinsic motivations and teamwork, critical thinking, and communication skills development. An independent t-test on post-tests shows that the experimental group outperforms the control group. Hence, this study concludes that GBL strategy can create a value-added experience that reinforces learning and enhances competencies. Thus, GBL should be an option in accounting teaching as the benefits achieved are from multiple learning dimensions.



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## 1. INTRODUCTION

Learning accounting subject involves skills like measuring, analyzing, and processing information for reporting to the stakeholders in the economic entity. Accounting competency is necessary for effective performance in an accounting career. However, research has shown that accounting education still focuses on accounting content, and the teaching methodologies utilized are content-driven [1]. Research on the attitude of accounting students at two UK universities concluded that final-year students perceive accounting courses are not enjoyable, less satisfying, and less challenging than they expected when they entered university [2], [3]. Traditionally established methods have been empirically verified as ineffective in promoting student motivation and interest [4]. Students often feel anxious about learning accounting and have difficulty achieving high scores on the tests conducted. Various literature indicates that new accounting graduates in the workplace do not have all the skills required by the profession and imply that this is attributable to current accounting teaching practices. Some empirical studies in management studies have proven that game-based learning (GBL) may have a positive impact on students' learning [5], [6]. The inclusion of game-based elements into educational settings has been found to have a positive impact on student motivation and perceived learning.

The current research aims to determine if the use of GBL in accounting can: increase students' motivation in the subject; increase students' accounting skills (teamwork, critical thinking, and communication skills) and; promote students' learning.

Studying accounting is said to be very uninteresting as the teachers normally focus on delivering the content by using mostly the traditional, face-to-face teaching approach (lectures and tutorials). Students' intrinsic motivations are often hampered and their accounting performance is affected negatively. In the past decade, Generation Z (Gen Z) who are in tertiary education have demanded more interactive learning methods that fit their learning preference where the use of the internet, information technology, and social media are part of their life. Gen Z, the digital natives, regards the chalk-and-talk approach and assessments by using the pencil-and-paper approach as less interesting. However, the teachers and lecturers of accounting courses are still widely using the traditional approach. Traditional modes of teaching are increasingly facing challenges to engage and motivate learners who prefer to apply acquired knowledge and experiment and get feedback in the form of certain outcomes through their somewhat practical experiences. They also prefer problem-solving situations where creativity is encouraged [7].

GBL involves the application of game elements to make learning more appealing [8]–[10]. The approach has become increasingly popular in higher education as well as in primary and secondary schools. The use of games in an educational context is shown to have contributed to an increase in motivation, engagement, and soft skills in addition to its impact on students' learning [5], [11], [12]. Gamification strategies have been particularly effective in increasing student motivation, engagement, and academic performance in various fields including science education and language learning [13]–[15]. Key aspects of gamification that contribute to intrinsic learning motivation include perceived collaboration, competition, favorable feedback, self-expression, and a sense of control [16]. Teachers who integrate digital games into their instruction report increased usage and perceive games as a tool that enhances student motivation for learning [17]. The collaborative and student engagement during the GBL activity creates a fun environment that fosters knowledge assimilation. Gen Z's exposure to games and technology provides an opportunity for faculty to utilize the approach to promote better learning and performance. The application of teaching aids helped to improve practices and students' learning of the concepts in accounting [6], [12]. The researchers also mentioned that the application of GBL in studies on Management education is scarce and lacks significant empirical evidence. GBL theory proposes more innovative and interactive learning and uses a more student-centered approach. It incorporates elements in behaviorist, cognitive, and connective learning theories [1], [18], [19].

Vocational programs such as accounting are said to have difficulty sustaining the motivation of students. A lot of time the students perceive that the subjects are of minor relevance in their lives [20]. This is probably because they do not have an interest and cannot relate to the subjects. This study utilizes the self-determination theory (SDT), which explains individuals' motivation-related qualities and motives that regulate their behavior. Motivation is categorized into intrinsic motivation, extrinsic motivation, and amotivation (lack of motivation) [21], [22]. GBL has been shown to have a significant impact on student motivation [13], [23], [24]. It enhances engagement and increases students' perception of what they have learned [25]. Additionally, GBL can help develop students' intrinsic motivation for learning [26]–[28]. In line with SDT, Vallerand *et al*. [29], [30] developed academic motivation scale (AMS) with seven subscales, including three types of intrinsic motivation (i.e., knowledge, accomplishment, and stimulation), three types of extrinsic motivation (i.e., identified, introjected, and external), and amotivation. Motivation is placed along a self-determination continuum that ranges from amotivation (lack of motivation) to intrinsic motivation (strong, positive motivation) [21]. Autonomous motivation is regarded as high quality whereas controlled motivation is of low quality. Intrinsic motivation for knowledge assesses the desire to perform an activity for the pleasure and acceptance experienced while learning, intrinsic motivation toward accomplishment assesses the desire to perform an activity for the pleasure and acceptance experienced from accomplishment and intrinsic motivation for stimulation assesses the desire to perform an activity to experience stimulation. For extrinsic motivation, three subscales are created: identified regulation assesses the desire to perform activities to gain a sense of importance and personal value, introjected regulation assesses the experience of pressure and guilt and extrinsic regulation assesses whether students participate to avoid negative consequences or achieve rewards. Amotivation, at the lowest continuum, assesses the lack of motivation or intention to act.

Stakeholders in the accounting area including professional accounting bodies, employers, and academics have highlighted that accounting graduates lack of required competencies [31]. These competencies are necessary, especially in the modern accounting profession which is technologically driven and has to respond to a rapidly changing business environment. Analyses of competencies based on past research highlight a few important skills and attributes expected from accounting graduates. The top four skills are knowledge (technical skill), teamwork, critical thinking (problem-solving), and communication skills [32]–[34].

Soft skills are critical for undergraduate students to succeed in the workplace, but there exists a gap between the skills possessed by undergraduate students and those required by the industry. Game-based

approaches have been found to contribute to the development of soft skills, such as critical thinking and problem-solving, which are essential in various fields [12], [28], [35]–[38]. It provides opportunities for intellectual engagement and prepares learners to deal with uncertainty, as in real-life projects. The various games provide a participatory learning methodology that engages students in scenarios that require the application of soft skills such as problem-solving, communication, stress management, and teamwork [39]–[43]. Thus, the researchers focus on the four competencies in this quasi-experiment. Research studies have also shown that the adoption of gamification in accounting education has led to a better understanding of financial accounting concepts [24], [44]–[46].

Teamwork, critical thinking, and communication skills are assessed using skills assessment scale (SAS) while knowledge is assessed using a test instrument. Research has demonstrated that students' motivation and attitude to learning influence their academic performance and, thus, the competencies with which they graduate. Thus, this research will survey students' motivation after the experimental phase and assess its impact on skills and perceived learning in accounting.

## 2. METHOD

Delivery of the content includes some activities that are designed based on GBL concepts. The content for teaching and learning are accounting topics that are considered difficult by students who are trying to learn accounting. The experimental topic is adjustments in accounting with sub-topics including: i) adjustments in nominal accounts; ii) adjustments in receivables; and iii) adjustments for non-current assets. People always regard accounting as a 'dry' subject involving formulas and calculations. Student's performance in the topics mentioned is often below expectation despite the effort put in [33]. Therefore, the researchers decided that the delivery of the topics should be made fun through the games created so that students somehow learn the content during the game activities. In addition, the researcher will survey the extent to which students' skills in learning accounting have been improved using the game-based approach.

The study uses a quasi-experimental design whereby, there will be an experimental group that will use the games prepared in the teaching and learning process of the topics in adjustments in financial statements and a control group that will utilize the traditional teaching and learning approach. The samples are students registered for the business accounting course at the Faculty of Management and Economics, Sultan Idris Education University during the semester 1 2021/2022 session. There are 35 students in the experimental group and 36 students in the control group. Data analyses include descriptive (frequency, mean, and standard deviation) and inferential tests (Single sample t-test, independent sample t-test, and regression). The regression analysis will determine which variable contributes in explaining the scores of the dependent variable. The required tests of assumptions, namely the normality, linearity, and multicollinearity tests are carried out before inferential tests are performed. The significance level of 0.05 is used throughout the analyses. Although sample sizes are small and unequal the Independent t-test is a robust parametric test that can withstand small samples [47]. However, statistical power is low therefore type 2 errors were more likely to occur, thus increasing the likelihood of non-detection of statistically significant occurrences.

The motivation is measured using the AMS by Vallerand *et al*. [29], [30] which contains 28 items. AMS contains seven subscales: three types of intrinsic motivation (i.e. intrinsic motivation knowledge (IMK), intrinsic motivation accomplishment (IMA), and intrinsic motivation stimulation (IMS); three types of extrinsic motivation (i.e. extrinsic motivation identified (EMID), extrinsic motivation introjected (EMIN), and extrinsic motivation external (EMEI)) and amotivation (AM). Despite extensive research using the AMS globally, it has neither been previously validated in Malaysia, specifically in an accounting course at a tertiary level. Skills acquisition involves the assessment of communication skills (COM-18 items), teamwork skills (TEAM-10 items), and critical thinking skills (CRI-13 items) using the SAS. The items were constructed based on the review of the literature. For AMS and SAS respondents are asked to rate to what extent they agree with each item with a scale of 1 (strongly disagree) to 6 (strongly agree). Perceived learning or students' performance is assessed by three sets of multiple-choice questions covering the three sub-topics i) adjustments in nominal accounts (20 items), ii) adjustments in bad debt, bad debt recovery, and provision for doubtful debt (20 items), and iii) adjustments for depreciation and accumulated depreciation (20 items). Each question is followed by four choices of answers with only one right answer. The instruments were validated by three academics in the accounting field. The assessors agree that all the items are appropriate to measure the intended constructs under study.

For the pilot test, 28 students were involved. Reliability analysis was done based on the completed responses. The item-total correlations in the instruments were between 0.394 to 0.957 and can be considered acceptable [48]. There are four items for each of the motivation dimensions, 18 items for communication, 10 items for Teamwork, and 13 items for critical thinking. Reliability coefficients (Cronbach Alpha) for AMS and SAS are presented in Table 1. The Cronbach Alpha values for all variables (and sub-variables) are all at an acceptable level (α between 0.915-0.976) which indicates that the items will produce stable and consistent results.

The final instrument is as in the Table 2 lists items on the demographic factors, Table 3 displays the 81 items on AMS, game-based learning acceptance (GAME1-GAME14), and SAS (see in Appendix)

Table 1. Reliability analyses for AMS and SAS (N=28)

| Variable | No. of items | Mean | SD | Item-total correlation | Cronbach Alpha |
|---|---|---|---|---|---|
| AMS: | | | | | |
| IMK | 4 | 5.036 | .925 | .702-.900 | .949 |
| IMA | 4 | 4.973 | .924 | .583-.957 | .927 |
| IMS | 4 | 4.955 | .931 | .707-.913 | .954 |
| EMID | 4 | 5.232 | .863 | .609-.845 | .920 |
| EMIN | 4 | 5.107 | .959 | .620-.805 | .915 |
| EMEI | 4 | 5.116 | .857 | .704-.832 | .930 |
| AM | 4 | 2.473 | 1.579 | .801-.918 | .964 |
| SAS: | | | | | |
| COM | 18 | 4.752 | .828 | .403-.871 | .976 |
| TEAM | 10 | 4.935 | .886 | .394-.924 | .963 |
| CRI | 13 | 4.898 | .789 | .417-.899 | .966 |
| Game acceptance: | | | | | |
| Game acceptance | 12 | 4.607 | 1.093 | .303-.952 | .975 |

Table 2. Demographic factors

| No | Code | Item |
|---|---|---|
| 1 | CS | What is your current semester? |
| 2 | Group | Which group are you in? |
| 3 | Gender | Male / Female |

For the perceived learning test, three sets of multiple-choice tests were administered. Using the Spearman-Brown prophecy formula [49], we predicted the reliability (coefficient alpha) of the question sets. Table 4 indicates the Spearman-Brown coefficients for receivables are 0.876 (18 items), depreciation 0.748 (12 items, 8 items deleted), and revenue and expenses 0.796 (14 items, 6 items deleted. Items with negative correlations and inter-item correlations less than 0.3 were eliminated to improve the reliability coefficient.

Table 4. Reliability analyses for perceived learning tests (N=28)

| Variable | Spearman-Brown (split half) (negative correlation deleted) | Spearman-Brown (split half) (negative correlation & less .15 correlation deleted) |
|---|---|---|
| Receivables (Final items: 1, 2, 3, 4, 6, 7, 8, 9,10, 11, 12,13, 14, 15, 16, 17, 18, 19) | .876 | - |
| Depreciation (Final items: 1, 4, 6, 7, 8, 9, 11, 13, 14, 16, 17, 19) | .425 | .748 |
| Revenue and expense (Final items: 1, 2, 3, 6, 7, 8, 9, 11, 13, 14, 15, 16, 17, 20) | .627 | .796 |

Two activities were planned for the game-based teaching and learning for each topic. Students are divided into seven groups with each group consisting of excellent, moderate, and weak students, based on their performance in a test conducted for the earlier topics. Each group includes five or six members. The experimental activities were conducted in six weeks during class time while the control group was taught the traditional way. Two additional games were conducted when all sub-topics were covered.

The first one is get it right (GimKit) involving questions for each topic. This is an online game. Students join the game using the password provided and play the game for 20 minutes. For all right answers, the group receives points representing some cash (RM). The value of cash received for each correct answer has been set based on the difficulty of the questions answered. All groups will be answering the same questions but their progress depends on the groups' skills in answering the questions. Marks will be penalized for mistakes made. This is where the students' communication, teamwork and critical thinking skills will become handy to outsmart other teams. The lecturer set a time limit of 25 minutes for the game. At the end of the game, the top three groups will receive bonus points (1st place 3 points, 2nd place 2 points, 3rd place 1 point). All groups will accumulate the points they received until all activities are completed. This activity motivates them to perform better in the next activities to improve their accumulated points.

Second is a card game named "adjust it". The game involves revision questions on the respective sub-topics in Adjustments in Accounting. There are three sets of cards divided based on the sub-topics (adjust it-depreciation; adjust it-nominal; adjust it-receivables). For all right answers, the group will receive points as indicated on the card. The group will select the card number to attempt. The point for each question has been set based on the difficulty level of the questions answered. The lecturer set a time limit of 40 minutes for the game. At the end of the game, the top three groups will receive bonus points (1st place 3 points, 2nd place 2 points, 3rd place 1 point) in addition to the scores they have accumulated in the game. At the end of week 4, points for all games are added and the top three winners are announced. Students seemed to be very excited and looked forward to every game to increase the groups' points. They work together and full-heartedly to ensure they perform the best.

In the fifth week, in addition to the above two games, the groups played a board game named "adjust your account." The objective of this game is to accumulate as many assets (current and non-current assets) as possible and to avoid being bankrupt. Tools used in the game are: a board divided like in a monopoly game (the center part includes sections for cards containing problems within the topics involved; the four sides of the board include 32 squares which are partitioned according to assets such as shop lot, computer, van, furniture, and machine). Each team will get a token of a different color and cash RM100,000.00 as a start. A banker will be appointed to manage money at the bank such as to pay salaries and bonuses and to collect taxes, fines, and payments concerning non-current assets as indicated in the cards selected. Each team will roll the dice before their token can be moved. What happens along the way depends on which space (square) the token stops at. Details of the game as indicated in the game instructions. The game is set for one hour to allow each team to attempt a few problems and make decisions to increase their assets. At the end of the game, the top three groups will receive bonus points (1st place 3 points, 2nd place 2 points, 3rd place 1 point) in addition to the scores they accumulated in the game.

An additional activity was conducted after all sub-topics were completed. In addition to the above activities, for each sub-topic, an exercise that has to be posted in a Padlet link was given with each group getting a different exercise. The lecturers assign marks for these exercises. The perceived learning tests were administered before the teaching and learning process for the respective topic was conducted (pre-test) and after the teaching and learning process was completed (post-test). Instruments for game acceptance, SAS, and AMS were administered after all activities were done.

## 3. RESULTS AND DISCUSSION

### 3.1. Does GBL motivate accounting students (intrinsically, extrinsically, and amotivation)?

Ho1 GBL does not motivate accounting students (intrinsically, extrinsically, and amotivation). Table 5 shows that game acceptance contributed positively and significantly towards the experimental group's intrinsic and extrinsic motivations: knowledge (intrinsic) with $R^2$=48.5%, F=31.110, p<0.05; accomplishment (intrinsic) with $R^2$=43.2%, F=25.133, p<0.05; stimulation (intrinsic) with $R^2$=51.4%, F=34.922, p<0.05; identified regulation (extrinsic) with $R^2$=32.7%, F=16.044, p<0.05; introjected regulation (extrinsic) with $R^2$=29.6%, F=13.854, p<0.05 and; extrinsic regulation (extrinsic) with $R^2$=25.3%, F=11.170, p<0.05. Thus, Ho1 is rejected. This finding is in line with past research [32], [33], [38], [41], [50], [51]. Their findings indicated an impact on intrinsic motivation, just like in the current research. However, Μποίκου [34] did not find a significant effect on motivation. The GBL variable also did not contribute toward amotivation (lack of motivation) with $R^2$=10.6%, F=3.902, p>0.05. Overall, the GBL method had a positive, significant impact on the students' motivations either intrinsic or extrinsic.

Table 5. Regression of game acceptance to motivations (N=35)

| Variables | R | $R^2$ | DF1 | DF2 | B | Beta | F | sig |
|---|---|---|---|---|---|---|---|---|
| GAME-IMK | .697 | .485 | 1 | 33 | .610 | .697 | 31.110 | .000 |
| GAME-IMA | .658 | .432 | 1 | 33 | .552 | .658 | 25.133 | .000 |
| GAME-IMS | .717 | .514 | 1 | 33 | .648 | .717 | 34.922 | .000 |
| GAME-EMID | .572 | .327 | 1 | 33 | .521 | .572 | 16.044 | .000 |
| GAME-EMIN | .544 | .296 | 1 | 33 | .498 | .544 | 13.854 | .001 |
| GAME-EMEI | .503 | .253 | 1 | 33 | .473 | .503 | 11.170 | .002 |
| GAME-AM | .325 | .106 | 1 | 33 | .766 | .325 | 3.902 | .057 |

### 3.2. Does GBL enhance skills (teamwork, critical thinking, and communication skills) required from accounting students?

Ho2 GBL does not enhance skills (teamwork, critical thinking, and communication skills) required from accounting students. Table 6 shows regression results of game acceptance contributed positively and

significantly toward the experimental group's soft skills. Contribution of acceptance with GBL to teamwork is 36.1% (F=18.611), p<0.05, B=0.600); critical thinking 36.9% (F=19.330, p<0.05, B=0.700) and communication 44.1% (F=26.084, p<0.05, B=0.727). Thus, Ho2 is rejected. The GBL method had a positive, significant impact on the students' soft skills acquisition. The findings support previous research [27], [28], [35], [36], [52]–[55].

Table 6. Regression of game acceptance to teamwork, critical thinking, and communication skills

| Variables | R | $R^2$ | DF1 | DF2 | B | Beta | t | F | sig |
|---|---|---|---|---|---|---|---|---|---|
| Game-teamwork | .600 | .361 | 1 | 33 | 1.979(C) | | 2.740 | 18.611 | .000 |
| | | | | | .641 (E) | .600 | 4.314 | | |
| Game-critical thinking | .608 | .369 | 1 | 33 | 1.597(C) | | 2.063 | 19.330 | .000 |
| | | | | | .700 (E) | .608 | 4.397 | | |
| Game-communication | .664 | .441 | 1 | 33 | 1.506(C) | | 2.178 | 26.084 | .000 |
| | | | | | .727 (E) | .664 | 5.107 | | |

C=control group; E=experimental group

### 3.3. Does game-based learning enhance accounting students' perceived learning (knowledge of the content experimented)?

Ho3 GBL does not enhance accounting students' perceived learning (knowledge of the content experimented). To answer this question a few steps are required. First is a t-test to confirm that both, the experimental and control groups are homogenous. Pretest scores for all three performance tests were compared between the experimental and control groups. The results showed that there were no significant differences between the scores for both groups as indicated in Table 7. All performance tests for the groups were not significant (p>0.05) proving that the groups are equally comparable.

Table 7. Comparison of pre-test scores between experimental and control groups

| Test variables | Population variance | Mean | t | df | Sig |
|---|---|---|---|---|---|
| Pre-receivable | Equal variances assumed | Exp: .414<br>Ctrl: .463 | -1.152 | 69 | .253 |
| Pre-depreciation | Equal variances assumed | Exp: .500<br>Ctrl: .551 | -1.300 | 69 | .198 |
| Pre-revenues & expenses | Equal variances assumed | Exp: .402<br>Ctrl: .480 | -1.481 | 69 | .143 |

Next, one-sample t-tests were conducted to compare if there were significant differences in the pre-scores and post-scores between the two groups. The t-test results are as in Table 8. From the analyses, it is proven that there are significant differences in the pre-post test scores for the experimental and control groups. The findings showed that both the experimental and traditional methods of teaching have a positive and significant impact on the students' perceived learning. However, when the means of the post-test scores are compared, it is obvious that the experimental method produces higher post-test scores among the students involved in the experiment. This is indicated in Table 9.

Table 8. Comparison of pre-test and post-test among experimental and control groups

| Comparison of pre and post test | Mean | t | df | Sig |
|---|---|---|---|---|
| Experimental group: | | | | |
| Pre-post-receivable | Pre: .414 | 14.594 | 34 | .000 |
| | Post: .673 | 16.499 | | |
| Pre-post-depreciation | Pre: .500 | 17.369 | 34 | .000 |
| | Post: .671 | 21.451 | | |
| Pre-post-revenues and expenses | Pre: .402 | 12.038 | 34 | .000 |
| | Post: .665 | 17.863 | | |
| Control group: | | | | |
| Pre-post-receivable | Pre: .463 | 14.827 | 35 | .000 |
| | Post: .553 | 14.043 | | |
| Pre-post-depreciation | Pre: .498 | 11.907 | 35 | .000 |
| | Post: .551 | 20.697 | | |
| Pre-post-revenues and expenses | Pre: .480 | 11.824 | 35 | .000 |
| | Post: .484 | 12.437 | | |

Table 9. Comparison of post-test scores between experimental and control groups

| Post test | Population variance | Mean | t | df | Sig |
|---|---|---|---|---|---|
| Post-receivable | Equal variance assumed | Exp: .673<br>Ctrl: .553 | 2.128 | 69 | .037 |
| Post-depreciation | Equal variance assumed | Exp: .681<br>Ctrl: .498 | 3.588 | 69 | .001 |
| Post-revenues & expenses | Equal variance assumed | Exp: .665<br>Ctrl: .484 | 3.360 | 69 | .001 |

Table 9 shows the difference in post-scores between the two groups using the t-test. From the analyses, it is proven that there are significant differences in the post-scores when compared between the experimental and control groups. All performance tests for the groups were significant ($p<0.05$) with the experimental group showing higher mean scores for all tests. This proves that the experimental group managed to achieve higher scores using the GBL approach. The finding supports previous research findings [16], [23], [27], [28], [33], [43], [52]. Thus, Ho3 is rejected.

## 4. CONCLUSION

This research utilizes an active learning teaching approach through GBL to enhance accounting students' motivation, soft skills, and perceived learning. Specifically, the content of the game design focuses on the topics related to adjustments which students normally regard as difficult topics and have difficulty getting good scores in tests and examinations. The research aims to examine the psychometric properties of the AMS (which explains SDT) in a vocational-related student population. We hypothesized that AMS elements will show some correlations in the performance of students in the course, based on the topics selected. The instruments used in the research had been validated and fulfilled the reliability requirement. The findings showed that the game-based approach contributed positively towards students' motivation and soft skills development. Students' engagement during the activities helped them to be more confident in teamwork, critical thinking, and communication skills. The game-based approach has also produced significantly higher post-test scores among the experimental group. Consequently, educators are strongly encouraged to practice a game-based teaching approach in accounting teaching as the benefits are not only in terms of improved academic performance but also enhanced soft skills and motivation. The GBL approach will develop students' interest in the subject, and consequently improve their understanding of the content. Knowledge about students' motivation will allow educators to design appropriate activities to maximize learning using the SDT perspective. Overall, the study contributes to the understanding of GBL for motivation and soft skills development and provides valuable insights and recommendations for future research and practice in this domain.

## APPENDIX

Table 3. AMS, game-based learning acceptance (GAME1-GAME14), SAS

| No | Code | Item |
|---|---|---|
| I enroll as a university student because… | | |
| 1 | IMK1 | I experience pleasure and satisfaction while learning new things. |
| 2 | IMK2 | for the pleasure I experience when I discover new things never seen before. |
| 3 | IMK3 | for the pleasure that I experience in broadening my knowledge about subjects that appeal to me. |
| 4 | IMK4 | my studies allow me to continue to learn about many things that interest me. |
| 5 | IMA1 | for the pleasure I experience while surpassing myself in my studies. |
| 6 | IMA2 | for the pleasure that I experience while I am surpassing myself in one of my personal accomplishments. |
| 7 | IMA3 | for the satisfaction I feel when I am in the process of accomplishing difficult academic activities. |
| 8 | IMA4 | University education allows me to experience personal satisfaction in my quest for excellence in my studies. |
| 9 | IMS1 | I really like going to the university. |
| 10 | IMS2 | For me, studying at university is fun. |
| 11 | IMS3 | For the pleasure that I experience when I am in discussions with interesting lecturers. |
| 12 | IMS4 | For the 'great' feeling that I experience while reading about various interesting subjects. |
| 13 | EMID1 | I think that a university education will help me better prepare for the career I have chosen. |
| 14 | EMID2 | Eventually, it will enable me to enter the job market in a field that I like. |
| 15 | EMID3 | This will help me make a better choice regarding my career orientation. |
| 16 | EMID4 | I want to show myself that I can succeed in my studies. |
| 17 | EMIN1 | I want to prove to myself that I am capable of completing my university degree. |
| 18 | EMIN2 | Of the fact that when I succeed in university, I feel important. |
| 19 | EMIN3 | I want to show myself that I am an intelligent person. |
| 20 | EMIN4 | I want to show myself that I can succeed in my life. |
| 21 | EMER1 | I need at least a university degree in order to find a high-paying job later on. |
| 22 | EMER2 | I want to obtain a more prestigious job later on. |

Table 3. AMS, game-based learning acceptance (GAME1-GAME14), SAS (continue)

| No | Code | Item |
|---|---|---|
| I enroll as a university student because… | | |
| 23 | EMER3 | I want to have 'the good life' after graduation. |
| 24 | EMER4 | I want to have a better salary later on. |
| 25 | AM1 | Honestly, I don't know. I really feel that I am wasting my time in university. |
| 26 | AM2 | I once had good reasons for going to university; however, now I wonder whether I should continue. |
| 27 | AM3 | I can't see why I go to university and frankly, I couldn't care less. |
| 28 | AM4 | I don't know. I can't understand what I am doing in the university. |
| 29 | GAME1 | I feel motivated to learn accounting using the game method. |
| 30 | GAME2 | I enjoy learning that involves games. |
| 31 | GAME3 | I become an active learner if game-based learning is used in accounting. |
| 32 | GAME5 | I prefer game-based learning in the teaching of accounting topics. |
| 33 | GAME6 | I pay attention during accounting class when game-based activities are involved. |
| 34 | GAME7 | I am not easily bored when game-based learning is used in accounting class. |
| 35 | GAME8 | I am more confident to answer questions when a game-based learning assessment is conducted. |
| 36 | GAME9 | I am always ready to learn accounting topics taught using game-based learning. |
| 37 | GAME11 | I can understand concepts in accounting topics better with the help of games. |
| 38 | GAME12 | Game-based learning improves my understanding/mastery of accounting topics. |
| 39 | GAME13 | My interest in accounting has increased when games are incorporated in the learning process. |
| 40 | GAME14 | I can cooperate well in group work in accounting class that involves game-based learning. |
| 41 | COM1 | I discuss with others before trying to solve a problem. |
| 42 | COM2 | I feel comfortable speaking in small groups. |
| 43 | COM3 | I am open to other people's opinions to solve a problem. |
| 44 | COM4 | I clarify information to get my message understood. |
| 45 | COM5 | I utilize open-ended questions to get others' opinions. |
| 46 | COM6 | I can explain a situation to anyone. |
| 47 | COM7 | I can pick up on people's non-verbal communication. |
| 48 | COM8 | I can explain myself in writing. |
| 49 | COM9 | I can explain myself verbally. |
| 50 | COM10 | I can show empathy when talking to others. |
| 51 | COM11 | I often give positive feedback to others. |
| 52 | COM12 | I am able to explain things clearly. |
| 53 | COM13 | I can write a well-organized, coherent report. |
| 54 | COM14 | I can make an effective audio-visual presentation. |
| 55 | COM15 | I can construct tables or graphs to communicate a solution. |
| 56 | COM16 | I can communicate effectively with teammates and lecturers. |
| 57 | COM17 | I can communicate effectively even in an online setting. |
| 58 | COM18 | I listen carefully to the opinions of others even when they disagree with me. |
| 59 | TEAM1 | I can cooperate in groups, especially in learning accounting. |
| 60 | TEAM3 | I can get along with people who do not share my opinions. |
| 61 | TEAM4 | I prefer to work in a group than individually. |
| 62 | TEAM5 | I can perform better in a group environment, |
| 63 | TEAM6 | I believe most problems can be solved as a group. |
| 64 | TEAM7 | I am comfortable working with others to accomplish group goals. |
| 65 | TEAM8 | I am comfortable working in teams of people with different skills & backgrounds. |
| 66 | TEAM9 | I am comfortable working in teams where knowledge and ideas are applied. |
| 67 | TEAM10 | I am always excited to do things in a group. |
| 68 | TEAM11 | I want to ensure my team performs the best. |
| 69 | CRI1 | Game learning provides me with opportunities to solve problems. |
| 70 | CRI2 | I am interested in solving problems in accounting learning. |
| 71 | CRI3 | I enjoy searching for alternatives to accounting problems. |
| 72 | CRI4 | Game-based learning allows me to relate to a variety of issues in accounting. |
| 73 | CRI5 | I enjoy finding answers to challenging questions. |
| 74 | CRI6 | I am a good problem solver. |
| 75 | CRI7 | I am confident that I can reach a reasonable conclusion. |
| 76 | CRI8 | I strive to be well informed. |
| 77 | CRI9 | I am likely to change my opinion when I am given new information that conflicts with my current opinion. |
| 78 | CRI10 | I enjoy solving problems. |
| 79 | CRI11 | I ask good questions to clarify a solution. |
| 80 | CRI12 | I work to solve accounting problems even when it takes a long time. |
| 81 | CRI13 | I keep on working on things until I get them right. |

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