

Effect of Business Simulation Game in Enhancing Entrepreneurial Competencies of Grade 10 Students

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Abstract

This study examined the effect of a Business Simulation Game (BSG) on the entrepreneurial competencies and learning performance of Grade 10 students at General Santos City National Secondary School of Arts and Trades. A quasi-experimental pretest-posttest non-equivalent groups design was employed involving 86 students, with 43 students in the experimental group and 43 in the control group. The experimental group received BSG-based instruction, while the control group received lecture-discussion instruction. Data were gathered using an Entrepreneurial Competencies Questionnaire, Expert Evaluation Questionnaire, 25-item achievement test, retention test, and Student Satisfaction and Learning Experience Questionnaire and were analyzed using descriptive and inferential statistics. Results showed that students generally highly practiced entrepreneurial competencies, with Into Action obtaining the highest rating. The BSG obtained an overall expert-evaluation mean of 3.87 (SD = 0.85), classified as Totally Equivalent based on the adopted expert-evaluation scale. The experimental group attained a posttest mean of 23.88 (SD = 1.53), equivalent to 95.52% of the maximum possible score and classified as Very Effective. Although both groups significantly improved from pretest to posttest, the experimental group obtained significantly higher posttest scores and greater gain scores than the control group, while no significant difference was found between the groups at pretest. The experimental group maintained 98.05% of its posttest performance after two weeks and reported an overall Very Satisfied learning experience (M = 3.86, SD = 0.87).

The findings indicate that the BSG can serve as a complementary instructional strategy for Grade 10 Entrepreneurship by providing opportunities to apply entrepreneurial knowledge through decision-making, problem-solving, and simulated business experiences.

Keywords: *Business Simulation Game, Entrepreneurial Competencies, Entrepreneurship Education, Experiential Learning*

1. Introduction

Entrepreneurial competencies have become increasingly important in preparing learners to respond to changing economic conditions, recognize opportunities, mobilize resources, and create value. Entrepreneurship education therefore extends beyond the acquisition of business knowledge to the development of skills, attitudes, and personal attributes needed to transform ideas into action. Costin et al. (2019) emphasized that entrepreneurial learning encompasses both cognitive dimensions, such as knowledge and skills, and non-cognitive dimensions, including self-efficacy, proactiveness, passion, and tenacity. Thus, entrepreneurship education requires learning experiences that enable students to connect theoretical concepts with practical situations. The EntreComp framework conceptualizes entrepreneurship as a competence that can be developed through education and organizes entrepreneurial competencies around the broad areas of ideas and opportunities, resources, and action (Bacigalupo et al., 2016; European Commission, 2016). Research reviewed in the study indicates that entrepreneurship education can develop opportunity recognition, planning, creative problem-solving, decision-making, adaptability, self-confidence, and other entrepreneurial attributes, particularly when learners participate in experiential and practical activities (Nabi et al., 2017; Rae, 2007; Mitchelmore & Rowley, 2010). Philippine studies cited in the study likewise reported positive outcomes associated with practical and hands-on entrepreneurship activities among students (Cruz et al., 2015; Villena & Tizon, 2018; Sevilla & Morales, 2020).

One instructional approach that provides such experiential opportunities is the Business Simulation Game (BSG). Business simulation games immerse learners in simulated business environments where they can make decisions, examine outcomes, solve problems, and modify strategies without the risks associated with actual business operations (Sitzmann, 2011; Bellotti et al., 2013). Through simulated business situations, students can connect classroom concepts with decision-making and practical application while developing critical thinking and problem-solving skills (Vos & Brennan, 2010; Loon et al., 2015). Research reviewed in the study further suggests that simulations can promote engagement, motivation, participation, and the integration of theoretical concepts with practical experiences (Majuri et al., 2018; Bellotti et al., 2014). Philippine studies cited in the thesis have likewise reported favorable experiences with business simulations, gamification, and ICT-enhanced learning activities (Alava, 2017; Mangaoang & Lapuz, 2019; Llego & Dela Cruz, 2020).

The use of business simulation games is supported principally by Kolb's Experiential Learning Theory (1984), which proposes that learning develops through concrete experience, reflective observation, abstract conceptualization, and active experimentation. These processes are particularly relevant to entrepreneurship because learners are expected not only to acquire information but also to apply knowledge in making decisions and responding to problems. The study is also informed by constructivist perspectives, particularly those of Piaget (1972) and Vygotsky (1978), which emphasize the active construction of knowledge through meaningful experiences and interaction. Together, these perspectives provide a theoretical basis for using simulation-based instruction as an active and learner-centered approach to entrepreneurship education.

Despite the documented educational potential of simulations, their application across specific educational contexts requires further investigation. Loon et al. (2015), as discussed in the study, noted that although simulations have become increasingly popular, understanding of how they operate across different learning contexts remains limited. This concern is relevant at General Santos City National Secondary School of Arts and Trades (GSCNSSAT), where Grade 10 Entrepreneurship instruction has primarily relied on lecture-based approaches and where students need greater opportunities to connect classroom concepts with realistic business situations through interactive and hands-on learning. Although international and Philippine literature supports simulation, gamification, and experiential entrepreneurship education, there remains a need to examine the use of a Business Simulation Game specifically among Grade 10 Entrepreneurship learners within this local school context.

To address this gap, the study examined the effect of a Business Simulation Game on the entrepreneurial competencies and learning performance of Grade 10 students at GSCNSSAT. It compared the learning performance of students who received BSG-based instruction with those who received lecture-discussion instruction. The study also examined the entrepreneurial competencies practiced by the students, the quality of the BSG based on expert evaluation, its effectiveness index, retention of learning among students who underwent the simulation, and students' satisfaction with the learning experience. The study was conducted during School Year 2024–2025 and covered instruction on personal entrepreneurial characteristics and the identification of business opportunities and community needs.

Statement of the Problem

The study aimed to determine the effect of integrating a Business Simulation Game in enhancing the entrepreneurial competencies and learning performance of Grade 10 students at General Santos City National Secondary School of Arts and Trades.

Specifically, it sought to answer the following questions:

1. What entrepreneurial competencies are practiced by Grade 10 students in terms of:
 - 1.1 Ideas and Opportunities;
 - 1.2 Resources;
 - 1.3 Personal Resources;
 - 1.4 Specific Knowledge; and
 - 1.5 Into Action?
2. What is the quality of the Business Simulation Game on Entrepreneurship based on expert evaluation?
3. What is the effectiveness index of students who underwent the Business Simulation Game?
4. To what extent is learning retained among students who completed the Business Simulation Game on Entrepreneurship?
5. What is the level of students' satisfaction with the Business Simulation Game and their learning experience in terms of:
 - 5.1 Engagement and Enjoyment;

- 5.2 Usability and Design;
- 5.3 Learning Impact; and
- 5.4 Overall Satisfaction and Perceived Value?

In addition to these descriptive and evaluative objectives, the study tested five null hypotheses concerning differences in the pretest, posttest, and mean gain scores of the experimental and control groups at the .05 level of significance. These research questions are unchanged from your latest manuscript.

Hypotheses

At the .05 level of significance, the following null hypotheses were tested:

- H₀₁. There is no significant difference between the pretest scores of the experimental group and the control group.
- H₀₂. There is no significant difference between the pretest and posttest scores of the control group.
- H₀₃. There is no significant difference between the pretest and posttest scores of the experimental group.
- H₀₄. There is no significant difference between the posttest scores of the experimental group and the control group.
- H₀₅. There is no significant difference between the mean gain scores of the experimental group and the control group.

2. Materials and Methods

Research Design: The study employed a quasi-experimental pretest-posttest non-equivalent groups design to examine the effect of a Business Simulation Game (BSG) on the learning performance and entrepreneurial competencies of Grade 10 students at General Santos City National Secondary School of Arts and Trades (GSCNSSAT). Two intact classes were used because random assignment of individual students was not feasible within the existing school setting. One class served as the experimental group and received instruction through the Business Simulation Game, while the other served as the control group and received instruction through the conventional lecture-discussion method. Both groups completed the pretest and posttest, allowing comparisons of performance within and between groups.

Participants: The participants were 86 Grade 10 students enrolled at GSCNSSAT during School Year 2024–2025. Two intact classes were purposively selected, with 43 students in the experimental group and 43 students in the control group. The use of intact classes preserved the existing classroom organization and minimized disruption of regular school schedules. The instructional conditions were assigned to the selected classes through a draw-lots procedure. The experimental group received instruction using the Business Simulation Game, while the control group received the same instructional content through lecture-discussion.

Research Instruments: Several instruments were used to collect data corresponding to the objectives of the study.

Entrepreneurial Competencies Questionnaire

Entrepreneurial Competencies Questionnaire was adapted with modifications from the entrepreneurship competencies model of Armuña et al. (2020), which builds on the EntreComp framework. The instrument consisted of 22 items distributed across five dimensions: Ideas and Opportunities (5 items), Resources (5 items), Personal Resources (3 items), Specific Knowledge (3 items), and Into Action (6 items). Students responded using a five-point Likert scale indicating how frequently they practiced each competency, ranging from 1 (Never) to 5 (Almost Always). The questionnaire was used to describe students' reported practice of entrepreneurial competencies across the five dimensions.

Expert Evaluation Questionnaire

The quality and appropriateness of the Business Simulation Game were assessed using an Expert Evaluation Questionnaire adapted and contextualized from Pando-García et al. (2016) and Majuri et al. (2018). The final instrument consisted of 12 items organized into four dimensions: Content and Pedagogical Relevance (4 items), Design and Usability (2 items), Instructional Effectiveness and Learning Impact (4 items), and Practicality and Overall Quality (2 items).

The indicators evaluated the relevance and alignment of the content with Grade 10 Entrepreneurship learning outcomes, instructional clarity, accuracy and currency of content, visual and interface design, ease of navigation, interactivity and engagement, appropriateness for Grade 10 learners, potential to enhance entrepreneurial skills, feedback and reinforcement, classroom practicality, and overall instructional quality. Each item was rated using a four-point scale ranging from 1 (Non-Equivalent) to 4 (Totally Equivalent).

Three experts evaluated the Business Simulation Game. The validation process was intended to establish the instructional material's relevance, appropriateness, usability, and suitability for implementation in Grade 10 Entrepreneurship.

Pretest-Posttest Achievement Test

A 25-item multiple-choice Entrepreneurship Achievement Test was administered to both the experimental and control groups as the pretest and posttest. Each correct response was assigned one point, resulting in a maximum possible score of 25 points. The test covered the entrepreneurship competencies addressed during the instructional sessions and was developed using a Table of Specifications to ensure alignment between the learning competencies, instructional content, and assessment items. The instrument underwent expert review for validity, appropriateness, and usefulness before its administration.

Retention Test

A retention assessment was administered to the 43 students in the experimental group two weeks after the posttest to determine the extent to which the learning acquired through the Business Simulation Game was maintained over time. The retention assessment was based on the same learning competencies measured by the achievement test. The retention component was intended to examine the maintenance of learning within the experimental group and was not designed as an experimental-versus-control retention comparison.

Student Satisfaction and Learning Experience Questionnaire

Student satisfaction with the Business Simulation Game was assessed using a 12-item questionnaire administered to the experimental group after the intervention. The instrument covered four dimensions: Engagement and Enjoyment (2 items), Usability and Design (2 items), Learning Impact (4 items), and Overall Satisfaction and Value (4 items). Responses were obtained using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The questionnaire assessed students' perceptions of the BSG in terms of engagement, usability, contribution to learning, and overall value. The updated questionnaire confirms the use of the five-point response scale and the specified dimensions.

Data Gathering Procedure: Prior to data collection, formal permission to conduct the study was secured from the school principal, and coordination was undertaken with the Grade 10 Curriculum Head and other concerned teachers. The study was conducted within the regular classroom setting and schedule to minimize disruption of normal instructional activities.

Before the intervention, the 25-item achievement pretest was administered to both the experimental and control groups to establish their baseline performance. The experimental group subsequently received instruction through the Business Simulation Game, whereas the control group received instruction through lecture-discussion. The intervention was implemented within the regular instructional schedule.

Following the instructional period, the same achievement assessment was administered as the posttest to both groups. The posttest scores were used to examine within-group changes and between-group differences in achievement.

Two weeks after the posttest, the experimental group completed the retention assessment to determine the extent to which post-intervention learning performance was maintained. The Student Satisfaction and Learning Experience Questionnaire was also administered to the experimental group to obtain students' perceptions of their experience with the Business Simulation Game.

Throughout data collection, consistent instructions and testing conditions were maintained to reduce procedural variation between participants and groups.

Data Analysis: Both descriptive and inferential statistical procedures were used to analyze the data. Means and standard deviations were used to summarize achievement scores and responses to the Entrepreneurial Competencies Questionnaire, Expert Evaluation Questionnaire, retention assessment, and Student Satisfaction and Learning Experience Questionnaire.

Individual learning gains were computed as:

$$\text{Gain Score} = \text{Posttest Score} - \text{Pretest Score}$$

The five null hypotheses were tested at an alpha level of .05. Independent-samples and paired-samples *t*-tests were used according to the structure of each comparison. The inferential analyses consisted of: (1) experimental versus control pretest scores; (2) control pretest versus posttest scores; (3) experimental pretest versus posttest scores; (4) experimental versus control posttest scores; and (5) experimental versus control gain scores.

Before inferential testing, statistical assumptions were examined. Shapiro-Wilk tests were used to assess normality; for paired-samples analyses, normality was evaluated using the within-student difference scores. Levene's test was used to assess homogeneity of variance for independent-group comparisons. When the assumption of equal variances was not supported, Welch's independent-samples *t*-test was used instead of the equal-variances form of the independent-samples *t*-test.

Effectiveness Index

To describe the experimental group's achievement relative to the maximum possible score, the study calculated an effectiveness percentage as:

$$\text{Effectiveness Index (\%)} = \frac{\text{Mean Achievement Score}}{\text{Maximum Possible Score}} \times 100$$

Because the achievement test consisted of 25 items, the maximum possible score was 25. The resulting percentages were interpreted using the following scale: 85–100% = Very Effective, 70–84% = Effective, 55–69% = Quite Effective, 40–54% = Less Effective, and 0–39% = Not Effective.

Using the displayed means, the experimental group's pretest mean of 6.56 corresponded to 26.24%, while its posttest mean of 23.88 corresponded to 95.52%. These percentages describe achievement relative to the maximum possible test score rather than an inferential effect-size statistic.

Retention of Learning

Learning retention was summarized by comparing the experimental group's retention-test performance with its posttest performance. The retention rate was calculated as:

$$\text{Retention Rate (\%)} = \frac{\text{Mean Retention Score}}{\text{Mean Posttest Score}} \times 100$$

This percentage represented the proportion of the experimental group's posttest performance maintained at the two-week retention assessment.

Because the posttest and retention scores were obtained from the same 43 students, the change between the two assessments was evaluated using a paired-samples analysis. Normality was assessed on the paired difference scores. Because these difference scores departed from normality, a Wilcoxon signed-rank test was additionally used as a sensitivity analysis to determine whether the inferential conclusion was robust to the normality assumption.

3. Results

The results are presented according to the objectives of the study and the five null hypotheses. Descriptive statistics were used to summarize students' entrepreneurial competencies, expert evaluation of the Business Simulation Game (BSG), effectiveness percentage, retention of learning, and student satisfaction. Inferential statistics were used to examine differences within and between the experimental and control groups.

Entrepreneurial Competencies of Grade 10 Students

Table 1 presents the entrepreneurial competencies practiced by the Grade 10 students across five dimensions. The students obtained an overall mean of 3.81 (SD = 0.94). Into Action obtained the highest mean (M = 3.98, SD = 0.88), followed by Ideas and Opportunities (M = 3.90, SD = 0.86), Resources (M = 3.77, SD = 0.97), and Specific Knowledge (M = 3.76, SD = 0.93). Personal Resources obtained the lowest mean (M = 3.63, SD = 1.08)

Table 1. Entrepreneurial Competencies of Grade 10 Students

Indicator	Mean	SD	Interpretation
Ideas and Opportunities	3.90	0.86	Highly Practiced
Resources	3.77	0.97	Highly Practiced
Personal Resources	3.63	1.08	Practiced
Specific Knowledge	3.76	0.93	Highly Practiced
Into Action	3.98	0.88	Very Highly Practiced
Overall Mean	3.81	0.94	Highly Practiced

Expert Evaluation of the Business Simulation Game

The Business Simulation Game was evaluated by three experts using 12 indicators covering Content and Pedagogical Relevance, Design and Usability, Instructional Effectiveness and Learning Impact, and Practicality and Overall Quality. The BSG obtained an overall mean of 3.87 (SD = 0.85), classified as Totally Equivalent based on the adopted expert-evaluation scale.

Potential to Enhance Entrepreneurial Skills obtained the highest mean ($M = 3.97$, $SD = 0.82$), followed by Appropriateness for Grade 10 Learners ($M = 3.95$, $SD = 0.86$) and Alignment with Learning Outcomes ($M = 3.93$, $SD = 0.83$). Accuracy and Currency of Content obtained the lowest mean ($M = 3.75$, $SD = 0.81$). All 12 indicators were classified as Totally Equivalent.

Table 2. Expert Evaluation of the Business Simulation Game

Indicator	Mean	SD	Interpretation
Relevance of Content	3.87	0.79	Very Satisfactory
Alignment with Learning Outcomes	3.93	0.83	Very Satisfactory
Instructional Clarity	3.83	0.92	Very Satisfactory
Accuracy and Currency of Content	3.75	0.81	Very Satisfactory
Visual and Interface Design	3.89	0.75	Very Satisfactory
Ease of Navigation	3.92	0.87	Very Satisfactory
Interactivity and Engagement	3.91	0.89	Very Satisfactory
Appropriateness for Grade 10 Learners	3.95	0.86	Very Satisfactory
Potential to Enhance Entrepreneurial Skills	3.97	0.82	Very Satisfactory
Feedback and Reinforcement Features	3.83	0.90	Very Satisfactory
Practicality of Use in a Classroom Setting	3.88	0.88	Very Satisfactory
Overall Instructional Quality	3.92	0.84	Very Satisfactory
Overall Mean	3.89	0.85	Very Satisfactory

These results indicate that the expert evaluators considered the BSG appropriate in terms of instructional content, design, usability, learning potential, and classroom application.

Effectiveness of the Business Simulation Game

The experimental group's achievement relative to the maximum possible score of 25 was examined using the effectiveness percentage described in the Materials and Methods.

The experimental group obtained a pretest mean of 6.56 ($SD = 1.76$), corresponding to an effectiveness percentage of 26.24% and classified as Not Effective. Following the BSG intervention, the posttest mean increased to 23.88 ($SD = 1.53$), corresponding to 95.52% of the maximum possible score and classified as Very Effective.

Table 3. Effectiveness Percentage of the Experimental Group

Assessment	Mean	SD	Effectiveness Percentage	Interpretation
Pretest	6.56	1.76	26.24%	Not Effective

Assessment	Mean	SD	Effectiveness Percentage	Interpretation
Posttest	23.88	1.53	95.52%	Very Effective

Tests of the Null Hypotheses

Both the experimental and control groups consisted of 43 students. At pretest, the experimental group obtained $M = 6.56$ ($SD = 1.76$), while the control group obtained $M = 6.67$ ($SD = 1.89$). At posttest, the experimental group obtained $M = 23.88$ ($SD = 1.53$), compared with $M = 17.21$ ($SD = 3.07$) for the control group. The corresponding mean gain scores were 17.33 ($SD = 1.66$) for the experimental group and 10.53 ($SD = 3.13$) for the control group.

Table 4. Inferential Tests of Pretest, Posttest, and Gain Scores

Hypothesis	Comparison	Test statistic	<i>p</i>	Decision
H ₀₁	Experimental vs. Control Pretest	$t(84) = -0.30$	.769	Fail to reject H ₀₁
H ₀₂	Control Pretest vs. Posttest	$t(42) = 22.09$	< .001	Reject H ₀₂
H ₀₃	Experimental Pretest vs. Posttest	$t(42) = 68.53$	< .001	Reject H ₀₃
H ₀₄	Experimental vs. Control Posttest	Welch's $t(61.70) = 12.77$	< .001	Reject H ₀₄
H ₀₅	Experimental vs. Control Gain Scores	Welch's $t(63.88) = 12.58$	< .001	Reject H ₀₅

Baseline Performance of the Experimental and Control Groups

For H₀₁, the experimental group's pretest scores ($M = 6.56$, $SD = 1.76$) did not differ significantly from those of the control group ($M = 6.67$, $SD = 1.89$), $t(84) = -0.295$, $p = .769$. Therefore, H₀₁ was not rejected. The result indicates no statistically significant baseline difference in achievement between the two groups before implementation of the instructional conditions.

Pretest and Posttest Performance of the Control Group

For H₀₂, the control group's mean increased from 6.67 ($SD = 1.89$) at pretest to 17.21 ($SD = 3.07$) at posttest. The paired-samples analysis showed a statistically significant difference, $t(42) = 22.092$, $p < .001$. Thus, H₀₂ was rejected, indicating that the students taught through lecture-discussion also demonstrated significant improvement from pretest to posttest.

Pretest and Posttest Performance of the Experimental Group

For H₀₃, the experimental group's mean increased from 6.56 ($SD = 1.76$) at pretest to 23.88 ($SD = 1.53$) at posttest. The paired-samples t -test showed a statistically significant

difference, $t(42) = 68.53$, $p < .001$. Thus, H_{03} was rejected, indicating a significant improvement in the achievement of students who underwent the Business Simulation Game intervention.

Posttest Performance of the Experimental and Control Groups

For H_{04} , the experimental group ($M = 23.88$, $SD = 1.53$) obtained a higher posttest mean than the control group ($M = 17.21$, $SD = 3.07$). Because the equal-variance assumption was not supported in the audited analysis, Welch's independent-samples t -test was used. The difference was statistically significant, Welch's $t(61.70) = 12.768$, $p < .001$. H_{04} was therefore rejected.

Gain Scores of the Experimental and Control Groups

For H_{05} , the experimental group obtained a mean gain of 17.33 ($SD = 1.66$), whereas the control group obtained a mean gain of 10.53 ($SD = 3.13$). Welch's independent-samples t -test showed a statistically significant difference between the groups, Welch's $t(63.88) = 12.581$, $p < .001$. Thus, H_{05} was rejected.

Overall, the analyses showed that the experimental and control groups did not significantly differ in achievement at pretest. Both groups demonstrated significant pretest-to-posttest improvement; however, the experimental group obtained a significantly higher posttest mean and significantly greater gain scores than the control group.

Retention of Learning

Retention of learning was assessed among the same 43 experimental-group students two weeks after the posttest. The experimental group obtained a posttest mean of 23.88 ($SD = 1.53$) and a retention-test mean of 23.42 ($SD = 1.31$). The difference between the two means was 0.47 point. Based on the ratio of the retention-test mean to the posttest mean, students maintained 98.07% of their posttest performance.

Table 5. Posttest and Retention-Test Performance of the Experimental Group

Assessment	N	Mean	SD
Posttest	43	23.88	1.53
Retention-Test	43	23.42	1.31

Retention rate: 98.07%

A supplementary paired-samples analysis showed that the 0.47-point decrease from posttest to retention was statistically significant, $t(42) = 2.10$, $p = .042$. Because the paired difference scores departed from normality, a Wilcoxon signed-rank sensitivity analysis was also conducted and produced the same inferential conclusion ($W = 104$, $p = .021$). Thus, although a statistically detectable decline occurred, the experimental group maintained 98.07% of its posttest performance over the two-week interval.

The retention analysis applies only to the experimental group because a corresponding retention assessment was not administered to the control group.

Student Satisfaction with the Business Simulation Game

Table 6 presents the students' satisfaction with the Business Simulation Game across four dimensions. The overall satisfaction rating was $M = 3.86$ ($SD = 0.87$), interpreted as Very Satisfied.

Learning Impact received the highest rating ($M = 3.98$, $SD = 0.92$), followed by Usability and Design ($M = 3.95$, $SD = 0.84$). Overall Satisfaction and Value obtained $M = 3.79$ ($SD = 0.83$), while Engagement and Enjoyment obtained the lowest mean ($M = 3.71$, $SD = 0.89$). The latter two dimensions were interpreted as Satisfied, whereas Learning Impact and Usability and Design were interpreted as Very Satisfied.

Table 6. Students' Satisfaction with the Business Simulation Game

Assessment	Mean	SD	Interpretation
Engagement and Enjoyment	3.71	0.89	Satisfied
Usability and Design	3.95	0.84	Very Satisfied
Learning Impact	3.98	0.92	Very Satisfied
Satisfaction and Value	3.79	0.83	Satisfied
Overall	3.86	0.87	Very Satisfied

The results show that students generally reported a positive experience with the BSG, with the strongest ratings associated with its perceived learning impact and usability

4. Discussion

The findings demonstrate that the Business Simulation Game (BSG) provided a meaningful experiential approach to developing entrepreneurial learning among Grade 10 students. Students generally demonstrated a high level of entrepreneurial competencies, with Into Action emerging as the strongest dimension, while Personal Resources obtained the lowest rating.

This pattern suggests that the simulation was particularly suited to competencies involving decision-making, problem-solving, and applying entrepreneurial ideas. It supports Kolb's Experiential Learning Theory (1984), which emphasizes learning through concrete experience and active application, as well as the constructivist perspectives of Piaget (1972) and Vygotsky (1978). The relatively lower Personal Resources rating suggests that competencies such as confidence, perseverance, and leadership may require more sustained and reflective learning experiences.

The BSG also received an overall Very Satisfactory evaluation from the experts, indicating that it was considered appropriate in terms of content, learning outcomes, instructional

quality, usability, and suitability for Grade 10 learners. This finding supports the principles of Tyler's curriculum model and Biggs' Constructive Alignment, which emphasize coherence among learning objectives, instructional activities, and intended outcomes. It is also consistent with previous studies emphasizing the importance of expert validation in ensuring the pedagogical quality and curriculum alignment of simulation-based instructional materials.

The achievement results provide the strongest evidence regarding the contribution of the BSG. Although both the experimental and control groups improved significantly, the experimental group achieved significantly higher posttest scores and significantly greater gain scores than the control group. Because the groups did not significantly differ at pretest, this pattern indicates that students exposed to the BSG demonstrated greater learning gains during the intervention period. These findings are consistent with Kolb's Experiential Learning Theory and with the literature of Rae (2007) and Nabi et al. (2017), which emphasizes the value of experiential entrepreneurship education in connecting theoretical knowledge with practical decision-making and problem-solving.

The experimental group also maintained 98.05% of its posttest performance after two weeks. Although there was a small but statistically significant decline between posttest and retention scores, the high retention rate indicates that most of the learning demonstrated immediately after the intervention was maintained. This finding is consistent with literature suggesting that active and simulation-based learning can support meaningful and sustained learning. However, because no retention test was administered to the control group, the study cannot establish that the BSG produced better retention than traditional instruction.

Students were also Very Satisfied overall with the BSG, with Learning Impact and Usability and Design receiving the highest ratings. These results indicate that students generally perceived the simulation as useful, accessible, and supportive of their entrepreneurship learning. The findings are consistent with Self-Determination Theory (Deci & Ryan, 1985) and studies showing that interactive learning environments can support motivation, engagement, and perceived competence. The comparatively lower rating for Engagement and Enjoyment nevertheless suggests an opportunity to make future versions of the simulation more dynamic and engaging.

Overall, the findings suggest that the Business Simulation Game can serve as a useful complementary instructional strategy in Grade 10 Entrepreneurship, particularly for providing students with opportunities to apply knowledge, make decisions, and solve simulated business problems. The findings should nevertheless be interpreted within the study's quasi-experimental design, single-school context, and two-week retention period. Further studies involving additional schools, longer follow-up periods, and retention comparisons between experimental and control groups would strengthen the evidence regarding the broader and longer-term effects of simulation-based entrepreneurship instruction.

5. Conclusion

Based on the findings of the study, the following conclusions were drawn:

1. The Grade 10 students demonstrated entrepreneurial competencies across Ideas and Opportunities, Resources, Personal Resources, Specific Knowledge, and Into Action, with Into Action emerging as the most highly demonstrated dimension.
2. The Business Simulation Game obtained an overall expert-evaluation mean of 3.87 (SD = 0.85), classified as Totally Equivalent based on the adopted expert-evaluation scale. The expert ratings covered content and pedagogical relevance, design and usability, instructional effectiveness and learning impact, and practicality and overall quality.
3. The experimental group demonstrated substantial improvement following the Business Simulation Game intervention, attaining 95.52% of the maximum possible posttest score, classified as Very Effective. Although both the experimental and control groups significantly improved from pretest to posttest, the experimental group achieved significantly higher posttest scores and greater learning gains than the control group despite having no significant difference in baseline performance.
4. The students who underwent the Business Simulation Game maintained 98.07% of their posttest performance after two weeks, indicating that most of the learning demonstrated immediately after the intervention was retained.
5. The students were generally Very Satisfied with the Business Simulation Game, particularly with its learning impact and usability and design, indicating a positive learning experience with the simulation-based approach.

Overall, the findings indicate that the Business Simulation Game can serve as a complementary instructional strategy for Grade 10 Entrepreneurship, providing opportunities for students to apply entrepreneurial knowledge through decision-making, problem-solving, and simulated business experiences.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are offered:

1. Entrepreneurship teachers may integrate the Business Simulation Game as a complementary strategy to conventional instruction, particularly for lessons requiring practical application, decision-making, and problem-solving.
2. The BSG may be further enhanced by incorporating activities that strengthen Personal Resources, such as confidence, leadership, perseverance, and self-motivation, as well as additional interactive features to improve student engagement and enjoyment.
3. Schools and curriculum implementers may consider the use of expert-reviewed and curriculum-aligned simulation activities to provide students with more experiential opportunities in Entrepreneurship education.
4. Future researchers may replicate the study using larger samples, multiple schools, longer intervention and retention periods, and retention assessments for both experimental and control groups to determine whether the findings are sustained and applicable across broader educational contexts.

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