RESEARCH ARTICLE

# The Effectiveness of Social Media As An E-Learning Tool in Enhancing Understanding and Learning Experience of Business Simulation Game: A Case of Edugate

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ABSTRACT

This study aims to analyze the effectiveness of social media as an instructional support tool in enhancing students' understanding of a Business Simulation Game. The increasing integration of digital platforms in higher education has encouraged the use of social media as a supplementary learning medium. However, empirical evidence regarding its effectiveness in supporting simulation-based training remains limited. Therefore, this study examines whether social media-based learning contributed to improved learning outcomes and explores students' learning experience of its implementation, grounded in the Technology Acceptance Model (TAM). The research employs a mixed-method approach involving 125 university students who participated in the competition. Quantitative data were collected through pre-test and post-test assessments as well as Likert-scale questionnaires, while qualitative data were obtained from open-ended responses. The data were analyzed using descriptive analysis, instrument validity and reliability testing, and N-Gain score analysis. The results indicate an increase in post-test scores compared to pre-test results, reflecting improved understanding after the implementation of social media-based instructional support. In addition, students expressed positive learning experience and perception in term of TAM. These findings confirms that social media can function effectively as a supplementary tool in Business Simulation Game competition.



## Introduction

The rapid advancement of digital technology has significantly transformed educational practices, particularly through the widespread adoption of e-learning systems. The COVID-19 pandemic further accelerated this transformation, positioning online learning as a dominant instructional model in higher education institutions worldwide (Saufi, 2025). Digital learning environments provide flexibility in time and location while enabling access to interactive and multimedia-based instructional materials that enhance students' conceptual understanding and collaborative engagement. Moreover, the integration of digital technologies into education has expanded opportunities for lifelong learning and improved inclusivity for learners across diverse geographical regions (Saufi, 2025). Consequently, higher

education institutions are increasingly exploring innovative digital approaches to improve the quality and effectiveness of teaching and learning processes.

Within business and management education, this technological transformation has encouraged the adoption of experiential learning approaches that connect theoretical knowledge with practical application. One prominent method is simulation-based learning, which immerses students in scenario-based environments where they must make strategic decisions and analyze complex business situations. Simulation games enable learners to experiment with decision-making processes and observe the consequences of their actions within a controlled environment, thereby strengthening analytical thinking and problem-solving skills (Gros, 2007; Andreu-Andres & Garcia-Casas, 2010). In addition, game-based learning approaches promote active participation and engagement, allowing students to construct knowledge through experimentation and reflection rather than passive information reception (Vlachopoulos & Makri, 2017). These pedagogical approaches align with experiential learning theories, which emphasize that meaningful learning occurs through active experience and reflective practice (Cai, 2024).

Simulation-based learning is particularly relevant in business and economics education, where students are required to understand dynamic market conditions, operational processes, and strategic decision-making. Participation in simulation-based activities has been shown to develop managerial competencies such as leadership, communication, teamwork, and analytical thinking (Robertson et al., 2009). In this context, PT Harfan Tri Megah (Edugate) developed a web-based Business Simulation Game designed to simulate integrated enterprise operations, including production, marketing, accounting, human resources, and warehousing. The simulation environment challenges participants to manage virtual companies and make strategic decisions within competitive scenarios. To support participants' preparation before the competition, Edugate utilizes multiple digital platforms such as Instagram, YouTube, Zoom, and WhatsApp as supplementary instructional tools. These platforms function as channels for distributing tutorial content, instructional videos, and communication materials that assist participants in understanding the simulation mechanics and strategies.

The rapid development of digital communication technologies has also expanded the role of social media in educational contexts. Social media platforms facilitate information exchange, collaboration, and knowledge sharing among users through interactive communication networks (Cheston et al., 2013). With approximately 5.4 billion users globally, social media has become one of the most influential digital infrastructures for communication and content distribution (Statista, 2025). Platforms such as YouTube, Instagram, and LinkedIn increasingly serve as educational resources where learners access instructional materials, discuss academic topics, and interact with educators and peers (Muftah, 2024; Ciampa et al., 2016). In higher education, social media has gradually evolved from a social networking tool into an important component of technology-enhanced learning environments (Sarwar et al., 2019; Khan et al., 2021).

To explain how users adopt and utilize digital learning technologies, many studies employ the Technology Acceptance Model (TAM). The TAM framework, originally proposed by Davis (1987), suggests that technology acceptance is primarily influenced by two cognitive beliefs: perceived usefulness (PU), which refers to the degree to which individuals believe that using a system improves their performance, and perceived ease of use (PEOU), which refers to the extent to which the system can be used with minimal effort. These perceptions influence users' attitudes toward technology and subsequently shape their behavioral intentions to adopt and utilize the system (Davis, 1989). The TAM framework has been widely applied in educational research to analyze students' acceptance of e-learning platforms, mobile learning systems, and social media-based learning environments (Park, 2009; Venkatesh & Davis, 2000). Previous studies also highlight the influence of complementary factors such as perceived enjoyment, self-efficacy, perceived creativity, and relative advantage in shaping technology adoption and engagement in digital learning environments (Rogers, 2003; Runco & Jaeger, 2012; Manolika et al., 2021).

Despite the growing number of studies on digital learning technologies, much of the existing research primarily focuses on student engagement, motivation, and behavioral intention rather than measurable cognitive outcomes. For example, studies have demonstrated that social media can increase students' participation and motivation in learning activities (Niyomsuk & Polyiem, 2022) and that video-based learning enhances comprehension and engagement (Galatsopoulou et al., 2022). Similarly, simulation games have been shown to improve analytical thinking and decision-making skills in business education (Skjelberd & Daus, 2022; Cai, 2024). However, limited empirical research has

examined whether social media-based instructional support contributes to measurable improvements in students' conceptual understanding, particularly within simulation-based competitive learning environments. Furthermore, previous studies often investigate simulation games, social media learning, or digital instructional tools separately, rather than examining their combined role in enhancing learning effectiveness.

This gap highlights the need for empirical investigation into how social media-based learning support can complement simulation-based education and contribute to improved learning outcomes. In the context of Business Simulation Game competitions organized by Edugate, social media functions as a supplementary instructional platform that provides participants with learning resources, tutorials, and strategic insights prior to the competition. However, it remains unclear whether the use of these digital learning supports translates into measurable improvements in students' understanding of business simulation concepts.

Therefore, this study aims to evaluate the effectiveness of Edugate's social media platforms as instructional support tools in enhancing students' learning outcomes in the Business Simulation Game competition. Specifically, the research seeks to measure learning improvement through pre-test and post-test comparisons and to analyze students' perceptions of the social media learning experience using the constructs of the Technology Acceptance Model. By integrating technology acceptance perspectives with learning outcome evaluation, this study contributes to the literature by providing empirical evidence on the relationship between digital learning support and cognitive learning effectiveness in simulation-based business education.

## Method

This study employed a mixed-method approach combining quantitative and qualitative techniques to examine the effectiveness of social media as an instructional support tool in improving students' understanding of the Business Simulation Game. The quantitative approach was used to measure participants' learning outcomes and perceptions through structured questionnaires and pre-test and post-test assessments, while qualitative insights were obtained through open-ended responses. This approach allowed the researcher to capture both measurable learning improvements and participants' subjective learning experiences (Sekaran & Bougie, 2016; McKim, 2017). The unit of analysis consisted of undergraduate students participating in the Business Simulation Game Competition at the International Management, Accounting, and Business Tournament (TREASURE) 2025 organized by the State Polytechnic of Malang (POLINEMA) in collaboration with PT Harfan Tri Megah (Edugate). The study involved 125 participants who attended the preparatory training program prior to the competition. Because the population size was limited and all participants experienced the same learning intervention, a census sampling technique was employed, in which the entire population was included as the research sample. Data were collected during a five-day training period before the competition. Participants first completed a pre-test designed to measure their initial understanding of business simulation concepts and ERP-based business processes. During the training program, participants attended synchronous learning sessions through Zoom and accessed supplementary learning materials distributed via Edugate's social media platforms, particularly Instagram and YouTube. After completing the training sessions, participants took a post-test and filled out a structured questionnaire measuring their perceptions of the social media-based learning support.The social media questionnaire items were developed based on constructs from the Technology Acceptance Model (TAM) introduced by Davis (1987). The measured constructs included Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Perceived Enjoyment (PE), Perceived Creativity (PC), Satisfaction (S), Relative Advantage (RA), Self-Efficacy (SE) Attitude Toward Use (ATU), and Intention of Use (IUO). Furthermore, the questionnaire items related to synchronous learning experience were developed based on several constructs, including Experience Generation (EG), Conceptual Understanding and Perceived Learning (CUPL), Skill Development (SD), Affective Evaluation (AE), Teamwork (TW), and Satisfaction (S). Each construct was measured using several indicators evaluated through a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

**Table 1**

| **Social media Questionnaire** | |
|---|---|
| PEOU1 Instagram content and YouTube videos are easy to use during the training process.<br>PEOU2 Learning to use Business Simulation features via YouTube videos is easy.<br>PEOU3 Using social media and YouTube videos does not require much mental effort. | RA1 Watching BusinessSim YouTube tutorial videos in BusinessSim training helps me understand the feature.<br>RA2 Watching BusinessSim YouTube tutorial videos in BusinessSim training helps me understand the business process within each feature.<br>RA3 Watching BusinessSim youTube tutorial videos on BusinessSim allows me to perceive points from lessons I did not attend. |
| PC1 Watching Business Simulation tutorial videos and Instagram posts sparked my creativity.<br>PC2 Videos helped me be more imaginative and provided ideas. | SE1 I have technical skills needed to watch BusinessSim videos.<br>SE2 If I need help watching videos in the future, there are sources available to help.<br>SE3 I have necessary technical tools (computer, mobile phone, internet access) to access the videos and posts. |
| PE1 I enjoy watching Edugate's YouTube and Instagram content.<br>PE2 Business Simulation YouTube videos are fun to watch.<br>PE3 Using videos in training is a pleasant experience. | ATU1 All things considered using the Business YouTube tutorial videos in training is good for me. |
| S1 I am satisfied with the training using BusinessSim tutorial videos.<br>S2 YouTube videos were effective in achieving training goals.<br>S3 The videos significantly improved my understanding of business processes.<br>S4 The tutorial videos motivated me to spend more time studying.<br>S5 I enjoy learning analytical skills using YouTube<br>S6 The purpose of instruction of BusinessSim YouTube video tutorial is clear.<br>S7 Mentors supported both collaboratives and individual learning.<br>S8 I can discuss BusinessSim training with mentors through YouTube, Instagram, Email, and WhatsApps.<br>S9 I think that YouTube and Instagram support trendy and interesting training. | IOU1 In the future, I will continue to use videos during my study<br>IOU2 In the future, I will continue to join training classes that use videos<br>IOU3 In the future, I will continue to participate in discussions about the videos shown in the BusinessSim YouTube tutorial videos.<br>IOU4 In the future, I may search for other videos from different sources related to the BusinessSim for more knowledge<br>IOU5 In the future, I may search online video lecturers about the business process to learn more.<br>IOU6 I would recommend others to join BusinessSim classes in which videos are used for learning. |
| PU1 YouTube, E-Mail, and WhatsApp provided flexibility in communicating with mentors and team.<br>PU2 Instagram and YouTube content helped me reflect, analyze, and think critically.<br>PU3 The learning resources met my learning needs during Business Simulation training.<br>PU4 By watching Edugate's YouTube videos, I gain more knowledge.<br>PU5 I learn better through videos and Instagram posts. | **Open Questions**<br>A1 What challenges or issues did you experience while watching the YouTube tutorial videos? What do you think should be improved?<br>A2 What is your opinion about Edugate's Instagram content in helping you understand the Business Simulation Game Material?<br>A3 What suggestions do you have to make communication through WhatsApp more effective & less confusing? |

| | |
|---|---|
| PU6 YouTube videos give me flexibility to study anytime.<br>PU7 YouTube tutorial videos saved me time.<br>PU8 Tutorial videos in training met my expectations.<br>PU9 Watching YouTube videos and Instagram posts improved my performance in the competition.<br>PU10 Using YouTube videos increased my productivity in learning. | A4 Were the emails you received during the training clear and helpful? What could be improved?<br>A5 Which features in the Business Simulation game do you think need to be improved or added?<br>A6 How was your overall experience using the Business Simulation Game and joining the competition?<br>A7 Is there anything you would like to share or say to the committee? |
| **Training Questionnaire** | |
| The BusinessSim Training gives me the opportunity to:<br>EG1 Better grasp the application of Business Process knowledge.<br>EG2 Experiment with different business strategies.<br>EG3 Have a strategic perspective.<br>EG4 Enhance knowledge and understanding through discussion with the mentor. | AE1 The BusinessSim training motivated me to want to succeed in the Business Simulation Competition - Treasure 2025.<br>AE2 The BusinessSim training motivated me to learn about business/operation strategies.<br>AE3 I find the experience of BusinessSim training is conducive to learning effectively. |
| BusinessSim E-learning Module and Mini Games enabled me to better understand:<br>CUPL1 Overall Business Process<br>CUPL2 Planning Skills<br>CUPL3 Understanding sales order process and strategy<br>CUPL4 Understanding financial performance<br>CUPL5 Understanding human resource management<br>CUPL6 Understanding intercompany sales and negotiation<br>CUPL7 The ability to read and analyze | TW1 Teamwork draws agreement on important issues more effectively.<br>TW2 Key decisions about our team were made by the entire team.<br>TW3 I was comfortable sharing my strategy ideas with my team.<br>TW4 Most of the time, members of my team asked each other for feedback on their department progress. |
| BusinessSim training enabled me to:<br>SD1 Evaluate the success of particular strategies that were adopted.<br>SD2 Extend knowledge that they would not normally have picked up in a class situation.<br>SD3 Use the learned skills in future jobs. | **Open Question**<br>A1 Can you describe your experience during the BusinessSim training?<br>A2 What did you understand or learn after Day1/Day 2 of the training?<br>A3 What challenges or difficulties did you experience during the training?<br>A4 Do you think the Zoom training was effective in helping you understand BusinessSim? Why or why not?<br>A5 What suggestions do you have for improving the BusinessSim training experience?<br>A6 Do you have any feedback for the mentor? |
| S1 The BusinessSim training made the game more interesting.<br>S2 The skills and knowledge learned during the BusinessSim training will be useful for my future career.<br>S3 Overall, I learned a lot from this training. | S6 The training caught my interest from the beginning.<br>S7 The Zoom training and E-Learning module was easy to use and understand.<br>S8 I learned things from the teacher or E-Learning Module that I would not have learned if I only joined the Zoom Training. |

| | |
|---|---|
| S4 Overall, I am satisfied with the BusinessSim training as a learning media.<br>S5 I had fun when training ran. | S9 I received the necessary training in using Business Simulation Game features, so that I could focus on the business strategy.<br>S10 I would consider re-watching the Zoom training the next day if I have access to the Zoom recording. |

The validity of the research instrument was evaluated using face validity to ensure that each item appropriately represented the intended constructs. Reliability testing was conducted using Cronbach's Alpha to assess the internal consistency of the questionnaire items. The results indicated that all constructs met the acceptable reliability threshold, with Cronbach's Alpha values ranging from 0.88 to 0.97, indicating that the measurement instruments were reliable for data collection (Sugiyono, 2013). To measure learning effectiveness, pre-test and post-test scores were analyzed using the N-Gain Score Analysis based on Hake's normalized gain formula. This analysis measures the improvement in participants' conceptual understanding after the training intervention. The N-Gain results indicated a moderate level of learning improvement among participants, demonstrating that the social media-based instructional support contributed positively to the enhancement of students' understanding of Business Simulation Game concepts.

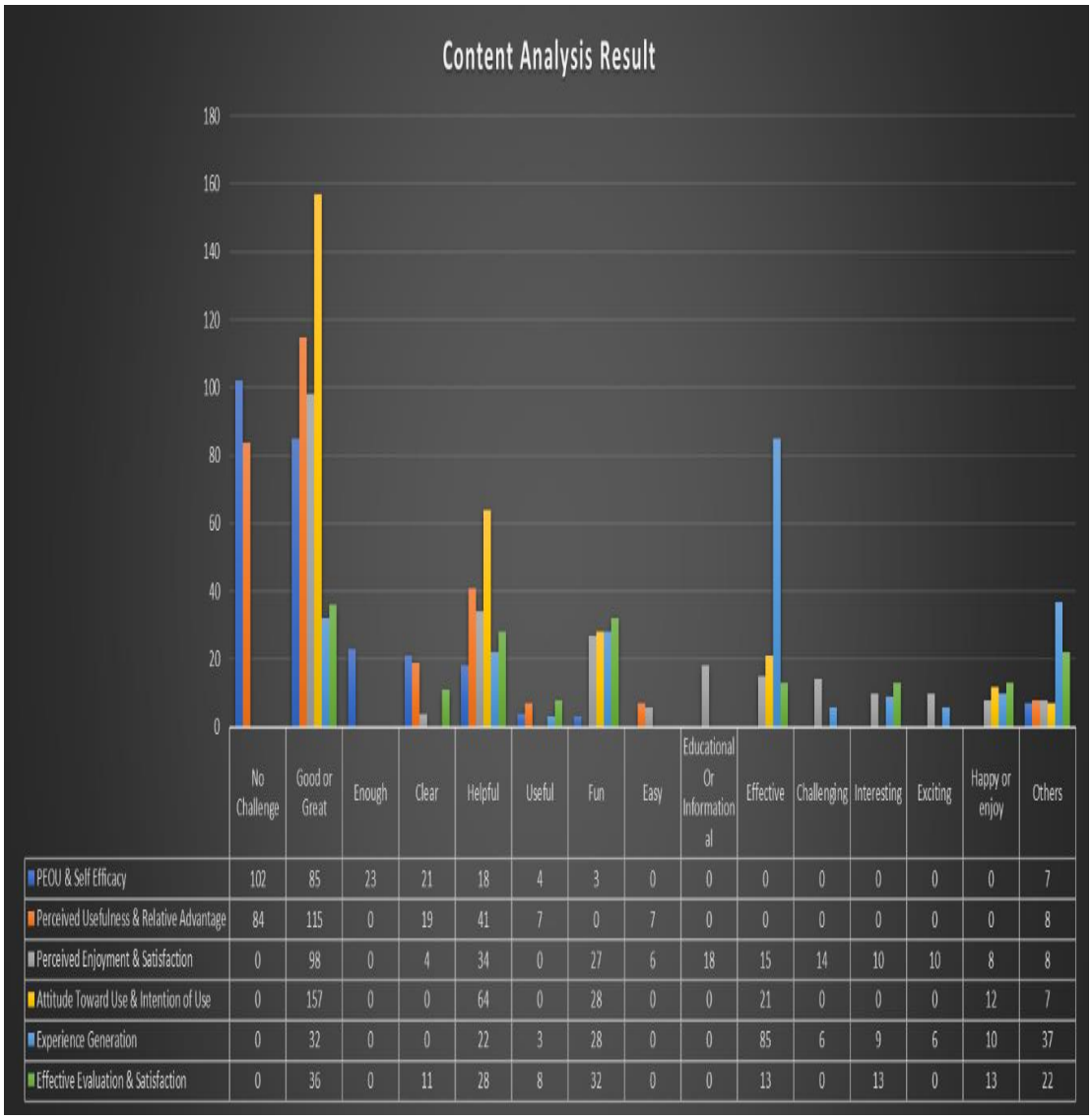
**Results and Discussion**

This study involved 125 participants of the Business Simulation Game competition to examine the effectiveness of social media and online training as digital learning tools. The pre-test and post-test consisted of ten identical multiple-choice questions to measure learning improvement, while the questionnaire assessed participants' perceptions across cognitive, affective, and behavioral dimensions. The respondents were predominantly female (63.2%) and mostly Indonesian students (96%), representing diverse universities and academic disciplines, with Business Management, Accounting, Digital Business, and Information Systems as the dominant fields. Most participants were from the 2022–2023 cohorts, and although 79.2% had prior exposure to ERP/SAP-related courses, more than half had never previously participated in a business simulation competition. Instrument testing confirmed strong measurement quality, with all items achieving a Content Validity Index of 1.00 and Cronbach's Alpha values ranging from 0.88 to 0.97, indicating high reliability.

Descriptive statistical analysis revealed generally positive perceptions of Edugate's social media learning platforms, with mean scores between 3.72 and 3.80 across variables such as perceived ease of use, usefulness, enjoyment, creativity, satisfaction, and relative advantage. Training evaluation results demonstrated even stronger agreement, with all variables exceeding a mean score of 4.00, indicating effective learning experiences, improved conceptual understanding, enhanced analytical skills, and positive emotional engagement. Pre-test and post-test analysis further confirmed the effectiveness of the two-day online training, where the average score increased from 64.4 to 91.5, producing an N-gain score of 0.75 in the high effectiveness category. Content analysis supported these findings, indicating that participants perceived the integration of social media learning resources and synchronous online training as accessible, informative, and engaging, although minor improvements in instructional clarity, system stability, and training interactivity were suggested.

The qualitative data, categorized into six primary dimensions, reveals a strong consensus regarding the effectiveness of the training model. A dominance of positive sentiment was observed across all TAM constructs, where the "Good or Great" category received the highest frequency of mentions. This was particularly evident within the Attitude Toward Use & Intention of Use dimension, which recorded 157 positive sentiments, suggesting that the integration of social media and synchronous training successfully fostered a strong behavioral intention among students to continue utilizing such digital learning tools.Furthermore, the study identified significant findings regarding ease of access and self-efficacy, as 102 responses in the PEOU & Self-Efficacy category indicated "No Challenge". This high frequency confirms that the instructional materials provided via Instagram and YouTube were perceived as user-friendly, effectively lowering the technical barriers to entry for complex business simulations. The effectiveness in experience generation was also highlighted, with 85 respondents explicitly characterizing the training as "Effective". This qualitative feedback aligns with the quantitative N-Gain score of 0.75, proving that the multi-platform approach involving Zoom and social media successfully translated theoretical ERP/SAP concepts into tangible experiential

learning.Participants also reported high levels of perceived helpfulness and engagement; the Perceived Usefulness & Relative Advantage dimension saw 41 respondents describing the training as "Helpful," while 115 responses praised the overall quality as "Good or Great". These insights explain the high mean scores found in the descriptive analysis, showing that students found digital support more advantageous than traditional methods. However, despite the overwhelming positivity, minor critiques were noted in categories such as "Enough" and "Others". These responses pointed toward a need for further improvements in instructional clarity and system stability, providing a critical basis for the study's recommendations for future iterations of the competition.




| | No Challenge | Good or Great | Enough | Clear | Helpful | Useful | Fun | Easy | Educational Or Informational | Effective | Challenging | Interesting | Exciting | Happy or enjoy | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PEOU & Self Efficacy | 102 | 85 | 23 | 21 | 18 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Perceived Usefulness & Relative Advantage | 84 | 115 | 0 | 19 | 41 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Perceived Enjoyment & Satisfaction | 0 | 98 | 0 | 4 | 34 | 0 | 27 | 6 | 18 | 15 | 14 | 10 | 10 | 8 | 8 |
| Attitude Toward Use & Intention of Use | 0 | 157 | 0 | 0 | 64 | 0 | 28 | 0 | 0 | 21 | 0 | 0 | 0 | 12 | 7 |
| Experience Generation | 0 | 32 | 0 | 0 | 22 | 3 | 28 | 0 | 0 | 85 | 6 | 9 | 6 | 10 | 37 |
| Effective Evaluation & Satisfaction | 0 | 36 | 0 | 11 | 28 | 8 | 32 | 0 | 0 | 13 | 0 | 13 | 0 | 13 | 22 |

**Figure 1. Content Analysis Result**

## Conclusions and Recommendations

This study evaluates the effectiveness of social media and Zoom-based training as instructional and promotional tools in preparing participants for the Business Simulation Game organized by PT Harfan Tri Megah (Edugate). The results show that social media contributes positively to participants' awareness, engagement, and initial understanding of the competition, although its role mainly serves as a complementary learning medium that supports information dissemination and motivation rather than deep conceptual learning. In contrast, Zoom-based training demonstrates stronger instructional impact by significantly improving participants' conceptual understanding, skill development, and learning outcomes, as reflected in the increase between pre-test and post-test scores. The participation of international students, particularly from the Philippines, also indicates the cross-context applicability of the training model in broader educational settings. Based on these findings, several recommendations are proposed, including continuous improvement of social media learning content, the incorporation of

more interactive and workshop-based training methods, enhancement of system stability, and the consistent use of English to support international expansion. Nevertheless, the study is subject to several limitations, including data collection immediately after the training and competition, differences in participants' academic backgrounds and prior experience with simulation systems, and the limited scope of respondents, which may affect the generalizability of the findings.

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