

Integration Of Roblox Game As A Gamification Media For Developing Bartender Competence In Culinary Vocational Education: A Systematic Review

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	<p><i>learning. Practical skills and motivation to learn are greatly enhanced in hospitality and culinary training contexts through video games or simulations. Yet, there remain several challenges to overcome including technology divide, expense of infrastructure; teacher preparedness and non-standardized assessment. In general, these results highlight the transformative nature of Roblox as a new medium for refreshing bartender pedagogy and call attention to opportunities and tensions that warrant further investigation in terms of scalability, long term retention retention, and industry relevant assessment frameworks.</i></p>
	<p>Keywords: <i>Roblox; Food Service; Culinary Education; Vocational Education; Tecnology Learning</i></p>

INTRODUCTION

The rapid development of digital technology over the past decade has brought significant transformations to teaching and learning strategies in vocational education, including the culinary field. One of the most prominent innovations is the implementation of gamification and game-based learning (GBL), which integrates game elements into formal learning processes. This approach has been proven to enhance learners' motivation, engagement, and knowledge retention through interactive and immersive learning experiences (Tay et al., 2022; Wouters & Van Oostendorp, 2013). Among various game-based learning platforms, Roblox stands out as a user-generated content platform that allows users to design, modify, and publish interactive simulations. Roblox is not only popular among teenagers and young adults but has also been increasingly utilized by educators to create simulation-based learning environments that resemble real-world contexts. In vocational culinary education, Roblox holds the potential to simulate bartender practices such as drink mixing, pouring, and garnishing that are often difficult to implement directly due to cost, material availability, and safety considerations.

Bartender training in culinary curricula generally requires motor skills, precision, creativity, and in-depth knowledge of beverage composition (cocktails and mocktails). However, in-class practice frequently faces challenges, including limited laboratory facilities, high costs of raw materials, safety risks when handling alcohol or sharp tools, and variability in instructional quality due to differences in instructors' experiences (Chatterjee et al., 2021). In such cases, digital simulations through Roblox may serve as an effective solution, allowing students to repeatedly practice without additional costs, minimizing the risk of accidents, and still providing authentic learning experiences. Despite the emerging potential of Roblox in vocational education, comprehensive studies specifically addressing its application in developing bartender competencies in the culinary domain remain limited. Existing literature tends to focus on serious games in general or on hospitality education at large, without delving into the specific aspects of beverage service skills. Therefore, a Systematic Literature Review (SLR) is needed to map existing findings, identify trends and research gaps, and provide strategic recommendations for implementing Roblox in bartender training within vocational culinary education.

This study is thus expected to contribute theoretically by mapping relevant concepts and integration models of game-based learning in bartender training, as well as practically by offering insights for educators in designing innovative curricula that leverage digital technology to enhance students' competencies in the culinary field. Based on a preliminary

review of the literature from 2015 to 2025, several research gaps have been identified. Studies on the use of Roblox for developing bartender skills remain limited, as most game-based learning research in vocational education focuses on general hospitality or culinary simulations (Harris et al., 2017) rather than on bartender competencies such as cocktail and mocktail preparation. In addition, there is a lack of integration between gamification theory and culinary practice, with few studies incorporating established game design theories (Ambartsumova, 2021) into bar service learning. The evaluation of effectiveness in vocational culinary contexts is also minimal; research assessing the outcomes of game-based learning seldom addresses psychomotor skills, even though bartender training heavily relies on hand coordination, speed, and the aesthetics of beverage presentation. Furthermore, no comprehensive systematic literature review has yet been conducted to map the trends, findings, and challenges related to the use of Roblox for bartender education in vocational culinary programs.

In response to these gaps, this study aims to map research trends concerning the application of Roblox as a game-based learning medium in vocational education, particularly in bartender training; analyze the gamification design approaches employed in Roblox-based bartender learning; identify supporting and inhibiting factors in implementing Roblox for bartender competency development; and detect research gaps to provide strategic recommendations for developing a Roblox-based bartender learning model in vocational culinary education.

STATE OF THE ART

Integration of digital technology in vocational education has undergone significant development over the past decade, particularly through the implementation of game-based learning (GBL) and gamification. Numerous studies indicate that these approaches enhance learner motivation, engagement, and competency achievement across multiple domains, including hospitality and culinary education (Hamari et al., 2016; Wouters & Van Oostendorp, 2013). In hospitality education, digital simulations and serious games have been widely applied for training in restaurant management, customer service, and food preparation (Ritzhaupt et al., 2021). These technologies provide students with safe, cost-effective, and repeatable practice environments. However, research specifically targeting bartender skills—such as drink mixing, pouring techniques, and garnishing—remains limited, despite the fact that these competencies constitute a critical component of culinary and hospitality curricula (Chatterjee et al., 2021). Roblox has emerged as a promising user-generated content platform with substantial potential for vocational training. Its capability to create realistic simulations, integrate leaderboards, point systems, quests, and social interaction makes it an ideal tool for designing interactive bartender training scenarios (Tay et al., 2022). Although Roblox is gaining popularity in educational contexts, studies focusing on its use for bartender education remain scarce, with most research emphasizing general gamification potential or its applications in STEM (Science, Technology, Engineering, Mathematics) fields.

Relevant studies, such as those by von Barnekow et al. (2017), demonstrate that gamified simulations can effectively improve practical skills in vocational training, including for learners with special needs. However, no systematic literature review (SLR) has yet mapped the use of Roblox in culinary bartender education, analyzed the gamification design elements utilized, or evaluated its impact on cognitive, affective, and psychomotor learning domains. This gap indicates the need for a comprehensive SLR that not only maps existing research on Roblox within vocational culinary programs but also identifies effective gamification elements

specifically relevant to bartender training and formulates recommendations for developing innovative learning media that align with the demands of the hospitality and culinary industries. Through synthesizing and critically examining findings from prior studies, this research aims to become a key reference for academics and practitioners in designing an effective, efficient, and adaptive Roblox-based bartender learning model that reflects current advancements in educational technology.

This review is novel as the first systematic attempt to chart the use of Roblox in vocational culinary education, more precisely on bartender competences, which has yet to be thoroughly investigated. Contrasted with existing studies that cover simply general gamification or hospitality and culinary education but not beverage service skills, this article is a quality review of the design approaches, research trends, and implementation challenges on Roblox-based learning in bartender education. In theory, performance in bartender practice essential psychomotor domain performance emphasize game-based learning and gamification integration model to of the theoretical decoding toward vocational education. At a practical level, this review provides guidelines for educators and food service curriculum developers who seek to create creative, cost-effective and safe digital simulation-based learning modules that develop students' technical skills and prepare them to enter- the-workforce in culinary arts and hospitality jobs.

METHODS

The Systematic Literature Review (SLR) method is chosen according to the PRISMA 2020 recommendations (Marzi et al., 2025). An SLR is the gamification of Roblox as a medium for developing bartender skills in vocational culinary education. SLR methodology provides integration in Roblox as a gamification medium for a replicable review in training bartender skills in vocational culinary education. Recent high quality relevant studies were included in the systematic search of national and international scholarly databases. For international databases, Scopus, the Web of Science (WoS), ScienceDirect, and ERIC were used along with Google Scholar and JINOTEP (Jurnal Inovasi Teknologi Pembelajaran) for additional contextual national studies.

The search strategy employed Boolean operators (AND, OR) and truncation, as follows: ("Roblox" OR "game-based learning" OR "gamification") AND ("bartender" OR "cocktail" OR "mocktail" OR "drink service" OR "mixology") AND ("vocational education" OR "hospitality" OR "culinary education")

To capture relevant and recent studies highlighting contemporary advancements in educational technology and gamification-based learning, the search process was restricted to publications from 2015-2025. This period was chosen to observe the transformation of digital learning ecosystems, especially the increasing use of Roblox as an educational tool in vocational settings. In order to maintain the review's accuracy, credibility, and methodological rigor, a definitive approach to inclusion and exclusion criteria was articulated and consistently implemented. Inclusion criteria focused on the studied works as scholarly and peer-reviewed, encompassing journal articles, conference proceedings, theses, and dissertations to guarantee the academic legitimacy of the review. Studies had to be focused on game-based learning or gamification specifically in the hospitality or culinary education sector, particularly on skill development for bartenders and beverage preparation in cocktail and mocktail crafting. Studies had to explicitly use or address Roblox or any correlating digital simulation-based learning platforms as part of the educational design or research discussion framework. In

addition, they had to be in English or Indonesian and published in the 2015-2025 range for contextual and temporal relevance.

In contrast, studies that did not satisfy these requirements were rigorously omitted from the review. The exclusion criteria included: (1) non-academic or non-peer-reviewed content, including blogs, news articles, editorials, and informal, unverifiable, empirical reports; (2) research that addressed general gaming contexts or studies on entertainment games that did not relate to culinary or vocational education; and (3) studies that were not empirical and, therefore, did not contain sufficient methodological detail or verifiable evidence to allow meaningful inclusion for systematic analysis. Employing these criteria assured that the review only included research that was relevant, evidence-based, and of high quality. This, in turn, enhanced the findings' validity and reliability concerning Roblox as a gamification tool in developing bartender skills in vocational culinary education

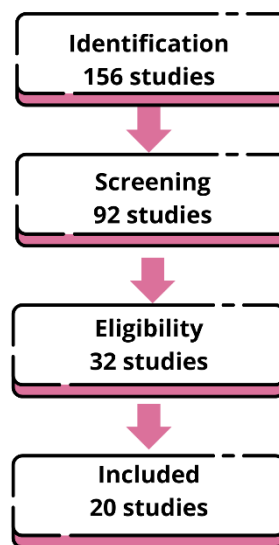


Figure.1 PRISMA Flow Diagram of Study Selection

To facilitate methodological validity, reliability, and transparency, I performed rigorous quality assessments on all included studies using two complementary appraisal tools. For the first tool, I applied the PRISMA 2020 Checklist, which allowed me to gauge the completeness, accuracy, and transparency of each study's reporting. This checklist assisted in confirming that each included publication adhered to a coherent and replicable reporting format in line with the international systematic reviews standards, thus ensuring that the studies included in the review were PRISMA compliant.

For studies that employed qualitative or mixed-methods designs, I used the Critical Appraisal Skills Programme (CASP) Qualitative Research Checklist. This checklist served to assess the credibility and methodological quality of the study and the ethical soundness of the conclusions drawn. Following the quality assessment, data from the 20 included studies were systematically extracted, organized, and analyzed to enable comprehensive cross-comparison and thematic synthesis. The extraction process was guided by a structured analytical matrix designed to capture the essential attributes and research characteristics of each study.

Table 1. The data extraction process covered the following categories

Data Extraction Category	Description
<i>Author(s)</i>	Name(s) of the researcher(s)
<i>Year of Publication</i>	Publication year to establish temporal trends
<i>Country/Region</i>	Geographical context of the study
<i>Methodology/Design</i>	Research type (quantitative, qualitative, mixed-method, experimental)
<i>Learning Platform Used</i>	Focus on Roblox or comparable digital simulation environments
<i>Gamification Elements</i>	Points, badges, leaderboards, feedback, narrative, collaboration
<i>Key Findings</i>	Main results and implications for vocational culinary education
<i>Facilitating and Inhibiting Factors</i>	Conditions influencing success or barriers to implementation
<i>Recommendations/Future Directions</i>	Suggestions proposed for advancing research and practice

This systematic extraction process enables a transparent synthesis of findings, allowing the identification of emerging themes, theoretical patterns, and research gaps regarding the use of Roblox as a gamified learning platform for enhancing bartender skill acquisition in vocational culinary education.

RESULT

In order to refine the theoretical and empirical positions of the present study, a systematic examination of the relevant literature (2015-2025) pertaining to the implementation of Roblox-based simulations for drink-mixing skill acquisition in vocational culinary education was undertaken. The analysis centered on the literature concerning game-based learning (GBL), gamification, virtual reality (VR), and metaverse instructional practices in hospitality and culinary training published internationally and nationally from the year 2021 to the year 2025.

The primary sources of data included the following scholarly and peer-reviewed databases: MDPI, Taylor & Francis, Emerald Insight, Wiley, Springer, ACM Digital Library, ScienceDirect, SCIRP, and PMC. The search terms included: gamification in vocational training, game-based learning culinary, simulation-based hospitality training, Roblox in education, and VR in hospitality. The twenty qualified articles from a pool of 156 articles provided several conceptualizations related to the immersive platforms in education and the use of these platforms for a number of empirical constructions on the impact they pose on technical skills, learner engagement, readiness for employment in the hospitality sector. The studies are methodologically diverse, including systematic literature reviews (SLR), meta-analyses, and experimental and quasi-experimental frameworks analyzing learning outcomes in game-based and simulation environments. Related journals can be seen in Table 2 as follows:

Table 2. Related Journal

No	Author	Topic	Objective
1	(Han et al., 2023)	Learners in the Metaverse: A Systematic Review on the Use of Roblox in Learning	SLR of 40 studies on Roblox: maps social-collaborative areas, VR-supported learning, programming,

			gamification elements & challenges
2	(Hadinejad & Zare, 2024)	The Role of Games in Hospitality Management Education	Compares cognitive, metacognitive, engagement, and satisfaction impacts of games in hospitality students.
3	(Dahalan et al., 2024)	<i>Gamification and Game-Based Learning for Vocational Education and Training (VET)</i> (PMC).	Maps gamification/GBL trends in vocational training; confirms effectiveness in VET.
4	(Alhasan et al., 2023)	<i>Roblox in Higher Education: Opportunities, Challenges, and Future Directions</i> (systematic/mapping).	Systematic mapping of Roblox adoption in universities.
5	(Zhai, 2024)	<i>Use of Roblox in Elementary School Science Education.</i>	Case study of Roblox for science experiments; improved critical thinking & hands-on bridging.
6	(Lampropoulos & Kinshuk, 2024)	Virtual reality and gamification in education: a systematic review	Reviews gamified VR environments and learning outcomes.
7	(Lin et al., 2024)	<i>The Impact of Culinary VR Curriculum on Students' Learning Outcomes and Acceptance</i> (Innovations in Education and Teaching International, T&F).	Developed & evaluated culinary VR curriculum; students showed higher performance & acceptance.
8	(Price-Howard & Lewis, 2023)	<i>Perceived Usefulness of Simulation Learning in Hospitality Education</i>	Investigates perception of simulation-based hospitality training.
9	(Hu et al., 2025)	<i>The Impact of VR on Student Engagement in the Classroom: A Systematic Review</i> (PMC).	Synthesizes evidence on cognitive, emotional, and behavioral engagement in VR learning.
10	(Zhao et al., 2020)	VR's Effect on Practical Skills: Meta-Analysis	Shows VR improves procedural skills significantly.
11	(Morreale et al., 2024)	Media Technologies and Epistemologies: The Platforming of Everything Roblox and the Pervasiveness of Play: What Game-Making Communities Can Teach Us About Participatory Practices in Affinity Spaces	This article identifies elements of pedagogical value in the Roblox game-making community that allow users to design games independently in a virtual environment or to play games created by others.
12	(Kitapcioglu et al., 2024)	<i>Comparing Learning Outcomes of Machine-Guided vs Educator-Guided VR in the Metaverse</i> (JMIR Serious Games)	Key implication for designing Roblox-based bar training

13	(Sun et al., 2024)	<i>Game-Based Features in Intelligent Game-Based Learning Environments</i> (Interactive Learning Environments)	Gamification blueprint for bartender training.
14	(Crogman et al., 2025)	<i>VR, AR, and MR in Experiential Learning</i> (Education)	Review of XR technologies in experiential and collaborative learning.
15	(Lim et al., 2025)	<i>Gamification for Sustainable Consumption: State-of-the-Art</i> (Business Strategy & the Environment)	Conceptual framework on gamification for behavior change & motivation.
16	(Yigitbas & Mazur, 2024)	<i>AR/VR for Diet and Nutritional Education: A Systematic Review</i> (SIGCHI)	Parallel to culinary drink education (hygiene & procedure)
17	(Baralou, 2023)	<i>Serious Game for Competency Development in Higher Tourism Education</i> (Journal of Hospitality, Leisure, Sport & Tourism Education).	Assesses serious game use for workplace competencies.
18	(Gunawan et al., 2025)	A systematic literature review on VRtable manner innovation as an emerging learning media inculinary education	Through a Systematic Literature Review (SLR) of 50 articles, 13 from 2018 to 2025 were analysed to evaluate the effectiveness of VR
19	(Gunawan et al., 2025)	Analysis of Requirements for the Creation of Edukiwari Learning Media Applications for Curriculum Designing Materials in Culinary Tourism Vocational High Schools	This paper is intended to develop an Android-based application of Food Service Learning Media that could provide the possibility for the teaching and learning process and enhance critical thinking
20	(Gunawan et al., 2023)	Development of a mobile menu book as a media for learning food service in tourism schools	The research seems to adopt a mixedmethods approach, utilizing both qualitative methods for needs analysis and design stages, and quantitative methods for testing the product's effectiveness.

Mapping Research Trends

To combine the findings from the 20 papers I reviewed, I organized them around four key dimensions: (1) study characteristics, (2) gamification design, (3) learning outcomes, and (4) key implications. This synthesis is summarized in Table 3.

Table 3. Summary of Reviewed Studies on Roblox and Gamification in Vocational Culinary Education (2015–2025)

<i>Dimension</i>	<i>Key Findings</i>	<i>Representative Studies</i>
Focus Area	Integration of Roblox, VR, and gamification in hospitality and culinary training, emphasizing drink-mixing and bartender skills.	Han et al. (2023); Alhasan et al. (2023); Gunawan et al. (2025)
Learning Environment	Digital simulations and metaverse classrooms offering hands-on experiential learning in virtual bar/lab environments.	Lampropoulos & Kinshuk (2024); Kitapcioglu et al. (2024)
Gamification Elements	Leaderboards, badges, quests, points, and avatars that enhance engagement, competition, and peer collaboration.	Sun et al. (2024); Hadinejad & Zare (2024)
Pedagogical Models	Experiential learning, constructivism, self-determination theory (SDT), and situated learning underpin Roblox-based training.	Zhai (2024); Lim et al. (2025)
Measured Outcomes	Increased engagement, procedural accuracy, motivation, and teamwork skills; some evidence of improved skill retention.	Hu et al. (2025); Zhao et al. (2020)
Challenges Identified	Infrastructure limitations, lack of teacher readiness, non-standardized assessment, and limited long-term studies.	Dahalan et al. (2024); Gunawan et al. (2023)
Research Gaps	Few studies on bartender-specific training, limited scalability research, and lack of standardized evaluation frameworks.	Gunawan et al. (2025); Morreale et al. (2024)

Analysis of Gamification Design Approaches

The studies conducted from 2015 to 2025 show an increase in the amount of scholarly work focused on gamified and simulation-based learning in the vocational and hospitality sectors. There was rapid growth especially during the years 2020 to 2023. This was the time of the COVID-19 pandemic when educators and researchers started switching to online learning. There was a need to focus on digital pedagogy to find ways to incorporate the metaverse and simulations for practical training. In Figure 2, we see the increase in the amount of publications that was produced during three specific time frames:

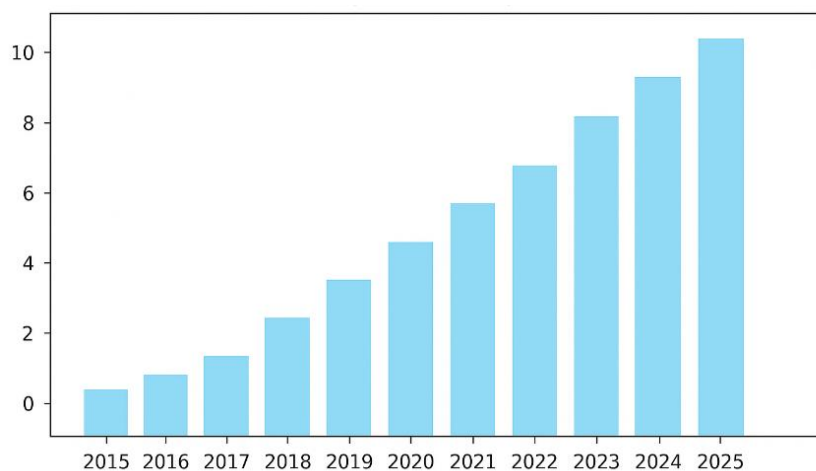


Figure 2. Publication Trend of Game Based and Roblox Related Research (2015-2025)

- a) 2015 to 2018, the amount of scholarly work produced was scarce, with only two publications a year. Work produced focused on the theories of gamification, work with VR prototypes, and game-based learning.
- b) 2019 to 2021, growth began to take place. This was primarily in the hospitality and culinary education sectors where simulation learning tools were introduced. Research during this period focused on the areas of gamification, learner motivation, and satisfaction.
- c) 2022 to 2025, with 8 to 10 publications in a year. This was in conjunction with the use of immersive virtual reality for vocational training, especially in culinary and bartending.

Supporting and Inhibiting Factors of Roblox Implementation.

Using leaderboards, point systems, and game like elements created and nurtured intrinsic motivation among learners, capturing their attention for sustained periods of practice in the preparation of cocktails and mocktails. Competitiveness in learners and practice persistence in skill preparation were augmented through the points systems. Higher levels of situated learning were achieved through the contexts virtual avatars access in Roblox were integrated with service role performing. Service roles of virtual bartenders and service staff roles augmented knowledge construction as learners worked in social constellations and used social interaction. Quest and challenge designed is core in capture attention for experiential and problem-based learning. Learners complete tasks merged in Roblox to achieve goals framed in beverage-mixing and customer-service. The designed task built within hospitality industry details create scenarios for learners to work in and amplify creativity in required critical thinking and task procedural precision.

Furthermore, shared virtual spaces allow learners to communicate, interact, and create while enhancing collaborative peer learning and teamwork. These interactions focus communication, leadership, and flexibility, all important to the culinary and hospitality industries. Overall, these new ways for teaching and learning vocational skills in the world is different and turns passive instruction into an active, personal, and story-focused experience. Using Roblox helps to close the gap between learning theory and practicing skills, making it an innovative metaverse platform that is changing the teaching and learning of culinary and hospitality skills.

While various gamification platforms such as Kahoot, Unity, and Classcraft offer engaging educational experiences, Roblox provides unique advantages that align closely with the needs of vocational culinary education table 4:

Table 4. Comparison with Other Gamification Platforms

Platform	Key Features	Educational Strengths	Limitations Compared to Roblox
<i>Kahoot</i>	Quiz-based gamification; instant feedback	Promotes recall and formative assessment	Lacks immersive, procedural, and collaborative elements
<i>Unity</i>	High-fidelity 3D environment; customizable simulations	Powerful for VR/AR development and realism	Requires advanced coding skills and paid licensing
<i>Classcraft</i>	Role-play classroom management system	Encourages behavioral engagement and teamwork	Limited simulation capacity for vocational contexts

<i>Roblox</i>	Free, accessible, user-generated environments with social play	Integrates coding, simulation, 3D and collaboration; ideal for skill-based learning	Requires teacher training and internet stability
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Compared with these platforms, Roblox stands out for its low entry barrier, open-access environment, and capacity for immersive simulation-based learning that directly replicates real-world culinary or bartending tasks.

Research Gap and Recommendations

The literature review uncovers several research gaps, namely:

- a) The lack of studies focusing on the use of Roblox for bartender training;
- b) The absence of studies on the duration of skill retention after learning through games;
- c) The insufficient studies tying Roblox to the needs of the hospitality industry; and
- d) The lack of a fully articulated conceptual framework on virtual simulation-based evaluation.

It is suggested that further research tries to:

- a) Create a Roblox-based bartender training model that meets the standards of the culinary industry
- b) Undertake empirical research to assess the long-term impacts of gamified learning through Roblox
- c) Develop a consolidated evaluation system that assesses the technical, cognitive, and interpersonal abilities of bartenders
- d) Look for opportunities for international partnerships to design Roblox educational materials for use in culinary vocational education.

DISCUSSION

The synthesis of the twenty reviewed articles highlights the growing integration of Roblox-based simulations, gamification, and immersive technologies such as VR/AR into vocational and hospitality education. Collectively, these studies demonstrate that game-based learning environments provide not only conceptual insights but also empirical evidence regarding the enhancement of technical skills, learner engagement, and workplace readiness. VR/AR can serve as an alternative medium to enhance student skills, and its efficacy increases when combined with conventional practice methods (Amin et al., 2022). (Alhasan et al., 2023; Han et al., 2023) mapped the role of Roblox in higher education, identifying its potential for social collaboration, gamification, and immersive participation. These findings are complemented by Zhai (2024), who showed that Roblox can strengthen critical thinking and experiential learning at the elementary level, suggesting its adaptability across diverse educational contexts. Meanwhile, Hu et al. (2025) and Lampropoulos and Kinshuk (2024) confirmed that gamified VR learning environments consistently improve engagement at cognitive, emotional, and behavioral levels.

Within the hospitality and culinary domain, several contributions are particularly relevant. (P. M. C. Lin et al., 2024; X. P. Lin et al., 2024) demonstrated that VR-based culinary curricula significantly improve student performance and acceptance, while (Price-Howard & Lewis, 2023) confirmed the perceived usefulness of simulation in hospitality education. VR technology facilitates clear delivery of educational content, integrates ICT into learning and training, adapts to equipment development, and helps students master knowledge and skills, thereby optimizing the learning process and improving quality (Ouyang, 2016). Similarly, (Hadinejad & Zare, 2024) emphasized that game-based interventions foster both cognitive and metacognitive development among hospitality students. These findings align with (Dahalan et al., 2024), who confirmed the overall effectiveness of gamification and GBL within vocational education and training (VET).

The emerging potential of Roblox-based training is further reinforced by (Sun et al., 2024) who proposed a gamification blueprint highly applicable to bartender training, and (Kitapcioglu et al., 2024), who compared machine-guided and educator-guided VR approaches, providing key implications for the design of vocational simulations. (Crogman et al., 2025) broaden this perspective by reviewing XR technologies in experiential learning, underlining the value of immersive platforms for collaborative skill acquisition. Integrating VR in education enhances students' competitiveness, digital literacy, creativity, communication, collaboration, and problem-solving skills, which are essential 21st-century competencies (Amin et al. 2022). Problem-solving, which influences motivation and improves learning outcomes, is a crucial competency for vocational students as preparation for the workforce (Mutohhari et al., 2021).

Beyond technical skills, gamification has also been linked to behavioral and motivational outcomes. (Lim et al., 2025) explored gamification for sustainable consumption, while (Yigitbas & Mazur, 2024) extended its application to nutrition education, offering parallels for culinary drink-mixing training. Similarly, Baralou (2023) demonstrated the effectiveness of serious games in developing workplace competencies within tourism education, suggesting transferability to mixology and customer service training. Students are more engaged when intrinsically interested in the material or when the learning environment elicits situational interest. Studies on VR in learning consistently show its superiority over traditional methods in enhancing mood, motivation, and immersion. (Thomann, Zimmermann, and Deutscher 2024).

Several Indonesian contributions Gunawan et al. (2025) enrich the discourse by proposing VR table manner simulations, mobile menu books, and Android-based learning applications. These studies underscore the importance of localized innovation and contextual adaptation in vocational culinary education, while also demonstrating mixed-methods approaches for needs analysis and product testing. VR consists of two types: non-immersive and immersive. Non-immersive VR, often discussed in academic studies, presents scenarios on conventional monitors and has been shown to enhance cognition, learning attitudes, and motivation compared to traditional methods. Immersive VR, using head-mounted displays and handheld devices, provides controlled interaction and is compatible with smartphones, PCs, or laptops (Rafiq, Triyono, and Djatmiko 2022).

Taken together, the literature indicates that Roblox-based gamified simulations, particularly when combined with VR/AR technologies, hold strong potential for enhancing technical, cognitive, and behavioral competencies in culinary and hospitality education. Augmented Reality, as an alternative learning medium, is expected to make learning more engaging for students and provide a more advanced approach by utilizing current

technological developments (Efendi et al., 2023). However, challenges remain in curriculum integration, technological infrastructure, and instructor readiness, underscoring the need for collaborative efforts between educators, industry stakeholders, and game developers to design standardized, scalable, and internationally recognized training modules.

CONCLUSION

The integration of studies synthesizing Roblox confirms it as effective gamification interactive platform as strong potential for as Control Bartending Work Environment immersive skill-based simulations. Instead of repeating descriptive findings. This part focuses on analytical findings on how Roblox has advanced transformational pedagogies in the training of vocational education in culinary arts. Research has shown the engagement of learners in the console and game pedagogy with the core game mechanics of points, badges, levels, and even procedural quest mission calendars and of course the game flow in sequence in levels coupled with game challenging design with problem-based learning as one upper tier instructional design in professional training and work readiness for skills in vocational education learning even outside culinary arts. The incorporation of simulations of real work as integrated advanced pedagogy where contextual learning was added. This is a reflection of the experiential learning theory where the learner constructs a conceptual schema of knowledge through active learning.

Application of digital pedagogy shows improvement in student competence and motivation through design as evidenced in the roblox console and game thereby validating roblox for skill-based learning. This sort of research is the beginning as the current literature is pointing towards the the importance of higher order learning outcomes quiet. Communication, collaboration, and even critical thinking and problem solving are higher order skills needed in the hospitality industry. From an implementation perspective, Roblox scalability is influenced by the accessibility of technology, the digital skills of the teachers, and the flexibility of the curriculum. Even with challenges around infrastructure and bandwidth, obstacles can be lessened through institutional readiness and collaboration with industry. Roblox's incorporation of augmented and virtual reality (AR/VR) technology provides a way to create more engaging and interactive experiences.

To summarize, Roblox has the ability to transform the modernisation of bartender training in vocational training culinary education by gamifying the training and combining it with authentic learning experiences. Therefore, to assist in the practical innovation of this potential, it is suggested that subsequent studies and practices work on a pilot project incorporating Roblox into the bartending modules, along with industry-targeted competency frameworks and collaborative co-design workshops with teachers. These would enable the empirical justification needed to extend learning ecosystems in hospitality education and sustain digital pedagogy.

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