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GAMES AND SIMULATIONS IN HOSPITALITY EDUCATION: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Hospitality education and training provide up to date knowledge which conveys industry objectives, history, processes, laws, and/or policies to students and employees. A new focus on the application of simulation in the hospitality industry as a means for education and training has been met with successful findings. This research studied the last three years of academic research and investigated the application of simulation in hospitality education and training. A literature search was completed in google scholar of simulation in hospitality education and training within the last three years. This review of the literature reveals that universities and hospitality organizations are actively implementing simulations as a means for education and training. Results include reduced costs, time saved, and increase in motivation and interest among students and employees when implemented effectively. The literature review provides a basis of research for instructors and managers on which to make decisions regarding education and training methods and models. However, such research is limited due to lack of consistency among learner assessments used to determine the effectiveness of simulation and the interpretive nature of participant perceptions.

Contribution/Originality: This study contributes in the existing literature by developing a systematic literature review and by presenting a foundation of current investigations on which hospitality instructors make decisions concerning education and training methods and models.

1. INTRODUCTION

The concept of using games to foster learning is by no means a new development. However, in the last decade, one to one technology has become more and more an integral part of classroom management. Similarly, educational research has shifted focus towards how simulation, virtual realities and serious games may influence learning. Several researchers have reviewed literature assessing the success of training simulations multiple disciplines (e.g., Pratt and Hahn (2015)). Few have focused on building simulation to complement the teaching of foodservice and hospitality management skills.

Hospitality education provides up to date knowledge and skills, which convey industry objectives, history, laws, and norms to students. The success of a hospitality organization is reproduced in the capacities, which they possess.

Thus, creative talents are the basis of companies (Veloso, da Silva, Dutra, Fischer, & Trevisan, 2014). Today, there are many methods used for education and training. Thirteen common hospitality training approaches are identified. Some of which can be carried out remotely through online learning. These methods include case study, games-based training, internship, job rotation, job shadowing, lecture, mentoring or apprenticeship, programmed instruction, role-modeling, role play, simulation, stimulus-based training, and team-training" (Prado, Arce, Lopez, García, & Pearson, 2020). There is limited literature analyzing the effectiveness of simulation in hospitality education due to lack of consistency among learner assessments used to determine the effectiveness of simulation and the interpretive nature of participant perceptions. This paper aims to fill in the gap and present a foundation of current investigations on which hospitality instructors make decisions concerning education and training methods and models. This research defines simulations before beginning a study of the last three years of academic research, which solely investigates the application of business games, and simulation in hospitality education and training. The authors evaluated previous studies related to the topics of age and cultural influences, effective application methods and models, and participant perceptions of the application of simulation in the hospitality industry.

2. LITERATURE REVIEW

2.1. Games and Simulations

This paper first attempts to conceptualize the terms "games" and "simulations". Throughout the body of this manuscript, the two terms are not completely separate. Rather, the two technologies are lumped under the online learning environments and together their impact on hospitality management training is measured. While they are designed to be engaging and even enjoyable, simulation-based educational tools are different from other simulations in the entertainment industry in that they are designed for knowledge and skill development rather than leisure (Hamari & Koivisto, 2015). Web-based games, whether educational or entertainment, are not only available on technological platforms such as computers and consoles which implement game code. They can also run on an internet browser on a mobile device for the convenience of the learner (Willoughby, 2008). With the number of game types growing by the day, the necessity for generating terminology still it is a necessity specially when discussing various forms of business simulations within education. Scholars and game designers could utilize variable framework to categorize simulations; however, Gros (2007) suggests that the majority agree on the following seven game genres:

1. *"Action games (also called platform games)*—Reaction based games; most of the games of the first generation are action games."
2. *"Adventure games*—The player solves several tests to progress through a virtual world."
3. *"Fighting games*—Fighting against computer-controlled characters or other players."
4. *"Role-playing games*—Human players assume the characteristics of some person or creature."
5. *"Simulations*—The player must complete objectives within a simplified recreation of a place or situation to achieve a goal."
6. *"Sports games*—These games are based on sports."
7. *"Strategy games*— Players devise an appropriate strategy to achieve a goal within a historical or fictional situation."

In contrast, simulations are more complex in nature. Learners must apply content knowledge and competencies to solve realistic scenarios within a scenario-based environment to reach instructor objectives. Simulation or scenario-based training not only develops technical skills but also valuable employability skills including but not limited to personal interactions and decision-making situations. Virtual games help learners in interactive and self-driven learning environments, which have become more practical as new technologies are being adopted in education (Angelini, 2016). When creating games and simulations, choice of delivery platforms is critical. Characteristics such as the technical hurdles, modes of simulation capacities, the participants engage in simulations,

and the teaching objectives all play important roles toward reaching learner and instructor goals. Vlachopoulos and Makri (2017) suggest that games and simulations can be classified to make such choices easier to navigate:

1. Game purpose: Learning goals- Knowledge acquisition, content understanding, motivation, engagement, skill acquisition.
2. Game learning content: Subject discipline- Social science, business/management/ marketing, languages, math, sciences.
3. Game technical characteristics: Strategies, approaches, concepts, techniques, modes- Single/multiplayer, linear/nonlinear, collaborative competitive, persuasive, synchronous, immersive.
4. Game platform: Delivery modes- computer, video, digital, mobile, networked, online, web-based, microgames, console/handheld, 2D-3D, game based.
5. Game Type: Game play description e.g. assuming a character, strategic decision making, coordination-puzzle, and venture, strategy, logical, action, and role-playing business.

In conclusion, games are tools which are artificial and pedagogical by nature. They can be categorized in a variety of ways and generally contain conflict, rules, and predetermined goals. Simulations are dynamic tools which possess a scenario based and problem-solving nature. Simulations share much of the design and entertainment qualities of games; however, they represent reality, claiming consistency, accuracy, and validity while fostering content knowledge retention, technical skill development and overall learner growth (Angelini, 2016; Hamari & Koivisto, 2015).

2.2. Learning through Games and Simulations

Quality virtual game-based learning tools aligning with the learning goals of the instructor can demonstrate that learning can be accurately evaluated and achieved. Simulation learners experience personal drive, change and constant growth through the acceptance of a virtual challenge. Gamification can be the valuable tool for instructors to push learners to demonstrate innovation while solving real world problems and maintaining time and financial freedom (Ahmed & Sutton, 2017).

Challenge and skill are main factors leading to the learner and instructor satisfaction within simulation and game-based environments (Caponetto, Earp, & Ott, 2014). Furthermore, challenge within simulation and game-based learning increased learning outcomes for participants (Hung, Shah, Dalag, Shin, & Gill, 2015). Simulation and game-based learning provides many benefits, both for the instructor and for students. Not only are online courses more likely to engage in quantitative reasoning, Dumford and Miller (2018) also conclude that online learning provides freedom to decide when to enter training, flexibility in schedule, equal opportunity to express thoughts and convenient access to course materials. However, students with greater numbers of online courses also reported less exposure to effective teaching practices and lower quality of interactions (Dumford & Miller, 2018). Student-instructor relationships are a powerful motivator. The lack of rapport being built with technology in online courses may cause a decrease in motivation to complete tasks within the typical virtual learning environment. Under this circumstance, simulation and games-based learning may come to play a significant role in eliminating those gaps in the traditional online course environment (Hung et al., 2015).

3. METHODOLOGY

3.1. The Design and Methodology

This literature review was developed using the systematic review process adapted from "The benefits of publishing systematic quantitative literature reviews for Ph.D. candidates and other early-career researchers" (Pickering & Byrne, 2014). This systematic procedure outlined in the figure below is designed to 1) identify concerns, 2) define search criteria, 3) search literature, 4) examine literature and 5) analyze literature as outlined in

the Figure 1. The literature review focuses on effective application methods and models, age and cultural influences, and participant perceptions in the application of simulation in the hospitality industry.
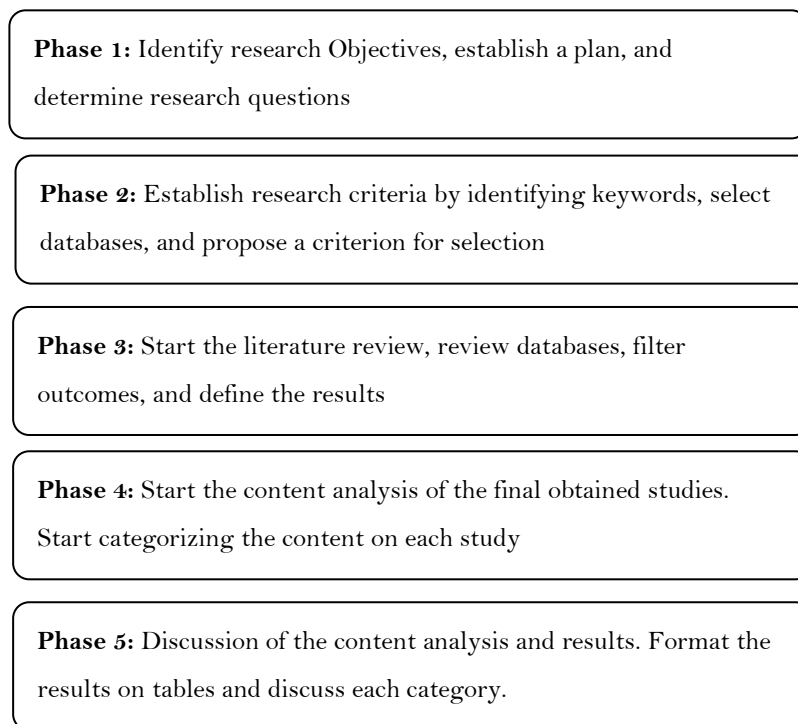
Phase 1: Identify research Objectives, establish a plan, and determine research questions

Phase 2: Establish research criteria by identifying keywords, select databases, and propose a criterion for selection

Phase 3: Start the literature review, review databases, filter outcomes, and define the results

Phase 4: Start the content analysis of the final obtained studies. Start categorizing the content on each study

Phase 5: Discussion of the content analysis and results. Format the results on tables and discuss each category.

Figure-1. The systematic review processes in this study.

3.1.1. Identify Concerns (Step 1)

Hospitality education and training methods based on face-to-face instruction are structured, timely and cannot always effectively maintain active engagement within a large group of students. To help solve the problem, the authors wanted to know the different training approaches proposed in the literature, along with participant perception and roles of gender and culture in terms of effectiveness. Therefore, the following questions guided this review:

  i. Does age affect the usefulness of the method?
  ii. Does culture affect the success of the method?
  iii. What is the participant perception of the approach?
  iv. What other topics were lumped with hospitality education?
  v. How effective is the application of simulations in educational settings?

3.1.2. Define Search Criteria (Step 2)

The review protocol was developed using the PRISMA flowchart as adapted from Moher's "Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement" as outlined in Table 1. This flow of information begins with identifying relevant sources through database searching and proceeds through screening for duplicates, assessing eligibility and finally determining the articles being included (Moher et al., 2009).

The literature review included articles with the search term "simulation in hospitality education and training" from peer-reviewed publications date from 2015 to 2018. Papers with abstracts which do not mention any terms related with simulation and hospitality were excluded.

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Table-1. Phases of a systematic review as adapted from Moher et al. (2009).

Identification	1,850 of records identified through database searching	0 of additional results classified through alternative sources
Screening	1,836 of records after duplicates removed	
	1836 of records screened	14 of records excluded
Eligibility	26 of full-text articles assessed for eligibility	5 of full-text articles excluded, with reasons
Included	21 of studies included in qualitative synthesis	
	21 of studies included in quantitative synthesis (meta-analysis)	

As suggested in previous studies, papers in which they do not define the terms "education" or "training", papers which only have concepts and definitions and literature reviews, surveys, summaries or papers with the same objective were excluded as outlined in the Table 2.

Table-2. Inclusion/exclusion criteria Inclusion criteria adapted from Moher et al. (2009).

Inclusion criteria	• Terms fulfill search "simulation in hospitality education and training" • Peer-reviewed publications • Publication date: 2015-2018
Elimination criteria for titles and abstract	• Studies which do not mention any terms related with simulation and hospitality
Exclusion criteria for full text	• Papers which do not define the terms "education" or "training" • Papers mentioning just concepts and definitions • Literature reviews just mentioning the keywords

Note: Criteria used during the study design.

3.1.3. Searching the Literature (Step 3)

The purpose of the literature review was to find education and training approaches utilizing simulation applied in hospitality since 2015 and present the results obtained by hospitality instructors. A literature search in google scholar of simulation in hospitality education and training within the last three years was considered.

3.1.4. Examine Literature (Step 4)

An initial literature search resulted in 8,950 articles for review. Twenty-six (26) were found to be centrally focused on simulation in hospitality education and training after examining titles and abstracts. The full-text of remaining papers were then scanned for exclusion criteria. Five (5) more articles were removed before the final 21 were synthesized for findings.

3.1.5. Analyze Literature (Step 5)

The 21 studies located for content analysis were dissimilar with respect to sample type, location of study, and knowledge areas. The review shows that most of the papers examined higher education (71.5%), followed by high school age (19%), and adults (9.5%). The data suggests that simulation seems to be more available for university students while lacking in high school settings. The low number of adult data suggests that there may be a gap in awareness of simulation as a training tool for hospitality and tourism jobs Table 3.

Table-3. Research type summary.

Research Type	# of studies	%
Higher Education	15	71.5
Secondary	4	19
Adults	2	9.5

A wide variety of locations were investigated. Most of the studies took place in the UK and China (19% each), followed by the United States (14.1%), Taiwan (9.5%), and Egypt, Africa, Lungano, Romania, Thailand, Canada, Greece, and Australia (4.8% each). It does not come as a surprise that the larger developed countries with greater tourism and technology availability have more data to offer in terms of the effectiveness of simulation on hospitality training Table 4.

Table-4. Research location.

Research Location	# of studies	%
United Kingdom	4	19
China	4	19
United States	3	14.1
Taiwan	2	9.5
Egypt	1	4.8
South Africa	1	4.8
Lungano	1	4.8
Romania	1	4.8
Thailand	1	4.8
Greece	1	4.8
Australia	1	4.8
Canada	1	4.8

Note: Location of Studies published and included in this project.

Most of the studies focused on motivation within hospitality education (33.3%). Other knowledge areas investigated were hotels (14.2%), business/management (14.2%), Culinary Arts (9.5%), and tourism, game development, cyber security, computer communications, learning theory and employability skills (4.8% each). This leads the authors to conclude that motivation is the central concern of instructors who seek to utilize simulation and game-based learning in hospitality education Table 5.

Table-5. Knowledge areas of research.

Knowledge Areas	# of studies	%
Motivation in Hospitality Education	7	33.3
Business/ Management	3	14.2
Hotel	3	14.2
Culinary	2	9.5
Tourism	1	4.8
Game development	1	4.8
Cyber security	1	4.8
Computer communications	1	4.8
Learning theory	1	4.8
Employability traits	1	4.8

Most of the studies were quantitative by design (71.5%), followed by conceptual (19%) and mixed (9.5%). Table 6 Most studies utilized correlation analysis at 43%, followed by Mixed Analysis (29%), other (14%), Content Analysis (9%), and Factor Analysis (5%), Table 7.

Table-6. Research design.

Research Type	# of studies	%
Quantitative	15	71.5
Conceptual	4	19
Mixed	2	9.5

Note: Design of Research Projects included in this study.

Table-7. Type of statistics analyses used.

Statistical Analysis	# of studies	%
Correlation	9	43
Content Analysis	2	9
Factor Analysis	1	5
Mixed	6	29
Other	3	14

Note: Type of analyses used in the studies reviewed.

Most papers were published in 2015 (33%) followed by 2018 & 2016 (24%), and 2017 (19%). Sample sizes were typically as small as a single classroom size. Less than 99 participants made up 76% of research, 100-499 participants at 19%, followed by 500-1000 at 5%. Table 8.

Table-8. Research timing & sample size.

Year	Unit	# of studies	%
	2018	5	24
	2017	4	19
	2016	5	24
	<2015	7	33
Sample Size			
	<99	16	76
	100-499	4	19
	500-1000	1	5

Note: Timing and Sample sizes.

4. DISCUSSIONS

The current review focused on age and culture effects, method effectiveness, and participant perceptions of simulation in hospitality education. The initial filter generated 8,950 peer-reviewed journal articles for review. Only, twenty-one (21) papers met our inclusion criteria and were considered for full article analysis. Those papers were significantly different with respect to sample type, location of study, and knowledge areas.

When considering the question: Does age affect the efficiency of the methods? It was observed that most of the hospitality studies investigated higher education (71.5%) leaving only (19%) of studies geared towards high school age students. This is a disheartening finding because teenagers make up a major portion of the workforce whose hospitality and employability skill development will be heavily reliant on the use of technology.

A wide variety of locations were investigated. The majority for the studies took place in the UK and China (19% each) while the United States trailed with (14.1%). Among the studies conducted in the United States studies, locations included Florida, New York, and Texas. It was concerning to find such few studies on hospitality education in a country as heavily reliant on tourism as the United States, but the few studies leave the western part of the United States unexplored.

What is the participant perception of the approach? Throughout this literature review, simulations have been described as an applicable educational and training tool to augment learners' motivation and increase course superiority in higher education (Pratt & Hahn, 2015). Most of the studies focused on learner motivation and perceptions of hospitality education (33.3%). It is not surprising to find studies which declare that simulating occurrences which take place in real companies, under direct supervision of the teacher, captivates the attention and encourages involvement in class activities (Curta, Petrusel, & Iftinca, 2015). However, to ensure its validity, simulation and game-based learning in hospitality education should must bring into line educational and training objectives of the instructors and demonstrate that skill development can be assessed and achieved (Ahmed & Sutton, 2017). One of the standout simulation success stories involved students' whose motivation to learn food safety knowledge increased after participating in a computer simulation game. The results revealed that when learners are engaged in the learning material with both cognitive and affective structures learning is maximized (Yu, Sirsat, &

Madera, 2018). Such perceptions show great promise for the continued use of simulation games in hospitality education to increase learner motivation.

Around fourteen percent (14.3%) of the literature review discussed subtopics such as information technology, cybersecurity and communications in conjunction with hospitality education. Such research concluded that participants of multidisciplinary business simulation games achieved expressively better in post-assessments than those who contributed in work-integrated learning. This suggests that the simulation is a positive addition to hospitality curriculum. However, there was no correlation between simulation scores and the post-assessment outcomes of learners who had utilized the educational game. This suggests that simulation tools must not be considered to establish academic ability but rather competency completion (Merritt & Kelley, 2018). Thus, simulation increases learner motivation but may not be an effective assessment tool for hospitality content knowledge.

When addressing the questions: How effective is the applications of games in learning settings. Less than 5% devoted research toward simulation's impact on the development of employability traits within hospitality education. One study reported that perceived self-efficacy and the advance of taking decisions on future real scenarios among students is greatly increased with the use of simulation training (Kimhi et al., 2016). Furthermore, research shows that simulation games have positive impact on students' conceptual understanding, skills development, problem-solving performance and encouraging elements of self-awareness (Mohsen, Abdollahi, & Omar, 2019; Strachan, 2016; Wang & Wang, 2016). However, simulation may not be the best way to assess hospitality content knowledge, but it greatly increases confidence utilizing content knowledge to make decisions and interact with others.

There was an acceptable amount of studies found to apply simulation theory to the hospitality industry during the last three years. However, there is still significant data collection issues not addressed in many of the articles including but not limited to younger generation and older studies, research conducted in western United States, and more effective methods of assessing knowledge and learning using simulations.

5. RESEARCH AND PRACTICAL IMPLICATIONS

Investing in creative talent through education and training is essential to maintaining a competitive edge in the hospitality industry. Such education and training not only ensure up-to-date knowledge, industry objectives, history, processes, laws, but also improves productivity, self-concept, decision making, and motivation within the industry. A literature review of the last three years of academic research investigating the application of simulation in hospitality education and training provides a basis of research for instructors and managers on which to make decisions regarding education and training methods and models. With the success of simulation at the college level implications for further applications of simulation on younger grade levels and even employee training with adults can be a basis to expand research in this area. Furthermore, the literature review provided participant perceptions and whether age and culture play a role in the effectiveness of the simulation in the hospitality industry approach.

6. LIMITATIONS AND FUTURE RESEARCH

This review of literature reveals that universities and hospitality organizations are implementing simulations as a means for education and training to expend less, save more, have more time, and augment incentive and interest among participants. However, such research is limited and lacks consistency among assessment of the effectiveness of the simulation approach and the interpretive nature of participant perceptions. There is also a lack of published studies of this topic in the United States. Lack of data for adults may be the bases of further experimentation of the utilization of games as a learning tool in academic settings and training business environments. Similarly, the low amount of research conducted of high school students leaves to question the

perceptions and effectiveness of simulation for secondary hospitality education. All limitations should be considered for further research.

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