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THE ELEMENTS FOR DESIGNING AND DEVELOPING THE FRONT OFFICE INSTRUCTIONAL MODULE: FUZZY DELPHI TECHNIQUE

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ABSTRACT

Incorporating experiential learning methods into classroom activities is crucial for creating an immersive on-campus experience. Front Office students require proficiency in communication, practical skills, knowledge application, and dispositional skills. This study aims to identify the essential elements necessary to integrate scenarios and resources for designing an online scenario-based learning module named the e-SBL FOIM-ATG for front-office courses in a Community College. The research design follows a quantitative approach, utilizing the Fuzzy Delphi technique. Research data was collected through a questionnaire administered to fifteen experts specializing in hospitality (Front Office), educational technology, scenario-based learning, and curriculum development. Analysis of the data revealed that the experts reached a consensus on all elements, with consensus values exceeding 75%, threshold value (d) ≤ 0.2, and fuzzy score (A) $\geq$ α-cut value = 0.5. This consensus confirms the importance of these elements in developing the Front Office Instructional Module – Advise the Guest at the Community College. This research holds significant implications for lecturers, students, and the broader education system in Malaysia, promoting the adoption of scenario-based active learning as a transformative educational approach.

Keywords: Experiential learning, scenario-based learning, customer-centric, hospitality industrt, Fuzzy Delphi, Front Office

1. Introduction

The hotel industry assumes a pivotal role in propelling Malaysia's economic growth (Sangaran & Selvanayagam, 2021), thereby necessitating a concerted focus on the development and augmentation of the competencies possessed by front-office professionals who occupy the vanguard of delivering superior services to esteemed guests (Sri Astuti et al., 2018). Paramount among these competencies are effective communication, cultural understanding, and customer service, all of which play an indispensable role in crafting exceptional guest experiences (Gawuna, 2019). Thus, the Front Office Department within hotels is a critical locus of interaction between guests and hotel staff, and the proficiency of front office professionals significantly influences guest impressions and satisfaction (Gumaste et al., 2015).

The ADDIE model is a method often used to design an iterative instructional design framework. For this study, the focus is on the design stage under the ADDIE model. In this stage, the fuzzy Delphi method (FDM), a methodological approach that, while robust, remains relatively underexplored, would be utilized. Serving as the Design stage, FDM facilitates expert consensus to identify and prioritize essential elements, thereby laying the groundwork for subsequent stages such as Development, Implementation, and Evaluation.

However, it is imperative to underscore that this paper intricately revolves around the Fuzzy Delphi Method (FDM). Our narrative aligns with the ADDIE model, with an unwavering focus on leveraging FDM to discern and define the essential elements necessary for constructing an online scenario-based learning module (e-SBL FOIM-ATG) tailored for Front Office courses in a Community College. This unique emphasis distinguishes our approach and positions FDM as the cornerstone of our instructional design framework.

1.1 Problem Statement

The hospitality industry is constantly changing, and institutions need to keep up with the latest trends to provide students with the best education possible (Musseau, 2023). In Malaysia, the hospitality and tourism industry is threatened by an acute shortage of skilled employees (Hussain, Ragavan et al., 2020). These shortages compel this industry to create 600,000 new job opportunities in Malaysia, and thus, the demand for more skilled, work-ready graduates in the coming decade is unparalleled (Hussain, Ahmad et al., 2020). Kasa et al. (2020) also stressed that critical thinking and interpersonal skills are crucial generic skills to be equipped for graduates. Also, Lugosi and Jameson (2017) found that including practical and experiential elements of hospitality courses is paramount to developing highly employable graduates. Therefore, the need to shift the focus from the traditional concepts of teaching to developing skills for course facilitation is dire (Musseau, 2023), as they guide and help students to learn independently (Weill, 2023). Added by Weill (2023), technology plays a key role in contemporary hospitality instructor training. E-learning platforms, virtual simulations, and other digital resources can help learning centers enhance their training effectiveness. However, most educational institutions, including Community College Malaysia, face challenges in terms of limited resources, time constraints, and outdated training methods (Weill, 2023).

In response to this research problem, the study aims to identify the essential elements necessary to integrate scenarios and resources for designing an online scenario-based learning module, namely, e-SBL FOIM-ATG, for Front Office courses in a Community College. The objectives are two-fold:

i. To identify the main components of the Front Office Instructional Module based on expert consensus.

ii. To identify the elements in the main component of the Front Office Instructional Module based on expert consensus.

2. Literature Review

2.1 Front Office Course in Community College

The Front Office course offered by community colleges holds a pivotal role in the Hotel Operation certificate. It aims to instill knowledge and practical skills crucial for effective hotel management, including check-in, check-out, reservation processing, bill settlement, guest service management, and complaint handling. However, the inherent challenges arising from these short courses have been identified (Kipli et al., 2021; Brennen, 2017), particularly in the acquisition of essential soft skills (Ivančič et al., 2023; Poláková et al., 2023). These soft skills are paramount in the dynamic and customer-centric hospitality industry.

Educators at community colleges face resource constraints, which make it difficult to engage students effectively. Teaching aids and support materials are often insufficient (Chijioke & Naade, 2018; Widiyatmoko & Nurmasitah, 2013), and they can hinder the successful execution of practical sessions. Consequently, students sometimes struggle to grasp materials and actively participate in the learning process.

While innovative teaching approaches are noted for their potential to empower educators and enhance student motivation and comprehension (Trang & Phuc, 2020; Answer, 2019; Mohamad & Ismail, 2018), these approaches need to be explicitly connected to the essential elements required for the proposed online scenario-based learning module. Therefore, the proposed module, named e-SBL FOIM-ATG, seeks to bridge the gap between theory and practice by emphasizing active learning, experiential learning, and the strategic application of technology.

Aligning with contemporary education paradigms and the Industry 4.0 era, the integration of modern technology and pragmatic learning is strongly emphasized (Ministry of Education Malaysia, 2014). To address the challenges identified and cultivate 21st-century competencies such as creativity, innovation, collaboration, critical thinking, and communication among students, this study advocates for a curriculum that incorporates values related to critical thinking and problem-solving skills (Maniram, 2022; Stone et al., 2017).

2.2. Experiential Learning in Hospitality

In the realm of hospitality education, experiential learning techniques are widely embraced to enhance critical thinking skills and bridge the gap between theory and practice. Brennen (2017) and Askren (2017) highlighted the significance of experiential learning in preparing students for the hospitality industry, emphasizing the need for practical experiences. Scenario-based learning and learning-by-doing are advocated as valuable tools (Md Abdul Haseeb, 2018). Kong's (2021) review emphasizes how experiential learning fosters motivation and engagement and promotes active learning and real-world experiences. Simultaneous role-playing, as demonstrated in Ampountolas et al.'s (2018) study, is acknowledged for enhancing practical comprehension and confidence. Parnrod and Panrod (2019) underscore the four essential 21st-century skills, communication, collaboration, critical thinking, and creativity, which are necessary for success in hospitality careers. Based on the previous studies above, experiential learning techniques can serve as an effective method for developing essential 21st-century skills among students. This study aligns with Bartle's (2015) emphasis on acquiring "21st-century abilities" alongside core curriculum knowledge, recognizing the broader scope of skills and traits crucial in the contemporary world.

2.3. Kolb's Experiential Learning Cycle (1984)

Kolb's Experiential Learning Cycle (1984) highlights an active, hands-on approach known as "learning by doing." This method emphasizes engagement and adaptation through interaction with the environment. This method shifts away from a teacher-centered model, as it fosters direct experiences tied to real-world issues and encourages collaboration among students. The teacher's role is to facilitate rather than direct student growth, aligning with the principles of active experimentation and reflective observation. This method introduces the four-step learning cycle that involves concrete experience (where students engage in practical problem-solving), reflection (during which they review and observe), abstract conceptualization (where knowledge is extrapolated from reflection), and active experimentation (students adapt prior knowledge based on new theories developed through experience). This approach is applicable in both educational and on-the-job training settings, promoting a dynamic and holistic learning experience. In this study, the proposed module will integrate these four cycles, as shown in Figure 1.

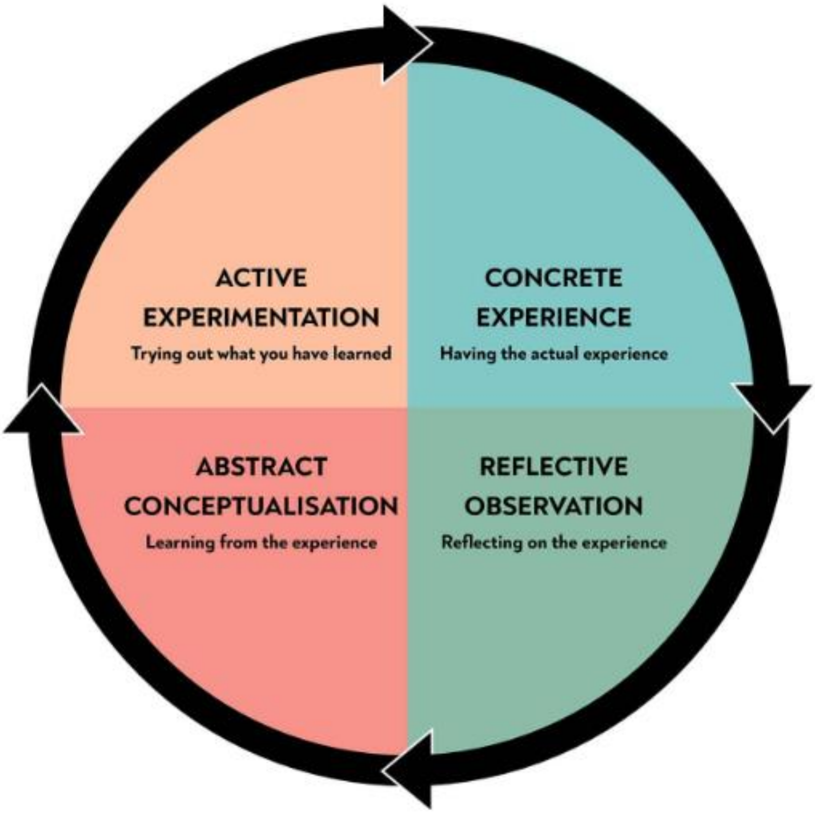

Figure 1: Kolb Experiential Learning Cycle (1984)

(Source: McLeod, 2017)

2.4. Social Learning Theory

Albert Bandura's Social Learning Theory underscores the significance of observation, modeling, and imitation of others' actions, attitudes, and emotions. Aligned with behaviorist theories like classical and operant conditioning, Social Learning Theory (SLT) emphasizes that effective learning occurs through social interactions, where individuals imitate behavior observed in their environment. Bandura introduces two key concepts: mediating processes in the interaction between stimuli and responses and observational learning as the method to assist in acquiring the behavior. Four mediational procedures—attention, retention, reproduction, and motivation—are outlined, emphasizing the importance of focused attention, vivid recall, active reproduction of observed behavior, and motivation for successful imitation. Bandura's SLT provides insights into the cognitive and environmental factors influencing learning and behavior. In this study, these four processes will also be integrated into the proposed module, as shown in Figure 2

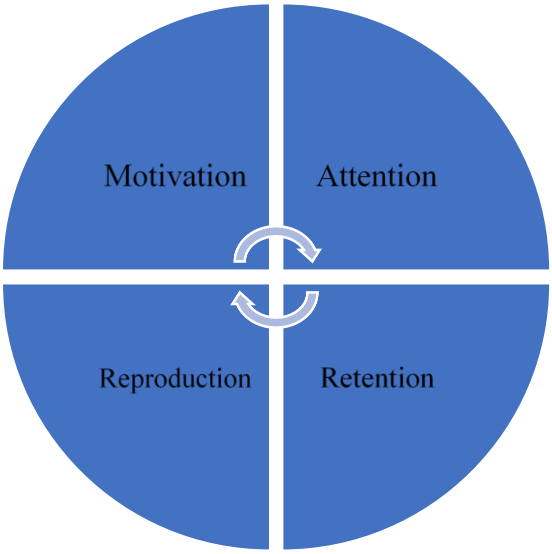

Figure 2: Bandura (1977) Four Mediational Procedures

2.5. Learning by Doing Theory [Goal-Based Scenarios Elements (GBS)]

Experiential learning is recognized as an effective pedagogical approach (Çinar, 2020), and it has been encompassed in numerous methods such as service-learning projects, field trips, internships, role-play, apprenticeships, and simulations. Integrating this theory into these methods comes with unique strengths and challenges (Acharya et al., 2019; Lei & Lam, 2021; Nyanjom et al., 2020; Pratt & Hahn, 2016; Rong-Da Liang, 2021). Goal-based scenarios (GBS), a learn-by-doing assignment, involve students performing roles individually or in groups to achieve specific objectives (Schank, 1996). This strategy fosters active learning, sustaining student motivation, and enhancing critical thinking and problem-solving skills (Kim, 2018; Park, 2017). GBS has seven components: learning objectives, mission, cover story, role, scenario operations, resources, and feedback, and they are crucial for effective implementation (Schank et al., 1999). In this study, these GBS elements were adapted to develop a module using Wakelet as the platform, providing a structured and immersive learning environment, as shown in Figure 3.

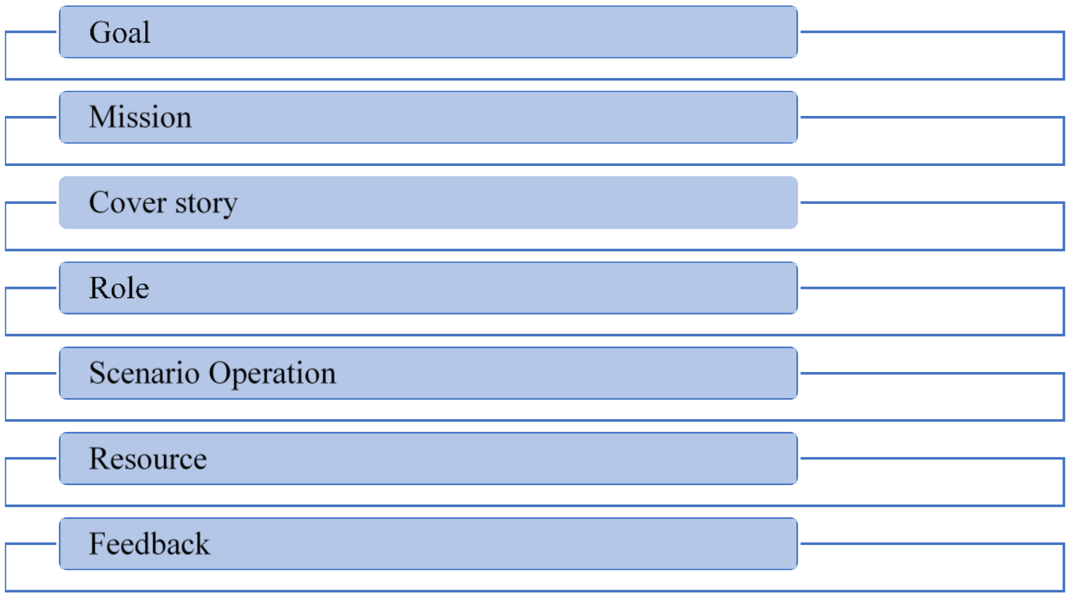

Figure 3: Goal-Based Scenario's Elements

2.6. Analysis, Design, Development, Implementation and Evaluation (ADDIE) Model

In developing instructional modules, researchers have the flexibility to choose a suitable model. In this study, the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model is employed. Recognized for its straightforward and widely accepted processes, the ADDIE model was chosen to streamline the development of the Front Office Instructional Module (FOIM) systematically, saving time and costs. The ADDIE model is a systematic instructional design framework consisting of five sequential phases: Analysis (identifying learning challenges, objectives, audience demands, and prior knowledge), Design (setting systematic learning objectives), Development (simulation content and instructional materials are produced), Implementation (the simulation technique is practiced and training processes are established for teachers and learners), and Evaluation (formative and summative evaluations at each ADDIE process level). The application of ADDIE ensures a systematic and effective approach to module development, aligning with recent educational research trends (Khalil & Elkhider, 2016; Lim & Han, 2020). The focus of this study is on the Design phase. During the Design phase, specific attention was given to setting clear learning objectives, establishing the structure of the instructional modules, and determining the overall instructional strategy. In this study, this phase played a crucial role in shaping the educational content, scenario-based learning elements, and the overall approach to enhancing students' learning experiences for front-office operations. The design decisions made during this phase are integral to ensuring the systematic development and effectiveness of the instructional modules. To ensure that the proposed module is suitable for practice, the Fuzzy Delphi Method (FDM) was used in this study.

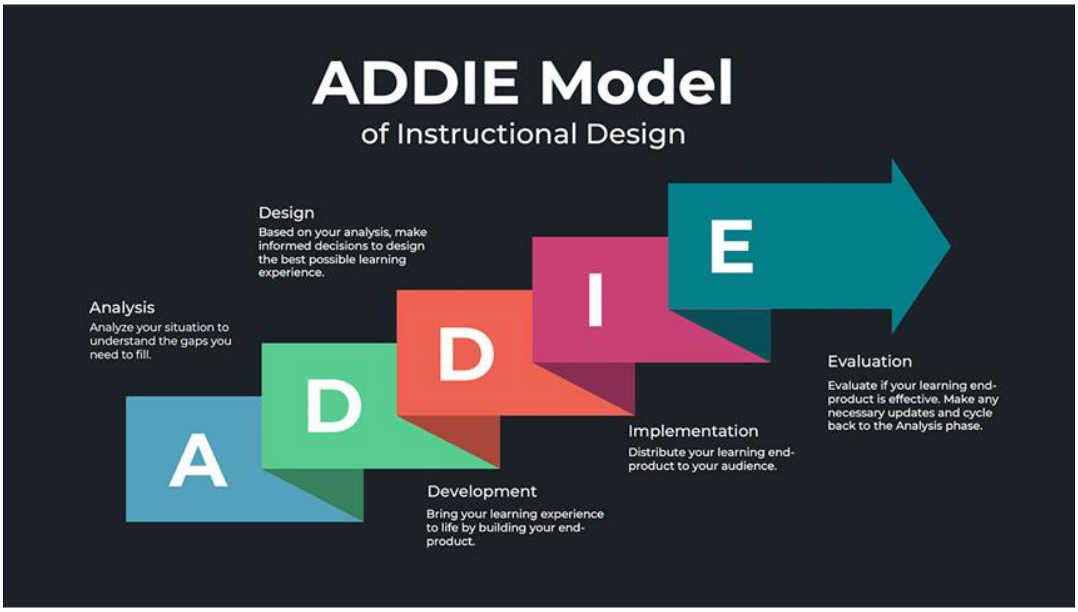

Figure 4: ADDIE Model

(Source: DeBell, 2020)

2.7. Conceptual Framework

The conceptual framework of the current study integrates Bandura's Social Learning Theory (1977), Kolb's Experiential Learning Cycle (1984), and the learning-by-doing theory (Schank et al., 1999). The theories were applied to enhance students' learning experiences and cultivate 21st-century skills. Through the Experiential Learning Cycle and Social Learning Theory, students engage in role-playing within authentic scenarios that include goal-based scenario elements. This approach aligns with the four-stage experiential learning cycles and Bandura's four processes. The study focuses on students' learning experiences, specifically gained through role-playing in authentic scenarios, aiming to significantly impact the teaching of the Front Office subject, fostering a more engaging educational approach for the future. A conceptual framework for this study is shown in Figure 5.

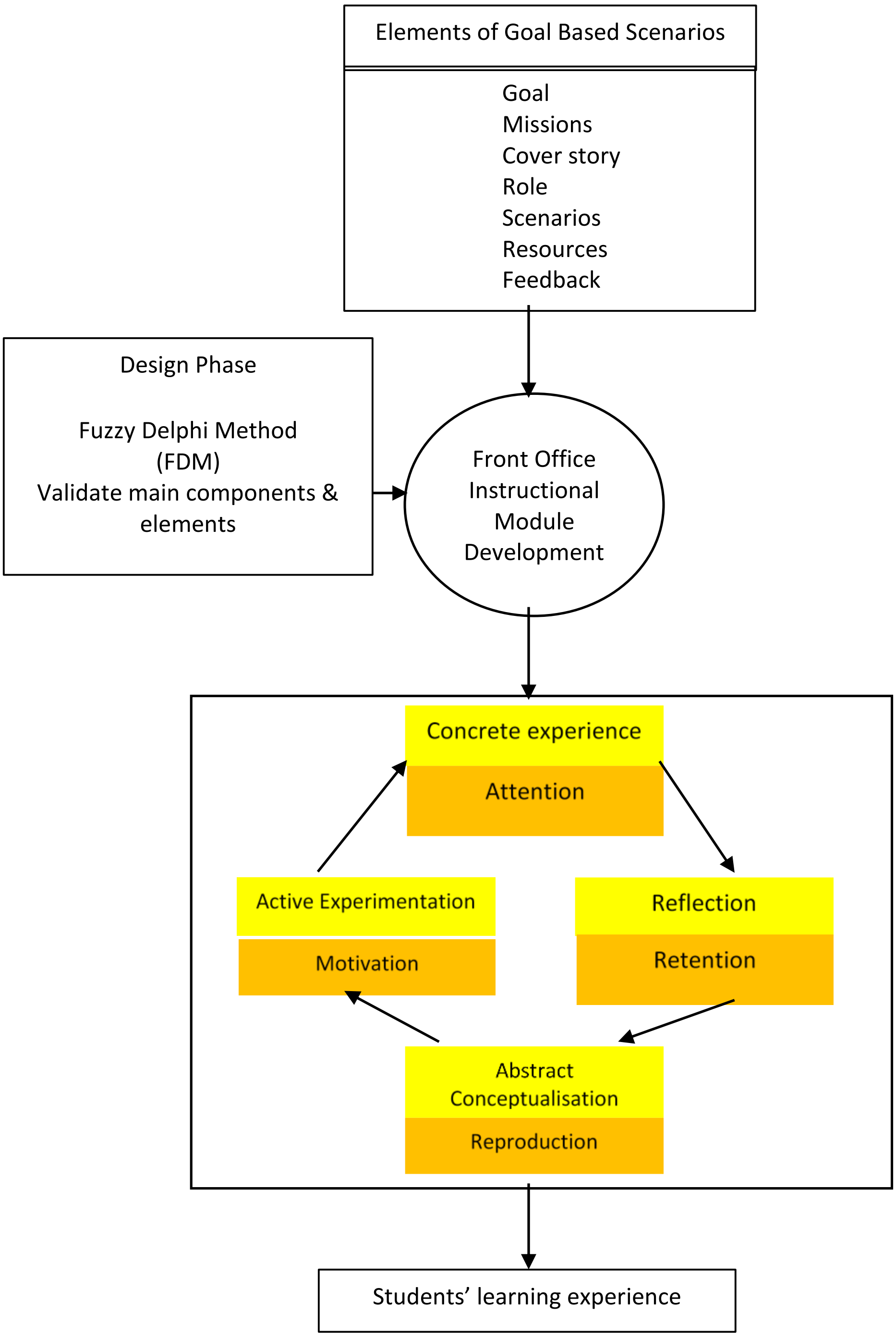

Figure 5: Conceptual Framework

2.8. Theoretical Framework

The theoretical framework of this study is grounded in three main theories: Learning by Doing Theory (Goal-based Scenarios), Kolb's Experiential Learning Theory, and Social Learning Theory. These frameworks suggest that effective learning occurs through active engagement, particularly in role-playing in authentic scenarios. The role-playing activities are designed to directly align with the mission and goals, incorporating decision points and various operations to enhance students' skills. During role-playing, standardized clients or guests are utilized to simulate realistic scenarios to aid students who assume the receptionist. These role-playing scenarios help develop the students' interpersonal and technical skills as receptionists. Experiential learning, following a four-step cycle, is a key aspect involving concrete experiences, reflection, conceptualization, and application in new situations. Bandura's processes of attention, retention, reproduction, and motivation further contribute to student learning through experiential and situated learning environments. The integration of these theories is depicted in Figure 6, based on Kolb's Experiential Learning Cycle (1984), Bandura's Social Learning Theory (1977), and the Learning by Doing Theory (Essential Elements of a Goal-Based Scenario) (Schank et al., 1999).

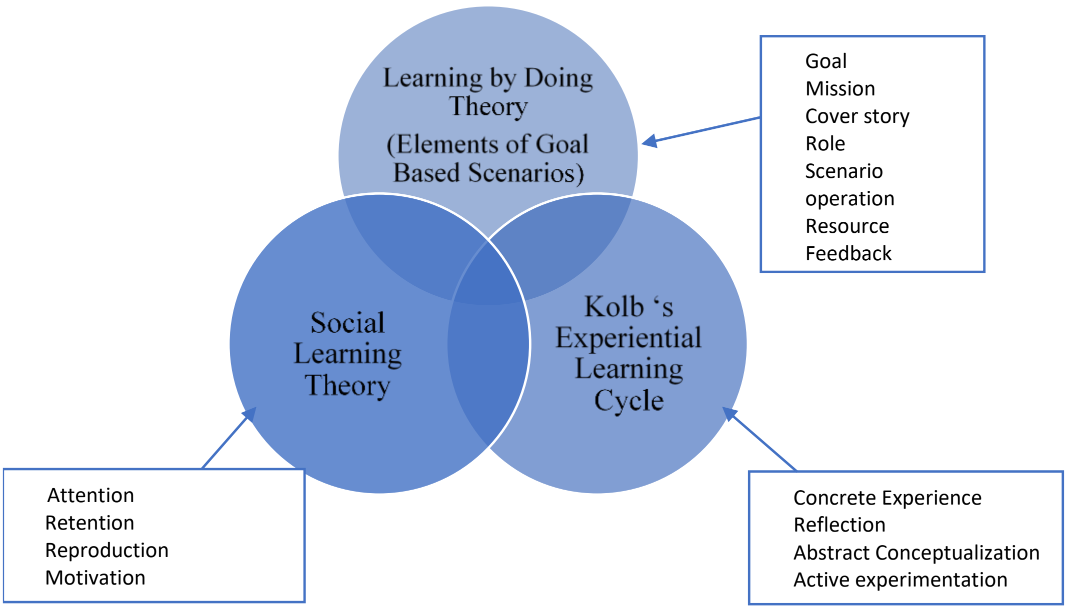

Figure 6: Theoretical Framework

In light of these considerations, this study aims to delineate the components necessary for designing and constructing the e-SBL FOIM-ATG scenario-based learning module tailored to the Front Office course. Drawing insights from experts and emphasizing key variables identified through an extensive literature review, this module aims to provide a comprehensive solution to the challenges faced in hospitality education. The integration of technology and experiential learning methods is proposed as an incentive to encourage students to delve into knowledge acquisition, infusing learning with deeper significance and preparing students for successful careers in the ever-evolving hospitality sector.

3. Methodology

3.1. Research Design

This study employed a quantitative approach called the Fuzzy Delphi Method (FDM). FDM was utilized to secure expert consensus on the constructs and elements necessary for constructing the proposed module. The construct measures were identified and synthesized from the literature to inform the initial construction of constructs and instrument items. The FDM facilitated the analysis of contributions from fifteen experts, and the data were processed using Excel software to determine expert consensus. The FDM method not only expedited the process but also ensured precise data analysis, thereby strengthening the likelihood of attaining expert concurrence (Mustapha & Darusalam, 2018). The FDM method procedure is shown in Figure 7, and Table 1 shows the list of experts employed in this study.

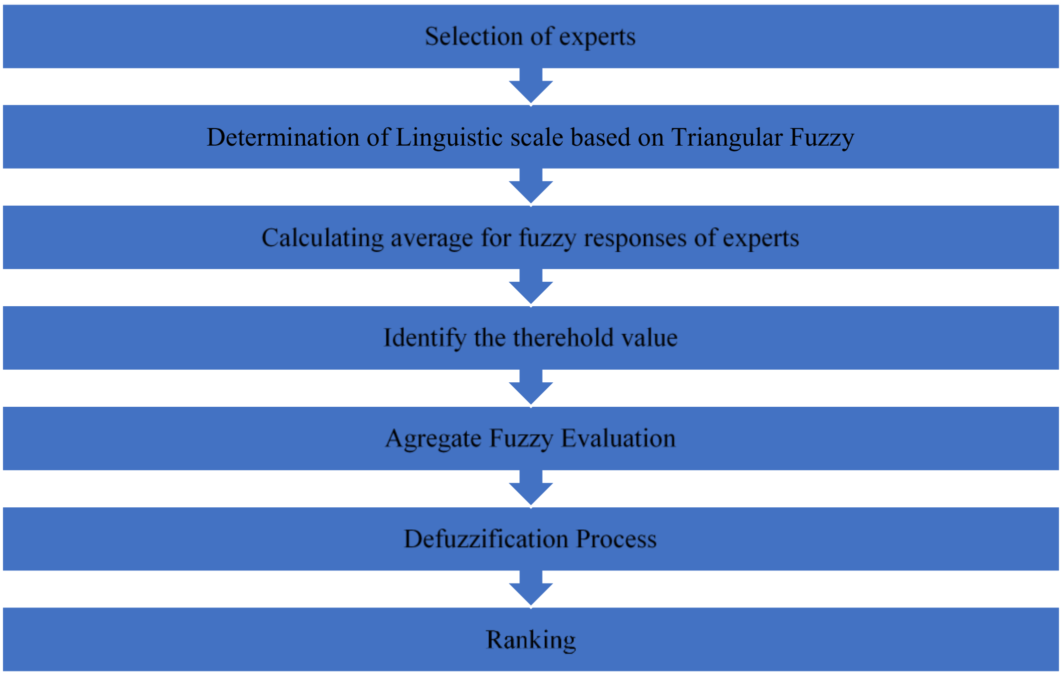

Figure 7: A Flowchart of a Fuzzy Delphi Method (FDM) procedure

Table 1: List of Experts Used

Position	Expertise	Working Experience	Teaching experience in Front Office	Institution
Senior lecturer	Front Office/ curriculum	15	5	PTSS
Senior lecturer	Front Office/ curriculum	15	5	PTSS
Senior lecturer	Front Office/ curriculum	15	7	PTSS
Senior lecturer	Front Office/ curriculum	12	5	PTSS
Senior lecturer	Front Office/ curriculum	17	5	KKSP
Senior lecturer	Front Office/ curriculum/ Scenario-based learning	16	7	KKCP
Senior lecturer	Front Office/ curriculum	11	10	KKCP
Senior lecturer	Front Office/ curriculum/ Scenario-based learning	15	13	KKBB
Senior lecturer	Front Office/ curriculum	12	8	KKBB
Senior lecturer	Front Office/ curriculum	12	12	KKKP
Senior lecturer	Front Office/ curriculum/ Scenario-based learning	15	15	KKRP
Senior lecturer	Front Office/ curriculum/ Scenario-based learning	21	18	KKSY
Trainer FO	Front Office	27	25	Stamford College
Lecturer UPSI	Instructional/ pedagogy	15	15	UPSI
Lecturer UPSI	Information technology/ education technology	19	-	UPSI
Total Experts	**15**			

3.2. Sample Study

The sample size for Fuzzy Delphi studies, as suggested by Mustapha and Darusalam (2018) and Clayton (1997), typically falls between ten to fifteen participants. The selection of this sample was executed through purposive sampling techniques (Chua, 2010). The researcher identified fifteen experts within the field, including educators and trainers. This sample was strategically chosen based on the participants' experience and expertise in hospitality, specifically concerning front-office operations, educational technology, scenario-based learning, and curriculum development. The selection criteria for experts aligned with Berliner's (2004) definition, where an individual is considered an expert in the field if they possess over five years of experience. In this study, the experts had (i) a minimum of ten years of experience in the field, (ii) a minimum of five years of experience in teaching Front Office courses, and (iii) were involved as curriculum drafters for Front Office courses.

The initial identification of potential experts within the hospitality and education sectors involved a multi-faceted approach that encompassed various channels and sources. Firstly, professional networks played a crucial role in identifying individuals who demonstrated expertise in Front Office operations, educational technology, scenario-based learning, and curriculum development. Through established connections with colleagues, peers, and industry professionals within the hospitality field, potential experts were identified based on their reputation, demonstrated knowledge, and contributions to the field. Academic affiliations with universities and educational institutions specializing in hospitality management or related fields also served as key sources for identifying potential experts. Faculty members with expertise in teaching Front Office courses, especially in TVET (hands-on), and contributing to curriculum development initiatives, were identified through their affiliations with academic institutions. Overall, the initial identification of potential experts involved leveraging a diverse array of channels, including professional networks, academic affiliations, and industry connections, to ensure a comprehensive and targeted approach to identifying individuals with the requisite expertise for the study.

3.3. Study Instrument

The theoretical framework outlines the theoretical underpinnings that inform the design and development of the e-SBL FOIM-ATG module. It incorporates Bandura's Social Learning Theory, which emphasizes the importance of observational learning, imitation, and modeling in shaping behavior. Kolb's Experiential Learning Cycle highlights the iterative process of learning through concrete experiences, reflective observation, abstract conceptualization, and active experimentation. This theory is also integrated into the process through role-playing scenarios. Additionally, the Learning by Doing Theory by Schank et al. emphasizes the role of practical, hands-on experiences in facilitating learning and skill development.

The conceptual framework translates the theoretical principles outlined in the theoretical framework into a practical framework through the design of the e-SBL FOIM-ATG module. It identifies essential elements necessary for integrating scenarios and resources to enhance learning experiences and cultivate 21st-century skills in front-office courses. This includes components such as goals, mission, cover story, role, scenario operation, resources, feedback, assessment, and their alignment with the three main theoretical models.

The construction of constructs and instrument items was initiated through an extensive review of the literature and expert interviews. This comprehensive approach aimed to identify and incorporate relevant components and elements into the Front Office Instructional Module. The questionnaire comprises nine parts: Part A for respondent demographics and Part B to J for various components of the instructional module. The total number of items in the questionnaire is 70, and a 7-point Likert scale was employed to gauge the level of expert agreement.

The process of developing questions for each dimension involved a combination of literature review and semi-structured interviews with experts. From the above, researchers identified key constructs and sub-components within each dimension based on theoretical frameworks, best practices in instructional design, and insights from subject matter experts. Questions were then formulated to assess experts' perceptions, opinions, and experiences related to each construct, ensuring comprehensive coverage of relevant aspects of the instructional module. Goal-based scenario elements from the learning-by-doing theory are the main components, and front-office topics are the sub-components of developing the module. At the same time, Kolb‘s Experiential Learning Cycle and Social Learning Theory are only involved during the process of using the module, especially in the role-playing parts. Experts’ consensus validated the questionnaire, ensuring its reliability and validity for capturing expert perspectives on the instructional module. Overall, the development of the questionnaire involved a rigorous and systematic approach to ensure its alignment with the research objectives and the comprehensive assessment of the instructional module's components and elements.

The relationship between the construct measures, theoretical frameworks, and the FDM is established to facilitate consensus-building among experts regarding the essential elements of the instructional module. The FDM process involves iteratively eliciting and aggregating expert opinions to refine and validate the construct measures identified in the literature, align with the theoretical frameworks, and capture the essential elements necessary for effective scenario-based learning in front-office courses.

3.4. Fuzzy Delphi Method Implementation Process

3.4.1. Step 1: Selection of Experts

The selection of experts in this study was based on the criteria defined by Mustapha and Darusalam (2018). The selection considered the expertise, qualifications, time, and experience of the experts. Ensuring precision is crucial during the selection process to avoid any doubts or disputes regarding the results, opinions, and views. Experts were determined based on an individual's years of experience in the field, with those having more than five years of experience considered experts. In contrast, those with less experience were categorized as novices (Shanteau et al., 2002). Kaviza (2018) and Mustapha and Darusalam (2018) further specified that an expert in the field is an individual with over five years of experience in their specific area of expertise. Qualifications pertain to professional recognition and accreditation based on an individual's academic qualifications. The experts were required to have a minimum of five years of experience in a field relevant to this study.

3.4.2. Step 2: Determination of Linguistic Variables Based on Triangular Fuzzy Number

Linguistic value refers to qualitative descriptions or expressions used to represent expert opinions or judgments on a particular topic or parameter. In FDM, experts provide their views or evaluations using linguistic terms rather than precise numerical values. These linguistic terms can range from qualitative descriptors such as "low," "medium," and "high" to more specific terms tailored to the context of the study. A 7-point Likert scale was chosen as the scale for the expert agreement instrument. After receiving values from the experts, these values were converted into Fuzzy triangular numbers, as explained in Table 2. Triangular fuzzy refers to a type of fuzzy set that is characterized by a membership function that assigns degrees of membership to elements based on a triangular-shaped membership function. In the context of FDM, triangular fuzzy sets are often used to represent the uncertainty or ambiguity inherent in experts' judgments or opinions. This allows for the representation of imprecise or vague information and facilitates the aggregation of diverse expert opinions to reach a consensus. Following Cheng and Lin's (2002) guidance, Triangular Fuzzy Numbers would represent the values m1, m2, and m3, where m1 denotes the minimum value, m2 represents the median value, and m3 stands for the maximum value, as seen in Figure 8 below.

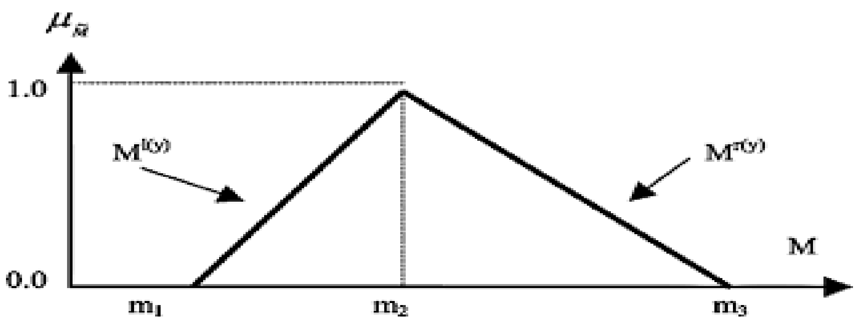

Figure 8: Triangular Fuzzy Number

Table 2: 7-point Fuzzy Scale

Level of Agreement Variables	Fuzzy Scale	Likert Scale
Extremely Agree	(0.9,1.0,1.0)	7
Highly Agree	(0.7,0.9,1.0)	6
Agree	(0.5,0.7,0.9)	5
Fairly Agree	(0.3,0.5,0.7)	4
Disagree	(0.1,0.3,0.5)	3
Highly Disagree	(0.0,0.1,0.3)	2
Extremely Disagree	(0.0,0.0,0.1)	1

Source: Mohd Jamil and Mat Noh (2020)

3.4.3. Step 3: Distance Determination Process to Determine the Threshold Value (d)

The threshold value in FDM refers to a predefined criterion or boundary used to determine the level of agreement or consensus among experts regarding a particular issue or parameter. It serves as a cutoff point beyond which expert opinions are considered sufficiently aligned to reach a consensus. Expert consensus can be gauged through the Threshold Value. The calculation for this Threshold value is as follows:

$$d(m,n) = \sqrt{\frac{1}{3}(m_1 + n_1)2 + (m_2 + n_2)2 + (m_3 - n_3)2} \quad (1)$$

If the computed Threshold value "d" is equal to or less than 0.2 (< 0.2), it is indicative of achieving expert consensus (Chen & Lin, 2002). Moreover, each item must garner an overall agreement surpassing 75% (>75%).

3.4.4. Step 4: Determine Percentage of Group Agreement

To confirm the consensus among experts, it is imperative to attain a minimum threshold of 75% (Chen & Lin, 2002). If this threshold is not met, it becomes necessary to either eliminate the item or construct in question or consider conducting a follow-up round of evaluations.

3.4.5. Step 5: Determining the Alpha Level of the Fuzzy Valuation Aggregate

Fuzzy logic is a mathematical approach that deals with reasoning and decision-making in situations where uncertainty and imprecision exist. It extends classical binary logic by allowing for the representation of partial truth, where propositions can be true to a certain degree. In FDM, fuzzy logic is employed to handle the imprecise nature of expert opinions and to aggregate these opinions to derive a consensus. The determination of the Fuzzy value is accomplished by adding Fuzzy numbers for each item, following the formula: Amax = (1)/4 * (m1 + m2 + m3) (Mohd Jamil et al., 2014).

3.4.6. Step 6: Defuzzification Process Phase

Defuzzification is a crucial step in fuzzy logic systems, including FDM. Its goal is to convert fuzzy linguistic variables (expressed in terms like "low," "medium," or "high") into crisp or numerical values that can be more easily interpreted or utilized for decision-making. In the context of FDM, the defuzzification process involves converting the fuzzy output obtained from aggregating expert opinions into a precise numerical value or decision. The Average Fuzzy Numbers were calculated as the α-cut value, positioned precisely midway between '0' and '1,' denoted by α-cut = (0 + 1)/2 = 0.5 (Mohd Jamil et al., 2014). If the value of Average Fuzzy Numbers falls below this α-cut threshold of 0.5, the item is considered unsuitable and is rejected due to the absence of expert consensus.

3.4.7. Step 7: Position Determination Process

The last stage includes prioritizing the items according to their Defuzzification values, with the item having the highest value signifying the most significant position, as indicated by Mohd Ramli and Awang (2020).

4. Result

4.1. Analysis of Expert Consensus on Main Component

The Fuzzy Delphi Method (FDM) analysis indicates that experts reached a consensus on all items within the primary component. The items submitted to the experts can be found in Table 3.

Table 3: Items for the Front Office Instructional Module's Main Components

No.	Items
1.	Assessment
2.	Role
3.	Scenarios
4.	Resources
5.	Feedback
6.	Goal
7.	Cover story
8.	Missions

Table 4 presents the threshold value (d), expert consensus percentage, defuzzification, and item position for the above items.

Table 4: Overall Findings of the Main Components

Item number	Condition of Triangular Fuzzy Numbers		Condition of Defuzzification Process	Position	Expert consensus *Threshold value,* d
	Threshold value, d	Percentage of Experts Group Consensus, %	*Fuzzy Score (A)*		
1	0.083	93%	0.929	6	Accepted
2	0.195	93%	0.880	8	Accepted
3	0.083	93%	0.929	6	Accepted
4	0.074	93%	0.936	2	Accepted
5	0.074	93%	0.936	2	Accepted
6	0.074	93%	0.936	2	Accepted
7	0.074	93%	0.936	2	Accepted
8	0.063	93%	0.942	1	Accepted

Notes:

Condition to be met:

Triangular Fuzzy Numbers Defuzzification Process

1) Threshold value(d) ≤ 0.2 3) Fuzzy Score (A) ≥ α – cut value of 0.5

2) Percentage of Expert Consensus ≥ 75

The main component has obtained an expert agreement of 93%, surpassing the threshold value (d) of 0.9. Chu and Hwang (2008) suggested that items receiving as low as 20% expert agreement should not be considered suitable for research purposes. However, in this context, all items have garnered expert agreement levels exceeding 75%, and their defuzzification values also surpass the α-cut value of 0.5. This outcome underscores a unanimous expert consensus on all these items (Chen & Lin, 2002), affirming that experts reached a consensus regarding the main component's elements.

4.2. Analysis of Expert Consensus on Goal Elements

The results indicate that every item in the goal elements has a threshold value (d) equal to or less than 0.2 (Table 5). Thus, all these items have attained a consensus among experts, as per Chen and Lin (2002). Furthermore, the expert agreement percentage affirms that all items exceed the 75% threshold, and the defuzzification values for each item also surpass the α-cut value of 0.5. In conclusion, these findings demonstrate that the goal elements have garnered a unanimous consensus among the experts.

Table 5: Overall Findings of the Goal Elements

Item	Condition of Triangular Fuzzy Numbers		Condition of Defuzzification Process	Expert consensus
	Threshold value, d	Percentage of Experts Group Consensus, %	*Fuzzy Score (A)*	
1	0.063	93%	0.942	Accepted
2	0.049	93%	0.949	Accepted
3	0.049	93%	0.949	Accepted
4	0.074	93%	0.936	Accepted
5	0.074	93%	0.936	Accepted

Notes:

Condition to be met:

Triangular Fuzzy Numbers Defuzzification Process

1) Threshold value(d) ≤ 0.2 3) Fuzzy Score (A) ≥ α – cut value of 0.5

2) Percentage of Expert Consensus ≥ 75%

4.3. Analysis of Expert Consensus on Mission Elements

According to the results, each item exhibited a threshold value (d) equal to or less than 0.2 (Table 6), signifying a unanimous consensus among the experts, in line with Chen and Lin (2002). The expert agreement percentage validates that all items exceed the 75% threshold, and the defuzzification values for each item also surpass the α-cut value of 0.5. In summary, these results confirm that the mission elements have secured a unanimous consensus from the experts.

Table 6: Overall Findings of the Mission Elements

Item	Condition of Triangular Fuzzy Numbers		Condition of Defuzzification Process	Expert consensus
	Threshold value, d	Percentage of Experts Group Consensus, %	*Fuzzy Score (A)*	
1	0.063	93%	0.942	Accepted
2	0.063	93%	0.942	Accepted
3	0.063	93%	0.942	Accepted
4	0.089	93%	0.922	Accepted
5	0.089	93%	0.922	Accepted

Notes:

Condition to be met:

Triangular Fuzzy Numbers — Defuzzification Process

1) Threshold value(d) ≤ 0.2 — 3) Fuzzy Score (A) ≥ α – cut value of 0.5

2) Percentage of Expert Consensus ≥ 75%

4.4. Analysis of Expert Consensus on Cover Story Elements

The results indicate that every item obtained a threshold value (d) equal to or less than 0.2 (Table 7), signifying a unanimous consensus among the experts, consistent with Chen and Lin (2002). The expert agreement percentage affirms that all items significantly exceed the 75% threshold, and the defuzzification values for each item exceed the α-cut value of 0.5. In essence, these findings validate that the items within the cover story elements have garnered unanimous endorsement from the experts.

Table 7: Overall Findings of the Cover Story Elements

Item	Condition of Triangular Fuzzy Numbers		Condition of Defuzzification Process	Expert consensus
	Threshold value, d	Percentage of Experts Group Consensus, %	*Fuzzy Score (A)*	
1	0.074	93%	0.936	Accepted
2	0.074	93%	0.936	Accepted
3	0.074	93%	0.936	Accepted
4	0.083	93%	0.929	Accepted
5	0.089	93%	0.922	Accepted

Notes:

Condition to be met:

Triangular Fuzzy Numbers — Defuzzification Process

1) Threshold value(d) ≤ 0.2 — 3) Fuzzy Score (A) ≥ α – cut value of 0.5

2) Percentage of Expert Consensus ≥ 75%

4.5. Analysis of Expert Consensus on Role Elements

Considering the outcomes, all items reached a threshold value (d) equal to or less than 0.2 (Table 8), indicating a unanimous agreement among experts, aligning with Chen and Lin (2002). The expert agreement percentage confirms that all items surpass the 75% threshold, and the defuzzification values for these items consistently exceed the α-cut value of 0.5. These results unequivocally establish that the items within the role elements have secured unanimous consensus from the experts.

Table 8: Overall Findings of the Role Elements

Item	Condition of Triangular Fuzzy Numbers		Condition of Defuzzification Process	Expert consensus
	Threshold value, d	Percentage of Experts Group Consensus, %	*Fuzzy Score (A)*	
1	0.063	93%	0.942	Accepted
2	0.063	93%	0.942	Accepted
3	0.063	93%	0.942	Accepted
4	0.074	93%	0.936	Accepted
5	0.074	93%	0.936	Accepted

Notes:

Condition to be met:

Triangular Fuzzy Numbers | Defuzzification Process

1) Threshold value(d) ≤ 0.2 | 3) Fuzzy Score (A) ≥ α – cut value of 0.5

2) Percentage of Expert Consensus ≥ 75%

4.6. Analysis of Expert Consensus on Scenario Operation Elements

According to the results, all items reached a threshold value (d) equal to or less than 0.2 (Table 9), indicating a consensus among experts, as outlined by Chen and Lin (2002). The expert agreement percentage validates that all items comfortably surpass the 75% threshold, and the defuzzification values for these items consistently exceed the α-cut value of 0.5. These outcomes affirm that the items within the scenario operation elements have unequivocally received a unanimous consensus from the experts.

Table 9: Overall Findings of the Scenario Operation Elements

Item	Condition of Triangular Fuzzy Numbers		Condition of Defuzzification Process	Expert consensus
	Threshold value, d	Percentage of Experts Group Consensus, %	*Fuzzy Score (A)*	
1	0.063	93%	0.942	Accepted
2	0.049	93%	0.949	Accepted
3	0.049	93%	0.949	Accepted
4	0.074	93%	0.936	Accepted
5	0.083	93%	0.929	Accepted
6	0.049	93%	0.949	Accepted
7	0.049	93%	0.949	Accepted
8	0.063	93%	0.942	Accepted
9	0.074	93%	0.936	Accepted
10	0.049	93%	0.949	Accepted
11	0.167	93%	0.884	Accepted
12	0.166	93%	0.878	Accepted
13	0.074	93%	0.936	Accepted
14	0.083	93%	0.929	Accepted
15	0.063	93%	0.942	Accepted
16	0.063	93%	0.942	Accepted
17	0.063	93%	0.942	Accepted
18	0.063	93%	0.942	Accepted
19	0.049	93%	0.949	Accepted
20	0.063	93%	0.942	Accepted

Notes:

Condition to be met:

Triangular Fuzzy Numbers

1) Threshold value(d) ≤ 0.2

2) Percentage of Expert Consensus ≥ 75%

Defuzzification Process

3) Fuzzy Score (A) ≥ α – cut value of 0.5

4.7. Analysis of Expert Consensus on Resource Elements

Based on the research outcomes, all items reached a threshold value (d) of 0.2 or less (Table 10), signaling a unanimous consensus among experts in accordance with the criteria established by Chen and Lin (2002). The expert agreement percentage attests that all items comfortably exceed the 75% threshold, and the defuzzification values for these items consistently surpass the α-cut value of 0.5. These results provide strong confirmation that the items within the resource elements have garnered unanimous endorsement from the experts.

Table 10: Overall Findings of the Resource Elements

Item	Condition of Triangular Fuzzy Numbers		Condition of Defuzzification Process	Expert consensus
	Threshold value, d	Percentage of Experts Group Consensus, %	*Fuzzy Score (A)*	
1	0.083	93%	0.929	Accepted
2	0.063	93%	0.942	Accepted
3	0.049	93%	0.949	Accepted
4	0.049	93%	0.949	Accepted
5	0.074	93%	0.936	Accepted
6	0.063	93%	0.942	Accepted
7	0.063	93%	0.942	Accepted
8	0.063	93%	0.942	Accepted
9	0.063	93%	0.942	Accepted

Notes:

Condition to be met:

Triangular Fuzzy Numbers

1) Threshold value(d) ≤ 0.2

2) Percentage of Expert Consensus ≥ 75%

Defuzzification Process

3) Fuzzy Score (A) ≥ α – cut value of 0.5

4.8. Analysis of Expert Consensus on Feedback Elements

As indicated by the research findings, all items have reached a threshold value (d) of 0.2 or lower (Table 11), presenting a consensus among experts in complete unanimity, as specified by Chen and Lin (2002). The expert agreement percentage affirms that all items comfortably exceed the 75% threshold, and the defuzzification values for these items consistently surpass the α-cut value of 0.5. These results provide solid confirmation that experts unanimously endorse the items within the mission elements.

Table 11: Overall Findings of the Feedback Elements

Item	Condition of Triangular Fuzzy Numbers		Condition of Defuzzification Process	Expert consensus
	Threshold value, d	Percentage of Experts Group Consensus, %	*Fuzzy Score (A)*	
1	0.063	93%	0.942	Accepted
2	0.063	93%	0.942	Accepted
3	0.049	93%	0.949	Accepted
4	0.063	93%	0.942	Accepted
5	0.063	93%	0.942	Accepted
6	0.049	93%	0.949	Accepted
7	0.049	93%	0.949	Accepted
8	0.049	93%	0.949	Accepted
9	0.074	93%	0.936	Accepted
10	0.074	93%	0.936	Accepted

Notes:

Condition to be met:

Triangular Fuzzy Numbers | Defuzzification Process

1) Threshold value(d) ≤ 0.2 | 3) Fuzzy Score (A) ≥ α – cut value of 0.5

2) Percentage of Expert Consensus ≥ 75%

4.9. Analysis of Expert Consensus on Assessment Elements

In accordance with the research outcomes, all items reached a threshold value (d) of 0.2 or less (Table 12). This outcome signifies that these items have achieved a unanimous agreement among experts, consistent with the criteria outlined by Chen and Lin (2002). The expert agreement percentage demonstrates that each item surpasses the 75% threshold, and the defuzzification values for these items consistently exceed the α-cut value of 0.5. Consequently, the results affirm a consensus among experts regarding the items within the mission elements.

Table 12: Overall Findings of the Assessment Elements

Item	Condition of Triangular Fuzzy Numbers		Condition of Defuzzification Process	Expert consensus
	Threshold value, d	Percentage of Experts Group Consensus, %	*Fuzzy Score (A)*	
1	0.049	93%	0.949	Accepted
2	0.049	93%	0.949	Accepted
3	0.049	93%	0.949	Accepted
4	0.063	93%	0.942	Accepted
5	0.063	93%	0.942	Accepted

Notes:

Condition to be met:

Triangular Fuzzy Numbers | Defuzzification Process

1) Threshold value(d) ≤ 0.2 | 3) Fuzzy Score (A) ≥ α – cut value of 0.5

2) Percentage of Expert Consensus ≥ 75%

5. Discussion

Based on the results obtained from the Fuzzy Delphi analysis, the researchers identified the key components and elements that garnered consensus among the experts. The findings indicate that all of these components and elements are essential for designing and developing the e-SBL FOIM-ATG module. Specifically, the experts reached a consensus that the main components should encompass goals, mission, cover story, role, scenario operation, resources, feedback, and assessment. These items should be the focus of the module development, especially assessment, role, scenario operation, resources, and feedback. Assessment has been pointed out as the most crucial component that needs to be included in the module design. As

Roma (2021) stated, tourism and hospitality students need assessment, specifically to reach the competencies required by the industry. Scenario-based learning strives to offer learners lifelike encounters within simulated scenarios, immersing them in a narrative featuring intricate problems demanding solutions (Elliott-Kingston et al., 2016). This approach enables learners to employ their expertise in the subject matter, as well as their critical thinking and problem-solving abilities in a practical, real-world setting (Sharma, 2018).

Furthermore, concerning the components of goals, mission, cover story, and role, the results indicate that the primary objective in module design is to equip students with the knowledge and competencies required for managing reservation, check-in, and check-out processes across diverse scenarios. Thus, in designing the module, each integrated component will possess distinct objectives and functions tailored to the learning objectives. As outlined by Mandke (2020), front office staff's responsibilities encompass guest reservations, check-in processes, guiding guests to their rooms upon arrival, and upholding a superior standard of guest service and professionalism. It is paramount to include these topics in the module to allow the students to learn through them. Furthermore, Arellano et al. (2023) also showed that these three topics are crucial to be remembered by students, with check-in and check-out procedures receiving the highest mean of 5 and learning about reservations and its different types receiving a mean value of 4.93.

Next, for scenario operation, findings show that the main focus in designing the module is to use items such as 1) reservations with guaranteed bookings, 2) reservations with guaranteed bookings and special requests, 3) check-in without reservation bookings and payment made by cash, 4) check-in with reservation bookings and payment made by credit card, 5) check-in with reservation bookings, and 6) the need to check in early and to deal with normal check-out with payment. In the hotel industry, the front office department is defined as the nerve center or the heart of the hotel, and most hotel employees vouched that it plays a crucial role due to its main operational activity. The basic skill needed in this department is to correctly and efficiently check guests into their rooms. Incorporating scenarios such as handling individual reservations, assigning suitable guest rooms while maintaining room preferences, and managing the payment procedures during guest check-in is crucial for the module's design (Mondal, 2022).

Meanwhile, for the resources that should be included in the module design to support students while doing role play with the scenario operation, the experts emphasized video demonstrations, simulation hotels and rooms (used for Bellmen), YouTube, guests' inventory, a customized simplified hotel system, and dialogues as main communication resources. Incorporating active learning techniques and digital resources into educational methods holds significant promise for fostering not just subject-specific knowledge but also versatile skills essential for graduates (Mio et al., 2019). Furthermore, learners are supplied with necessary educational materials to facilitate their participation in learning activities (Awang & Mohd Mahudin, 2023) and prescribed assessment duties, along with supplementary resources to enhance their understanding and engagement in these tasks more profoundly (Ariadurai & Rajendra, 2020).

In the context of the e-SBL FOIM-ATG module, the inclusion of assessment tasks aligns with Kolb's Experiential Learning Theory by facilitating the reflective observation stage of the learning cycle, prompting learners to critically evaluate their experiences within simulated scenarios and integrate new knowledge into their existing understanding. Similarly, scenario-based learning activities in the module correspond to Kolb's theory, which emphasizes learning through concrete experiences, and Social Learning Theory, which highlights the role of observation and imitation in learning from others. By immersing learners in realistic situations where they must apply theoretical knowledge to solve problems, scenario-based learning fosters active engagement and experimentation, mirroring Kolb's model of experiential learning. Furthermore, the collaborative elements are often integrated into scenario-based learning activities to encourage social interaction and knowledge-sharing among learners, supporting the principles of Social Learning Theory. Thus, by connecting assessment tasks and scenario-based learning activities to the principles of Kolb's Experiential Learning Theory and Social Learning Theory, the theoretical underpinnings of the e-SBL FOIM-ATG module are effectively integrated into the discussion, providing a clear rationale for their inclusion in the module design.

6. Research Implications

The implications of this study underscore the foundational significance of the identified components and elements in shaping the e-SBL FOIM-ATG module, particularly in meeting the rigorous competency standards of the tourism and hospitality industry. These implications hold considerable relevance for educators, curriculum designers, and institutions committed to enhancing students' practical skills and competencies. Beyond academia, the contributions extend to practical ramifications, as they provide a tangible framework for implementing these key elements in educational settings. These findings can offer stakeholders valuable guidance in tailoring curricula and instructional methods to align with industry demands.

From a theoretical standpoint, this study contributes to advancing the discourse on instructional design and competency-based education. The identified components serve as theoretical anchors, illuminating how theoretical principles manifest in effective instructional modules. The study underscores the critical alignment between theoretical constructs and practical industry requirements, fostering a nuanced understanding of the symbiotic relationship between educational theories and real-world competencies. These theoretical implications offer valuable insights into the theoretical underpinnings of effective instructional design, enriching scholarly discussions surrounding competency-driven education and paving the way for further exploration in this area.

7. Conclusion

The outcomes derived from the Fuzzy Delphi analysis underscore the unanimous consensus among experts regarding the significance of all scrutinized components and elements for the design of the e-SBL FOIM-ATG module. The critical components identified goals, mission, cover story, role, scenario operation, resources, feedback, and assessment. The integration of these elements into the module is recommended, with a distinct emphasis on evaluation, role, scenario operation, resources, and feedback. Notably, assessment emerges as the most pivotal component, aligning seamlessly with the industry's competency requirements for students in the tourism and hospitality sector. The acknowledgment of scenario-based learning as a valuable approach, fostering real-life experiences and problem-solving opportunities, contributes substantially to students' theoretical understanding and practical skills.

Regarding the specific elements of goals, mission, cover story, and role, the experts' consensus showed that the primary focus is on equipping students with knowledge and skills related to reservation handling, check-in, and check-out procedures across diverse scenarios. Thus, each integrated component must serve specific aims and roles aligned with the predefined learning objectives. This emphasis is substantiated by the paramount importance of these topics in the hotel industry, where front office staff plays a pivotal role in ensuring the seamless execution of check-in and check-out processes.

The design of scenario operation should encompass various scenarios, including reservations with guaranteed bookings, reservations with guaranteed bookings and special requests, check-in without reservation booking, check-in with reservation booking and payment by cash, check-in with reservation booking and payment by credit card, check-in with reservation booking and early check-in, and handling normal check-outs with payment. These scenarios mirror real-world front-office activities, rendering them indispensable for the comprehensive module.

Experts recommend a variety of resources to bolster students during role-plays associated with scenario operations, such as video demonstrations, simulation tools, YouTube, hotel inventories, simplified hotel systems, and communication dialogues.

The inclusion of these resources aligns seamlessly with a pedagogical approach that integrates active learning and digital tools, fostering the development of both disciplinary knowledge and transferable skills essential for graduates.

8. Future Research Recommendations

In light of the findings, it is recommended that future research endeavors focus on several key areas to enhance the academic discourse and practical application of the identified components and elements. Firstly, longitudinal studies should be conducted to assess the sustained impact of these components on students' competency development and subsequent career trajectories. Next, comparative analyses across diverse instructional modules within varying educational contexts could be conducted to provide valuable insights into the nuanced effectiveness of these components. Thirdly, expanding the research scope to explore the adaptability of these elements in different settings and their interdisciplinary applications would contribute to a better comprehensive understanding of their practical implications. Future research should solicit student feedback on the relevance and efficacy of these components. The feedback is crucial for ongoing module enhancement and should be integrated into future research initiatives. Moreover, exploring innovative competency-based assessment strategies can be conducted to foster the continual evolution of educational methodologies. Lastly, collaborative ventures with industry professionals should be pursued to strengthen the alignment of educational modules with the dynamic demands of the industry, ensuring the relevance and applicability of the research findings in real-world settings.

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