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Overcoming barriers in hospitality accounting education: A fuzzy-analytic hierarchy process method approach

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ABSTRACT

An accounting education is essential for preparing hospitality professionals to manage financial operations, evaluate performance, and make informed strategic decisions in a data-driven industry. In spite of this, many hospitality students continue to struggle with accounting-related coursework, which undermines their ability to succeed in managerial positions. The purpose of this study is to examine persistent barriers that hinder the performance of hospitality students in accounting courses, in recognition of how important financial literacy is to their professional development. In order to uncover insights into the specific challenges students face, we used a fuzzy Analytic Hierarchy Process (fuzzy-AHP) that prioritized key obstacles from the perspective of the students. It was identified that language barriers were one of the most significant factors, particularly for non-native speakers, indicating a pressing need for targeted language support interventions. In addition, students reported limited engagement before and after class sessions, indicating the need to enhance interactive and practical exercises in order to reinforce learning. According to the study, psychological stress and the complexity of accounting terminology had a comparatively lower impact on performance, while technological proficiency had no discernible impact on performance. The findings highlight the importance of integrating language assistance, hands-on applications, and structured engagement strategies to ensure that future hospitality graduates acquire the financial competencies essential for effective management and global competition.

Keywords: Hospitality Accounting, Fuzzy-AHP, Barriers to Learning, Student Engagement

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1. Introduction

While accounting skills are crucial for managing profitable hospitality operations, many students still view the subject with skepticism (Dalak & Özdinç, 2023). Some learners even schedule classes at “convenient” times to minimize exposure to perceived challenges, arguing that analytical and accounting courses are unrelated to what they perceive to be the “people-focused” core of hospitality. There are extreme cases in which people choose hospitality precisely because they anticipate fewer quantitative requirements, indicating a persistent aversion to number-based coursework. Despite the importance of product and service quality in the hospitality industry, financial savvy has become increasingly essential to profitability and strategic decision-making (Repetti, 2019). Even so, many students may avoid accounting whenever possible and risk failing the course more than once, even though they recognize its importance (Zopiatis et al., 2019). Unease resulting from this reluctance can last long after graduation.

The challenges are further exacerbated by students' high levels of stress and discouragement. Even minor computational errors can trigger anxiety, resulting in disengagement and underperformance. In time, this dynamic results in a broader disconnect between learners and financial literacy's long-term benefits, advantages that many learners only realize as they enter the workplace. According to Dalak and Özdinç (2023), entry-level professionals once dismissed accounting as "technical" or "unnecessary" are often surprised by daily accounting tasks. In addition, learners who possess foundational skills but are unable to apply them may perceive a disconnect between their numeric competencies and their developing hospitality identity. Overall, these observations highlight the need to investigate why these adverse perceptions persist and how they can be overcome.

It is evident that students' wary attitudes reveal a complex set of obstacles between the financial skills required of hospitality careers and their own financial capabilities. Although curricular constraints and industry pressures are beyond learners' control (Kim et al., 2017; Repetti, 2019; Zopiatis et al., 2019), misconceptions about accounting, negative math experiences, and a lack of understanding of its role in hospitality operations (Ayoun & Palakurthi, 2008; Bello et al., 2019; Situmeang & Latuamury, 2023) are important barriers. Educators and students can discover strategies for increasing student engagement and practical confidence by examining these factors. This hurdle must be recognized and addressed in order to make accounting accessible, empowering, and supportive of individual career growth, as well as strengthening a competitive, profit-driven industry.

With this in mind, the present study aims to identify and prioritize the specific barriers affecting hospitality students' performance in accounting-based units. We began by conducting a thorough literature review to identify recurring themes. From an initial pool of thousands of academic and industry sources, we screened, filtered, and narrowed down to relevant studies addressing issues such as anxiety, misconceptions, pedagogical gaps, and language barriers. Our consensus-based list of barriers was derived from curated work, confirming inter-rater reliability with Cohen's Kappa and confirming each factor had real-world application. To capture students' perspectives systematically, we use fuzzy AHPs, a multicriteria decision-making approach that is especially effective when dealing with subjective judgments. Fuzzy-AHP allows decision-makers to reduce the loss of information caused by making human perceptions strictly numerical (e.g., "very important," "moderately important," "less important"). This feature captures learners' subjective experiences of anxiety, misconceptions, and pedagogical limitations, which are not easily measurable. We aim to provide educators, program administrators, and industry partners with actionable insights through a fuzzy-AHP lens. Moreover, the use of a robust multi-criteria framework in this study has addressed a critical gap in a context where such an approach is relatively uncommon.

Additionally, we aim to address two core research questions: (1) Which specific barriers do hospitality students perceive as most detrimental to their performance in accounting-based units? and (2) What practical, student-oriented interventions can educators and administrators use to overcome these barriers? Several studies have addressed barriers to hospitality accounting performance, but few have attempted to catalogue and prioritize them from the student's point of view. Prioritizing these issues can shed light on the most pressing concerns-whether anxiety or preparation-and inform curriculum design, instructional support, and internship placements.

Based on our Fuzzy-AHP analysis, it was found that language-related hurdles are most prevalent among hospitality students studying accounting, with Foreign Education Language ranking highest. A second challenge is a lack of pre- and post-class engagement, which prevents students from internalizing essential accounting concepts. There are also difficulties associated with terminological confusion and psychological factors such as anxiety. On the other hand, technological proficiency had no measurable impact on learners' performance, suggesting that students already possess a sufficient level of digital literacy. As a result of these findings, it is evident that language and engagement-related factors remain the primary barriers to learning and should be prioritized in curriculum development. Additionally, the study demonstrates the impact of targeted interventions such as language support, practice sessions, and integrated case-based

learning. We intend to make the findings directly applicable to institutions, educators, and industry stakeholders seeking to improve hospitality accounting education.

The study is structured as follows. Section 2 reviews the literature on hospitality accounting education barriers. Section 3 describes the fuzzy-ahp methodology. Section 4 reports the application together with the consistency and sensitivity analyses. Section 5 discusses the findings and Section 6 concludes with recommendations and directions for future research.

2. Literature Review

Most hospitality management programs include accounting courses such as Introduction to Financial Accounting, Managerial Accounting, Cost Accounting, and Accounting for Decision Making. Among the topics covered in these courses are financial statement preparation and interpretation, cost classification, budgeting, performance analysis, and the application of accounting data to decision-making. These courses are designed to provide hospitality students with a foundation in financial literacy and to connect quantitative analysis with real-world hotel and tourism operations. By understanding these course components, we can better understand how accounting education is integrated with broader managerial functions in the hospitality industry. These accounting-based courses present hospitality students with a number of challenges, from anxiety to negative perceptions to not being able to bridge theory and practice. Student performance has been hampered by these barriers, particularly an aversion to math and an undervaluation of accounting relative to service skills (Repetti, 2019; Dalak & Özdinç, 2023). It is common for hospitality students to believe that there are fewer quantitative demands, a view influenced by past math difficulties, fear of making even minor mistakes, or the notion that numbers don't matter in fields centered around people. Zopiatis et al. (2019) demonstrates how this mindset can reinforce the belief that one is "not good with numbers" as a result of repeated failures. Despite the fact that external factors like insufficient advocacy from hotel leadership (Yusoh & Mat, 2020) and the industry's public image (Bello et al., 2019) may also hinder students' motivation to engage in accounting, the literature consistently indicates that students' attitudes and actions remain key to their success in both short- and long-term accounting (Kim et al., 2017). In fact, recent graduates describe feeling unprepared to interpret real financial data (Fawcett & Lockwood, 2000). Findings such as these highlight the importance of interventions that boost learners' self-efficacy, reduce anxiety, and help them engage regularly with financial concepts. By addressing these student-centered barriers, the hospitality industry can transform accounting from a dreaded obstacle to a powerful skill set.

An overly technical presentation cannot explain why hospitality students avoid accounting. In reality, the main problem is that they are unable to relate theoretical accounting concepts taught in the classroom to hospitality operations, leading them to view accounting as repetitive “number crunching” without practical relevance (Goh & Scerri, 2016). Additionally, attitudes toward accounting are changing rapidly, heavily influenced by students' understanding of foundational concepts. Number-related anxiety and unfamiliar financial concepts further discourage students from completing financial coursework (Chen et al., 2013).

Negative stereotypes within business education may further contribute to students viewing hospitality management specializations as unrigorous or insufficiently functional (Tung & King, 2016). Persistence in misconceptions and rigid instructional approaches can reduce motivation and negatively impact students' confidence when interpreting financial statements or discussing accounting professionally (Fawcett & Lockwood, 2000; Jung, 2008; Zwaal & Otting, 2013). Students who perceive accounting as static or purely task-specific disengage from the course, while those who recognize its strategic relevance do better in both academic and professional pursuits (Harris, 1997; Potter & Schmidgall, 1999; Lee et al., 2004; Kosarkoska, 2016).

Engagement is also influenced by students' initiative to clarify terminology, apply concepts practically, and seek additional resources to bridge conceptual gaps (Bello et al., 2019). Without adequate peer-assisted learning support or engaging instruction, motivation can decline quickly in fast-paced coursework (Chen et al., 2013). It is ultimately up to students to seek assistance, allocate consistent study time, and see financial coursework as a tool for professional development. (Zwaal & Otting, 2013; Bello et al., 2019).

It is common for students who fail to take this proactive approach to pass exams relying only on surface-level memorization (Goh & Scerri, 2016), not developing crucial skills like creative thinking and effective communication. Traditionally, hospitality education emphasized interpersonal skills and leadership skills (Kim & Schmidgall, 2019), but quantitative skills are increasingly being integrated into strategic decision-making through budgeting, interpreting financial statements, and evaluating cost controls. By recognizing financial literacy as a critical issue rather than a secondary one, students can develop deeper mastery and motivation (Zopiatis et al., 2019). As hospitality evolves, combining interpersonal competencies with robust financial literacy becomes imperative, underscoring the need to fully engage with accounting in order to achieve long-term success as a professional.

Through simulations, real-world applications, and peer-assisted discussions, hospitality students reduce anxiety, deepen their learning, and internalize financial concepts (Calderon et al., 2018; Bello et al., 2019). Students start to perceive accounting as an important part of operational and strategic decision-making when they dedicate time and effort to learning accounting material (Ayoun & Palakurthi, 2008; Situmeang & Latuamury, 2023)

Students who understand accounting as requiring judgment, strategic insight, and effective communication develop curiosity and sustained engagement, which foster a deeper understanding of the subject. Simulations, cooperative learning, and real-case applications can help students become more engaged and participate more actively, but the key remains the students' initiative to move beyond memorization (La Lopa et al., 2018).

Students compartmentalize accounting knowledge rather than integrating it into broader strategic contexts, leading to a perception of inaccessibility or irrelevantness of accounting (Edelheim & Ueda, 2007). In contrast, simulation-based learning, interactive challenges, software-supported exercises and sessions aimed at boosting students awareness of career pathways can demonstrate how business decisions are influenced by analytical skills, increasing motivation and reducing skepticism regarding nontraditional instructional methods (Harris, 1997; Downey & DeVeau, 2005; Chen & Downing, 2006). To better prepare hospitality managers, industry leaders also advocate for occupations-oriented, practical training that emphasizes forecasting, planning, and applied accounting skills. Ultimately, context-driven teaching incorporates dynamic, hands-on projects and group interactions helps students maintain motivation and aligns with contemporary hospitality educational demands (Kosarkoska, 2016; Ilvento, 1984).

A growing body of research emphasizes that students can overcome barriers to accounting success through practical engagement, which includes group exercises (collaborative learning activities) (Ayoun & Palakurthi, 2008; Situmeang & Latuamury, 2023), internships (Bello et al., 2019), accounting simulations (Zopiatis et al., 2019), role-play, case-based learning, extracurricular activities (active learning methods) (Ma et al., 2016;) and technological applications (Kim & Schmidgall, 2019). Engaging students in collaborative learning activities with real-world data increases engagement and simplifies complicated accounting concepts (Goh & Scerri, 2016). According to Calderon et al. (2018) and La Lopa et al. (2018), small-group settings improve accounting engagement and learning outcomes. By participating in regular peer-assisted study groups, collaborating deeply rather than superficially, and taking part in field trips and part-time work, students can keep up with challenging content (Goh & Ritchie, 2011). The early stages of a hospitality controller's career require them to develop essential skills, such as problem-solving, analysis, and collaboration. Both Kosarkoska (2016) and Chen and Downing (2006) found that students' active dedication to mastering the material greatly enhanced analytical skills and enthusiasm. In addition, game-based activities, simulations, role-playing, and case-based exercises encourage active learning by providing continuous feedback and reflection (Harris, 1997; Downey & DeVeau, 2005). Providing students proactively engage in internships and hands-on projects further reinforces these outcomes (Ilvento, 1984; Situmeang & Latuamury, 2023). The findings of Dalak and Özdinç (2023) indicate that peer-assisted tutoring, internships, and computer-based accounting courses reduce student anxiety and promote financial literacy, but students must be proactive to realize these benefits. While clicker systems and computer-aided instruction can enhance students' engagement and comprehension, students still must ensure that they attend class regularly, prepare diligently, and actively use these resources (Bojinova & Oigara, 2011; Caldwell, 2007). A number of studies have demonstrated that completing homework, attending regularly, and participating actively in class discussions improve performance (Chen et al., 2013). As long as students participate in reflective collaboration, interactive simulations and games effectively integrate theory with practice, enhancing critical thinking and strategic decision-making skills. Students who utilize campus resources and internships early and actively are significantly more likely to have a successful career and managerial career, yet few take full advantage of these resources, emphasizing their personal responsibility to be successful (Hertzman et al., 2015).

Educators can encourage resource utilization, but students must actively engage to take advantage of internships, clubs, interactive case-based learning, and technology-enhanced assignments (Feinstein & Parks, 2002). By using experiential methods, students are able to improve numeracy skills, reduce anxiety, and understand accounting's strategic role in hospitality management. Meanwhile, deliberate practice, reflective learning, and collaborative activities bridge the gap between accounting theory and real-world hospitality operations, enhancing students' confidence, competence, and positive attitudes toward accounting-related tasks (La Lopa et al., 2018). Ma et al. (2016) found that proactive, self-directed students develop stronger analytical and problem-solving skills. Zwaal and Otting (2013) argue that students who feel autonomous, competent, and socially integrated thrive when they learn independently. As Hein and Riegel (2011) show, institutions offer practical, relevant experiences, but meaningful outcomes depend ultimately on students' initiative. Furthermore, effective course designs that combine theoretical frameworks with real-world projects, entrepreneurial experiences, and active collaboration significantly increase student engagement and participation (Baldarelli, 2012).

Language proficiency also plays an important role in shaping students' engagement with accounting in global hospitality contexts where IFRS terminology serves as a common financial language (Situmeang & Latuamury, 2023). The fast pace of lectures and diverse accents often hinder international students' engagement (Dalak & Özdinç, 2023). Peer-assisted

tutoring or language assistance often helps students gain greater confidence and understanding of accounting tasks. In addition to cultural norms, shyness and cultural norms complicate accounting coursework. In multicultural hospitality environments, language barriers consistently complicate understanding of accounting content (Kim et al., 2017). It is increasingly important to master multiple languages (Kavčič & Mihelčič, 2006), but learners are required to take initiative-whether through peer-assisted learning, self-study, or specialized resources. A linguistic approach mitigates confusion surrounding global financial standards and specialized accounting terminology (Goh & Scerri, 2016). Usage of students' non-native languages can lead to greater cognitive load and misunderstandings, highlighting the value of glossaries and targeted vocabulary sessions (Kosarkoska, 2016). Ultimately, students must take initiative to make the most of these resources, demonstrating the importance of developing strong communication skills to reduce anxiety and improve accounting performance. Using interactive technologies in the classroom, such as clickers, may encourage international students who would otherwise be hesitant to participate in class (Green & Repetti, 2015). Additionally, anxiety-related problems, such as math issues, testing difficulties, or language issues-directly affect students' classroom behavior (Chen et al., 2013). Cooperative learning, technology aids, and modern terminology adoption are crucial strategies when foreign textbooks are used and translation challenges are present (Annaraud, 2007). Ultimately, learning environments are influenced by institutional and systemic factors, but student initiative in overcoming language barriers and learning specialized vocabulary contributes significantly to success. According to Fawcett and Lockwood (2000), accounting functions as a specialized language. In international hospitality contexts, fluency in these conventions is increasingly demanded, so students must study consistently, participate actively, and develop both linguistic and technical skills. It is especially important for non-native speakers to learn specialized vocabulary to interpret and utilize financial data effectively (Kim et al., 2017).

Technology has become increasingly important to hospitality accounting, especially with digital tools facilitating budgeting, invoice tracking, and financial analysis (Repetti, 2019). While computational anxiety can deter learners, accounting-specific software and spreadsheet applications alleviate stress by linking theory directly to practical tasks (Dalak & Özdinç, 2023). Spreadsheet proficiency is particularly crucial, since managers use spreadsheets regularly to inform their decisions (Kim et al., 2017). The ability to use Excel effectively can help learners meet the demands of their industries (Calderon et al., 2018).

In spite of this recognized importance, accounting education has a varying level of integration of technology. In many classrooms, little technology is used, limiting student interaction (La Lopa et al., 2018). User-friendly software can help students overcome computer anxiety, but incrementally tackling more complex tasks can help students overcome rejection of technology and poor performance (Chen et al., 2013).

Research shows that hospitality accounting curricula are being revised to match industry demands due to technological advances (Freed, 2010). Despite the limitations of advanced methods like discounted cash flow analysis and software-based teaching, proactive students often supplement these techniques with additional resources (Jung, 2008). A high-level simulation significantly improves students' spreadsheet skills and overall analytical capabilities (Edelheim & Ueda, 2007). Students must develop technical skills to stay competitive and effectively mitigate fraud risks in financial management. Modeling spreadsheets is particularly useful for evaluating sensitivity (Kosarkoska, 2016). In fact, students engage with digital applications more frequently, which facilitates a smoother learning experience (Downey & DeVeau, 2005). Technology support varies among institutions, but proactive students often develop their own spreadsheet modeling skills, which improves their communication, cash-flow analysis, and problem-solving skills (Chen & Downing, 2006). Furthermore, hospitality students should have strong spreadsheet and IT skills for managing strategic financial planning, control and analysis (Dennington et al. 1992; Harris, 1997). Educators must help students understand how these competencies apply to real-world scenarios in order to reinforce motivation and practical relevance (Damitio & Schmidgall, 1991; Ilvento, 1984). Students who embrace technological advancements and actively refine their digital competencies will ultimately succeed academically and professionally.

3. Methodology

Structured Literature Review

This study seeks to identify and prioritize the most significant barriers preventing hospitality students from succeeding in accounting-based courses. Our research question is: Which specific barriers do hospitality students perceive as most detrimental to their performance in accounting-based units? Using four major academic databases, we identified and evaluated the body of work examining barriers to hospitality students' accounting performance: Web of Science (WOS), Google Scholar, Scopus, and ProQuest. Multiple databases are essential for minimizing publication bias (Tranfield et al., 2003). By using multiple repositories, a more balanced evidence base can be constructed, which includes grey literature as well as less-cited but methodologically sound works (Webster & Watson, 2002). A broad range of coverage enhances rigor and reliability, and also ensures that any conclusions or recommendations represent the broader scholarly discourse

(Petticrew & Roberts, 2008). A cut-off date of 1 August 2023 was used to find English-language publications containing the following key terms; "accounting education, accounting skill, hospitality, tourism, and student". A preliminary search yielded 8,841 publications. The broad set of keywords was then refined by a screening and excluding process. Following the elimination of duplicate entries (n = 532), non-English publications (n = 618) were excluded. Our next step was to remove dissertation abstracts, conference proceedings, books, book chapters, research notes, redacted works and book reviews (n = 1,634). We filtered for peer-reviewed studies that directly relate to hospitality or tourism accounting education. Peer review and editorial oversight are not always applied to these materials, which reduces their reliability and comparability (Petticrew & Roberts, 2008; Webster & Watson, 2002). Moreover, they often present partial or generalized insights without addressing how accounting intersects with hospitality/tourism education (Cooper, 1998; Tranfield et al., 2003). We can ensure methodological rigor as well as topical relevance by limiting our scope to peer-reviewed research in line with established systematic review frameworks (Kitchenham, 2004). Through inclusion of studies that meet rigorous peer review standards and are thematically focused on accounting education in the hospitality industry, the resulting insights are enhanced in robustness, relevance, and transferability. The remaining documents aligned closely with the study's methodological rigor and research objectives. This resulted in a net total of 6,057 potentially relevant publications. We manually screened titles and abstracts of the remaining studies to identify relevant research on student-focused barriers. Within the remaining 43 sample, a wide range of issues related to accounting education and hospitality or tourism student performance are explored through a variety of research methods (surveys, qualitative panels, mixed methods).

The final sample were examined by two independent coders in depth to capture the barriers hospitality students face in accounting-based courses. Thematic codes (e.g., math anxiety, linguistic challenges) were assigned to relevant segments. Disagreements between coders-for example, disagreements on which theme was represented-were resolved via joint discussion, ultimately resulting in mutually agreeable codes.

For each coder (Round 1 vs. Round 2), we calculated Cohen's kappa using SPSS. The measure of agreement across all coded themes (172 coded instances in total) was .694, SE = .055, t(171) = 9.106, p .001, which is within substantial agreement (Landis & Koch, 1977). Final codes indicate a high level of reliability, indicating that both coders followed the thematic categories consistently and accurately reflected the existing barriers.

Table 1 shows the frequency and context of each theme in 43 selected studies. The table illustrates how frequently and in what manner each obstacle is identified in existing research, such as anxiety, misconceptions, language difficulties, and limited engagement. The finalized themes represent factors affecting hospitality students' performance in accounting classes after inter-rater reliability and coding discrepancies were resolved. Throughout these themes, linguistic, psychological, and engagement challenges play an important role. These themes are described below with illustrative references.

Table 1: Identified Themes in Sample Studies

Theme 1: Barriers to Student Engagement:	La Lopa et al., (2018); Goh & Scerri (2016); Ma et al., (2016); Tung & King (2016); Hertzman et al., (2015); Green & Repetti (2015); Dalak & Özdinç (2023); Chen et al., (2013); Zwaal & Otting (2013); Jung (2008); Edelheim & Ueda (2007); Kosarkoska (2016); Chen & Downing (2006); Downey & DeVeau (2005); Lee et al., (2004); Fawcett & Lockwood (2000); Harris & Brown (1998); Repetti (2019); Harris (1997); Damitio & Schmidgall (1991); Ilvento (1984); Bello et al., (2019); Mbumbo et al., (2019); Zopiatis et al., (2019); Calderon et al., (2018)	Students face a number of cognitive obstacles, negative preconceptions, and peer influences that can hinder their motivation and self-confidence. Often, coursework's tangible value is obscured by the gap between academic education and real-world application. As a result, students may feel disconnected from their foundational concepts and view them as irrelevant to their future careers. Unsupervised self-study can result in students losing sight of the importance of financial acumen for hospitality jobs when they become overconfident in their accounting abilities. A series of misconceptions about hospitality business, such as underestimating accounting's role in career advancement or isolating it from core industry activities, also reinforce this detachment.
Theme 2: Absence of Pre-to-Post Classroom Engagement	Situmeang & Latuamury (2023); La Lopa et al., (2018); Goh & Scerri (2016); Ma et al., (2016); Hertzman et al., (2015); Green & Repetti (2015); Dalak & Özdinç (2023); Chen et al., (2013); Zwaal & Otting (2013); Baldarelli (2012); Hein &	Both in and out of the classroom, students are not actively engaged, specifically through individual research, peer-assisted learning, and group participation. The underutilization of industry-relevant educational resources is also evident, which is critical to the practical application of theoretical constructs in

and Preparation:	Riegel (2011); Edelheim & Ueda (2007); Downey & DeVeau (2005); Fawcett & Lockwood (2000); Harris (1997); Ilvento (1984); Bello et al., (2019); Zopiatis et al., (2019); Kim & Schmidgall (2019)	hospitality accounting. This gap is further exacerbated by lack of initiative in using self-assessment tools, participating in field trips, and participating in simulations. As a result of inadequate preparation and supplementary effort, students might perform suboptimally in the classroom.
Theme 3: Not Mastering the Terminology of the Course:	Annaraud (2007); Goh & Scerri (2016); Chen et al., (2013); Fawcett & Lockwood (2000)	Accounting's complex vocabulary and specialized terms are the primary causes of language barriers. Even a native speaker may struggle with finance-oriented terminology. In turn, this can lead to increased anxiety and diminished confidence, which discourages students from engaging fully in discussions.
Theme 4: Foreign Language Education:	Ayoun & Palakurthi (2008); Annaraud (2007); Dalak & Özdinç (2023); Bello et al., (2019); Goh & Scerri (2016); Green & Repetti (2015); Chen et al., (2013);	Linguistic complexity increases for those who study a foreign language or do not speak it natively. While learning technical accounting terms, learners must also assimilate information presented in another language. Students may have difficulty following lectures, comprehending reading assignments, and expressing analytical insights due to misunderstandings. The combined language barriers create a substantial learning bottleneck, preventing students from engaging in classroom dialogue, collaborative projects, and practical exercises that are crucial to mastering hospitality accounting fundamentals.
Theme 5: Challenges in Technological Proficiency:	La Lopa et al., (2018); Green & Repetti (2015); Dalak & Özdinç (2023); Chen et al., (2013); Edelheim & Ueda (2007); Kosarkoska (2016); Chen & Downing (2006); Downey & DeVeau (2005)	Mastery of data is essential in today's financial world due to sophisticated analytics. Without specialized training and experience, these tools can be challenging. Many students struggle to harness these digital utilities effectively and confidently, putting them at a disadvantage.

Source: Elaborated by Authors

Fuzzy AHP

The fuzzy based analytic hierarchy process (fuzzy-AHP) is one of the multi criteria decision making method to find the weights of the criteria by taking into consideration the linguistic preferences through using the pairwise comparison scale. In this method, the linguistic preferences are converted to quantitative terms using fuzzy triangular numbers.

There are many different approaches proposed to fuzzy AHP for these applications. This study applies Chang's (1992) extent analysis method to weights of factors affecting student performance. In criteria affects student performance problem, let $X = \{x_1, x_2, x_3, x_4, ..., x_n\}$ represent an object set and let $U = \{u_1, u_2, u_3, u_4, ..., u_m\}$ represent the a goal set.

Based on the method of Chang's (1992) extent analysis, each object is taken and extent analysis for each goal, g_i, is performed respectively. Therefore, *m extent analysis values* for each object can be obtained, with the following signs,

$$M_{gi}^1, M_{gi}^2, M_{gi}^3, M_{gi}^4, \dots, M_{gi,}^m \ (1)$$

where g_i is the goal set $(i = 1, 2, 3, 4, \dots n)$ and where all the M_{gi}^j $(j = 1, 2, 3, 4, \dots m)$ are Triangular Fuzzy Numbers (TFNs). The steps of Chang's analysis can be given as in the following (Kahraman, et al, 2004):

Step 1: The value of fuzzy synthetic (S_i) extent with respect to the i^{th}object is defined as equation (2);

$$S_i = \sum_{j=1}^{m} M_{gi}^j \otimes \left[\sum_{i=1}^{n} \sum_{j=1}^{m} M_{gi}^j\right]^{-1} \ (2)$$

To obtain first part of equation (2) ($\sum_{j=1}^{m} M_{gi}^{j}$), perform the fuzzy addition operation of m extent analysis values for a particular matrix such that;

$$\sum_{j=1}^{m} M_{gi}^{j} = \left(\sum_{j=1}^{m} l_j, \sum_{j=1}^{m} m_j, \sum_{j=1}^{m} u_j \right)$$

$$where\ l\ is\ the\ lower, u\ is\ the\ upper\ limit\ and\ m\ is\ the\ most\ promising\ value \quad (3)$$

To obtain second part of equation (2) ($\left[\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j}\right]^{-1}$), perform the fuzzy addition operation of $M_{gi}^{j}(j = 1, 2, 3, 4, \ldots m)$ values give as equation (4);

$$\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j} = \left(\sum_{i=1}^{n} l_i, \sum_{i=1}^{n} m_i, \sum_{i=1}^{n} u_i \right) \quad (4)$$

and then compute the inverse of the vector in equation (4), then equation (5) is obtained;

$$\left[\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j}\right]^{-1} = \left(\frac{1}{\sum_{i=1}^{n} u_i}, \frac{1}{\sum_{i=1}^{n} m_i}, \frac{1}{\sum_{i=1}^{n} l_i} \right) \quad (5)$$

Step 2: The degree of possibility of $M_2 = (l_2, m_2, u_2) \geq M_1 = (l_1, m_1, u_1)$ is defined as equation (6);

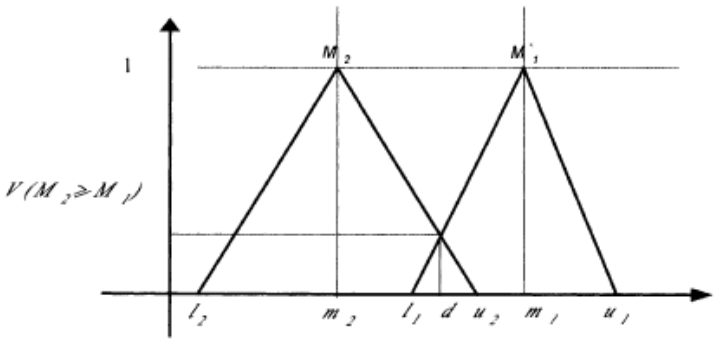
$$V\ (M_2 \geq M_1) = \sup_{y \geq x} \left[\min\left(\mu_{M1}\ (x), \mu_{M2}\ (y) \right) \right] \quad (6)$$

Equation 6 expression can be equivalently expressed as follows;

$$V\ (M_2 \geq M_1) = \begin{cases} 1, & if\ m_2 \geq m_1, \\ 0, & if\ l_1 \geq u_2, \\ \dfrac{l_1 - u_2}{(m_2 - u_2) - (m_1 - l_1)} & otherwise \end{cases} \quad (7)$$

where d is the ordinate of the highest intersection point D between μ_{M1} and μ_{M2} **(see Figure 1)**

Figure 1: Intersection between M_1 and M_2 **(Zhu, Jing, & Chang, 1999)**



$V\ (M_2 \geq M_1)$ and $V\ (M_1 \geq M_2)$ values are required to compare M_1 and M_2;

Step 3: The degree possibility for a convex fuzzy number to be greater than k convex fuzzy numbers $M_i(i = 1, 2, 3, 4, \ldots k)$ can be defined by

$$V\ (M \geq M_1, M_2, M_3, M_4, \ldots M_k) = V[(M \geq M_1)\ and\ (M \geq M_2)\ and \ldots and\ (M \geq M_k)] = minV(M \geq M_i), i = 1, 2, 3, 4, \ldots k. \quad (8)$$

Assume that,

$$d'(A_i) = \min V\,(S_i \geq S_k)\ (9)$$

For $k = 1, 2, 3, 4, \ldots n; k \neq i$. After that, the weight vector is given by equation 10;

$$W' = \left(d'(A_1), d'(A_2), d'(A_3), d'(A_4), \ldots d'(A_n)\right)^T\ (10)$$

Where $A_i (i = 1, 2, 3, 4, \ldots n)$ are n elements.

Step 4: Via normalization, the normalized weight vectors are given as

$$W = \left(d(A_1), d(A_2), d(A_3), d(A_4), \ldots d(A_n)\right)^T\ (11)$$

Where W is a nonfuzzy number.

4. Fuzzy AHP Application (Comparison of five factors affecting student performance)

It is essential to take an informed and unbiased decision for managers must take into account the potential implications of each alternative. The decision-making process becomes more challenging when there are several criteria to consider. So that, managers often use a method called multi-criteria decision method (MCDM) to prioritize different criteria (Pan, 2008; Sun, 2010). In MCDM, each criterion is assigned a weight in accordance with its importance, and each alternative is evaluated against the weighted criteria. It is possible for experts to make an informed decision by systematically comparing the alternatives (Saaty & Vargas, 2001; Vaidya & Kumar, 2006). It is possible to use a variety of methods, such as the Analytic Hierarchy Process (AHP) (Saaty, 1980), the MOORA (Multi-Objective Optimization on the basis of Ratio Analysis) (Brauers, & Zavadskas, 2006), the ELECTRE (Elimination Et Choix Traduisant la Realité) (Figueira et al., 2005), and the MACBETH (Measuring Attractiveness by a Categorical Based Evaluation Technique) (Bana e Costa & Oliveira, 2012) among others. Among them, Saaty's AHP has been extensively applied to the evaluation of complex multi-criteria alternatives in a variety of fields (Al-Harbi, 2001; Tam,& Tummala, 2001; Podvezko, 2009; Bruno et al., 2012; Darko et al., 2019; Šostar & Ristanović, 2023).

However, AHP requires pairwise comparisons and crisp judgments (Saaty, 1980). As a consequence of the complexity and uncertainty involved in real-life decision problems, experts have difficulties in making crisp comparisons. Fuzzy AHP integrates fuzzy logic with the traditional AHP method to handle the uncertainty and vagueness in decision-making (Chan & Kumar, 2007). Instead of using precise numerical values for pairwise comparisons, fuzzy AHP allows decision makers to use ranges or linguistic terms to express their preferences. Moreover, this methodology applies various sectors such as Kahraman, Cebeci, and Ruan (2004) use fuzzy AHP procedure to find the best catering company that provides the most customer satisfaction, whereas Pan (2008) uses FAHP for determining an appropriate construction method to ensure successful bridge construction projects.

Furthermore, accounting sectors use fuzzy ahp, for examples Bayou and his colleagues (2007) have used FAHP to determine the best mechanism for establishing standards for accounting and auditing, whereas Shaverdi et al. (2014) assess the financial performance of the Iranian petrochemical industry using a fuzzy AHP approach. In addition that, some researchers use FAHP methodology to evaluate performance of students (Onay et al., 2016; Ajoi et al., 2021).

This paper aims to determine which factor most impacts tourism students' accounting performance. Therefore, fuzzy AHP is chosen to determine weights for the criteria. By integrating fuzzy logic into AHP, this study can capture students' perceptions systematically, which allows the researchers to develop more accurate and action-oriented interventions. First part of the article revealed 5 criteria affecting student performance through reviewing systematic literature. These criteria and codes of them can be seen in Table 2.

Table 2: Criteria Codes and Names

Criterion Code	Criterion Name
C1	Psychological Factors
C2	Absence of Pre-to-Post Classroom Engagement and Preparation
C3	Not mastering the terminology of the course
C4	Foreign Education Language
C5	Challenges in Technological Proficiency

Source: Elaborated by Authors

In order to determine the importance levels of the criteria, pair-wise comparison questions have been constructed after the criteria have been determined. This survey was completed by 38 students who took and completed the course "Financial Accounting". In the study, 38 undergraduate students were enrolled in the Tourism Management Department within the Faculty of Business at Dokuz Eylül University in İzmir, Türkiye. During the academic year 2023–2024, all participants successfully completed the accounting course. Throughout the course, the International Financial Reporting

Standards (IFRS)-based curriculum used in the faculty's English-medium track was entirely presented in English. The participants were in their third year of study, which corresponds to the time when students are required to complete core accounting and finance modules. Throughout earlier coursework, all students had been exposed to introductory accounting concepts, ensuring a consistent baseline of accounting literacy for the fuzzy-AHP pairwise comparison. Since the language of instruction was English for a cohort of non-native English speakers, language proficiency was considered a legitimate analytical factor. Therefore, the "Foreign Language Education" factor reflects the real-world challenges these students face in learning accounting through a foreign language. To make the pair-wise comparisons between criteria, linguistic variables are used in the question form. In Table 3, we can see these linguistic variables and their corresponding triangular fuzzy numbers.

Table 3: The linguistic variables and fuzzy numbers.

Linguistic Variables	Fuzzy Numbers
Absolute	(7/2, 4, 9/2)
Very strong	(5/2, 3, 7/2)
Fairly Strong	(3/2, 2, 5/2)
Weak	(2/3, 1, 3/2)
Equal	(1, 1, 1)

Source: Kahraman, Cebeci, & Ulukan (2003)

After that, 38 student answers were consolidated using the Fuzzy Geometric Mean method to establish a single, representative group decision matrix. As a result, the analysis adheres to the principle of group decision making inherent to the FAHP methodology, ensuring a unified consensus. Consolidated Fuzzy Pairwise Comparison Matrix is shown in Table 4.

Table 4: Consolidated Fuzzy Pairwise Comparison Matrix with Respect to The Goal

Criterion Code	C1			C2			C3			C4			C5		
C1	1,00	1,00	1,00	0,72	0,89	1,09	0,58	0,70	0,86	0,52	0,63	0,78	1,19	1,51	1,91
C2	0,92	1,13	1,38	1,00	1,00	1,00	1,04	1,26	1,52	0,78	0,95	1,15	1,58	1,99	2,46
C3	1,16	1,42	1,72	0,66	0,79	0,96	1,00	1,00	1,00	0,80	0,95	1,12	1,50	1,86	2,26
C4	1,29	1,58	1,91	0,87	1,06	1,29	0,90	1,06	1,25	1,00	1,00	1,00	1,71	2,08	2,48
C5	0,52	0,66	0,84	0,41	0,50	0,63	0,44	0,54	0,67	0,40	0,48	0,58	1,00	1,00	1,00

Source: Elaborated by Authors

The first step of the Fuzyy AHP is to a fuzzy synthetic extent value calculation, thus we used equation (2) to find out the fuzzy synthetic extent value of five criteria.

$$S_{C1} = (4.01;\ 4.73;\ 5.63) \otimes \left(\frac{1}{22.98}; \frac{1}{27.04}; \frac{1}{31.87}\right) = (0.13; 0.18; 0.25)$$

$$S_{C2} = (5.32;\ 6.33;\ 7.52) \otimes \left(\frac{1}{22.98}; \frac{1}{27.04}; \frac{1}{31.87}\right) = (0.17; 0.23;\ 0.33)$$

$$S_{C3} = (5.12;\ 6.02;\ 7.06) \otimes \left(\frac{1}{22.98}; \frac{1}{27.04}; \frac{1}{31.87}\right) = (0.16; 0.22;\ 0.31)$$

$$S_{C4} = (5.76;\ 6.77;\ 7.93) \otimes \left(\frac{1}{22.98}; \frac{1}{27.04}; \frac{1}{31.87}\right) = (0.18; 0.25;\ 0.35)$$

$$S_{C5} = (2.77;\ 3.18;\ 3.73) \otimes \left(\frac{1}{22.98}; \frac{1}{27.04}; \frac{1}{31.87}\right) = (0.09; 0.12;\ 0.16)$$

The degree of possibility of Si over Si (i – j) was determined by using Eqs. (7).

$$V\ (S_{c1} \geq S_{c2}) = 0.57, V\ (S_{c1} \geq S_{c3}) = 0.64, V\ (S_{c1} \geq S_{c4}) = 0.46, V\ (S_{c1} \geq S_{c5}) = 1$$

$$V\ (S_{c2} \geq S_{c1}) = 1, V\ (S_{c2} \geq S_{c3}) = 1, V\ (S_{c2} \geq S_{c4}) = 0.90, V\ (S_{c2} \geq S_{c5}) = 1$$

$$V\ (S_{c3} \geq S_{c1}) = 1, V\ (S_{c3} \geq S_{c2}) = 0.92, V\ (S_{c3} \geq S_{c4}) = 0.82, V\ (S_{c3} \geq S_{c5}) = 1$$

$$V\ (S_{c4} \geq S_{c1}) = 1, V\ (S_{c4} \geq S_{c2}) = 1, V\ (S_{c4} \geq S_{c3}) = 1, V\ (S_{c4} \geq S_{c5}) = 1$$

$$V\ (S_{c5} \geq S_{c1}) = 0.39, V\ (S_{c5} \geq S_{c2}) = 0, V\ (S_{c5} \geq S_{c3}) = 0.02, V\ (S_{c5} \geq S_{c4}) = 0$$

Based on equation (9), the minimum degree of possibility was determined as follows:

$$d'(C_1) = min\ (0.57; 0.64; 0.46;\ 1) = 0.46$$

$$d'(C_2) = min\ (1;\ 1;\ 0.90;\ 1) = 0.90$$

$$d'(C_3) = min\ (1;\ 0.92;\ 0.82;\ 1) = 0.82$$

$$d'(C_4) = min\ (1;\ 1;\ 1;\ 1) = 1$$

$$d'(C_5) = min\ (0.39;\ 0;\ 0.02;\ 0) = 0$$

Therefore the weight vector was given as $W' = (0.46;\ 0.90;\ 0.82;\ 1;\ 0)$.

As a last step; we applied the normalization process and the normalized weight vectors of the 5 criteria were found to be:

$$W_{GOAL} = (0.14;\ 0.28;\ 0.26;\ 0.31;\ 0\ )^{T}$$

The priority weights for the criteria were found to be (0.14; 0.28; 0.26; 0.31; 0). The final score shows that "Foreign Language Education" is the most important factor that impacts tourism student performance when learning accounting. Moreover, the second biggest problem in learning is the lack of prior preparation and engagement. In third and fourth place, respectively, are "Not mastering the course terminology" and "Psychological Factors". “Challenges in Technological Proficiency” has no impact on the learning process.

4.1. Consistency and Sensitivity Analysis of the Fuzzy AHP Application

By demonstrating that the combined opinions are valid and unambiguous, consistency analysis is fundamental to validating students’ judgments. Moreover, the sensitivity Analysis tests the robustness and stability of the final priority ranking.

To perform the Consistency Analysis, the Consolidated Fuzzy Pairwise Comparison Matrix (Table 4) was defuzzed using the Weighted Averaging Method (Wang et al.., 2008). Equation (12) gives the formula used for this transformation.

$$\text{Crisp Value}\ (a_{ij}) = \frac{l_{ij}+2m_{ij}+u_{ij}}{4} \quad (12)$$

Table 5: Defuzzified Crisp Pairwise Comparison Matrix (A′)

Criterion Code	C1				C2				C3				C4				C5			
C1	1,00	0,90	0,71	0,64	1,53	1,00	0,90	0,71	0,64	1,53	1,00	0,90	0,71	0,64	1,53					
C2	1,14	1,00	1,27	0,95	2,01	1,14	1,00	1,27	0,95	2,01	1,14	1,00	1,27	0,95	2,01					
C3	1,43	0,80	1,00	0,95	1,87	1,43	0,80	1,00	0,95	1,87	1,43	0,80	1,00	0,95	1,87					
C4	1,59	1,07	1,06	1,00	2,09	1,59	1,07	1,06	1,00	2,09	1,59	1,07	1,06	1,00	2,09					
C5	0,67	0,51	0,55	0,49	1,00	0,67	0,51	0,55	0,49	1,00	0,67	0,51	0,55	0,49	1,00					

Source: Elaborated by Authors

After defuzzing the Consolidated Fuzzy Matrix (A′), the Consistency Ratio (CR) was calculated using the standard Eigenvalue Method of the AHP. The Consistency Index (CI) was then computed using the standard formula (Equation 13).

$$\text{CI} = \frac{\lambda_{max}-n}{n-1} \quad (13)$$

The Eigenvalue Method applied to the defuzzified matrix yielded a maximum eigenvalue of λ_{max}≈5.176. Using this value, the CI was calculated as follows;

$$\text{CI} = \frac{5.176-5}{5-1} \approx 0.044$$

Subsequently, the Consistency Ratio (CR) was determined by dividing the calculated CI by the corresponding RI value for n=5;

$$\text{CR} = \frac{0.044}{1.12} \approx 0.039$$

As a result, the calculated CR falls below the generally accepted threshold of 0.10. Thus, the aggregated judgments of the group are highly consistent and reliable, confirming the validity of using priority weights as a decision-making framework.

Furthermore, a comprehensive sensitivity analysis was performed to ensure that the obtained results were robust and stable. The importance of this step lies in ensuring that the final ranking is not heavily influenced by the fluctuations or uncertainties in the initial fuzzy comparison values. The analysis focuses on varying the weight of the most critical factor,

(C4: Foreign Language Education, weight is 0.3145), to identify the threshold at which the established criterion ranking is destabilized.

In the analysis, the top-ranked criterion, C4, is incrementally decreased and increased, then re-normalized to maintain a total weight of 1 for all remaining weights. Additionally, a symmetric sensitivity test was conducted to assess how a 10% change in C4 weight impacts the weights of the remaining criteria. Furthermore, the critical point at which the established ranking structure collapses was simulated and analyzed. The purpose of this test is to further verify the resilience of the overall preference structure. Table 6 presents the base case and three simulation scenarios.

Table 6: Sensitivity Analysis of Criterion C4

Scenario	Change in Weight of C4	New Weight of C4	Rank Order	Model Stability
Baseline	0% (Reference)	0.3145	C4>C2>C3>C1>C5	Stable
Scenario A	10% Decrease	0.2831	C4>C2>C3>C1>C5	Ranking Maintained
Scenario B	10% Increase	0.3459	C4>C2>C3>C1>C5	Ranking Maintained
Scenario C	20.5% Decrease	0.2500	C2>C4>C3>C1>C5	Ranking Shift

Source: Elaborated by Authors

It is confirmed by scenarios A and B that a ±10% fluctuation in the weight of the leading criterion (C4) will not alter the established priority rankings. In Scenario C, the critical point is identified and the model remains stable only until the weight of C4 is reduced by roughly 20.5% (weight of C4=0.2500).As a result of this robust threshold, the group decision framework is highly resilient to moderate uncertainty.

5. Findings and Discussion

According to the fuzzy-AHP results, hospitality students perceive the factors that influence their performance in accounting-based courses in a structured manner. The final normalized weights for the five criteria were as follows: Foreign Language Education (C4 = 0.31), Absence of Pre-to-Post Classroom Engagement and Preparation (C2 = 0.28), Not Mastering the Terminology of the Course (C3 = 0.26), Psychological Factors (C1 = 0.14), and Challenges in Technological Proficiency (C5 = 0.00). According to these results, linguistic and engagement barriers account for more than half of the total weight, indicating their importance in influencing student learning. In contrast, the zero weight for technological proficiency confirms that digital competence is not a differentiator for this cohort. Study findings indicate that certain obstacles, especially foreign language challenges and lack of engagement, significantly hinder hospitality students' performance when learning accounting. While technological proficiency was tested in the analysis, the results indicated that there was no measurable impact of this factor on student performance. Therefore, the fuzzy AHP results indicate that student success in accounting-based units is primarily dependent on language support, continuous engagement with course materials, explicit terminology training, and anxiety-relieving pedagogy. These findings directly address our first research question, which identifies specific barriers hospitality students themselves consider problematic. Our second research question, how educators and administrators can overcome these barriers, is discussed in the later sections. Our roadmap for more targeted and evidence-based interventions synthesizes prior scholarship with our own results.

The ranking reveals a clear hierarchy of obstacles affecting learning outcomes. Language-related and engagement-related factors dominate the structure of perceived barriers, accounting for most of its weight. Despite the presence of terminology issues and psychological factors, they play a supporting role in shaping comprehension and confidence. According to these patterns, external, communication-centered difficulties outweigh internal or technological concerns in determining accounting achievement. These results demonstrate that foreign language education greatly influences student outcomes. It appears that language barriers can pose a significant challenge for a significant portion of learners, especially in accounting classes taught in foreign languages, despite language barriers being recognized in hospitality accounting education literature for some time (Goh & Scerri, 2016; Bello et al., 2019). Similarly, Dalak and Özdinç (2023) observed that students with dense, specialized vocabulary often struggle to translate course materials while grasping complex concepts. Several authors (Annaraud, 2007; Ayoun & Palakurthi, 2008; Kim et al., 2017) agree that non-native English speakers in hospitality programs must simultaneously learn financial reporting language and accounting theory. Students may fall behind in class discussions and lectures if instructors speak rapidly or use advanced jargon. Anxiety levels are further compounded if individuals are confident in their interpersonal abilities, but less confident in their technical abilities.

Language-Related Barriers: Considering the linguistic challenges, hospitality programs should prioritize early language assessment and supplementary accounting vocabulary support. Furthermore, Goh and Scerri (2016) argue that discipline-specific terms need to be understood just as much as basic fluency. Providing learners with steppingstones for deeper engagement (i.e., beginning with simple readings before moving to more challenging finance studies) can reduce fear of misunderstandings through bilingual glossaries and aligned reading lists. In Dalak and Özdinç (2023), advanced bilingual students help classmates with linguistic and conceptual difficulties using peer tutoring (peer-assisted learning). Formal

translations and interpretations may be useful in some contexts, but not when the translator lacks specialized accounting knowledge. In such a case, academic language support, like "English for Specific Purposes", is essential for specialized courses. These adjustments reflect a better understanding of language proficiency as a prerequisite for academic success in accounting and career excellence in the global hospitality sector.

Engagement and Learning Behavior: The second major takeaway is the importance of ongoing engagement before and after class, which predicts whether students fully grasp accounting principles. Fast-paced coursework in hospitality programs can lead to surface-level learning (Goh & Scerri, 2016; Ma et al., 2016). Overwhelmed by concepts, exercises, and readings, students may focus only on exam preparation. It is not enough to memorize the rules of accounting; students need to practice problems, study real-life cases, and reflect on their performance to improve their analytical skills (Chen et al., 2013). In real-world hospitality operations, Fawcett and Lockwood (2000) argue that it is not enough to memorize ratio definitions or cost-flow assumptions, but also to understand how these details are interpreted in budgeting, controlling, and forecasting. In light of this, the literature strongly suggests that students should study continuously, with pre-class readings, reviews after each class session, peer discussions, and problem-solving exercises that reinforce learning incrementally.

A number of studies have studied why students fail to maintain an ongoing learning routine. Many students believe that "accounting is just arithmetic" and that memorizing formulas the night before an exam is enough (Kosarkoska, 2016). Others attribute this "lack of engagement" to hospitality being primarily a people-oriented field (Repetti, 2019). Therefore, our study's findings that pre- and post-classroom involvement are a key barrier parallel existing criticism of lecture-based learning. A passive format deprives students of hands-on learning while allowing them to continue with surface strategies. Green and Repetti (2015) and Dalak and Özdinç (2023) highlight the benefits of clickers, gamified quizzes (gamified learning), and online forums. By using these tools, students can gain incremental knowledge between sessions by tackling small, frequent tasks. Students can also be held accountable through flipped classrooms or structured group work (Zwaal & Otting, 2013; Ma et al., 2016; Griffin, 2021). The combination of these strategies shows that students can develop and retain accounting skills through reflective journals, structured online discussions, and peer-assisted learning.

Terminology Mastery and Conceptual Understanding: Among these language and engagement barriers is the issue of terminology mastery. Language issues affect students' ability to comprehend linguistic media, and accounting jargon complicates matters. Many accounting terms require conceptual understanding rather than linguistic understanding, such as depreciation, amortization, revenue recognition, and cost of goods sold (Fawcett & Lockwood, 2000). Due to subtle differences between foreign language finance vocabularies or even multiple synonyms in English textbooks, international students often find these terms confusing. Basic terminology can lead to misinterpretation of problem-solving instructions, report Mbumbo et al. (2019). The results of this study support earlier research (Goh & Scerri, 2016; Situmeang & Latuamury, 2023) that students' math difficulties are frequently rooted in misunderstandings.

It is recommended by Kosarkoska (2016) and Chen et al. (2013) to implement accounting glossaries early in the accounting class. This resource provides concise, context-driven explanations of hospitality terms, showing how they apply to typical hospitality scenarios (for example, how inventory valuation differs in restaurants versus retail). A second strategy is to schedule periodic "terminology checkpoints," where key vocabulary and concepts are revisited and clarified. Teachers can integrate clarifications into the course to promote language mastery and help students ask questions before exams instead of keeping them for an optional "extra help" session. The repeated exposure, conceptual illustrations, bilingual or simplified references can help students become comfortable with new terms, ultimately boosting their confidence and willingness to use those terms in projects, internships, and the workplace.

Psychological Factors: A number of psychological obstacles have also been identified, such as anxiety, poor self-efficacy, and the perception that accounting is "too technical" for hospitality students. These factors rank lower than foreign language or engagement barriers, indicating that external learning conditions are more important than purely internal motivation or affect. Despite this, there is substantial literature demonstrating that psychological barriers can exacerbate other obstacles in hospitality programs (Chen et al., 2013; Goh & Scerri, 2016). Students who struggle with new terminology may feel more anxious, which further reduces their willingness to participate and ask questions. Eventually, avoidance takes hold due to this cyclical effect. A student's negative self-perception can quickly snowball if they receive poor grades or little personal feedback. Nevertheless, psychological issues deserve attention, even though our study's respondents ranked them as the least influential factor.

Interventions usually aim to reshape the learning environment and demonstrate learning appreciation. Simulations, role-plays (active learning methods), and field trips to hospitality firms can help students understand the connection between cost accounting and revenue management, according to Dalak and Özdinç (2023). By learning accounting is not just a "math puzzle" but a strategic tool directly impacting hotel profitability and restaurant inventory management, learners are encouraged to reevaluate their attitudes toward a subject that used to cause them anxiety. Interactive techniques, short group discussions, problem-based learning, or even game-like challenges shift the mindset from "I must avoid mistakes"

to "I will explore and learn collaboratively." According to Zwaal and Otting (2013), participatory teaching methods are particularly beneficial for accounting, finance, and quantitative analysis courses. By providing supportive feedback and keeping communication open, instructors can help students address their fears earlier rather than accumulate negative emotions over time.

Technological Proficiency: There was no measurable impact of technological proficiency on accounting performance (normalized weight = 0). While earlier studies emphasized the growing importance of digital skills in hospitality accounting (Kim & Schmidgall, 2019; Freed, 2010), our participants demonstrated sufficient technological familiarity such that digital competency no longer served as a differentiating variable. As a result, although technology remains essential in professional settings, it did not appear to be a barrier to this cohort's learning. Green and Repetti (2015) and Edelheim and Ueda (2007) similarly observed that when students already possess basic computer and spreadsheet literacy, technology ceases to be a limiting factor in accounting comprehension. Thus, the results of our respondents are likely to reflect a generational familiarity with digital tools rather than a lack of relevance in the broader curriculum (Smith, 2021).

Nevertheless, it is important to keep in mind that not all institutions or student populations are the same. For older learners and some regions, there are still significant technological gaps (Chen & Downing, 2006). Educators should assess students' technical skills early in the semester, especially when advanced software or data-analysis assignments are required. It is important to identify and support students who have difficulties with technology in order to prevent it from becoming a hidden problem.

Based on these five overarching criteria, foreign language education, continuous engagement, terminology mastery, psychological factors, and technological proficiency, the study presents a broader argument regarding hospitality accounting education. According to this study, the first four factors had a measurable impact on student performance, whereas technological proficiency had no significant impact on student performance. Despite the fact that language challenges can undermine even the most motivated student, and that consistent engagement is essential for meaningful learning, these challenges are often interconnected. As a result of language anxiety, students are less likely to participate in extracurricular activities, and a lack of foundational vocabulary knowledge can cause students to feel anxious and self-conscious. An effective intervention can reinforce the effectiveness of the other: well-designed group exercises (collaborative learning activities) increase participation, ease anxiety and allow students to internalize key terminology at the same time. Despite the fact that technology itself did not serve as a barrier, it remains a valuable pedagogical tool for integrating theoretical accounting concepts into hospitality environments. Based on these findings, curriculum designers should integrate scaffolded bilingual glossaries, continuous assessment mechanisms, and anxiety-reducing feedback structures into their curriculums. It is possible to sustain engagement and bridge theoretical and operational gaps by incorporating micro-tasks, reflective learning logs, and short accounting simulations. Accordingly, the fuzzy-AHP results demonstrate that hospitality students' challenges in accounting are primarily a result of their poor linguistic and engagement skills. In comparison with psychological factors or technological proficiency, these external, skill-based barriers exert a significantly greater influence. Educators can prioritize targeted interventions by recognizing this hierarchy, aligning curriculum design with students' actual learning requirements.

Education and administration must look beyond ad hoc and one-dimensional measures to translate these insights into action. "Study harder" or "buy a dictionary" won't suffice to overcome systemic barriers. Rather, institutions should implement comprehensive support models, assessing prospective students' language skills in light of accounting's specialized requirements (Khan, 2021). Hospitality students might be offered bridging courses or early language modules relevant to their discipline. Tourism-related financial vocabulary can be taught through partnerships between language centers, business faculties, and hospitality management schools (Yang & Ren, 2021). Increasing pre- and post-class engagement can be achieved by designing course schedules that include frequent low-stakes quizzes and group presentations that reward consistent effort rather than last-minute cramming. Staff training can also address psychological hurdles by identifying anxious students, establishing peer-assisted learning networks, and integrating problem-based projects that build students' confidence.

The findings of this study contribute to the broader literature on student-centered learning in hospitality settings. Language skills, self-efficacy, and contextual engagement can either stagnate or spiral into positive learning momentum. Accounting cannot be treated as a "specialist elective" in the hospitality industry due to the increasing emphasis on financial acumen, embedding tasks like budgeting, revenue management, forecasting, and cost control into virtually every position. It is a more fundamental skill set than marketing strategy. Through language support, tutorials, and experiential opportunities that highlight accounting's relevance, curriculum designers can ensure it is woven consistently throughout the hospitality program. This approach is informed by these interlocking barriers. Experiencing field-based learning, which enables students to track real financial data in hotels, resorts, and event management operations, can be particularly impactful (Kim & Jeong, 2021).

Although we discuss specific interventions, any reform will only succeed if faculty and administration are committed. Some instructors may find the idea of a lecture format change unsettling. There might be concern over overloading already limited budgets with bilingual resources. But ignoring the evidence could negatively impact graduate readiness and student satisfaction (Hertzman et al., 2015). Institutions can better justify investing in robust, integrated strategies by identifying these barriers as critical drivers of academic underperformance, student disengagement, and career underdevelopment. These include faculty professional development, language center collaboration, and classroom technologies that support low anxiety, continuous learning. Accordingly, the fuzzy-AHP results suggest that linguistic and behavioral engagement variables, rather than technological or purely psychological factors, are responsible for learning disparities in hospitality accounting. Students' perceptions of accounting can be transformed from obligatory coursework into applied professional competence by providing targeted language support and iterative learning design. Overall, the analysis provides a coherent and evidence-based explanation of why hospitality students struggle with accounting and how structured interventions may be used to overcome those weaknesses.

6. Conclusion

The purpose of this study is to provide a comprehensive and data-driven understanding of the obstacles affecting the performance of hospitality students in accounting-based courses. As a result of the fuzzy-AHP approach, the research quantified the relative significance of five major barriers, revealing that language proficiency and classroom engagement exert the greatest influence, followed by terminology mastery and psychological factors. By contrast, technological proficiency did not have any measurable impact on academic performance, suggesting that modern students possess adequate levels of digital literacy to meet current academic demands.

The findings of this study contribute to the literature by moving beyond descriptive analyses and providing a quantifiable assessment of the factors that shape accounting learning outcomes in hospitality education. By emphasizing the dominance of linguistic and engagement barriers, the study emphasizes the necessity for pedagogical reform to focus on communication, interaction, and confidence-building rather than technological supplements alone. A practical framework for redesigning curricula around students' lived experiences and performance realities is provided by this empirical hierarchy.

From a pedagogical perspective, the findings recommend that structured language support be embedded within accounting coursework, continuous formative assessments be conducted, and the use of interactive methods be incorporated to sustain motivation beyond the classroom setting. In order to bridge the gap between theoretical accounting principles and operational hospitality contexts, strategies such as bilingual glossaries, collaborative projects, and reflective learning exercises can be used. Participation and self-efficacy can be further enhanced through peer-assisted learning and inclusive feedback.

In the future, longitudinal or mixed-method designs should be used to evaluate the long-term effectiveness of such interventions and to determine whether they can be applied to other international hospitality programs. Furthermore, emerging digital learning environments and AI-driven tutoring systems should be examined as complementary tools that enhance conceptual understanding rather than substituting for engagement and language development. The study concludes by demonstrating that enhancing language competence and engagement practices can transform accounting education from a perceived barrier to an empowering professional development tool. By aligning teaching strategies with the prioritized barriers identified here, institutions are able to produce graduates who possess both technical accounting knowledge and the analytical and communicative skills required by the global hospitality industry.

References

Ajoi, T. A., Sinatra Gran, S., Kanyan, A., & Lajim, S. F. (2021). An enhanced systematic student performance evaluation based on fuzzy logic approach for selection of best student award. *Asian Journal of University Education*, 16(4), 10. https://doi.org/10.24191/ajue.v16i4.11932

Al-Harbi, K. M. A. (2001). Application of the AHP in project management. *International Journal of Project Management*, 19(1), 19-27. https://doi.org/10.1016/s0263-7863(99)00038-1

Annaraud, K. (2007). Accounting in russia: Challenges for hospitality stakeholders. *The Journal of Hospitality Financial Management*, 15(2), 1-11. https://doi.org/10.1080/10913211.2007.10653838

Ayoun, B., & Palakurthi, R. (2008). Doctoral Students in the U.S. Hospitality Programs: A Survey of their Demographic, Academic and Professional Characteristics. *Journal of Hospitality & Tourism Education*, 20(4), 6-17. https://doi.org/10.1080/10963758.2008.10696924

Baldarelli, M. (2012). New challenges in teaching accounting and reporting in tourist enterprises. *Archivio istituzionale della ricerca (Alma Mater Studiorum Università di Bologna)*. https://doi.org/10.6092/issn.2036-5195/3467

Bana e Costa, C. A., & Oliveira, M. D. (2012). A multicriteria decision analysis model for faculty evaluation. *Omega*, 40(4), 424-436. https://doi.org/10.1016/j.omega.2011.08.006

Bayou, M. E., de Korvin, A., & Reinstein, A. (2007). Using the fuzzy-analytic-hierarchical-process to select the optimum mechanism for developing accounting standards. *Review of Accounting and Finance*, 6(2), 109-130. https://doi.org/10.1108/14757700710750801

Bello, F. G., Kamanga, G., & Jamu, E. S. (2019). Skills gaps and training needs in the tourism sector in Malawi.. *DOAJ (DOAJ: Directory of Open Access Journals)*.

D. Bojinova, E., & N. Oigara, J. (2011). Teaching and learning with clickers: Are clickers good for students?. *Interdisciplinary Journal of e-Skills and Lifelong Learning*, 7, 169-184. https://doi.org/10.28945/1506

Brauers, W. K., & Zavadskas, E. K. (2006). The MOORA method and its application to privatization in a transition economy. *Control and Cybernetics*, 35(2), 445-469.

Bruno, G., Esposito, E., Genovese, A., & Passaro, R. (2012). AHP-based approaches for supplier evaluation: Problems and perspectives. *Journal of Purchasing and Supply Management*, 18(3), 159-172. https://doi.org/10.1016/j.pursup.2012.05.001

Calderon, T., Hesford, J. W., Mangin, N., & Pizzini, M. (2018). Sunrise Hotels: An integrated managerial accounting teaching case. *Journal of Accounting Education*, 44, 60-72. https://doi.org/10.1016/j.jaccedu.2018.06.001

Caldwell, J. E. (2007). Clickers in the large classroom: Current research and Best-Practice tips. *CBE—Life Sciences Education*, 6(1), 9-20. https://doi.org/10.1187/cbe.06-12-0205

Chan, F. T. S., & Kumar, N. (2007). Global supplier development considering risk factors using fuzzy extended AHP-based approach. *Omega*, 35(4), 417-431. https://doi.org/10.1016/j.omega.2005.08.004

Chang, D. (1992). "Extent Analysis and Synthetic Decision", Optimization Techniques and Applications, World Scientific, Singapore, 1, 352.

Chen, B. H., Hsu, M., & Chen, M. (2012). The relationship between learning attitude and anxiety in accounting classes: the case of hospitality management university students in Taiwan. *Quality & Quantity*, 47(5), 2815-2827. https://doi.org/10.1007/s11135-012-9691-6

Chen, M., & Downing, L. (2006). Using simulations to enhance students' learning in management accounting. *Journal of Hospitality & Tourism Education*, 18(4), 27-32. https://doi.org/10.1080/10963758.2006.10696872

Kolbe, R. H., & Cooper, H. M. (1991). Integrating research: A guide for literature reviews. *Journal of Marketing Research*, 28(3), 380. https://doi.org/10.2307/3172876

Dalak, S., & Özdinç, I. Y. (2023). Retrospective regret in hospitality graduates about their misvaluation of finance track courses during study. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 32, 100428. https://doi.org/10.1016/j.jhlste.2023.100428

Damitio, J. W., & Schmidgall, R. S. (1991). A comparison of hospitality executives', educators', and students' views on the importance of accounting skills. *International Journal of Hospitality Management*, 10(3), 219-228. https://doi.org/10.1016/0278-4319(91)90055-m

Darko, A., Chan, A. P. C., Ameyaw, E. E., Owusu, E. K., Pärn, E., & Edwards, D. J. (2018). Review of application of analytic hierarchy process (AHP) in construction. *International Journal of Construction Management*, 19(5), 436-452. https://doi.org/10.1080/15623599.2018.1452098

Dennington, L. J., Fried, B., Van Dyke, T. L., & Wilson, R. H. (1992). Financial management copetencies of the Four-Year hospitality graduaste. *The Journal of Hospitality Financial Management*, 2(1), 33-43. https://doi.org/10.1080/10913211.1992.10653632

Downey, J. F., & DeVeau, L. T. (2005). A computer software approach to teaching hospitality financial accounting. *The Journal of Hospitality Financial Management*, 13(1), 89-97. https://doi.org/10.1080/10913211.2005.10653802

Edelheim, J. (2007). Effective use of simulations in hospitality management education - a case study. *The Journal of Hospitality Leisure Sport and Tourism*, 6(1), 18-28. https://doi.org/10.3794/johlste.61.104

Fawcett, S. L., & Lockwood, A. (2000). Improving the learning environment for the development of hospitality accountancy skills using computer simulation gaming. *Tourism and Hospitality Research*, 2(3), 262-276. https://doi.org/10.1177/146735840000200306

Feinstein, A. H., & Parks, S. J. (2002). The Use of Simulation in Hospitality as an Analytic Tool and Instructional System: A Review of the Literature. *Journal of Hospitality & Tourism Research*, 26(4), 396-421. https://doi.org/10.1177/109634802237486

Figueira, J., Greco, S., & Ehrogott, M. (2005). Multiple criteria decision analysis: State of the art surveys. Springer New York. https://doi.org/10.1007/b100605

Freed, J. Q. (2010). Industry needs flexible graduates. Hotel & Motel Management,225(2), 1-32.

Goh, E., & Ritchie, B. (2011). Using the theory of planned behavior to understand student attitudes and constraints toward attending field trips. *Journal of Teaching in Travel & Tourism*, 11(2), 179-194. https://doi.org/10.1080/15313220.2011.575024

Goh, E., & Scerri, M. (2016). "I study accounting because i have to": An exploratory study of hospitality students' attitudes toward accounting education. *Journal of Hospitality & Tourism Education*, 28(2), 85-94. https://doi.org/10.1080/10963758.2016.1163498

Green, A. J., & Repetti, T. (2015). Clickers: A strategy for active learning in a hospitality classroom. *Journal of Hospitality & Tourism Education*, 27(4), 171-179. https://doi.org/10.1080/10963758.2015.1089513

Griffin, W. C. (2021). The future of hospitality education: A reflection. *Journal of Hospitality & Tourism Research*, 45(5), 939-941. https://doi.org/10.1177/10963480211000828

Harris, P. J. (1997). A seminar role-play model for hospitality accounting and finance education: development, implementation and evaluation. *International Journal of Hospitality Management*, 16(1), 65-77. https://doi.org/10.1016/s0278-4319(96)00047-3

Harris, P. J., & Brander Brown, J. (1998). Research and development in hospitality accounting and financial management. *International Journal of Hospitality Management*, 17(2), 161-182. https://doi.org/10.1016/s0278-4319(98)00013-9

Hein, S. G., & Riegel, C. D. (2011). Hospitality industry professionals' perceptions of the importance of content areas in the finance and accounting curriculum. *The Journal of Hospitality Financial Management*, 19(2), 1-22. https://doi.org/10.1080/10913211.2011.10653910

Hertzman, J. L., Moreo, A. P., & Wiener, P. J. (2015). Career planning strategies and skills of hospitality management students. *Journal of Human Resources in Hospitality & Tourism*, 14(4), 423-443. https://doi.org/10.1080/15332845.2015.1002071

Ilvento, C. L. (1984). Industry expresses attitudes toward accounting, finance curricula. *Florida International University Digital Commons (Florida International University)*, 2(2), 65-77.

Jung, H. (2008). WACC as the touchstone performance indicator. *International Journal of Contemporary Hospitality Management*, 20(6), 700-710. https://doi.org/10.1108/09596110810892254

Kahraman, C., Cebeci, U., & Ruan, D. (2004a). Multi-attribute comparison of catering service companies using fuzzy AHP: The case of Turkey. *International Journal of Production Economics*, 87(2), 171-184. https://doi.org/10.1016/s0925-5273(03)00099-9

Kahraman, C., Cebeci, U., & Ruan, D. (2004b). Multi-attribute comparison of catering service companies using fuzzy AHP: The case of Turkey. *International Journal of Production Economics*, 87(2), 171-184. https://doi.org/10.1016/s0925-5273(03)00099-9

Kahraman, C., Cebeci, U., & Ulukan, Z. (2003). Multi-criteria supplier selection using fuzzy AHP. *Logistics Information Management*, 16(6), 382-394. https://doi.org/10.1108/09576050310503367

Kavčič, S., & Mihelčič, E. (2006). ACCOUNTING SKILLS HOTEL ENTERPRISES NEED TODAY. *Tourism and hospitality management*, 12(1), 19-34. https://doi.org/10.20867/thm.12.1.2

Khan, M. A. (2021). The Role of a Professional Journal in the Development of Hospitality Education and Research. *Journal of Hospitality & Tourism Research*, 45(5), 880-886. https://doi.org/10.1177/10963480211011534

Kim, H. J. (., & Jeong, M. (2021). What has happened and what will drive changes in hospitality and tourism education?. *Journal of Hospitality & Tourism Research*, 45(5), 942-944. https://doi.org/10.1177/10963480211010986

Kim, M., & Schmidgall, R. S. (2017). Key managerial and financial accounting skills for private club managers: Comparison to lodging managers. *International Journal of Hospitality & Tourism Administration*, 20(4), 379-399. https://doi.org/10.1080/15256480.2017.1397583

Kim, M., Schmidgall, R. S., & Damitio, J. W. (2017). Key managerial accounting skills for lodging industry managers: The third phase of a repeated Cross-Sectional study. *International Journal of Hospitality & Tourism Administration*, 18(1), 23-40. https://doi.org/10.1080/15256480.2016.1263169

Kitchenham, B. (2004). Procedures for performing systematic reviews..

Kosarkoska, D. (2016). The Contents Methods of Teaching and the Place of Accounting in the Tourism Study Curriculum: (Case Study). International Journal of Science and Research, 5(5), 1153-1157.

La Lopa, J. M., Elsayed, Y. N. M. K., & Wray, M. L. (2018). The state of active learning in the hospitality classroom. *Journal of Hospitality & Tourism Education*, 30(2), 95-108. https://doi.org/10.1080/10963758.2018.1436971

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159. https://doi.org/10.2307/2529310

Lee, D., Cha, S., & Kim, J. (2004). Hospitality programs in korean graduate schools. *Journal of Human Resources in Hospitality & Tourism*, 3(1), 33-45. https://doi.org/10.1300/j171v03n01_04

Ma, Z., Chen, M., & Ampountolas, A. (2016). The effect of students' perceptions and learning approaches on the quality of hospitality financial management education. *Journal of Hospitality & Tourism Education*, 28(4), 169-177. https://doi.org/10.1080/10963758.2016.1226848

Mbumbo, E., Benedict, H., & Bruwer, J. P. (2019). The influence of management's accounting skills on the existence of their South African small, medium and micro enterprises. *International Journal of Education Economics and Development*, 10(3), 323. https://doi.org/10.1504/ijeed.2019.100670

Onay, A., Karamaşa, C., & Saraç, B. (2016). Application of fuzzy AHP in selection of accounting elective courses in undergraduate and graduate level. *Journal of Accounting, Finance and Auditing Studies*, 2(4), 20-42. https://doi.org/10.56578/jafas020402

Pan, N. (2008). Fuzzy AHP approach for selecting the suitable bridge construction method. *Automation in Construction*, 17(8), 958-965. https://doi.org/10.1016/j.autcon.2008.03.005

Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*. John Wiley & Sons.

Podvezko, V. (2009). Application of AHP Technique. *Journal of Business Economics and Management*, 10(2), 181-189. https://doi.org/10.3846/1611-1699.2009.10.181-189

Schmidgall, R. S., & Potter, G. S. (1999). Hospitality management accounting: Current problems and future opportunities. *International Journal of Hospitality Management*, 18(4), 387-400.

Repetti, T. (2019). I Don't Need to Know Accounting, I am Going to be a Hotel Manager. Right?. *Journal of Hospitality & Tourism Cases*, 7(4), 9-20. https://doi.org/10.1177/216499871900700402

Saaty, T. L., & Vargas, L. G. (2001). *Models, methods, concepts & applications of the analytic hierarchy process*. Springer Science & Business Media.

Saaty, T., (1980). The analytic hierarchy process, McGraw-Hill, New York.

Shaverdi, M., Heshmati, M. R., & Ramezani, I. (2014). Application of fuzzy AHP approach for financial performance evaluation of iranian petrochemical sector. *Procedia Computer Science*, 31, 995-1004. https://doi.org/10.1016/j.procs.2014.05.352

Situmeang, M. F., & Latuamury, S. E. (2023). The effect of intellectual capital, industry experience on the application of financial accounting standards in the tourism industry in ambon city. *The Eastasouth Management and Business*, 1(03), 95-104. https://doi.org/10.58812/esmb.v1i03.79

Smith, R. A. (2021). Pandemic and Post-Pandemic digital pedagogy in hospitality education for generations z, alpha, and beyond. *Journal of Hospitality & Tourism Research*, 45(5), 915-919. https://doi.org/10.1177/10963480211000818

Šostar, M., & Ristanović, V. (2023). Assessment of influencing factors on consumer behavior using the AHP model. *Sustainability*, 15(13), 10341. https://doi.org/10.3390/su151310341

Sun, C. (2010). A performance evaluation model by integrating fuzzy AHP and fuzzy TOPSIS methods. *Expert Systems with Applications*, 37(12), 7745-7754. https://doi.org/10.1016/j.eswa.2010.04.066

Tam, M. C. Y., & Tummala, V. M. R. (2001). An application of the AHP in vendor selection of a telecommunications system. *Omega*, 29(2), 171-182. https://doi.org/10.1016/s0305-0483(00)00039-6

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing Evidence-Informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207-222. https://doi.org/10.1111/1467-8551.00375

Tung, V. W. S., & King, B. (2016). The stereotyping of tourism management students in a business school setting. *Journal of Teaching in Travel & Tourism*, 16(1), 60-77. https://doi.org/10.1080/15313220.2015.1116423

Vaidya, O. S., & Kumar, S. (2006). Analytic hierarchy process: An overview of applications. *European Journal of Operational Research*, 169(1), 1-29. https://doi.org/10.1016/j.ejor.2004.04.028

Wang, Y., Luo, Y., & Hua, Z. (2008). On the extent analysis method for fuzzy AHP and its applications. *European Journal of Operational Research*, 186(2), 735-747. https://doi.org/10.1016/j.ejor.2007.01.050

Webster, J., & Watson, R. T. (2002). Analyzing the Past to Prepare for the Future: Writing a Literature Review. *MIS Quarterly*, 26(2), xiii-xxiii. https://doi.org/10.2307/4132319

Yang, J., & Ren, L. (2021). Government-Industry-Education-Research collaboration in tourism: University's perspective. *Journal of Hospitality & Tourism Research*, 45(5), 898-901. https://doi.org/10.1177/10963480211000823

Yusoh, N. N. A. M., & Mat, T. Z. T. (2020). Environmental management accounting adoption barriers among malaysian hotel companies. *International Journal of Financial Research*, 11(3), 31. https://doi.org/10.5430/ijfr.v11n3p31

Zhu, K., Jing, Y., & Chang, D. (1999). A discussion on Extent Analysis Method and applications of fuzzy AHP. *European Journal of Operational Research*, 116(2), 450-456. https://doi.org/10.1016/s0377-2217(98)00331-2

Zopiatis, A., Lambertides, N., Savva, C. S., & Theocharous, A. L. (2019). Hospitality education and finance courses: An 'inconvenient' relationship?. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 24, 63-69. https://doi.org/10.1016/j.jhlste.2019.01.001

Zwaal, W., & Otting, H. (2013). The attitude of hotel school students toward hospitality finance. *The Journal of Hospitality Financial Management*, 21(2), 115-122. https://doi.org/10.1080/10913211.2013.861231