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Exploring Simulation Pedagogy in Higher Education: A Narrative Review

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ABSTRACT

Interactive learning methods, particularly business simulations, have become increasingly prominent in higher education as they enable students to apply theoretical knowledge to practical, decision-making contexts. However, the effectiveness of simulations largely depends on the pedagogical approaches adopted by instructors. This study aims to identify and analyze different mentoring approaches in which instructors play active roles in simulation-based learning environments.

The research employs a narrative literature review across multiple academic databases, including Scopus, ERIC, and Google Scholar, using structured search criteria. Approximately 400 studies were initially identified, of which 65 met the inclusion criteria following full-text evaluation. A thematic synthesis was conducted to organize the findings and identify distinct pedagogical approaches.

The analysis reveals three primary mentoring approaches: (1) Directive Mentoring, characterized by structured guidance and clear instructional frameworks; (2) Reflective Mentoring, which emphasizes student self-analysis through guided questioning and the integration of theory and practice; and (3) Engagement Mentoring, a student-centered approach that incorporates gamification elements such as rewards, and leaderboards to enhance motivation and participation.

Each approach demonstrates unique strengths and limitations. Directive mentoring provides structure, particularly for students needing guidance. Reflective mentoring enhances independence and critical thinking. Engagement mentoring increases motivation while addressing autonomy, competence, and relatedness needs. Effectiveness is context-dependent, influenced by class size, demographics, resources, and learning objectives.

No single approach is universally superior, emphasizing situational pedagogical decision-making and potential benefits from integrated strategies. Findings offer practical guidance for educators and a foundation for future empirical research on simulation-based learning in higher education.

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Introduction

In higher education, particularly in business and educational management studies, interactive learning methods, such as business simulations, have gained prominence, especially at the master's level (Bach *et al*., 2023). These methods enable students to apply theoretical knowledge in practical, near-real-world scenarios, fostering skills in decision-making, strategic thinking, and teamwork (Aebersold, 2018; Auman, 2011; Bach *et al*., 2016). However, the effectiveness of simulations largely depends on the pedagogical approach employed by the instructor, as it shapes the facilitation of the learning process (Hanghøj, 2013). This article aims to identify pedagogical approaches where instructors play an active role, based on a narrative literature review, to evaluate their effectiveness in terms of master's students' learning outcomes. These approaches, ranging from instructor-centered to student-centered, are selected to assess their impact on student engagement, motivation, and learning outcomes (Zou *et al*., 2021).

Simulation-based learning is consistent with experiential learning theory, which emphasizes knowledge creation through experience, reflection, and experimentation (Kolb, 1984). Master's students, with their theoretical knowledge and career-oriented focus, are ideally suited for this approach, as they are prepared to tackle complex, practical challenges that require the integration of both theory and practice (Farashahi & Tajeddin, 2018).

Despite their potential, simulations present challenges, such as varying degrees of student readiness, scenario complexity, and difficulties in connecting theoretical knowledge to practical situations (Bach *et al*., 2016). Master's students, often with diverse professional backgrounds, require learning methods that address their individual needs, enhance motivation and engagement, and prepare them for real-world business challenges (Huang *et al*., 2023). The instructor's active role is critical in overcoming these challenges, by guiding the learning process, facilitating decision analysis, and ensuring the integration of theory and practice (Aebersold, 2018; Becker & Hermosura, 2019; Crookall, 2010; Moraes & Plaszeweski, 2023; Frei-Landau & Levin, 2023; Yahorava, 2024).

The literature offers diverse approaches, including those where instructors provide clear instructions (Auman, 2011; Farashahi & Tajeddin, 2018), guide students through reflection and critical thinking (Schön, 1983), or employ interactive, student-centered methods that incorporate gamification elements, such as rewards, competition, and achievements (Costa *et al*., 2021; Davis *et al*., 2018; Deterding *et al*., 2011; Kapp, 2012; Routledge, 2016). Gamification is particularly effective for master's students seeking motivating, interactive experiences that mirror real-world business dynamics (Deterding *et al*., 2011; Kapp, 2012). The instructor's active role as a facilitator and co-participant, especially through interactive debriefing, enhances learning outcomes by enabling students to analyze their decisions and connect theory to practice (Molin, 2017).

This article seeks to explore higher education pedagogy, instructor leadership methods, their active roles in simulations, and the needs of master's students, to identify approaches ranging from instructor-centered to student-centered. These approaches are selected to measure their effectiveness in terms of engagement, motivation, and learning outcomes (Zou *et al*., 2021).

While this review examines simulation pedagogy broadly within higher education contexts, the findings are particularly relevant for postgraduate programs. Master's students, with their advanced theoretical foundations and career-oriented focus, represent an ideal population for simulation-based learning approaches. Throughout this article, we interpret the general findings through the lens of postgraduate education, highlighting how these pedagogical strategies can be adapted to meet the specific needs of master's students who require complex, practice-oriented learning experiences that bridge theory and professional application (Huang *et al*., 2023; Bach *et al*., 2016).

The article is structured as follows: a literature review establishing the theoretical framework; a methodology section explaining the narrative review; a comparative review; a discussion of the role of gamification; and a discussion identifying the strengths and weaknesses of these approaches, followed by a recommendation to experimentally test and compare them with each other and with traditional lecture-based methods.

1. Literature Review

1.1 Historical Development of Learning through Simulations

The evolution of business simulations as a learning tool began in the mid-20th century, initially applied in military and managerial training (Faria *et al*., 2009). In the 1960s, simulations based on so-called "war games" were used to practice strategic decision-making, with participants engaging in scenario-based decisions through tabletop games or physical models (Aldrich, 2005; Chilcott, 1996; Keys & Wolfe, 1990; Kincaid & Westerlund, 2009). These early simulations often focused on managerial decisions, such as resource allocation, but their limited technological capabilities constrained their complexity and scale.

In the 1980s, simulations took a significant step towards higher education, as advancements in computer technology enabled the creation of more dynamic and interactive simulations (Faria *et al*., 2009). During this period, simulations like the Business Strategy Game emerged, allowing students to analyze financial, marketing, and operational decisions (Keys & Wolfe, 1990). However, these simulations were limited by simple interfaces and predefined scenarios which were less responsive to the needs of master's students seeking complex, real-world challenges.

From the 2000s, digital technologies, particularly the internet and software advancements, ushered in a new era of simulations (Zenios, 2020). Online platforms, such as Marketplace Simulations, enabled students to operate in simulated global, competitive environments, making decisions involving complex variables like market segmentation, pricing, and operational efficiency (Bach *et al*., 2016). This period also saw the introduction of gamification elements, such as rewards and leaderboards, which increased student motivation (Deterding *et al*., 2011).

In the 2020s, simulations further evolved with the integration of artificial intelligence (AI) and virtual reality (VR), offering students immersive learning experiences (Zenios, 2020). However, technological complexity increases the importance of the instructor's role as a facilitator to ensure students utilize these tools effectively (Chilcott, 1996; Bauer *et al*., 2022; Hanghøj, 2013). Recent comparative studies have demonstrated that simulation-based teaching approaches consistently outperform traditional instructional methods in developing students' practical competencies, particularly when instructors adopt active facilitation roles (Azizi *et al*., 2022).

1.2 Higher Education Pedagogy and Business Simulations

Higher education pedagogy, particularly in business and management studies, increasingly relies on interactive, experiential approaches to address the needs of master's students who demand practical, problem-oriented learning (Biggs & Tang, 2011). Business simulations, as a form of experiential learning, are grounded in Kolb's (1984) theory, which emphasizes knowledge creation through cycles of concrete experience, reflection, conceptualization, and experimentation (Kolb, 1984). This approach is particularly suitable for master's students, who often possess theoretical knowledge and seek to apply it in complex, real-world scenarios (Huang *et al*., 2023).

Traditional higher education pedagogy relied on lectures and classroom discussions with instructor-delivered knowledge (Auman, 2011; Farashahi & Tajeddin, 2018).

However, this approach is less effective for master's students who require active engagement and individualized learning experiences (Bach *et al*., 2016). In response, modern pedagogy has shifted towards student-centered methods, where instructors act as facilitators, guiding students through decision-making and reflection processes (Biggs & Tang, 2011). In this context, simulations enable master's students to develop critical thinking and decision-making skills, which are crucial for their career objectives (Zou *et al*., 2021).

The pedagogical effectiveness of business simulations depends on the instructor's ability to balance structure and student autonomy. The literature proposes approaches ranging from instructor-centered guidance (Farashahi & Tajeddin, 2018) to reflective facilitation, where instructors promote student self-analysis (Schön, 1983). Drawing on this range of approaches, three types can be distinguished according to the degree of instructor guidance and student autonomy; these will be analyzed further.

1.3 Instructor Roles in Interactive Simulations

The simulation-based learning process requires active instructor involvement to guide master's students through complex, real-world scenarios, facilitating the integration of theory and practice (Bauer *et al*., 2022; Crookall, 2010; Keskitalo, 2015; Keskitalo, 2022; Lupu *et al*., 2014; García-Salido *et al*., 2024). The instructor's activities span several stages: (1) preparation, where they set simulation objectives, select appropriate platforms (e.g., Marketplace Simulations), and assign teams (Faria *et al*., 2009); (2) implementation, where the instructor oversees the simulation's progress, provides instructions, answers questions, and adjusts scenario parameters, such as market conditions, as needed (Bach *et al*., 2016); and (3) debriefing, where they lead analysis and reflection sessions, helping students understand the consequences of their decisions and connect them to theoretical knowledge (Crookall, 2010). For example, in Marketplace Simulation, the instructor may set initial financial parameters, monitor team decisions, and lead discussions on how marketing strategies impacted outcomes. This process ensures that master's students develop critical thinking and decision-making skills aligned with their career goals (Zou *et al*., 2021).

Business simulations, as practical learning tools, require instructors to adopt diverse roles to ensure the integration of theory and practice, fostering engagement and motivation (Zou *et al*., 2021). The instructor's active involvement determines the simulation's effectiveness (Huang *et al*., 2023). The literature describes instructor roles in varied ways, reflecting the diversity of approaches in business simulations. For example, Faria *et al*. (2009) emphasize the instructor as an "administrator," organizing the simulation's structure, setting objectives, and providing technical support. Crookall (2010) focuses on the instructor as a "facilitator," guiding debriefing to help students analyze their decisions. In addition to the roles of instructor, guide and evaluator, Hanghøj (2013) proposes the "playmaker" concept, where the instructor teaches from a student perspective, while Molin (2017) describes the instructor as a "motivator," enhancing student engagement through interactive strategies. Other authors, such as Biggs and Tang (2011), highlight "active" leadership, where the instructor balances structure and student initiative. These diverse descriptions indicate that instructor roles span a broad spectrum – from administrative to motivational – reflecting varying levels of activity and student autonomy.

From these diverse roles, three main approaches can be identified based on instructor activity and student autonomy: directive mentoring, reflective mentoring, and engaged mentoring. The term "mentoring" is used for all three approaches, as it emphasizes the instructor's role as a supportive guide focused on master's students' individual needs, in contrast to "instructing," which implies rigid, one-way directives (Kapp, 2012). Directive mentoring involves providing structure while supporting students (Faria *et al*., 2009). Reflective mentoring promotes self-analysis, aiding students in integrating theory and practice (Crookall, 2010). Engaged mentoring, inspired by Hanghøj's "playmaker" concept (2013), but enhanced with gamification elements like rewards and competitive scenarios, increases student enthusiasm and engagement (Deterding *et al*., 2011; Davis *et al*., 2018).

Directive mentoring aligns closely with cognitive load theory by providing explicit instruction that reduces extraneous cognitive load during complex decision-making tasks (Anderson & Lawton, 2009). This approach proves particularly relevant during initial simulation phases, when students must simultaneously master technological interfaces, understand simulation mechanics, and apply business concepts. The structured guidance characteristic of directive mentoring helps students develop mental models that can later support more autonomous decision-making processes (Faria *et al*., 2009).

Reflective mentoring draws from constructivist learning theory, emphasizing the active construction of knowledge through experience and reflection (Schön, 1983). This approach recognizes that meaningful learning occurs when students connect new experiences with existing knowledge structures, requiring deliberate reflection and analysis (Kolb, 1984). The questioning techniques employed in reflective mentoring facilitate this connection process by guiding students through systematic examination of their decisions and outcomes (Crookall, 2010).

Engagement mentoring incorporates elements from multiple theoretical frameworks, including social learning theory, through peer interaction and observational learning, and self-determination theory through attention to autonomy, competence, and relatedness needs (Deci & Ryan, 2000). The gamification elements characteristic of this approach address intrinsic motivation factors by providing opportunities for mastery demonstration and social connection (Kapp, 2012).

1.4 The Role of Gamification

Gamification, the integration of game elements into non-game contexts, significantly enhances the effectiveness of business simulations (Deterding *et al*., 2011). Gamification elements, such as rewards, leaderboards, competitive scenarios, achievement systems, and point allocation, foster student engagement, enthusiasm, and critical thinking (Chee *et al*., 2015; Costa *et al*., 2021; De Smale *et al*., 2015; Routledge, 2016; Kapp, 2012). For master's students with strong theoretical foundations, gamification creates an interactive environment to test decision-making skills, such as in Marketplace simulation scenarios, where students manage pricing, marketing strategies, or operational processes (Bach *et al*., 2016).

The effectiveness of gamification is rooted in psychological theories, particularly Deci and Ryan's self-determination theory (2000), which highlights three basic psychological needs: autonomy, competence, and relatedness. For example, in a Marketplace simulation, leaderboards displaying team rankings based on market share or profit reinforce a sense of competition, satisfying the need for relatedness (Davis *et al*., 2018). Rewards, such as "best financial performance" or "innovative strategy," enhance the sense of competence, while the freedom to make team-based decisions ensures autonomy (Zou *et al*., 2021). However, the success of gamification depends on the mentor's ability to align these elements with learning objectives, avoiding excessive competition or loss of motivation (Nicholson, 2015).

The mentor's role is crucial for effective gamification implementation, particularly within the engaged mentoring approach. This approach enables the mentor to create a collaborative, student-centered environment where master's students take the initiative (Deterding *et al*., 2011). For instance, in a Marketplace simulation, the mentor may use leaderboards to encourage teams to refine strategies or award achievements like "best brand management," boosting student motivation (Davis *et al*., 2018).

Specific gamification elements, such as point systems, facilitate the tracking of student progress, reinforcing self-efficacy (Bandura, 1997). For example, in a Marketplace simulation, students earning points for increasing market share are more motivated to improve their decisions (Molin, 2017). Additionally, gamification fosters team dynamics, as competitive scenarios, such as identifying the "market leader" among teams, enhance collaboration and communication (Huang *et al*., 2023). However, the literature notes that excessive use of gamification, such as overemphasizing rewards, may divert attention from learning objectives, and thus requires careful mentor guidance (Nicholson, 2015).

2. Methodology

2.1 Research Design

This study employs a narrative literature review to investigate pedagogical strategies for teaching with simulations in higher education. The narrative review, as described by Pautasso (2019), was selected for its flexibility in synthesizing diverse literature sources and constructing coherent theoretical frameworks around complex research questions, building on empirical reviews of simulation games in higher education (Cadotte, 2022; Fanning & Gaba, 2008; Faisal *et al*., 2022; Hamada *et al*., 2019; Mehar & Arora, 2021; Leigh *et al*., 2023).

Unlike systematic reviews, which prioritize exhaustive and replicable searches, a narrative review allows for qualitative synthesis of findings to explore pedagogical roles, planning processes, and teaching approaches across a spectrum, from lecturer-centered to student-centered methodologies, in simulation-based education (Green *et al*., 2006; Ferrari, 2015). This methodology aligns with the study's aim of identifying distinct pedagogical approaches that can inform future empirical research and experimental comparison.

2.2 Research Questions

This narrative review addresses the following research questions:

1. What roles do lecturers adopt when implementing simulation-based teaching?
2. What pedagogical approaches (ranging from lecturer-centered to student-centered) are evident in the literature on simulation-based teaching?
3. What distinct pedagogical approaches can be synthesized from the literature to recommend for experimental comparison?

2.3 Literature Search and Selection

2.3.1 Search Strategy

The literature search followed a structured yet flexible process to ensure comprehensive identification of relevant studies while maintaining interpretive depth, incorporating problem-based and simulation-focused approaches (Dervić *et al*., 2018; Dolmans *et al*., 2016; Duchastel, 1991; Pautasso, 2013; Cevallos-Torres & Botto-Tobar, 2019; Mohsen *et al*., 2019).

The search was conducted across the following academic databases and scholarly search engines: Scopus, ERIC, and Google Scholar, using keywords such as "simulation-based teaching," "pedagogical approaches," "lecturer roles in simulations," "student-centered learning," and "higher education simulations."

To ensure rigor, the review adhered to established best practices for narrative synthesis. The search strategy was documented transparently, and included databases, keywords, and inclusion/exclusion criteria (Pautasso, 2013). The synthesis process was iterative, with regular cross-checking of themes against primary sources to minimize interpretive bias (Ferrari, 2015). While narrative reviews are inherently subjective, the use of structured data extraction and thematic coding – identifying, labeling, and grouping recurring concepts across studies – enhanced analytical rigor (Green *et al*., 2006). Additionally, the review prioritized peer-reviewed sources to ensure credibility and relevance.

To minimize bias in the selection and coding process, the following measures were implemented: inclusion and exclusion criteria were defined *a priori* and applied consistently; data extraction followed a structured template capturing key information systematically; and thematic coding was conducted iteratively, with regular cross-checking against primary sources to ensure interpretive validity (Green *et al*., 2006; Ferrari, 2015).

2.3.2 Inclusion and Exclusion Criteria

Inclusion criteria were established to focus on peer-reviewed articles, books, and conference papers, published in English between 2015 and 2025, that addressed simulation-based teaching in higher education. Studies were included if they discussed lecturer roles, planning processes, or pedagogical approaches in simulation-based contexts (Ferrari, 2015). Exclusion criteria included studies focused solely on the technical aspects of simulations, non-educational contexts, or non-peer-reviewed sources (Green *et al*., 2006).

2.3.3 Selection Process

The selection process involved screening titles and abstracts for relevance, followed by full-text review to confirm alignment with the research questions. A snowballing technique was also employed, where reference lists of key articles were reviewed to identify additional relevant studies (Ferrari, 2015). Approximately 400 studies were initially identified, with 65 studies meeting the inclusion criteria after full-text evaluation. (Table 1)

2.3.4 Data Synthesis and Analysis

The thematic synthesis followed a structured approach to organize findings into coherent themes addressing the research

Table 1. Progressive Source Selection in Narrative Literature Review

Selection Stage	Number of Sources	Retention Rate	Exclusion Criteria
Initial Database Search	400	100% (baseline)	–
Title/Abstract Screening	100-150	25-30%	• Off-topic studies • Non-peer reviewed sources • Outside date range (2015-2025) • Non-English language • Technical-only focus
Full-Text Assessment	50-90	50-60% of screened	• Insufficient methodology detail • Limited relevance to research questions • Low study quality • Non-educational contexts • Duplicate findings
Final Inclusion	65	60-70% of assessed	• Direct relevance to mentoring approaches • High methodological quality • Contributes unique insights • Alignment with theoretical framework • Peer-reviewed sources only

Overall Retention Rate: 16% of initial search results.

questions (Pautasso, 2019). Key information from each study was extracted, including lecturer roles (e.g., facilitator, instructor, observer), planning strategies (e.g., scenario design, debriefing structures), and pedagogical approaches (e.g., lecturer-centered, student-centered, or hybrid). Extracted data were coded thematically to identify recurring patterns, such as specific lecturer behaviors, planning frameworks, or pedagogical orientations. Codes were grouped into broader themes, such as "lecturer as facilitator" or "student-centered simulation design" (Ferrari, 2015). The coded themes were synthesized into a narrative that traces the evolution of pedagogical approaches in simulation-based teaching, highlighting shifts from lecturer-centered to student-centered methodologies (Green *et al.*, 2006). Based on the thematic analysis, three distinct pedagogical approaches introduced earlier were specified in detail, each characterized by unique combinations of lecturer roles, planning strategies, and student engagement methods.

2.4 Study Limitations

This narrative review has several limitations that should be acknowledged. First, the analysis was conducted by a single researcher, which may introduce individual interpretive bias despite efforts to maintain rigor. Additionally, the narrative review methodology, while suitable for synthesizing diverse perspectives, lacks the systematic rigor and replicability characteristic of meta-analytic approaches. Language restrictions to English potentially excluded relevant studies published in other languages, and time constraints limited the depth of analysis applied to each individual study.

The emphasis on pedagogical approaches also means that important technological or logistical factors related to simulation implementation might be underrepresented. Furthermore, given the rapidly evolving nature of simulation technology, some conclusions drawn from current literature may become outdated relatively quickly.

Finally, despite a systematic search strategy, it is possible that some relevant studies were inadvertently omitted. Publication bias may also influence the available literature, favoring studies that report positive outcomes related to simulation-based teaching effectiveness.

3. Comparative Analysis of the Three Approaches

Interactive business simulations, such as Marketplace Simulations, offer a unique environment for master's students to develop practical skills, critical thinking, and decision-making capabilities aligned with their theoretical knowledge and career goals. These draw from experiential and game-based pedagogies (Breunig, 2017; Hebert & Jenson, 2019; Hertel & Millis, 2023; Juan *et al*., 2017; Kaufman & Sauvé, 2010; Bach *et al*., 2016). Empirical evidence from quasi-experimental studies confirms that simulation-based approaches yield superior learning outcomes compared to traditional lecture-based methods, particularly in developing practical competencies (Azizi *et al*., 2022).

The mentor's role is pivotal in this process, as it shapes the quality of students' engagement, motivation, and learning outcomes (Faria *et al*., 2009). This section examines the three mentoring approaches – directive mentoring, reflective mentoring, and engagement mentoring – by comparing their characteristics, debriefing practices, advantages, and limitations, focusing on the learning experience of master's students.

3.1. Directive Mentoring

Description: Directive mentoring is characterized by high mentor activity and low student autonomy, where the mentor provides clear instructions, defines the simulation's structure, and sets objectives (Faria *et al*., 2009). In the context of Marketplace Simulations, the mentor may explain how to allocate budgets or formulate pricing strategies, offering minimal freedom to students. This approach aligns with traditional pedagogical models, where the mentor is the primary source of knowledge (Anderson & Lawton, 2009).

Debriefing: Debriefing is structured and focuses on "correct" decisions. For example, in a Marketplace simulation, the mentor may discuss why a particular strategy succeeded, emphasizing theoretical models like Porter's Five Forces, but with limited encouragement for independent student analysis (Crookall, 2010).

Advantages: Directive mentoring is efficient and effective, particularly for students needing clear guidance (Molin, 2017). It provides structure, reduces confusion in complex simulations, and is especially suitable for beginners with limited experience (Faria *et al*., 2009).

Limitations: This approach restricts student autonomy, reducing initiative and creativity (Zou *et al*., 2021). For master's students seeking self-determination, directive mentoring may be less motivating, as it hinders independent decision-making (Deci & Ryan, 2000).

3.2. Reflective Mentoring

Description: Reflective mentoring promotes student self-analysis through questions and prompts, emphasizing critical thinking and the integration of theory into practice (Schön, 1983). In a Marketplace simulation, the mentor may ask students to analyze why their marketing strategy failed, rather than providing direct answers (Crookall, 2010). This approach aligns with Kolb's experiential learning cycle, particularly the reflection and abstract conceptualization stages (Kolb, 1984).

Debriefing: Debriefing focuses on student-driven analysis, with the mentor using open-ended questions such as, "What lessons did you learn from this decision?" or "How did your choices impact market share?" (Crookall, 2010). This process fosters deep understanding, but requires more time and effort.

Advantages: Reflective mentoring enhances student independence and critical thinking, which is particularly valuable for master's students with strong theoretical foundations (Huang *et al*., 2023). It promotes self-determination, satisfying the psychological needs for autonomy and competence (Deci & Ryan, 2000).

Limitations: This approach may be less structured, leading to uncertainty for some students, particularly those needing clear guidance (Molin, 2017). Additionally, it requires significant time for debriefing, which may be challenging in constrained schedules.

3.3. Engagement Mentoring

Description: Engagement mentoring is a student-centered approach integrated with gamification elements such as rewards, leaderboards, competitive scenarios, and achievement systems (Deterding *et al*., 2011). It is enhanced by game elements to boost master's students' enthusiasm and engagement. In a Marketplace simulation, the mentor may encourage teams to refine strategies using leaderboards or award achievements like "best innovative strategy" (Davis *et al*., 2018).

Debriefing: Debriefing is interactive, enhanced by gamification elements. For example, the mentor may use a point system to discuss how team decisions impacted their "market share" scores, fostering collaboration and analysis (Zou *et al*., 2021). This process integrates reflection and motivation, enhancing the learning experience.

*Advantages***:** Engagement mentoring increases master's students' motivation and engagement, addressing the psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2000). It is versatile, adapting to diverse learning styles and promoting team dynamics (Huang *et al*., 2023). Gamification elements, such as leaderboards, boost enthusiasm, while interactive debriefing strengthens the integration of theory and practice (Davis *et al*., 2018).

Limitations: This approach requires significant resources, including high mentor involvement and the design of gamification elements (Nicholson, 2015). Some students may focus excessively on rewards, reducing learning depth if the mentor does not carefully manage the process.

4. Discussion

The emergence of directive, reflective, and engagement mentoring approaches within simulation-based learning represents a significant advancement in postgraduate business education, offering diverse pathways to enhance student outcomes, while presenting specific implementation challenges. Each approach contributes distinct advantages: directive mentoring provides structured support that minimizes confusion during initial learning phases, reflective mentoring fosters independent analytical thinking to achieve deeper understanding, and engagement mentoring enhances participation through motivational elements such as gamification. These strategies are complementary in nature, suggesting considerable value in hybrid implementations, where directive elements establish foundational knowledge, reflective techniques encourage critical evaluation, and engagement features maintain sustained interest throughout the learning process, supported by meta-cognitive and assessment frameworks (Crookall, 2010; Kolb, 1984; Kolb *et al*., 2009; Lovett *et al*., 2020; Moore *et al*., 2013; O'Neil *et al*., 2016; Price *et al*., 2019).

However, their effectiveness is contingent upon adaptation to situational factors, including group size, learner backgrounds, available institutional support, and specific learning objectives, emphasizing the necessity for contextualized strategies rather than standardized models (Faria *et al*., 2009; Biggs & Tang, 2011). This variability underscores the critical importance of theoretical foundations in guiding practical application – directive mentoring aligns with principles of reducing cognitive load during novel task encounters, reflective mentoring supports constructivist approaches to knowledge building through introspective processes, and engagement mentoring draws upon motivational and social learning theories to address fundamental needs for autonomy and social connection (Anderson & Lawton, 2009; Schön, 1983; Deci & Ryan, 2000; Kapp, 2012).

Practical implementation requires careful calibration: directive methods risk creating dependency if not gradually phased out, reflective sessions necessitate skilled facilitation to establish trust and promote openness, and engagement designs must achieve balance between gamified elements and core learning objectives to prevent distraction from educational goals (Farashahi & Tajeddin, 2018; Molin, 2017; Deterding *et al*., 2011; Nicholson, 2015).

Resource requirements vary significantly across approaches, with directive mentoring demanding comprehensive preparation, reflective mentoring requiring substantial time investment for guided interactions, and engagement mentoring necessitating sophisticated technological tools and specialized expertise – factors that can strain institutional capacity, particularly in larger cohorts or resource-constrained environments (Faria *et al*., 2009; Crookall, 2010; Hanghøj, 2013). Student diversity introduces additional complexity: experienced professionals may resist highly structured guidance, while novice learners struggle with open-ended reflective processes, and cultural or generational differences can significantly influence responses to competitive elements (Huang *et al*., 2023; Bach *et al*., 2016; Kapp, 2012).

Assessment and evaluation present ongoing challenges, as conventional measurement tools frequently fail to capture process-oriented learning gains such as adaptability or collaborative skills. This necessitates the development of more comprehensive evaluation frameworks that align with academic standards, while capturing the full spectrum of learning outcomes (Biggs & Tang, 2011).

Technological dependency further complicates implementation, with directive approaches relying on relatively simple tools while engagement platforms remain vulnerable to technical disruptions, requiring continuous training and the establishment of flexible contingency plans (Hanghøj, 2013). Collectively, these insights demonstrate the considerable potential of integrated mentoring approaches to address diverse learning needs, provided that educators and institutions commit to developing adaptive, supportive systems that effectively bridge theoretical foundations with practical implementation.

4.1 Practical Implementation Guidelines

The effectiveness of each mentoring approach depends significantly on contextual factors, which educators must carefully consider when designing simulation-based learning experiences. Class size emerges as a critical determinant: directive mentoring scales effectively to larger cohorts, where structured guidance ensures consistent learning outcomes, while reflective mentoring performs optimally in smaller groups (typically 15-25 students), where meaningful dialogue and personalized feedback become feasible (Faria *et al*., 2009; Molin, 2017). Engagement mentoring demonstrates adaptability across various class sizes, though technological infrastructure and mentor workload increase proportionally with student numbers (Hanghøj, 2013). Comparative research demonstrates that, regardless of class size, simulation-based pedagogical approaches consistently produce better competency development than traditional methods when instructors actively facilitate learning rather than simply delivering content (Azizi *et al*., 2022).

Student background characteristics also shape approach selection. Directive mentoring benefits students with limited prior business knowledge or simulation experience, providing the necessary scaffolding for skill development (Anderson & Lawton, 2009). Conversely, experienced professionals in postgraduate programs may find excessive structure constraining, responding more positively to reflective approaches that leverage their existing knowledge base (Huang *et al*., 2023). Cultural considerations prove equally important, as students from educational systems emphasizing hierarchical teacher-student relationships may initially struggle with the autonomy demanded by reflective or engagement approaches, requiring gradual transitioning supported by explicit expectations and modeling (Bach *et al*., 2016).

Resource availability constitutes another decisive factor. Institutions with robust technological infrastructure and dedicated learning technology support can effectively implement engagement mentoring with sophisticated gamification platforms and analytics tools (Deterding *et al*., 2011). Resource-constrained environments may achieve better outcomes through directive or reflective approaches, requiring minimal technological investment while delivering substantial pedagogical value (Crookall, 2010). Faculty development emerges as an often-overlooked resource consideration, as reflective and engagement approaches demand specialized facilitation skills that develop through training and practice rather than intuition alone (Biggs & Tang, 2011).

Learning objectives ultimately guide approach selection. When prioritizing rapid skill acquisition and procedural knowledge, directive mentoring offers efficiency advantages (Anderson & Lawton, 2009). Programs emphasizing critical thinking, metacognitive development, and transfer of learning to novel contexts achieve these outcomes more reliably through reflective approaches (Schön, 1983; Kolb, 1984). Engagement mentoring proves particularly effective when cultivating sustained motivation, collaborative skills, and intrinsic interest in subject matter (Deci & Ryan, 2000; Kapp, 2012).

4.2 Integration and Hybrid Models

The comparative analysis reveals that hybrid implementations combining elements from multiple approaches may offer superior outcomes compared to pure implementations of any single approach. A phased integration model shows particular promise: directive elements establish foundational knowledge and procedural competence during initial simulation cycles; reflective techniques progressively increase as students develop confidence and analytical capabilities, and; engagement features maintain motivation throughout the learning sequence (Farashahi & Tajeddin, 2018; Molin, 2017).

Such integration requires careful orchestration to avoid cognitive overload or conflicting pedagogical signals. Successful hybrid models maintain internal coherence through explicit communication of pedagogical rationale, deliberate sequencing that builds complexity gradually, and consistent reinforcement of learning objectives across different approach elements (Biggs & Tang, 2011). The mentor's metacognitive guidance – making pedagogical choices transparent to students and supporting their development as self-directed learners – proves crucial for realizing the benefits of integrated approaches (Kolb *et al*., 2009). (Table 2.)

Conclusion

This examination of mentoring approaches within simulation-based learning has iden-

Table 2. Comparative Analysis of Three Mentoring Approaches

Dimension	Directive Mentoring	Reflective Mentoring	Engagement Mentoring
Theoretical Foundation	Cognitive Load Theory (Anderson & Lawton, 2009)	Experiential Learning Theory (Kolb, 1984); Reflective Practice (Schön, 1983)	Self-Determination Theory (Deci & Ryan, 2000); Gamification Theory (Deterding *et al*., 2011)
Instructor Role	Primary knowledge source, structured guidance, administrator	Facilitator, questioning guide, reflective coach	Co-participant, motivator, playmaker
Student Autonomy	Low	High	Moderate to High
Key Strengths	Provides clear structure; Reduces confusion; Efficient for large groups; Suitable for novices	Enhances critical thinking; Promotes independence; Develops self-determination; Deep learning	Increases motivation; Addresses psychological needs; Versatile across learning styles; Promotes team dynamics
Primary Limitations	Restricts autonomy; May reduce creativity; Risk of dependency; Less motivating for experienced students	Time-intensive; May create uncertainty; Requires skilled facilitation; Less structured	Resource-intensive; Risk of excessive focus on rewards; Requires technological infrastructure; High mentor involvement needed
Optimal Context	Large classes (30+ students); Novice learners; Complex simulations requiring initial structure; Time-constrained environments	Small to medium classes (15-25 students); Experienced students with theoretical foundations; Programs emphasizing critical thinking	Diverse class sizes; Career-oriented students; Programs with technology infrastructure; Students seeking interactive experiences
Debriefing Style	Structured, instructor-led; Focuses on “correct” decisions; Theory-driven analysis	Student-driven; Open-ended questions; Self-analytical; Peer discussion encouraged	Interactive; Gamification-enhanced; Collaborative analysis; Motivational elements integrated
Resource Requirements	Moderate (preparation time, clear materials)	High (extensive facilitation time, skilled questioning)	High (technology platforms, gamification design, ongoing technical support)
Assessment Focus	Procedural knowledge; Decision accuracy; Theoretical application	Critical thinking; Reflection quality; Theory-practice integration	Engagement levels; Motivation; Collaborative skills; Achievement of learning objectives

tified three distinct pedagogical strategies – directive, reflective, and engagement mentoring – each offering unique contributions to postgraduate education effectiveness. The analysis reveals that no single approach demonstrates universal superiority; rather, effectiveness depends on careful alignment between pedagogical choices, learner characteristics, and institutional contexts.

Directive mentoring provides essential structure that minimizes cognitive overload during initial learning phases, particularly benefiting students requiring clear guidance. Reflective mentoring fosters independent analytical thinking and deeper conceptual understanding through guided self-examination. Engagement mentoring enhances motivation and sustained participation through gamification elements that address fundamental psychological needs.

The theoretical grounding in established frameworks – cognitive load theory, experiential learning theory, and self-determination theory – provides robust foundations for understanding how these approaches function and inform their effective application. Evidence suggests that hybrid implementations, thoughtfully combining elements from multiple approaches, may optimize learning outcomes by leveraging complementary strengths while mitigating individual limitations.

Successful implementation requires attention to contextual factors including class size, student backgrounds, available resources, and specific learning objectives. The findings provide educators and institutions with an evidence-based framework for making informed pedagogical decisions in simulation-based teaching, while identifying critical directions for future empirical research to further refine and validate these approaches.

As business education continues to evolve in response to rapid industry transformations and technological advances, this framework may serve as a catalyst for educational innovation, ultimately better preparing future business professionals to meet the complex demands of the contemporary global marketplace (Biggs & Tang, 2011; Uden *et al.*, 2018; Veermans & Jaakkola, 2018; Velez *et al.*, 2023; Wright & Khoo, 2021).

Implications and Further Research

The identified mentoring approaches carry significant implications for multiple stakeholders in postgraduate business education, and reveal promising avenues for future research to refine their application and effectiveness.

For Educators

Practitioners are encouraged to:

- Select and adapt mentoring approaches based on contextual factors, including class size, student background, and learning objectives;
- Develop competencies in reflective facilitation and engagement design through professional development programs;
- Implement hybrid models that strategically combine directive structure, reflective depth, and engagement motivation;
- Document teaching practices systematically, recording implemented strategies and observed outcomes to inform continuous improvement and contribute to the broader evidence base (Crookall, 2010);
- Establish professional learning networks dedicated to sharing methodological innovations to facilitate ongoing development (Hanghøj, 2013).

For Institutions

Educational institutions should consider:

- Strategic investment in technological infrastructure supporting simulation-based learning, including sophisticated data analytics tools for comprehensive assessment (Hanghøj, 2013);

- Allocation of adequate resources for intensive faculty development programs, particularly in the implementation of reflective and engagement methodologies (Molin, 2017);
- Establishment of collaborative partnerships with other institutions to support joint research initiatives and resource sharing (Faria *et al*., 2009);
- Development of assessment frameworks that capture both disciplinary knowledge and interpersonal competencies across varied educational contexts (Biggs & Tang, 2011).

For Future Research

Several critical research directions emerge from this analysis:

✓ Empirical Validation: Rigorous controlled trials are needed to evaluate directive, reflective, and engagement strategies through randomized experimental designs involving diverse student cohorts, measuring impacts on academic performance, learner satisfaction, and the development of enduring professional skills, incorporating advanced tools and peer facilitation (Anderson & Lawton, 2009; Farashahi & Tajeddin, 2018; Shaikh & Ali, 2025; Stoma *et al*., 2020; Sun *et al*., 2022; Svellingen *et al*., 2021; Towne *et al*., 2012). Building on recent quasi-experimental evidence demonstrating simulation superiority over traditional methods (Azizi *et al*., 2022), such studies should specifically compare the relative effectiveness of different mentoring styles within simulation-based contexts.

✓ Longitudinal Studies: Research tracking graduates into their professional careers can reveal the sustained impact of simulation-based learning on critical competencies, such as strategic thinking and collaborative leadership (Crookall, 2010; Anderson & Lawton, 2009).

Cross-Institutional Research: Collaborative research initiatives spanning multiple institutions can generate findings with broader applicability and scalability, accounting for variations in institutional resources and demographic characteristics (Faria *et al*., 2009).

✓ Hybrid Model Investigation: Future studies should examine whether phased or blended implementation strategies lead to improved learning outcomes, exploring optimal sequencing and integration of different approaches (Kolb, 1984; Biggs & Tang, 2011).

✓ Cultural Adaptation: Research exploring cultural adaptations necessary for successful implementation in diverse international educational contexts would enhance global applicability (Bach *et al*., 2016).

✓ Dynamic Systems: Development of adaptive systems capable of responding to real-time feedback while incorporating gamified elements to create truly responsive learning environments (Nicholson, 2015; Deterding *et al*., 2011).

✓ Comparative Studies: Research contrasting simulation-based approaches with traditional lecture-based instruction can clarify contexts where simulation demonstrates superior effectiveness in terms of student satisfaction and knowledge retention (Anderson & Lawton, 2009; Farashahi & Tajeddin, 2018).

✓ Disciplinary Extension: Extension of these approaches to other professional disciplines, including healthcare and engineering education, could reveal broadly applicable pedagogical principles (Biggs & Tang, 2011; Hanghøj, 2013).

Exploring these research directions can support evidence-based improvements in pedagogical practice, equipping all stakeholders to effectively address the evolving demands of contemporary business education.

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