Exploring Uncharted Territories: An In-depth Analysis of Undiscovered Learning Strategies in Higher Education

Mariyono Dwi[1]

Abstract

Globalization has significantly impacted higher education, increasing economic, cultural, and educational connectivity. This research examines how higher education institutions (HEIs) utilize multicultural simulation-based learning to navigate these complexities. We explore the role of simulation technologies in enhancing multicultural education across various disciplines and their effectiveness in fostering inclusive learning environments. The study offers practical guidance for educators and policymakers, recommending strategies for developing more inclusive curricula and addressing challenges faced by minority students. Our findings emphasize the need for innovative pedagogical approaches to prepare students for a globalized world.

Keywords: *Globalization, Higher Education, Multicultural Education, Simulation-Based Learning, Inclusive Curriculum, Cultural Diversity.*

INTRODUCTION

The importance of multicultural higher education in the context of globalization

Globalization has reshaped higher education, offering both challenges and opportunities. It has increased economic, cultural, and educational connectivity, compelling institutions to adapt (Dr. Shailendra Singh, 2016). Higher education institutions (HEIs) must internationalize, embrace cultural diversity, and equip students with global competencies (Zainab, 2023). However, globalization's local impacts vary, leading to diverse responses among HEIs (Douglass, 2005). Some excel in entrepreneurship education (Othman et al., 2012), while others struggle to balance local traditions with global pressures (Kivati, 2017). Integrating sustainability, aligned with the United Nations' Sustainable Development Goals, adds complexity and opportunity (Abo-Khalil, 2024). HEIs must navigate these dynamics strategically, fostering inclusivity, meeting global market demands, and preparing students for a globalized world through innovation and adaptability (Abo-Khalil, 2024; Zainab, 2023).

Globalization has transformed higher education, integrating economic, social, and cultural aspects, and requiring diverse pedagogical models for a global student body (Marginson, 2022; Zainab, 2023). International students benefit host economies and institutions (Kelly, 2012). Despite advantages, challenges include neoliberal dominance and cultural diversity concerns (Kimura-Walsh, 2010; Marginson, 2022). Globalization offers HEIs opportunities to promote social equity and justice (Kimura-Walsh, 2010).

Multicultural education is crucial for developing global citizens through cultural competence and adaptability (Chima Abimbola Eden et al., 2024; Vieira, 2024). Challenges include engagement and belonging issues for minority students, impacting their academic outcomes (Stuart et al., 2011; Yi & Moran, 2024). HEIs must prioritize justice, equality, and respect for diversity, developing culturally diverse curricula and enhancing faculty expertise (Jamil et al., 2021; Morey, 2000). Initiatives like 'Internationalization at Home' promote global understanding and intercultural competence (Prakash Sharma, 2020).

Research highlights the need for curricular development, faculty enhancement, and inclusive learning environments in multicultural higher education (Jamil et al., 2021; Morey, 2000). Integrating international perspectives enriches student learning and prepares them for multicultural leadership. Addressing inequalities, implementing diversity policies, and promoting intercultural dialogue are crucial for inclusivity and sustainability

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[1] Faculty of Islamic Religion, Islamic University of Malang, Malang, Indonesia, Email: dwimariyono@unisma.ac.id

(Marginson, 2022). Multicultural education promises to nurture inclusive, just societies and a brighter future for all (Marginson, 2022).

The Importance of Simulation in Contextual and Interactive Learning

The importance of simulation in contextual and interactive learning has very significant implications in advancing learning methods at various levels of education. The following are several paragraphs that explain the importance of simulations in the learning context:

Simulation technology has emerged as a highly effective tool for contextual and interactive learning across diverse educational domains (Ekpo et al., 2023; B. Wang, 2024). Simulation enhances knowledge understanding and application by replicating real-world scenarios, transcending traditional learning boundaries (B. Wang, 2024; Zhihua Wang , Ligang Zhang, 2017). Its effectiveness varies across fields, being beneficial in areas like fire training and radiography (Ekpo et al., 2023), but requiring careful instructional design for integration into local culture courses (Zhihua Wang , Ligang Zhang, 2017). Simulation technologies support active learning, improve decision-making, and foster knowledge retention (Addo et al., 2023; Krishan et al., 2023; Zelenskyi et al., 2024). However, thoughtful design is essential to address each field's unique challenges and requirements (Fengyu, 2023; Nafari et al., 2024).

Simulation learning offers deep and meaningful experiences by providing realistic scenarios and challenges for students (Eriksson, 2022; S. Jones, 2010; Papelis et al., 2019; Sudajit-apa, 2015). These environments allow risk-free application of knowledge, aiding decision-making without real-world consequences (Alverson et al., 2008; Hrynyschyn, 2024; S. Jones, 2010). For instance, virtual simulations enhance language proficiency and provide safe medical practice spaces (Alverson et al., 2008; Z. Wang, 2024). However, the fidelity of real-world behaviors in virtual environments is not always clear-cut (Hrynyschyn, 2024), and simulation effectiveness depends on design and perceived authenticity (Eriksson, 2022; Sudajit-apa, 2015). Although simulation environments enable skill practice and decision-making in controlled contexts across disciplines (Alverson et al., 2008; S. Jones, 2010; Koenig et al., 2011; Nair, 2021; Papelis et al., 2019; Z. Wang, 2024), ongoing research is crucial to understand their ability to replicate real-life behaviors and their impact on actual performance (Hrynyschyn, 2024).

Simulations develop critical thinking, problem-solving, and decision-making skills by encouraging deep skill development and considering diverse perspectives (S B et al., 2023). They provide a controlled environment for applying theoretical knowledge to practical scenarios, fostering analytical thinking (S B et al., 2023). However, studies indicate insufficient proficiency in students, suggesting a need for more targeted instructional methods within simulations (Irwanto et al., 2024). The positive correlation between critical thinking and problem-solving skills underscores the mutual benefit, particularly in simulation-based learning (Mohd Abeden & Siew, 2022; Siswati & Suratno, 2023). Educators can optimize simulations by integrating guided inquiry and problem-solving techniques to enhance students' analytical capacities (Irwanto et al., 2024).

Simulation enhances information retention by providing hands-on experiences, which are more effective than purely theoretical learning (Montgomery & Millenbah, 2011). Experiential learning improves critical thinking, decision-making, problem-solving, and knowledge retention (Montgomery & Millenbah, 2011). This approach integrates theoretical and practical elements, emphasizing its pivotal role (Murray, 2018). Studies consistently show the benefits of experiential learning, including through simulations and gamification, in enhancing academic achievement and student engagement (Lampropoulos & Sidiropoulos, 2024; Murray, 2018; Radović et al., 2022). Experiential learning promotes deeper cognitive processing, knowledge retention, and holistic student development. Integrating experiential learning into curricula improves knowledge retention and supports student development (Lampropoulos & Sidiropoulos, 2024; Montgomery & Millenbah, 2011; Murray, 2018; Radović et al., 2022). Overall, simulations provide engaging practical experiences that strengthen students' understanding and retention of course material.

The use of technology in simulations is increasingly crucial in today's tech-driven world. Computer simulations and virtual reality (VR) technologies create dynamic and comprehensive learning experiences across various domains (Abdennour et al., 2023; Di Wu, 2024). These tools offer immersive environments, enhancing

engagement and understanding (Di Wu, 2024). VR benefits extend to fields like sports education, digital media art, and medical training (B. C, 2024; SONG et al., 2012; B. Xu, 2024). Advanced features like Augmented Virtual Feature Classification (AVFC) and Whale Optimized Feature Extraction Recurrent Classification (WOFERC) models personalize learning, improving engagement and proficiency (Yinhui Hao, 2024; Yuan, 2024). Integrating computer simulations and VR transforms learning by enhancing interactivity, immersion, and personalization (B. Xu, 2024; Yinhui Hao, 2024; Yuan, 2024). These technologies modernize education, improving learning outcomes across disciplines and fostering innovation in creating realistic and immersive learning experiences.

Simulation is crucial in contextual and interactive learning, providing engaging experiences for students to prepare them for real-world challenges, enhancing education effectiveness and quality at all levels.

Problem Statement

The urgency for diverse and inclusive learning approaches in global higher education is underscored by the evolving dynamics of globalization. Cultural diversity is increasingly vital, with universities needing inclusive environments to meet the diverse needs of their student bodies. Embracing diversity strategically equips students with essential skills for success in multicultural societies, fostering tolerance and effective communication. Inclusive learning ensures every student feels supported, accommodating diverse learning styles and accessibility requirements. Diverse perspectives enrich the educational experience, promoting critical, creative, and innovative thinking crucial for today's global workforce. These approaches also increase accessibility for marginalized groups, making higher education more equitable. In simulation-based learning, contextual experiences allow students to apply theoretical knowledge practically, enhancing understanding and skills. Active participation in simulations promotes problem-solving and collaboration, fostering student-centered learning. Immediate feedback from simulations enables students to refine strategies in a safe environment, while teamwork and communication skills are enhanced, essential for diverse professional settings. Well-designed simulations also expose students to cultural diversity, fostering cross-cultural understanding and tolerance in our interconnected world.

Research Purposes

This research aims to analyze higher learning strategies using simulation in a multicultural context, examining various simulation approaches used in global higher education institutions. The study will cover various subject areas and disciplines, analyzing computer-based, role-playing, and clinical simulations. The research will also explore challenges and opportunities in implementing multicultural simulation approaches, identify best practices, and provide insights for future inclusive learning strategies.

LITERATURE REVIEW

Traditional Approaches to Multicultural Learning

A review of traditional multicultural learning strategies that have existed before.

Multicultural learning strategies enhance inclusive education through relevant pedagogy, curriculum development, intercultural competence training, and community engagement. Cooperative learning promotes cultural awareness, collaboration, and respect (Çalışkan & Batı, 2020; Saefudin et al., 2021). Incorporating historical, gender, and aesthetic perspectives broadens cultural understanding (Saefudin et al., 2021). While positive impacts are noted, especially in English Language Teaching in Indonesia (Haswani et al., 2023), effectiveness varies by context. Culturally relevant pedagogy integrates diverse perspectives, challenging stereotypes and promoting equity (Olateju Temitope Akintayo et al., 2024b). However, current implementations often fall short, as seen in Hong Kong's criticized Liberal Studies resources (Jackson, 2017). Conversely, Indonesia's approach has shown promise in promoting tolerance (Hartinah et al., 2023). The success of multicultural curricula depends on accurate representation and effective strategies, requiring ongoing reforms for inclusivity and equity (Hartinah et al., 2023; Jackson, 2017).

Intercultural competence training enhances communication, empathy, and cultural awareness, with consistent positive impacts (Dimitrov et al., 2014; Juliastuti et al., 2023; Mahmud & Wong, 2016; Syahrin et al., 2023; TIKIZ ERTÜRK et al., 2023). Despite some limitations, it benefits educational and professional settings (Pinto, 2018). Community engagement in education promotes cross-cultural learning and service-based experiences, benefiting students and local communities (Blouin & Perry, 2009). These programs integrate local knowledge into curricula and enhance diversity appreciation (Soong, 2013; T.M & Vijayanand, 2023). Challenges include aligning educational and community objectives and varying student engagement levels (DuBord & Kimball, 2016). Technology broadens global perspectives in international e-community engagement (Falk et al., 2023). These initiatives improve academic performance, civic engagement, and societal awareness (Askildson et al., 2013; Suresh Kumar, 2017). They must be well-designed and inclusive to optimize benefits, preparing students for responsible citizenship and fostering intercultural awareness (Andrew, 2011; Soong, 2013). Together, these strategies cultivate inclusive learning environments, promote social justice, and empower students as global citizens.

Limitations of Traditional Approaches in Meeting Diverse Multicultural Learning Needs

The literature highlights traditional pedagogical approaches' limitations in addressing diverse student needs. Innovative methods, discussed in the reviewed papers, promote engagement, critical thinking, and adaptability. These approaches offer tailored strategies, including agile methodologies, post-COVID-19 adaptation in Indian education, and creative teaching in design education (Fitsilis et al., 2023; Kian, 2020). Embracing such innovation is vital for creating inclusive, dynamic learning environments suited to multicultural education's complexities. Traditional pedagogical approaches often fail to address diverse student needs. Innovative methods, such as agile methodologies and creative teaching, enhance engagement, critical thinking, and adaptability (Dixit et al., 2024; Fitsilis et al., 2023; Madhukar Gampala, 2023; Nadarajan Thambu et al., 2020). These strategies are crucial for inclusive, dynamic learning environments suited to multicultural education (Kian, 2020; Koroban, 2023; Meschial et al., 2020).

Traditional methods are less effective in multicultural settings. Students preferring these methods may struggle with adaptability, while those comfortable with non-traditional approaches manage better (Clayton et al., 2010). Traditional strategies often miss cultural nuances, necessitating teachers' cultural understanding and intercultural communication skills (Omeri, 2014; Shahini et al., 2019b). Systematic, non-traditional approaches foster self-regulation and choice-making (Olaug Horverak, 2023). Thus, culturally responsive and adaptive methods are essential to promote inclusivity and engagement (Clayton et al., 2010; Omeri, 2014; Shahini et al., 2019b).

Traditional education approaches may struggle to accommodate the diverse needs of multicultural learners, overlooking cultural factors that shape students' academic performance and engagement (Sarmiento, 2010). Teachers' inadequate preparation and resources for multicultural education contribute to information overload and discomfort in discussing sensitive topics in culturally diverse settings (Naz et al., 2023). Despite the importance of multicultural education for equity, it presents challenges, necessitating better support and training for teachers (Naz et al., 2023). Furthermore, cultural differences significantly impact learning and teaching, requiring diverse pedagogical strategies (Shahini et al., 2019b). Pre-service teachers may lack awareness of incorporating cultural sensitivity in teaching special needs students (Taylor et al., 2015), and there's a complex interplay between cultural diversity and language acquisition not fully addressed by traditional methods (Molema, 2024). Addressing these challenges requires comprehensive teacher training, inclusive curricula, and the integration of multicultural values into educational practices (Garcia & Lopez, 2005; Hartinah et al., 2023), fostering a more inclusive and effective learning environment for all students (Nomnian, 2018).

Moreover, traditional approaches may perpetuate cultural biases, stereotypes, and inequalities by centering on Eurocentric perspectives and neglecting contributions from marginalized groups (Anjum & Aziz, 2024). The study highlights the lack of emphasis on interactive and experiential learning methods, which are crucial for fostering active engagement, critical thinking, and empathy across cultural boundaries (Heinrich et al., 2015; Salam et al., 2019; Shiraev & Levy, 2020). Furthermore, traditional approaches may struggle to keep pace with the rapid demographic changes and globalization trends reshaping contemporary higher education

landscapes(Altbach et al., 2010; Maassen & Cloete, 2006; Pucciarelli & Kaplan, 2016; Zwaan, 2017). There is a growing recognition that alternative pedagogical approaches, like simulation-based learning, offer promising avenues to address the limitations of traditional methods and foster inclusive, culturally responsive educational environments.

Use of Simulation in Higher Education Contexts

Study of the use of simulation in learning in higher education.

Globally, simulation studies in higher education, particularly in the United States, are gaining attention for innovative pedagogical practices across various disciplines (Chernikova et al., 2020; Hallinger & Wang, 2020a, 2020b; J. Lu et al., 2014). For example, studies in medical education have investigated the use of virtual patient simulations for clinical skills training, while in business schools, simulations are utilized to provide experiential learning opportunities in areas such as marketing and finance(Chernikova et al., 2020; Kononowicz et al., 2019; Qayumi et al., 2014).

Simulation technology in higher education has been extensively studied, revealing advantages such as increased safety, accessibility, and personalization in 2D and 3D simulated environments. These benefits are particularly valuable in online technical curricula (Alfred et al., 2018). However, physical interaction with learning materials, like constructing electrical circuits, may lead to better outcomes in terms of self-efficacy and construction speed (Alfred et al., 2018). Students respond positively to integrated computer simulators like bioreactor simulators, indicating that technology enhances satisfaction and learning outcomes by promoting autonomy and engagement (Cotoras, 2024). Systems like the Intelligent Assisted Learning System for Higher Education Students, integrating AI and machine learning, enhance engagement and performance with personalized pathways and real-time feedback (Y. Lin, 2024). Simulation technology enhances learning with safe, accessible, and personalized environments, yet its effectiveness hinges on design and its capacity to foster student autonomy and engagement (Alfred et al., 2018; Cotoras, 2024; Y. Lin, 2024).

In Europe, particularly in countries like the United Kingdom and Germany, there is increasing research on integrating simulations into higher education curricula. Studies examine how simulation-based learning impacts student engagement, knowledge retention, and skills development across various academic disciplines. This research emphasizes the integration of diverse elements into higher education curricula. Faas (2011) discusses incorporating multicultural and European values, while Lautala et al. (2010) and Potočki et al. (2023) explore integrating industry practices and nature-based solutions, reflecting a shift towards practical learning. Insights on the integration of simulations in European higher education, particularly in the United Kingdom and Germany, are lacking in the provided papers. While simulations are known to enhance practical learning, their explicit adoption in curricula is not detailed. The prevalence and integration of simulations in these contexts remain uncertain without direct evidence. Further investigation is needed to understand their role in evolving higher education curricula in Europe (Faas, 2011; Lautala et al., 2010; Potočki et al., 2023)

In Asia, countries like China and Japan have adopted simulations to enhance active learning and problem-solving skills among students. These tools are recognized for their effectiveness in contemporary education. While specific data on their adoption in China and Japan is limited, insights from other Asian contexts suggest similar trends. For instance, Salleh et al. (2012) describe a web-based simulation framework that improved university students' critical thinking skills, reflecting Asia's broader trend of integrating technology in education. Similarly, Palloan et al. (2021) discuss active learning strategies combined with e-learning to enhance critical thinking. While direct evidence for China and Japan is lacking, the research underscores the value of interactive and technology-enhanced methods, like simulations, in fostering critical thinking and problem-solving across Asia (Palloan et al., 2021; Salleh et al., 2012).

Further research is needed to explore simulations specifically in China and Japan.Research in this region often focuses on the design and implementation of culturally relevant simulation scenarios that resonate with local contexts and societal norms (ANKYIAH & Bamfo, 2023; Faudi et al., 2023; Palloan et al., 2021; Salleh et al., 2012; Umam & Fauziah, 2022). In Australia and New Zealand, studies have explored simulations' role in addressing distance education challenges and fostering collaborative learning among geographically dispersed

students. However, these studies primarily focus on theoretical frameworks, organizational climate, and technology to enhance collaboration, without specific mention of simulations (Alimen & Alimen, 2012; Soon & Sarrafzadeh, 2010; С Чандрасекаран, Parminder Badwal, Manfred Mühlfelder, 2016).

For example, Charles Sturt University's "Interact" learning management system supports virtual teamwork, hinting at interactive, simulation-like environments (Soon & Sarrafzadeh, 2010). Additionally, concept mapping frameworks (W. Ng & Hanewald, 2010) may pave the way for future simulation tools. While simulations are not explicitly discussed, the importance of collaborative learning and technology in distance education is highlighted, suggesting a potential for future simulation integration(Härtel & Tilton, 2019; Nichols, 2022; Yu et al., 2023).Overall, these studies collectively contribute to a growing body of literature that underscores the potential of simulations to enrich teaching and learning practices in higher education on a global scale.

Advantages and disadvantages of using simulations in multicultural contexts.

Studies in the US show that simulation-based learning experiences (SBLEs) can enhance cultural sensitivity, communication, and empathy among nurse practitioner students, despite their complexities (Turkelson et al., 2021). Simulations with standardized patients (SPs) improve NP students' readiness to interact empathetically with diverse patients, including Hispanics with limited English proficiency.

Additionally, simulations enhance healthcare students' cross-cultural communication skills and understanding of cultural contexts (Marja & Suvi, 2021). While simulations are valuable, other methods like experiential learning, cultural immersion, and virtual cross-cultural exchanges also play crucial roles in fostering intercultural competence (Budiharso et al., 2024; Seawright et al., 2021). In U.S. studies support simulations as powerful tools for enhancing cross-cultural understanding in healthcare education, complementing broader strategies like experiential learning and virtual exchanges(Budiharso et al., 2024; Marja & Suvi, 2021; Seawright et al., 2021; Turkelson et al., 2021).

Simulations enhance intercultural communication and collaborative problem-solving by creating immersive environments replicating real-world cultural dynamics, supported by the ELC, allowing learners to transcend paradigms and engage in natural decision-making (Wiggins, 2012). However, their effectiveness depends on thoughtful design, implementation, and participants' existing intercultural awareness (Pinariya & Sutjipto, 2021; Rui & Tong, 2021). Successful integration into curricula requires addressing linguistic, socio-cultural, and behavioral components of intercultural communication competence (Yueqin & Communication, 2013). Simulations are a promising tool for developing intercultural literacy and bridging cultural divides, provided they are well-designed and aligned with learners' competencies (Atasheva, 2024; LIU, 2023; Mary Omoboye & Nkechi Emmanuella Eneh, 2024).

Cultural bias in scenario design and the need for culturally competent facilitators can hinder the effectiveness of simulation-based learning in multicultural settings, potentially alienating participants or reinforcing stereotypes (Chao et al., 2011). Facilitators lacking cultural competence may struggle to engage diverse participants, hindering learning and preventing the development of cultural competence among participants (Bahreman & Swoboda, 2016; Halm & Wilgus, 2013). Cultural competence training is essential, but overemphasizing knowledge about 'Others' can lead to superficial understanding of cultural differences and potentially foster intergroup hostility (Chao et al., 2011).

Additionally, there may be a discrepancy between facilitators' perceived cultural competence and their actual levels of competence, as evidenced by unchanged cultural orientations despite increased awareness (Halm & Wilgus, 2013). To tackle challenges, scenario design should consider cultural biases and develop competent facilitators, prioritizing critical self-awareness over simply accumulating knowledge about different cultural groups (Chao et al., 2011). By doing so, facilitators can better navigate the complexities of multicultural environments and enhance the overall effectiveness of their interventions (Atakoziyeva et al., 2024; Balakrishnan et al., 2023).

European research emphasizes the effectiveness of simulations in enhancing cultural sensitivity and awareness among students, particularly in globalized work environments, by providing immersive experiences. Virtual learning environments using 3D video game technology and AI, as reviewed by Ogan and Lane (2011), provide

simulations that support cultural knowledge and communication skills. Han (2013) also discusses using pedagogical approaches, including simulations, to foster intercultural communication competence by integrating language, culture, and learning. Simulations are effective tools for developing intercultural competence, preparing students for cross-cultural interactions in a globalized economy (Ogan & Lane, 2011; Yueqin & Communication, 2013).

The study raises concerns about the generalizability of simulation outcomes across diverse cultural contexts and the potential for perpetuating stereotypes through oversimplified representations of cultural diversity (Fiske, 2017). Stereotypes vary widely across cultures, and simulations that ignore these nuances may reinforce harmful stereotypes. The stereotype content model (SCM) suggests that social structure predicts stereotypes, which may cause simulations to overlook cultural specificity (Caprariello et al., 2009). Additionally, platforms like TikTok can amplify stereotypes, which simulations might inadvertently mimic (Zhu, 2023). Implicit intergroup biases further complicate accurate stereotype reflection in simulations (Lai & Wilson, 2021).

To avoid reinforcing stereotypes, simulations should be designed with cultural awareness, understanding how stereotypes function in different societies and recognizing their cultural specificity. Considering the role of social media in shaping perceptions (Zhu, 2023) and the complexity of implicit biases (Lai & Wilson, 2021) is essential to prevent oversimplification. A contextual approach that acknowledges stereotype diversity and cultural specifics can enhance the generalizability and accuracy of simulation results (Long et al., 2020).

In Asia, studies highlight the potential of simulations to transcend language barriers and facilitate cross-cultural collaboration, particularly in virtual learning environments (Shadiev et al., 2024). Research shows that simulation, especially using machine translation technologies, can overcome language barriers and facilitate cross-cultural collaboration in Asia. Lin et al. (2004) provide empirical evidence from two experiments—the technical Intercultural Collaboration Experiment and the non-technical China-Japan-Korea Virtual Community Experiment—demonstrating effective communication through machine translation. However, human intervention and adaptation to translations are crucial for success, as understanding cultural nuances and adapting translations are key (LIN et al., 2004). This aligns with findings from other regions where machine translation in language education enhances cross-cultural communication skills (XiaoLei Song, 2024).

Simulation technologies like machine translation in Asia help bridge linguistic divides, but human oversight is crucial for cultural context adaptation, emphasizing the importance of human engagement (-, 2023; Sokol & Zhang, 2023). Cultural adaptation and the transferability of simulation skills to real-world contexts are crucial considerations for educators. Vallis et al. (2024) emphasize the need to adapt educational strategies to different cultural contexts due to nuances and resource limitations. Hsu and Taiwan (2024) highlight the role of simulation software like SimuCert in bridging theoretical knowledge and practical application, essential for real-world preparedness. However, while simulations provide a controlled environment to develop skills, their transferability to real-world scenarios is complex. Visone (2018) and Tai et al. (2017) note that classroom instruction and peer learning interventions may not always translate seamlessly into practice, underscoring the importance of real-world experience.

Educators should ensure learners are proficient in simulated environments and capable of applying their skills in diverse real-world situations, integrating cultural adaptation and real-world exposure (Hsu, 2024; Vallis et al., 2024). Moreover, research from Australia and New Zealand underscores the importance of incorporating Indigenous perspectives and cultural diversity into simulation design to ensure relevance and inclusivity (Oetzel et al., 2017; Olateju Temitope Akintayo et al., 2024b; Ololade Elizabeth Adewusi et al., 2024; Pinto, 2018). Despite these challenges, simulations are widely recognized as valuable tools for promoting multicultural competence and preparing students for the complexities of a globalized society.

METHODOLOGY

Content analysis serves as a crucial tool in social and educational research, enabling a systematic exploration and interpretation of meanings within texts and communication artifacts. This study employs content analysis to assess diverse simulation-based learning strategies implemented across global higher education institutions. This method offers a structured framework to identify themes, patterns, and trends in data.

Through content analysis, we delve into the application of simulations in multicultural contexts, identifying effective practices and challenges. By coding and categorizing data from various sources—such as curricula, learning materials, research reports, and interviews—we capture the nuances and complexities of these approaches. This rigorous approach ensures our findings are grounded in robust evidence, supporting our objectives to analyze and enhance simulation-based learning strategies in multicultural settings.

The content analysis procedure includes systematic stages to ensure the accuracy and reliability of our findings. Beginning with comprehensive data collection from relevant documents across different countries, we move to coding, where themes and patterns related to simulation use in multicultural learning are identified and organized. This stage employs manual coding or qualitative analysis software to enhance consistency and efficiency.

Next, the coded data undergoes analysis to uncover relationships between categories and assess the effectiveness of implemented strategies. Data triangulation validates findings from multiple sources, enhancing the credibility of our results. Finally, interpretation connects our findings with existing literature and theoretical frameworks, offering practical insights and recommendations for future learning strategy development. By following this robust content analysis procedure, our research aims to significantly contribute to improving multicultural learning approaches in global higher education.

RESULT AND DISCUSSION

Conceptualization of Multicultural Learning Simulation

Understanding Multicultural Learning Simulation

Simulation in higher education combines real-world scenarios to provide immersive, three-dimensional learning experiences, enabling practical application of theoretical knowledge in risk-free settings (Geng & Wu, 2021; JENSON & FORSYTH, 2012). Simulations enhance knowledge retention and practice, but face challenges like high student-to-faculty ratios. Integrating VR in psychological health and dietetics education enhances learning (Yang, 2018). Simulation in higher education enhances theoretical learning and practical application, providing students with lifelike experiences to prepare for real-world scenarios and overcoming conventional educational barriers.(Dimitropoulos & Manitsaris, n.d.; Y. Liu et al., 2019; Tiffany & Hoglund, 2014).

Simulations are effective teaching tools that enhance students' understanding of complex concepts and problem-solving skills by combining theoretical ideas with real-world scenarios (S B et al., 2023). The core principles of active learning and engagement in problem-based learning (PBL) forums are echoed by the benefits of simulations, despite the absence of specific discussion in the presented papers.

PBL, in particular, has been shown to be effective in helping fifth-grade students develop their critical thinking and problem-solving abilities (Ahdhianto et al., 2020), and educational forums have helped students feel more confident about clinical decision-making, which is a crucial component of problem-solving (O'Dell et al., 2009). Interactive applied learning methodologies, such as simulations, can enhance critical thinking and problem-solving abilities, providing valuable experiential learning experiences similar to problem-based learning and educational forums (Ahdhianto et al., 2020; O'Dell et al., 2009; S B et al., 2023).

Educational simulations utilize realism, interactivity, and feedback to enhance learning and align with real-world contexts, as seen in traffic models used in autonomous vehicle simulations (Cao et al., 2023). Interactivity is a crucial element in the design of interactive learning systems, reflecting the symbiotic relationship between educational simulation and gaming (ESG) (Sabry, 2011). Feedback mechanisms, like the feedback-enriched simulation environment (FENIkS), are crucial in teaching UI design principles and providing learners with direct performance insights (Ruiz et al., 2020).

The challenges of capturing human preferences in simulations are complex and involve overcoming contradictions and intriguing facets (Cao et al., 2023), while existing crowd-feedback systems may fall short in delivering the requisite interactivity to effectively engage users (Haug & Maedche, 2021). Moreover, despite interactivity's perceived benefits for learning, it doesn't invariably translate into heightened behavioral intentions to utilize educational tools in the future (Cervenec et al., 2022).

Literature highlights that combining realism, interactivity, and feedback in educational simulations is crucial for improving learning outcomes. Realism ensures simulations accurately reflect authentic conditions (Cao et al., 2023), interactivity captivates learners and correlates with enriched educational experiences (Cervenec et al., 2022; Sabry, 2011), while feedback furnishes learners with invaluable insights into their learning journey (Ruiz et al., 2020). Nonetheless, the implementation of these concepts proves intricate, necessitating meticulous consideration of the challenges and limitations delineated in extant research (Cao et al., 2023; Cervenec et al., 2022; Haug & Maedche, 2021).

Simulations enhance learning authenticity and impact by providing high-fidelity visual data and lifelike interactions, enhancing readiness for real-world tasks, as demonstrated in effective earthquake response training (Sun et al., 2023). Simulations' realism extends beyond fidelity, involving dynamic interactions between participants and the simulated context, emphasizing user engagement and the application of simulation experiences to real-world professional practices (Rystedt & Sjöblom, 2012).

Realism is essential for effective learning, but it doesn't guarantee success. Authenticity depends on cognitive processes, learner engagement, instructional design, and prior knowledge (Anthony et al., 2014; Corves et al., 2024). Authenticity in education extends beyond simulation, encompassing the sincerity of the instructor and the learning environment, significantly influencing both physical and virtual classroom experiences (Dietlin et al., 2019). Simulation-based learning should balance realism with other educational factors for optimal impact, considering learner perspectives and educational goals, ensuring cognitive fidelity and engagement (Anthony et al., 2014). Simulations in higher education foster active student engagement, real-time decision-making, and feedback, enhancing skills and connecting theoretical knowledge with practical application.

Multicultural learning simulations enhance understanding and appreciation of cultural diversity through immersive role-playing scenarios, fostering cross-cultural communication skills despite presenting challenges. Notably, Rizvi et al. (2016) pinpoint the formidable obstacle of fostering acceptance of diversity. Additionally, insights gleaned from Zembylas (2008) elucidate the emotionally charged experiences of adult learners grappling with issues of cultural diversity, particularly in online formats, which can evoke profound affective responses pivotal for profound learning but simultaneously arduous to navigate. Multicultural learning simulations enhance cultural competency by providing controlled environments for learners to engage with diversity, requiring educators to manage emotional responses and promote diversity acceptance (Rizvi, 2016; Zembylas, 2008)

Various Simulation Methods That Can Be Used in Teaching.

Numerous simulation methods can be utilized in teaching, each tailored to specific educational goals and disciplines.

Role-playing simulations are an effective educational method that allow students to explore different perspectives and develop empathy and communication skills by assuming roles within a scenario (Komisaryk et al., 2023). Interestingly, while role-playing is beneficial in improving communication skills, such as interactive fluency, it also fosters confidence and motivation to communicate in English for ESL students (Ishak & Abdul Aziz, 2022). Additionally, role-playing games have been shown to develop a high level of empathy among future inclusive teachers, which is crucial for children's development (Komisaryk et al., 2023). Furthermore, role-playing activities have been positively associated with the enhancement of speaking skills and self-confidence in oral English among Thai EFL undergraduate students (Suchada Tipmontree & Asama Tasanameelarp, 2021). Role-playing simulations enhance empathy and communication skills in educational settings by engaging students in active learning, encouraging perspective-taking, and building transferable soft skills (Ishak & Abdul Aziz, 2022; Komisaryk et al., 2023; Suchada Tipmontree & Asama Tasanameelarp, 2021).

Computer-based simulations use software to create detailed, dynamic models of systems or processes, enabling complex data manipulation and analysis (Hoban et al., 2012; Iryna et al., 2023; Ka, 2023; Paszkiewicz & Bolanowski, 2018; Wu et al., 2023). These simulations cover a wide range of applications, from modeling physical events in engineering (Oden et al., 2003) to deciphering the complexities of computer networks (Paszkiewicz & Bolanowski, 2018), biological systems (Ka, 2023), genetic data (Hoban et al., 2012), and socio-

economic processes (Obelets, 2022). The integration of Agent-Based Modeling with Large Language Models in Smart Agent-Based Modeling showcases the advancement of simulation techniques for capturing complex system dynamics more realistically (Wu et al., 2023). Despite their power, simulations pose challenges such as ensuring reliability (Oden et al., 2003), accommodating the intricacies of complex systems (Paszkiewicz & Bolanowski, 2018), and accurately modeling biological processes (Ka, 2023). Moreover, the development of simulation software must address stochastic data processing (Iryna et al., 2023) and foster scientific modeling advancements in interdisciplinary fields like ocean science (Jung et al., 2022).

Virtual reality (VR) simulations offer students immersive, three-dimensional environments, enhancing their sense of presence and engagement, thus potentially improving educational outcomes (Sheharyar & Bouhali, 2018). This immersive nature of VR is utilized in various educational fields, from engineering to language learning, to boost student engagement and support active learning (Lixin Wang, 2024; Rafiq et al., 2022). Despite the generally positive impact of VR on education, challenges such as user discomfort, object tracking inaccuracies, and equipment usability issues can hinder the learning experience (Lytvynova, 2023). Moreover, incorporating advanced features like Multimedia Linear Statistical Feature Classification (MLSC) and Augmented Virtual Feature Classification (AVFC) has been shown to further enhance engagement and proficiency in digital media art and English language learning, respectively (B. Xu, 2024; Yuan, 2024).

Augmented reality (AR) simulations enhance learning experiences by overlaying digital information onto the real world, providing contextual data and interactive elements (Bondah et al., 2023; Huri et al., 2024). This blending of digital content with the physical environment transforms traditional education by boosting engagement, understanding, and collaboration (Huri et al., 2024). Additionally, AR's capability to superimpose critical information in real-time enhances accuracy, efficiency, and safety across various industries (Alshamsi, 2023). Despite its potential, AR does not always enhance learning outcomes, as it did not show a significant advantage over traditional methods for grammar and vocabulary retention (Draxler et al., 2020). AR's educational impact is complex and depends on implementation and context, requiring further research and design to optimize its benefits in both educational and industrial settings (Alshamsi, 2023; Bondah et al., 2023; Draxler et al., 2020).

Game-based simulations combine educational content with a game format, fostering active learning and motivation through competition and reward systems (Cagiltay et al., 2015; Lantzouni et al., 2024; Y.-C. Lin & Hou, 2024; D. Xu et al., 2023). Simulations are designed for interactive student engagement, enhancing understanding and retention of material, with a competitive aspect often outperforming collaborative methods (Cagiltay et al., 2015; Y.-C. Lin & Hou, 2024). However, collaborative game mechanics also positively impact learning motivation across various dimensions (Y.-C. Lin & Hou, 2024). Additionally, games with progressive elements improve motivation and engagement, showing no significant difference between competitive and collaborative settings (D. Xu et al., 2023). Game-based simulations with educational content promote active learning and motivation through progression, competitive and collaborative elements. Further research should explore the optimal balance for enhanced learning experiences (Cagiltay et al., 2015; Y.-C. Lin & Hou, 2024; D. Xu et al., 2023).

Case studies and scenario-based learning involve students solving real-world problems that require critical thinking and problem-solving skills (Siswati & Suratno, 2023; Widiastuti et al., 2023). Grounded in the philosophy that active engagement enhances learning, these methods also foster competencies like collaboration, communication, and global literacy (Hmelo & Ferrari, 1997; Mat & Mustakim, 2021; Razak et al., 2022). Integrating these approaches with innovative curricula, such as maker-centered learning, further boosts creative problem-solving abilities (Huang et al., 2019). However, teaching problem-solving to underprepared students remains challenging, especially in technical fields (Loji, 2016). Case studies and scenario-based learning are effective strategies for developing critical thinking and higher-order cognitive skills, crucial for 21st-century education (Chabeli, 2006; S B et al., 2023). These methods provide distinct advantages and can be customized to various educational settings, enhancing the learning experience through interactive, engaging, and effective methods.

Multiculturalism in Higher Education

In higher education, multiculturalism entails recognizing and incorporating diverse cultural perspectives, aiming to enrich learning experiences and create inclusive environments (Llantos, 2021). Despite its benefits, multiculturalism poses challenges such as cultural adaptability in online learning (Vieira, 2024) and cultural entropy affecting organizational dynamics (Vieira, 2024). Leadership styles, particularly transformational leadership, are pivotal in managing multiculturalism and fostering academic excellence (ZHONG, 2024). Addressing these challenges is crucial for nurturing inclusive learning communities that prepare students for a globalized world (Bei, 2015; Jaspal, 2015; Markey et al., 2023; Sedibe, 2016; Zainab, 2023).

Multicultural curriculum design profoundly influences teaching and learning by integrating diverse cultural perspectives. This enriches learning experiences and fosters holistic subject understanding (Olateju Temitope Akintayo et al., 2024a). Educators must adapt pedagogical approaches to cater to diverse student backgrounds, valuing cultural diversity in the classroom (Molema, 2024). While multiculturalism offers enriched learning opportunities, it presents challenges such as resource constraints and peer interaction obstacles (Bachtiar, 2024; Sit, 2012). Effective responses involve inclusive teaching strategies, multicultural perspectives in pedagogy, and creating an environment conducive to intercultural dialogue (Molema, 2024; Olateju Temitope Akintayo et al., 2024a). Such approaches enhance learning outcomes and classroom dynamics, necessitating support and professional development for educators (Bachtiar, 2024).

Recognized for enriching the curriculum, multiculturalism in education integrates diverse cultural perspectives, experiential content, and histories, enhancing relevance and inclusivity (Chaika, 2023a). This approach cultivates empathy, critical thinking, and prepares students for the global workforce (Chaika, 2023a). Valuing diverse perspectives optimizes learners' potential and fosters an inclusive learning environment promoting intercultural dialogue (Molema, 2024). However, challenges arise in implementation, such as faculty lacking knowledge of cultural minorities' backgrounds (Kaweesi et al., 2023) and the need for ongoing professional development (Chima Abimbola Eden et al., 2024). Overall, incorporating multiculturalism requires collaborative efforts to overcome challenges and ensure culturally responsive and inclusive educational practices (Chaika, 2023a; Chima Abimbola Eden et al., 2024; Kaweesi et al., 2023).

Global Learning Strategy Analysis

Case Studies: Different Countries

Research from the United States highlights the importance of active learning techniques like problem-based learning and flipped classrooms in promoting student engagement and critical thinking skills (Fita et al., 2021; Kuntari et al., 2021). Evidence shows measurable improvements in critical thinking, demonstrated by enhanced test scores and student engagement (Ahdhianto et al., 2020; Niswa et al., 2022). Effective implementation of PBL, with the teacher as a facilitator, is crucial for its success (Fadilla et al., 2021; Yulianti, 2021). Systematic development and use of PBL materials, like student worksheets, further improve learning outcomes and critical thinking skills (Br Purba et al., 2024). In summary, PBL emerges as a potent active learning strategy for enhancing critical thinking skills, requiring careful design and teacher guidance. These findings underscore PBL's potential as an innovative educational tool (Arifin, 2021; Razak et al., 2022; Yana et al., 2022).

Collaborative learning methods like peer-to-peer and group projects promote social interaction, knowledge sharing, and enhance interpersonal skills, ultimately improving learning outcomes (Mekouar et al., 2021). Collaborative learning influences learner engagement across various dimensions, evolving over time as students interact (Jin et al., 2022). Factors like consistent online interaction and cultural diversity impact the effectiveness of collaborative learning, offering unique experiences but also introducing challenges (W. W. K. Ma & Yuen, 2011; Maina et al., 2017). Social media enhances student engagement in e-learning through collaborative methods (Ah Choo Koo, San Zheng Jie, 2021), while peer assessment in group projects promotes deep learning and critical evaluation (Dutta et al., 2023). Addressing these factors optimizes the benefits of collaborative learning for diverse student backgrounds and learning environments (Arkilic et al., 2013; H. M. Do, 2023; Neugebauer et al., 2016).

In Europe, inquiry-based learning (IBL) emphasizes self-directed learning and interdisciplinary studies, fostering cross-cultural understanding by integrating diverse perspectives (Poteau, 2015; Wessels et al., 2019). While recognized for enhancing various competences, further research is needed to define and implement specific methodologies for promoting them (Wessels et al., 2019). Integrating cultural content into English teaching enhances language proficiency and intercultural communication skills, highlighting the role of language education in fostering cross-cultural competence (Yan & Jing, 2023). IBL and interdisciplinary studies in Europe are significant strategies for promoting self-directed learning and cross-cultural understanding, requiring more systematic research for effective implementation (Poteau, 2015; Wessels et al., 2019; Yan & Jing, 2023).

Experiential learning, like internships and study abroad, exposes students to diverse perspectives and cultural practices, vital for their transition into the workforce (Swanson, 2022). Study abroad offers rich learning opportunities, immersing students in new cultural contexts and fostering global awareness (Reid, 2023). Student motivations for these experiences vary, influenced by career goals, finances, and minority status (Coker & Porter, 2016). While students recognize the benefits of experiential learning, institutions must ensure accessibility and effective communication, considering socioeconomic backgrounds (Davis et al., 2023). Study abroad programs should balance structure with flexibility, supporting transformational learning while allowing for personal growth (Reid, 2023). Experiential learning broadens students' perspectives and cultural understanding, essential for their professional and personal development (Coker & Porter, 2016; Davis et al., 2023; Quesada-Pineda & Haviarova, 2014)

In Asia, a dynamic blend of traditional and innovative teaching methods is evident, aiming to optimize learning outcomes and prepare students for modern challenges (Cesaria et al., 2020; Conțu, 2017; Hang et al., 2023; Haruna et al., 2018; Jaipal-Jamani & Figg, 2019). Studies highlight the effectiveness of gam and blended learning in enhancing student engagement and knowledge retention, such as the use of serious games in traditional handicraft education (Hang et al., 2023). Similarly, digital game-based strategies foster cognitive, skill, and attitude development in higher education (Jaipal-Jamani & Figg, 2019). Despite the adoption of innovative methods, traditional teaching approaches remain valued, recognized for facilitating immediate feedback and teacher-student interaction (Conțu, 2017). Moreover, the cultural heritage sector integrates digital tools to enrich the experiential value of heritage assets, blending technological advances with cultural education (Cesaria et al., 2020). This balanced approach respects cultural heritage while embracing technological progress, shaping a dynamic educational landscape in Asia.

Integrating cultural sensitivity training and intercultural communication skills into educational curricula is essential for preparing students for the globalized workplace. It enhances their abilities to navigate cross-cultural interactions effectively (TIKIZ ERTÜRK et al., 2023). Study abroad programs and innovative teaching methods like problem-based learning have shown effectiveness in improving intercultural communication skills (Chen, 2023; Williams, 2005). Challenges in implementing and assessing these programs exist, yet cooperative learning methods and targeted workshops using standardized patients offer promising avenues (Awada et al., 2020; Rosen et al., 2004). While integrating intercultural communication competence into business English teaching can be effective, further investigation is needed to understand its impact (W. Liu, 2022). Overall, evidence supports the benefits of cultural sensitivity training and intercultural communication skills integration, emphasizing the importance of ongoing research and development in this area (T. Baranova et al., 2020; Fu et al., 2015).

In Australia and New Zealand, Indigenous pedagogy is increasingly integrated into educational practice, emphasizing cultural diversity and reconciliation (Anstice et al., 2023; Carey & Russell, 2011). For instance, Carey and Russell (2011) describe a diploma course for Australian Aboriginal Health Workers shaped by Aboriginal cultural knowledge, emphasizing cultural partnership and accountability in non-Aboriginal teachers. Challenges exist, with concerns raised about the inclusion of the Aboriginal voice in Australian education and the need for further efforts to integrate perspectives (Bagnall & Moore, 2020). Similarly, culturally safe practices in optometry curricula incorporate Indigenous ways of knowing and understanding local Indigenous histories and contexts (Anstice et al., 2023). Additionally, kapa haka, a culturally responsive activity in New Zealand schools, highlights collaborative efforts to improve educational outcomes for Maori students (Whitinui, 2010).

While Indigenous pedagogies promote cultural diversity and reconciliation, there's ongoing work to ensure their full inclusivity and effective implementation across educational settings (Anstice et al., 2023, 2023; Bagnall & Moore, 2020; Carey & Russell, 2011). Despite variations in educational philosophies and practices, a common thread across these countries is the recognition of the importance of multicultural competence and inclusive learning environments in preparing students for an interconnected world.

Comparison of Multicultural Approaches and Policies in the Use of Simulation in Higher Education

Simulation-based learning in multicultural contexts promotes values like tolerance and mutual respect crucial for inclusive higher education (Syamsul Bahri et al., 2023). Culturally sensitive adaptations of simulations align with these values, benefiting diverse learners (Z. X. Ng & Yong, 2022). Technology integration in education, emphasized by Yusuf et al. (2024) and Tarhini et al. (2019), underscores the need for culturally inclusive tools in simulation-based learning. Integrating multicultural considerations enhances equity and effectiveness (Z. X. Ng & Yong, 2022; Tarhini et al., 2019; Yusuf et al., 2024), fostering inclusive educational experiences. Simulations, widely used in US education across disciplines, provide practical applications of theoretical knowledge (Amoguis, 2016; Murray, 2018; Sansom & Cox, 2013). Despite their benefits, simulations like patient encounters may lack the complexity of real interactions (Sansom & Cox, 2013). While valuable, business simulation labs cannot fully replace real-world experiences (Amoguis, 2016). Therefore, supplementing simulations with diverse experiential learning opportunities enriches educational outcomes (Amoguis, 2016; Sansom & Cox, 2013).

U.S. institutions are implementing DEI initiatives to promote inclusivity and diversity in education, such as nursing education, fostering cultural competence among future nurses (Wright et al., 2021). Similarly, new standards by the Council for Higher Education Accreditation emphasize DEI in higher education (Cumming et al., 2023). However, challenges persist, such as overlooking age as a factor in DEI initiatives on college campuses (Galucia & Morrow-Howell, 2023). Additionally, a lack of visibility of DEI initiatives in academic urology programs suggests uneven investment across institutions (Irani et al., 2024). Addressing barriers like institutional racism and implicit biases remains crucial for creating truly inclusive environments, particularly in nursing education (Kearney et al., 2024). Thus, while DEI initiatives are prioritized, there is ongoing work to ensure their comprehensive implementation and communication to all stakeholders (Cumming et al., 2023; Galucia & Morrow-Howell, 2023; Irani et al., 2024; Kearney et al., 2024; Wright et al., 2021).Multicultural approaches and policies in higher education use simulations, promoting critical thinking and problem-solving skills. Institutions in the US emphasize diversity, equity, and inclusion.

Similarly, in Europe, simulation-based learning aims to incorporate diverse cultural perspectives into educational content and assessment, aligning with goals of fostering intercultural competence and global readiness (Chaika, 2023b; Saukkonen, 2014). However, practical implementation faces challenges, including delays and modest activities due to conflicting values and interests (Saukkonen, 2014). Transitioning from cultural diversity to multiculturalism requires a shift towards actively promoting the acceptance of minority cultures. While Europe emphasizes multiculturalism in simulation-based learning to enrich education with diverse perspectives (Chaika, 2023b; Olateju Temitope Akintayo et al., 2024a), successful implementation demands careful navigation of complexities in integrating cultural diversity into both content and assessment.

The literature highlights Europe's systemic inequalities and cultural sensitivity challenges faced by educators and students, highlighting the need for professional development to address these complexities (Chima Abimbola Eden et al., 2024; Sinclair, 2020). Despite a favorable view towards diversity, social, institutional, and personal obstacles hinder effective teaching of culturally diverse students (Khong & Saito, 2014). Moreover, a lack of agreed-upon goals and low priority given to cultural competence in curricula complicate implementation (P.-Y. Lu et al., 2014). Addressing these challenges requires systemic change, including comprehensive curriculum development, educator training, and institutional commitment to diversity (Chima Abimbola Eden et al., 2024; Gesing & Burbage, 2023). Furthermore, localized professional development models emphasizing critical self-reflection and community engagement can enhance educators' cultural competence (Sinclair, 2020).

Thus, fostering cultural sensitivity in European education demands concerted efforts across multiple dimensions of the educational system.

Simulation-based learning in Asian contexts enhances cross-cultural communication and collaboration skills, bridging cultural gaps, but challenges remain in addressing systemic inequalities and promoting cultural sensitivity among educators (Sokol & Zhang, 2023). Modern educational technologies like SPOC flipped classrooms are proposed to overcome traditional teaching limitations and improve intercultural communication abilities (Zhang, 2023). However, challenges such as language barriers and adapting to machine translation technologies persist (LIN et al., 2004). The complexity of Asian communication styles and critiques of Eurocentric theories emphasize the need for nuanced, context-specific approaches (M.-S. Kim, 2010).

Simulation-based learning in Asia promotes cross-cultural competencies through technology integration and critical examination of communication theories, driving educational evolution in the region (M.-S. Kim, 2010; LIN et al., 2004; Sokol & Zhang, 2023; Zhang, 2023). In Australia and New Zealand, integration of indigenous knowledge into simulation-based learning activities promotes multicultural competence and inclusive environments in higher education, despite variations in approaches and policies.

Challenges and Obstacles to Implementation

The implementation of multicultural simulation approaches in higher education faces challenges due to limited resources, technology, and faculty training, particularly in developing countries, and can be categorized into technological, pedagogical, and cultural dimensions.

Technological Barriers

The adoption of advanced technologies like XR and ICT in education faces challenges such as access, affordability, and the digital divide (Hawkinson et al., 2024). In countries with less developed educational infrastructures like Iraq and Libya, integrating multicultural simulation approaches is further complicated (Dr. Hamzh Hammoda Mohamed Alaiat, 2023; Montazer & Kareem Al-Rikabi, 2021). Disparities in technology access hinder multicultural simulation approaches in higher education (Bing, 2023; Verma et al., 2023). Unequal participation and limited acceptance of technological advancements are significant obstacles (Verma et al., 2023). Systemic issues like gender biases also affect equitable implementation (Medina, 2023), while financial constraints limit access to higher education and necessary technological resources (AKULLO, 2023; Joshi et al., 2024). Overcoming these barriers requires multicultural platforms, teacher training, and equitable technology access (Bing, 2023). Addressing these challenges is crucial for creating inclusive and effective multicultural simulation environments (AKULLO, 2023; Bing, 2023; Joshi et al., 2024; Verma et al., 2023)

Pedagogical Barriers

Pedagogical challenges in multicultural education include adapting teaching methods to diverse content and technology, crucial for fostering cross-cultural competencies (Zainab, 2023). The lack of metrics to measure benefits complicates investment justification (M.-H. Do & Huang, 2023). Curriculum flexibility is essential for integrating multicultural themes. Rigid structures hinder this integration, as noted in the English language curriculum (Dimici & Başbay, 2021). Teachers must design multicultural curricula effectively, with task-based approaches being particularly effective (Brown & Livstrom, 2020; 2023c). However, flexibility alone is insufficient. Effective implementation requires skilled educators, which is often lacking. Malaysian lecturers struggle with multicultural simulations, and Algerian teachers face challenges with Project-Based Learning due to insufficient training (Arumugam M. Pillay et al., 2018; Baghoussi & Zoubida El Ouchdi, 2019). Similarly, educators in Nigeria, South Africa, and Indonesia encounter difficulties with teaching technologies, especially during the COVID-19 pandemic(Maulidyawati et al., 2022; Ntshangase & Tshuma, 2023; Ugwu et al., 2023). Addressing these challenges requires targeted professional development to enhance educators' competencies in integrating new pedagogical strategies and technologies (Arumugam M. Pillay et al., 2018; Baghoussi & Zoubida El Ouchdi, 2019; Maulidyawati et al., 2022; Ntshangase & Tshuma, 2023; Ugwu et al., 2023). This is essential for overcoming barriers and fostering successful multicultural education and simulation practices.

Cultural Barriers

Cultural barriers in implementing multicultural simulations in higher education include cultural entropy, bureaucratic excess, unclear communication, and limited engagement, all impacting performance (Rani & Senen, 2023). Faculty in non-diverse settings struggle to design scenarios promoting cultural competence (Romanello & Holtgrefe, 2009). Overcoming these barriers requires improving technology access, adapting pedagogical practices for diversity, and addressing cultural entropy (Dr. Hamzh Hammoda Mohamed Alaiat, 2023; Hawkinson et al., 2024; Montazer & Kareem Al-Rikabi, 2021; Zainab, 2023). Local cultural resistance and unsupportive policies also hinder implementation (Andreatta et al., 2011; Lifintsev & Canavilhas, 2017). Innovation and cross-cultural cooperation barriers stem from entrenched attitudes, affecting various fields (Alie et al., 2024; McDougall & Mank, 1982; Petersen, 2018). Success depends on overcoming resistance and fostering supportive environments, understanding cultural differences, and enhancing intercultural competence (L. Baranova, 2018; Bardi & Guerra, 2011; Leung & Chiu, 2010; Middleton et al., 2021; Ying, 2012)

Structural Barriers

Unsupportive institutional policies hinder multicultural simulation approaches. Discrepancies between policies and practical needs pose challenges (2011; Vance & Crawford, 2013). Inclusive leadership policies can facilitate implementation (Suleiman & Saxena, 2024), and aligning with institutional logics is crucial for success (Dang, 2021). Well-crafted, inclusive policies support multicultural simulation initiatives. Funding and resource limitations impact multicultural education and communication strategies. Structural barriers, exacerbated by insufficient funding, hinder initiatives (Hassanpour et al., 2022; Ryan et al., 1996). Funding issues affect the use of interpreters, translation technology, and MOOC development for multicultural audiences (Shahini et al., 2019a; van Vuuren et al., 2021). Investment in workforce diversity, technological support, and culturally sensitive material is essential to overcoming barriers and enhancing effectiveness (Hasanpour et al., 2022; Ryan et al., 1996; Shahini et al., 2019a; van Vuuren et al., 2021)

Psychological Barriers

Students and lecturers may resist multicultural simulation approaches due to psychological barriers such as discomfort with change, misunderstanding of benefits, or concerns about cultural identity threats (De Leersnyder et al., 2022). In Dutch international classrooms, cultural misunderstandings reduced inclusion and safety, highlighting the need for proactive multicultural approaches. Psychological discomfort in addressing sensitive issues impedes multicultural simulation implementation, affecting intercultural competence (Melnikova, 2020; TAŞKIN & ÇÖMLEKÇİ, 2023). However, targeted training and exposure to multicultural environments can enhance competence (J. M. Jones & Lee, 2021; Y. Kim, 2022).

Resistance to cultural change, driven by cultural inertia, can lead to tensions and prejudice (Zárate et al., 2019). This resistance reflects varying levels of collective self-esteem and openness to change (Quezada et al., 2012). Addressing these challenges requires understanding cultural dynamics and promoting acceptance of multicultural approaches (Adeoye & Ainnubi, 2023; Armenta et al., 2023). Implementing new methods like simulations may face resistance due to established curricula, underscoring the need to demonstrate local benefits.

Strategy For Overcoming Challenges

A multicultural simulation approach in higher education faces challenges like cultural and linguistic barriers, resistance to change, and faculty training needs, necessitating a coordinated strategy. Firstly, addressing cultural and linguistic barriers is crucial. Ma (2022) highlights the importance of culturally and linguistically responsive (CLR) practices to help international students adapt to new environments. Similarly, Fan and Chano (2024) discusses the psychological challenges ASEAN students face due to cultural disparities in China, suggesting that bilingual education can foster classroom participation and cultural exchange. To mitigate these barriers, institutions should provide faculty with training in CLR practices and develop bilingual education programs (Fan & Chano, 2024). Secondly, resistance to change and the need for faculty readiness are significant obstacles. Evenddy et al. (2023) identifies faculty resistance as a challenge to implementing Project-Based Learning (PjBL),

which can be analogous to multicultural simulations. Overcoming this requires faculty training, support, and the development of curriculum alignment and assessment rubrics (Evenddy et al., 2023).

Lastly, a comprehensive strategy should include reviewing and mapping situations that have the potential for cultural misunderstandings, increasing community awareness, and improving policy implementation through training and resource development (Hijriani et al., 2023). Additionally, addressing cultural entropy by fostering a culture of continuous learning and proactive leadership can help manage the organizational dynamics necessary for implementing multicultural simulations (Rani & Senen, 2023). Implementing a multicultural simulation approach in higher education requires faculty training, bilingual programs, curriculum alignment, and fostering a culture of continuous learning and proactive leadership (Evenddy et al., 2023; Fan & Chano, 2024; Hijriani et al., 2023; J. Ma, 2022; Rani & Senen, 2023).

Educational institutions recognize the need to invest in both hardware and software to support simulation-based learning, which is essential for fields like machine-building, chemical, and mining industries (Dedov et al., 2021). This investment creates realistic training environments but faces challenges in regions with limited technology, skills, and electronic readiness, impacting effective ICT use in education (Amihere, 2022). Beyond hardware, adopting cloud computing services can enhance resources and software access for students and teachers (Lakshminarayanan et al., 2013). Investment in technological infrastructure should be complemented by enhancements in electronic readiness, technical support, and cloud service adoption to ensure affordability, sustainability, and effectiveness in education (Alagappan et al., 2016; Amihere, 2022; Amoguis, 2016). The implementation of simulation in education is recognized as beneficial for enhancing outcomes, especially in business colleges (Amoguis, 2016). The lack of strategies for equal access across faculties and programs underscores the need for further research and development to ensure an inclusive educational environment.

Practical Implications and Further Research

Practical Implications

Guidance for Teachers and Policymakers

Teachers can enhance students' cross-cultural communication skills and empathy through culturally relevant simulations, while policymakers can support inclusive curricula incorporating diverse perspectives and simulation-based learning tools.

Recommendations for Developing an Inclusive Curriculum

Curriculum Development: Educators should integrate multicultural perspectives into simulation-based learning to foster inclusivity.

Faculty Training: HEIs should provide training for faculty to effectively implement and adapt simulations for diverse student populations.

Student Support: Policies should be developed to support minority students' engagement and sense of belonging in multicultural educational settings.

Diverse Content: Incorporate diverse cultural perspectives and case studies in simulations.

Intercultural Competence: Emphasize intercultural competence and global citizenship in learning objectives.

Accessibility: Ensure simulations are accessible to all students, including those with special needs.

Implications for Higher Education

Higher education institutions should prioritize the integration of simulations to address the cultural challenges in multicultural education. This approach can enhance students' readiness for globalized work environments and promote a culturally inclusive academic atmosphere.

Adopt Innovative Methods: Embrace simulation-based learning to address the limitations of traditional pedagogical approaches.

Enhance Engagement: Design simulations that actively engage students and reflect diverse cultural contexts.

Evaluate Impact: Continuously assess the effectiveness of simulation-based learning in multicultural education to identify areas for improvement.

Address Technological Disparities: Ensure equal access to advanced simulation tools.

Encourage Faculty Development: Focus on multicultural competence and simulation-based teaching methods.

Develop Flexible Curricula: Integrate multicultural perspectives and encourage critical self-reflection among educators and students.

Advanced Research

Suggestions for Further Research

Explore New Technologies: Investigate the use of advanced technologies like virtual reality in multicultural simulations.

Assess Long-term Impact: Study the long-term effects of simulation-based learning on students' intercultural competence and academic success.

Broaden Scope: Conduct research in underexplored regions to understand the global applicability of simulation-based learning in multicultural education.

Recommendations for Further Exploration

Invest in Technological Infrastructure: Support simulation-based learning through adequate technological resources.

Provide Comprehensive Faculty Training: Enhance multicultural competencies and simulation design skills among educators.

Develop Supportive Institutional Policies: Foster cross-disciplinary and cross-cultural collaborations.

Conduct Continuous Research and Evaluation: Refine and improve simulation approaches through ongoing studies.

CONCLUSION

The research highlights the importance of simulation-based learning in enhancing multicultural education in higher education institutions. However, it also highlights cultural barriers, technological issues, pedagogical issues, structural issues, and psychological issues. To overcome these, the study recommends exploring advanced technologies like AI and VR, assessing long-term effects on student learning outcomes, and integrating multicultural content into various subjects. The research also emphasizes the need for policy support in promoting the adoption of advanced educational technologies in diverse settings.

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