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Lessons Learned from the World Universities in Exploiting the Conversational Intelligent Robots (Chatbots)

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A B S T R A C T

Artificial intelligence technology has created new opportunities for aligning educational systems with technological advancements to enhance and deepen learning. A prominent example of this is the use of "interactive conversational intelligent robots" or " Chatbots." These tools aim to engage with students in a conversational manner, establishing a friendly and consultative interaction. They assist students in solving academic problems, clarifying scientific ambiguities, providing social-cultural guidance, and offering academic and career counseling. Due to these capabilities, Chatbots have rapidly gained attention within academic environments despite their relatively short existence, and are increasingly utilized in universities. This paper provides an overview of the functions of conversational intelligent robots, focusing on their primary applications in higher education systems. It also examines the experiences of various universities around the world in adopting this technology. By identifying the opportunities arising from AI-enabled tools, this study offers policy and practical recommendations for effectively leveraging this technology in Iranian universities.

Keywords: *Artificial Intelligence, Conversational Intelligent Robots (Chatbots), Intelligent E-Learning, Large Language Model, University, Iran.*

Introduction

Since the outbreak of COVID-19 in 2019, the need for adaptability and innovation in education—especially in higher education—has become increasingly urgent. Universities are expected to demonstrate policy intelligence and resilience to maintain their effectiveness in the era of artificial intelligence (Chmielecki, 2022). Intelligent technologies now offer new opportunities to enhance learning by analyzing learner data, identifying learning patterns, and supporting interactive and creative teaching methods (Hoseini Moghadam, 2023). These tools also enable task automation, workflow digitization, and the development of analytical dashboards, all contributing to improved educational quality (Chatterjee & Bhattacharjee, 2020). Moreover, technologies such as virtual and augmented reality are shaping more collaborative and flexible learning environments (Michel-Villarreal et al., 2023; Chegni et al., 2025; Akinwalere & Ivanov, 2022).

In this landscape, conversational agents like ChatGPT have rapidly entered academic spaces as one of the most prominent applications of generative AI. These tools simulate human dialogue using large language models and natural language processing (Adamopoulou & Moussiades, 2020; Ganesan et al., 2020). While some universities have embraced them to improve access to educational resources and support student learning, others have imposed restrictions due to concerns over academic integrity and misuse (Atashak, 2023; Rezaev & Tregubova, 2023; Xiao et al., 2023). Nevertheless, student use of AI tools is growing rapidly, driven by factors such as speed, ease of use, cost-effectiveness, and trust in responses (Guadalupe et al., 2023; Romero-Rodríguez et al., 2023; Hasanein et al., 2024; Imran & Almusharraf, 2024; Urban et al., 2023). These developments underscore the urgent need for thoughtful policy and strategic planning. Accordingly, this study aims to investigate global university approaches to Chatbots adoption and to propose a policy framework for Iranian universities to engage with this technology intentionally and effectively.

Methodology

This study adopts a comparative research methodology, one of the oldest approaches in the social sciences, aimed at identifying similarities and differences between two or more phenomena (Ghafari, 2011). Specifically, it utilizes a descriptive and experience-based analytical method grounded in Brady's comparative analysis model (Brady, 1969). Data collection was carried out through the examination of official documents, university websites, institutional reports, and international advisory and academic organizations. Additional sources included global university rankings and strategic policy documents to ensure the comprehensiveness of the data.

The statistical population comprises internationally recognized universities in Europe, Asia, and the Americas that actively employ conversational AI tools (Chatbots) in higher education. The research sample was purposively selected based on universities' documented experiences, global ranking status (e.g., QS, Times, Shanghai), data accessibility, and diversity in technological policies and geographical contexts (Saadati et al., 2016). The selection aimed to facilitate accurate comparative analysis and ensure that findings could represent broader patterns in global higher education systems.

Data analysis followed the four-step process proposed by Aghazadeh (2017), consisting of:

1. Description – collecting detailed information from various sources about Chatbot use policies and experiences;
2. Interpretation – analyzing and conceptually explaining the collected data;
3. Juxtaposition – categorizing interpreted data to reveal structural and policy-related similarities and differences;
4. Comparison – evaluating the identified patterns across institutions based on defined criteria such as implementation strategies, governance, and outcomes.

The results of this comparative process form the basis for policy recommendations tailored to Iranian universities regarding the integration of interactive AI technologies in higher education.

Findings

The adoption of Chatbots in academia has sparked diverse responses worldwide, reflecting varied cultural, technological, and institutional landscapes. Initial reactions often included skepticism and surprise, as exemplified by a professor from Northern Michigan University who, upon discovering that a student's exemplary submission was Chatbots-generated, adjusted their teaching strategy to include critical engagement with Chatbots -produced content. Similarly, while public schools in New York

City banned AI tools during exams, universities hesitated to enforce similar restrictions, citing concerns over academic freedom. However, several institutions formed think tanks to explore responsible AI usage.

In Tunisia, the Central University introduced "Najeh," Africa's first student-focused AI Chatbots, integrating it into its digital portal to assist students with assignments and internships. Over 86% of students reported satisfaction with this tool, emphasizing the potential benefits of AI for academic support. In contrast, Australian universities, including UNSW and Griffith University, have implemented AI-driven Chatbots like "Qbot" and "Sam" to enhance student interactions and address administrative challenges, showcasing innovative uses of AI in education. European universities are also redefining their strategies. Oxford University plans to integrate AI into curricula by 2030 while treating unauthorized use of AI tools in assessments as academic misconduct. In Italy, the University of Milan's collaboration with Microsoft led to the development of FLEXA, a personalized learning platform that adapts to individual student needs, fostering continuous professional development.

In Scandinavia, responses vary widely. Denmark has prohibited Chatbots usage in exams, citing the need to maintain academic integrity, while Sweden has yet to establish formal policies despite growing AI adoption. Norway's University of Bergen actively explores AI's potential to simplify administrative and learning processes.

By early 2024, over 1% of global academic papers were authored by Chatbots, and AI tools contributed to 17.5% of scholarly works. This rapid adoption has prompted universities like Princeton to develop AI-detection software, such as Turnitin, emphasizing the urgency for robust governance in this transformative era. As institutions worldwide embrace these tools, the challenge remains to balance innovation with maintaining educational standards and ethical practices.

Conclusion

Description and Interpretation of Data

This section synthesizes key findings and policy insights from various global university experiences regarding the integration and regulation of AI-based Chatbots like ChatGPT. Drawing on the Bardi methodological framework, it highlights diverse approaches, from Tunisia's pioneering Chatbots Najeh with high student satisfaction, to Australia's pragmatic deployment of multiple specialized bots for student engagement. The UK's Oxford University presents a future-oriented curriculum reform emphasizing smart technologies, while Italy's Milan University leverages personalized learning via Microsoft's FLEXA platform. Scandinavian countries stress ethical boundaries, with Denmark and Sweden adopting restrictive policies, contrasted by Norway and Iceland's mixed-use models balancing innovation and integrity. China's strategic focus on domestic AI development is juxtaposed with tight state control, creating both opportunity and constraint. Meanwhile, leading U.S. universities exhibit flexible, experimental adoption, supported by tools like Turnitin and CoAuthor, yet face challenges due to a lack of centralized regulatory guidance. These global cases underscore the necessity for balance—promoting responsible AI use without undermining educational depth, creativity, and academic honesty.

Applications of Conversational AI in Universities

This section categorizes the main educational applications of intelligent Chatbots in university contexts, responding to their increasing impact across various disciplines—engineering (23%), health sciences (22%), social sciences (16%), and natural sciences (15%).

1. Intelligent Student Assistant: Chatbots serve as accessible support systems for both domestic and international students, especially newcomers, helping them navigate university systems, locate resources, and manage FAQs. Their 24/7 availability improves administrative efficiency and reduces workload for faculty and staff.

2. Personalized Learning: AI enables customization of educational content based on learners' individual needs, transforming the previously rigid classroom model into adaptive and learner-centered environments. Intelligent platforms provide tailored content, interactive Q&A, simulated instructors, and test preparation, also fostering cross-cultural interaction in virtual worlds.

3. Inclusive Classrooms for Underrepresented Groups: AI-powered translation and accessibility tools (e.g., Presentation Translator) assist students with language barriers and disabilities, promoting equity. Chatbots like ChatGPT enhance language skills, reduce communication obstacles, and support continuous learning engagement.

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4. Smart Research Assistant: AI aids in managing information overload in academic research. Tools like Microsoft Academic use NLP to recommend reliable sources, summarize texts, and identify trending research areas. Chatbots also assist in writing and visual content creation, and facilitate virtual labs and clinical training for medical and technical students.

5. Smart Professional Development for Faculty: Chatbots support faculty through personalized interaction with students, continuous student performance assessment, data-driven pedagogical insights, and simulation environments that enhance teaching strategies, especially for early-career instructors.

Opportunities and Challenges

The implementation of AI Chatbots in universities offers substantial benefits, including streamlined access to information, enhanced personalization, improved teaching quality, and support for inclusive learning. However, challenges persist, such as risks of over-reliance on technology, potential academic dishonesty, ethical concerns regarding data use and content generation, and diminished critical thinking and human interaction. Additionally, disparities in policy approaches—ranging from prohibition to enthusiastic adoption—highlight the global lack of consensus on AI governance in higher education. This necessitates the formulation of comprehensive, flexible policies that uphold academic integrity while embracing technological innovation.

Policy Recommendations

Given the diverse global experiences and emerging applications, this section recommends a balanced policy framework for universities integrating chatbot technologies:

1-Promote responsible and transparent use of chatbots with clear academic guidelines.

2-Develop institutional policies that differentiate between supportive and prohibited uses, especially in assessments.

3-Encourage AI literacy among students and faculty to foster ethical, informed engagement.

4-Maintain a human-centered educational philosophy that integrates AI as a complementary, not substitutive, element.

5-Create oversight mechanisms for continuous monitoring of chatbot efficacy and potential misuse.

6-Prioritize equity by ensuring chatbot tools support multilingual, differently-abled, and international student populations.

7-Invest in faculty training and infrastructure for optimal integration of AI into teaching and research.

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