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Generative AI in higher education: A cross-institutional study on faculty preparation and resources

Armanto Sutedjo ¹, Stephanie Peitseng Liu ², Mahjabin Chowdhury ¹

¹ Center for Teaching Excellence, Texas A&M University, College Station, TX, USA

² Department of Educational Psychology, Texas A&M University, College Station, TX, USA

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Abstract

The release of ChatGPT in 2022 sparked widespread adoption of generative AI (GAI) in higher education, leading to significant shifts in teaching and learning practices. This study examines how universities are supporting faculty in integrating GAI, focusing on available guidelines, institutional positions on GAI adoption, and resources to aid faculty in teaching with GAI. There is limited research analyzing and comparing approaches across multiple institutions. Using qualitative thematic analysis followed by quantitative review, resources from fifteen research-intensive universities in North America were analyzed to identify the extent and variety of institutional support for the implementation of GAI in higher education. Findings reveal a strong emphasis on ethical guidelines and teaching resources, primarily provided through central offices such as those of the Provost and the Center for Teaching and Learning. Most institutions offer informational articles and professional development opportunities, though there is limited access to interactive resources like open forums or research-focused support. These results highlight a cautious yet supportive stance from institutions, balancing regulatory guidance with encouragement for responsible GAI use. This study provides insights for higher education leaders seeking to enhance faculty support in the age of GAI, offering a framework for more comprehensive, adaptable, and collaborative GAI integration.

1. Introduction

The rapid adoption of generative artificial intelligence (GAI) technologies, particularly since the release of ChatGPT in November 2022, has introduced both unprecedented opportunities and challenges to higher education institutions (HEIs) worldwide (Xiao et al., 2023). As what some would regard as the fastest-adopted software in history, ChatGPT's integration into education has created a paradigm shift, requiring immediate responses to the ethical, practical, and pedagogical implications of its usage. Institutions face the challenge of balancing GAI's educational potential with concerns over academic integrity and student dependency on GAI tools for assignments (Chan & Hu, 2023; Krause et al., 2024). This study explores how universities have responded to these developments, specifically examining the policies, stances, and resources that support faculty in adapting to GAI in their teaching practices.

The potential of GAI to automate and enhance various aspects of learning—such as research assistance, language translation, and content generation—has sparked widespread interest in its adoption within educational settings. Students are increasingly leveraging GAI for tasks like brainstorming, paraphrasing, and studying, which has led to new discussions around academic rigor, ethical GAI use, and responsible digital literacy (Javaid et al., 2023). However, integrating GAI into academia is complex. Faculty and administrators have expressed concerns over the impact of GAI on critical thinking skills, originality in assignments and privacy, especially when personal data are shared with GAI platforms (Chiu, 2024). Consequently, higher education institutions are tasked with creating policies that encourage effective GAI use in learning while minimizing risks related to over-reliance and unethical use (Walczak & Cellary, 2023).

Despite the urgent need for institutional frameworks and resources that facilitate responsible GAI use, there is a notable gap in the literature on cross-institutional approaches to supporting faculty in the GAI era. While some studies highlight the benefits of GAI in education, such as personalized learning and enhanced student engagement (Javaid et al., 2023; Zawacki-Richter et al., 2019), few have examined the range and quality of resources universities provide to faculty specifically for GAI integration in the classroom (Alqahtani & Wafula, 2024; Wang et al., 2024). While existing studies have examined individual institutional responses to GAI, there is limited research analyzing and

comparing approaches across multiple institutions. This study addresses this gap by providing a systematic analysis of GAI support resources across fifteen research-intensive universities in North America. This study seeks to address this gap by focusing on how these institutions support faculty through policies, training, and resources, contributing valuable insights into institutional readiness for GAI-enabled teaching (Chan, 2023; Yusuf et al., 2024).

This study is guided by three primary research questions:

1. What guidelines or policies are currently available for faculty to integrate GAI into their classrooms?
2. How are universities positioning themselves regarding GAI adoption in educational contexts?
3. What types of resources are offered to support faculty in teaching with GAI?

By addressing these questions, this study aims to provide a comprehensive view of how institutions approach GAI integration, identifying best practices and highlighting areas for policy improvement. The findings offer guidance for institutional leaders and policymakers to support faculty and promote GAI literacy, ethical GAI use, and enhanced teaching practices in a GAI-integrated educational landscape.

2. Literature review

2.1 Generative AI and educational transformation

The advancement of GAI tools, such as ChatGPT, represents a significant shift in educational practices, presenting both opportunities and challenges for higher education institutions (HEIs). ChatGPT, launched in late 2022, rapidly gained widespread adoption, highlighting the utility of GAI for diverse educational tasks ranging from research support to interactive learning tools (Xiao et al., 2023). Studies report that students increasingly rely on GAI to assist with brainstorming, language generation, and even complex problem-solving, spurring debate about the implications for academic integrity, pedagogical practices, and assessment design (Javaid et al., 2023; Krause et al., 2024). Faculty are also exploring GAI to streamline grading, enhance student engagement, and provide personalized learning opportunities, though concerns about ethical use and reliance on GAI-generated content persist (Yusuf et al., 2024). This evolving landscape necessitates new approaches from HEIs to provide clear guidelines, resources, and support that enable faculty to integrate GAI responsibly in teaching.

2.2 Theoretical perspectives on technology adoption in education

Rogers' Diffusion of Innovation Theory provides a valuable framework for examining the stages of GAI adoption among educators and HEIs (Rogers, 2003). The theory suggests that the adoption of new technology typically follows a pattern where individuals progress through stages from awareness to interest, evaluation, trial, and finally adoption or rejection. These stages offer insights into how GAI is being embraced or resisted within the higher education sector. Current studies reveal that most students have rapidly adopted GAI, whereas faculty and administrators demonstrate varying levels of acceptance (Chan & Hu, 2023). This divergence aligns with Rogers's model, positioning students as "early adopters" and educators as part of a slower "early majority", reflecting institutional hesitancy around GAI's ethical and educational implications (Xiao et al., 2023).

Similarly, Rogers's theory helps categorize HEIs' responses to GAI along a spectrum from early adopters to laggards, each demonstrating distinct levels of institutional support for GAI. The stage at which each HEI is placed in its adoption of GAI will be explored in this study, reflected by the extent and depth of the resources each provides to support GAI use, as well as the comprehensiveness of policies and guidelines created to assist faculty with GAI use. The importance of providing faculty with appropriate resources, including training and ethical guidance, underscores the importance of understanding the varying stages of GAI adoption to address the barriers faced at each stage. This theoretical lens helps situate the institutional responses to GAI use among faculty and students within a broader framework of technology adoption in educational contexts.

2.3 Institutional responses and policy development for GAI

Research on institutional responses to GAI highlights the spectrum of policies and resources HEIs are developing to manage GAI integration effectively. While some universities have embraced GAI by actively promoting its ethical and responsible use, others have adopted restrictive policies, limiting GAI in assignments to prevent potential academic misconduct (Chan & Hu, 2023; Xiao et al., 2023). Institutions adopting a more open stance focus on GAI literacy, providing training for faculty to use GAI tools as instructional aids. Resources such as GAI literacy courses, workshops, and dedicated GAI portals have become increasingly common in

universities that support GAI integration, aiming to help faculty navigate GAI tools while maintaining academic integrity and fostering critical thinking (Lee et al., 2024; Walczak & Cellary, 2023).

However, studies indicate significant variability across institutions regarding the quality and extent of GAI resources for faculty. Some institutions, particularly research-intensive universities, lead with comprehensive GAI support hubs that offer customized resources and training (Wang et al., 2024). These resources often cover essential aspects of GAI ethics, instructional uses, and data privacy, reflecting a proactive approach to GAI integration in learning and teaching (Wang et al., 2024). Other institutions with fewer resources or limited experience with GAI tools may struggle to provide adequate support, leading to an inconsistent landscape where faculty preparedness for GAI varies widely across the sector (Krause et al., 2024). Such disparities underscore the need for coordinated institutional frameworks and suggest that best practices in GAI integration remain underdeveloped across HEIs.

2.4 Challenges and ethical considerations of GAI in education

The ethical implications of GAI in higher education are a prominent theme in recent studies, focusing on issues such as privacy, academic integrity, and equity (Javaid et al., 2023). GAI tools present potential risks for student data security, especially when GAI tools store or share data without explicit user consent. Additionally, GAI-generated content raises questions about originality and intellectual honesty, with concerns that students may rely excessively on GAI for completing assignments, thus undermining the development of critical thinking skills (Lee et al., 2024; Krause et al., 2024). Faculty play a central role in establishing norms for ethical GAI use, yet studies suggest that faculty awareness and experience with GAI vary widely, which can affect the consistency of GAI policy implementation (Yusuf et al., 2024).

HEIs have responded by developing policies to promote responsible GAI use, yet these policies are often general, lacking specific guidelines on data privacy, content generation, or the appropriate level of GAI assistance in assignments (Chan & Hu, 2023). Additionally, balancing GAI's benefits with ethical considerations remains a challenge, as universities strive to leverage GAI's educational potential while safeguarding academic integrity and preparing

students for responsible GAI use in professional settings (Walczak & Cellary, 2023). Consequently, there is a critical need for comprehensive policies that define ethical standards for GAI use and support faculty in navigating these challenges.

2.5 Research gaps and study contributions

Despite a growing interest in GAI's role in education, cross-institutional studies examining how HEIs support faculty in GAI adoption remain limited. Most studies to date have focused on student usage patterns or have examined GAI's potential from a theoretical perspective without providing empirical evidence of institutional policies or resources (Chan, 2023; Xiao et al., 2023). This study aims to fill this gap by systematically analyzing the range of policies, resources, and institutional stances on GAI in research-intensive universities that meet the inclusion criteria. By documenting current practices, this research contributes to an understanding of how HEIs can best support faculty in integrating GAI responsibly, offering valuable insights for institutional leaders, policymakers, and educational researchers.

3. Methodology

This study initially employed an inductive qualitative thematic analysis, followed by subsequent quantitative analysis, to explore how higher education institutions (HEIs) respond to generative AI (GAI) by examining the resources, policies, and support provided to faculty through institutional web pages. The approach taken focused on identifying patterns in institutional stances, resource offerings, and guidelines across selected institutions, specifically targeting institutional content that informed or supported faculty in the adoption and integration of GAI in educational settings.

3.1 Research design

The research design was informed by thematic analysis principles, as outlined by Braun and Clarke (2006). This method was selected due to its flexibility in capturing detailed qualitative data across a range of sources, making it particularly suited for analyzing web-based content across institutions. Thematic analysis allowed for the identification of key themes and trends in the presentation and availability of GAI resources and policies, highlighting both commonalities and differences among institutions.

3.2 Sample selection

The sample for this study consisted of fifteen universities selected from a pool of 148 Research 1 Higher Education Institutions in North America by Carnegie Classification to further match the following criteria:

1. Research 1 University.
2. State University.
3. Represents the main flagship campus if there are multiple system-wide campuses.
4. Land-grant university.

This approach ensured that the sample reflected a wide range of institutional practices and responses to GAI in higher education.

3.3 Data collection

From July to mid-September 2024, data were collected from each university's official web pages, focusing on pages dedicated to faculty support, such as those from Centers for Teaching and Learning, University Libraries, Technology Services (IT), Offices of the Provost, and specific GAI-related landing pages. By targeting university-wide offices, we ensured that the information collected was accessible to faculty across departments, providing a comprehensive view of each institution's official stance and resources for GAI use. Each web page counted as a "data unit", which was then organized by content type and target audience for subsequent coding.

3.4 Coding framework

A structured coding framework was developed based on the data collected and further refined through iterative review. The primary codes reflected broad categories relevant to the institutional support landscape, including "University-wide Office", "Webpage Content Categories", "Target Populations" and "Resource Types on Webpage". These were subsequently broken down into detailed sub-codes to capture the specific information presented on each web page, as follows.

3.4.1 University-wide office

This code category included the organizational entities hosting the GAI resources within the university. This category divided into sub-categories as follows:

- Office of the Provost.
- Center for Teaching and Learning.
- Technology Services or Informational Technology.
- University AI landing page, a dedicated landing page for AI.
- University Library.

3.4.2 Webpage content categories

For every webpage identified, the researchers summarized the main theme and coded the pages into:

- Teaching and Learning, where the webpage provides information on incorporating GAI use in class syllabi, classroom practices for teaching with GAI, and pedagogical approaches to the integration of GAI in student learning.
- Learning Technologies, where the webpage provides information regarding technology use in the classroom, access to GAI-powered tools, and the integration of GAI within the campus infrastructure.
- Research, where the webpage provides information regarding best practices for utilizing GAI in research and the implications of using GAI for research.
- Regulatory, where the webpage provides information regarding regulations of GAI use for teaching and learning, data protection and privacy, and the academic repercussions of prohibited GAI use. Information also includes GAI use guidelines and principles.
- GAI Knowledge Base, where the webpage shares information regarding GAI, such as its history, development, showcase of its uses, and the different types of GAI applications available. This category includes GAI literacy courses.

Each content category captured unique aspects of GAI support, such as classroom practices, best practices for GAI research, and GAI literacy.

3.4.3 Target populations

This code captured the primary audiences targeted by the resources, divided into:

- Instructors - typically faculty members focused on classroom instruction including teaching assistants.
- Researchers - including research professors, post-doctoral researchers, and research assistants.
- University Employees - such as functional staff, members of leadership, and office employees.
- Students - including undergraduate, graduate, and continuing education students.
- General population - covering all types of sub-group populations including readers from outside the university.

3.4.4 Resource types on the webpage

Meanwhile, based on the types of resources described on the web page, the research team categorized them into:

- Informational Articles - providing factual and authoritative content about the application of generative artificial intelligence in higher education. These articles might be in the form of news articles, open letters, blogs, posts, etc.
- Informational Videos - designed to educate, inform, or instruct viewers about a particular topic, concept, or subject matter. These included university sponsored videos, interviews, and webinar recordings on GAI.
- Professional Development Programming - encompassing a variety of educational opportunities aimed at enhancing faculty skills, knowledge, and career performance. In this study, these opportunities were characterized by a one-way flow of information from the professional development leader to the participants. They included workshops, training sessions, and courses, which could be conducted face-to-face, synchronously online, or asynchronously online.
- Open Forums - referring to initiatives that enable participants to freely exchange information and ideas regarding GAI. Such activities emphasized multiple-way informational flow (between participants and the event facilitator). These activities included webinars, journal clubs, open discussions, brown bag events, and conferences.

This allowed us to identify the types of educational resources provided to faculty, including one-way information sharing (e.g., workshops, training) and multi-way discussion forums (e.g., webinars, journal clubs).

3.5 Data analysis

The data were analyzed through an inductive approach, beginning with open coding to identify preliminary themes and sub-themes within each primary code (Thornberg, 2012). Next, the research team employed axial coding to explore relationships between codes and refine their understanding of how institutions presented GAI resources and policies (Corbin & Strauss, 2015). This iterative process involved reviewing, collapsing, or rearranging sub-codes where necessary to achieve greater clarity and parsimony, ensuring that the final codes accurately captured the variety of institutional responses.

Discrepancies in coding were discussed among the research team until a consensus was reached, enhancing inter-coder reliability. Through this thematic analysis, the researchers identified key themes that reflected trends in institutional support for GAI, ranging from proactive policy adoption to resource constraints that affected the type and extent of support offered to faculty.

Once coding was complete, the researchers quantified the prevalence of each resource type, office involvement, and content focus. By examining the frequency of different content focus areas (e.g., teaching resources, regulatory guidelines), the researchers derived the types of information and source of information for GAI across institutions. To further explore resource distribution, the researchers analyzed the involvement of each office type together with the type of information presented and the viewership population targeted to seek insights on each institution's stance towards GAI integration.

4. Findings

This study analyzed the web-based resources and policies from a sample of higher education institutions (HEIs) that met the criteria defined in the methodology section to understand how they supported faculty in adopting generative AI (GAI) for teaching and research. The findings are presented in response to the study's research questions, highlighting trends in institutional guidelines, positions on GAI adoption, and resource offerings for faculty development.

To answer research question one, regarding what guidelines or policies were currently available for faculty to integrate GAI into their classrooms, the analysis revealed that institutions provided a significant amount of regulatory and instructional guidance aimed at supporting responsible and ethical GAI use in educational settings. The percentage of the types of information across institutions (see Figure 1) highlighted that teaching and learning materials made up 33% of the total resources, while regulatory content accounted for 35%. Chhina et al. (2023) suggested mitigation strategies for GAI integration such as guidelines creation, resources development, and drafting policy are important to support instructors. Furthermore, this distribution indicates that institutions placed a strong emphasis on equipping faculty with policies and best practices for classroom GAI use, focusing on instructional guidelines and ethical considerations. This finding aligns with Peláez-Sánchez et al. (2024), who discussed that the implementation of GAI within HEIs poses significant legal and ethical challenges.

Figure 1 provides further insight into the nature of GAI resources available. In addition to teaching and regulatory content, knowledge-based resources accounted for 24% of the information provided, offering foundational GAI literacy to faculty. This foundational support reflects an institutional focus on ensuring that faculty have a basic understanding of GAI before incorporating it into their teaching. However, resources focused on research applications (5%) and learning technologies (3%) were notably limited. This suggests a gap in support for faculty interested in using GAI for research or broader educational technology applications, indicating that institutional support remains primarily focused on teaching applications rather than exploratory or experimental uses.

Moreover, delving into where information for artificial intelligence is sourced, Figure 2 shows that these guidelines and policies are disseminated mainly through central administrative offices, particularly the Provost Offices and the Centers for Teaching and Learning (CTL), each responsible for 30% and 27% of the resources, respectively. This centralization of policy resources suggests that institutions prioritize authoritative and standardized information channels to guide faculty on GAI use. By anchoring these resources within offices associated with academic oversight and teaching support, universities ensure that GAI guidelines are aligned with institutional values, such as academic integrity, transparency, and ethical responsibility.

Figure 1. Types of Information

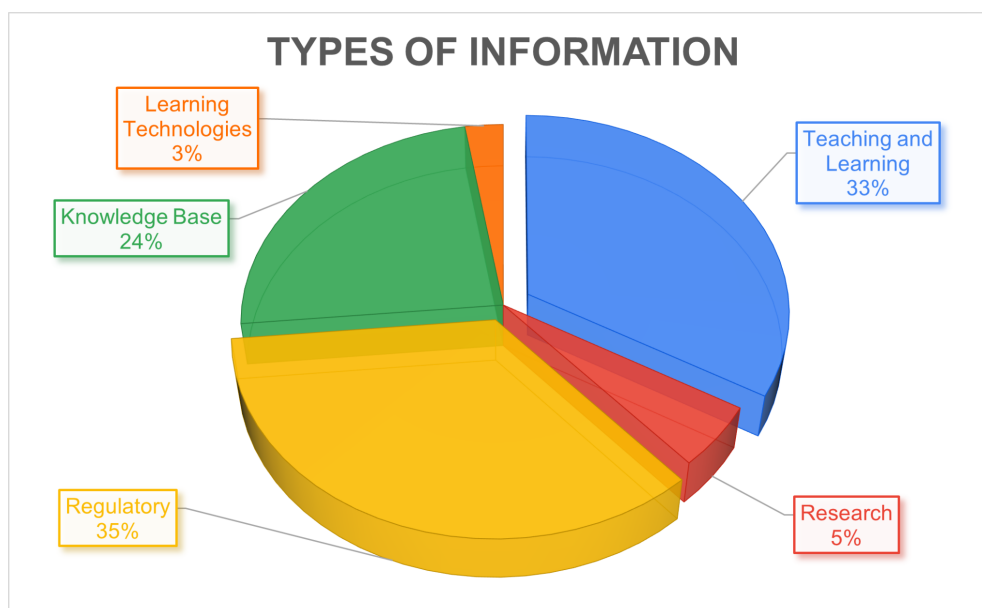


Figure 2. University-Wide Website Category

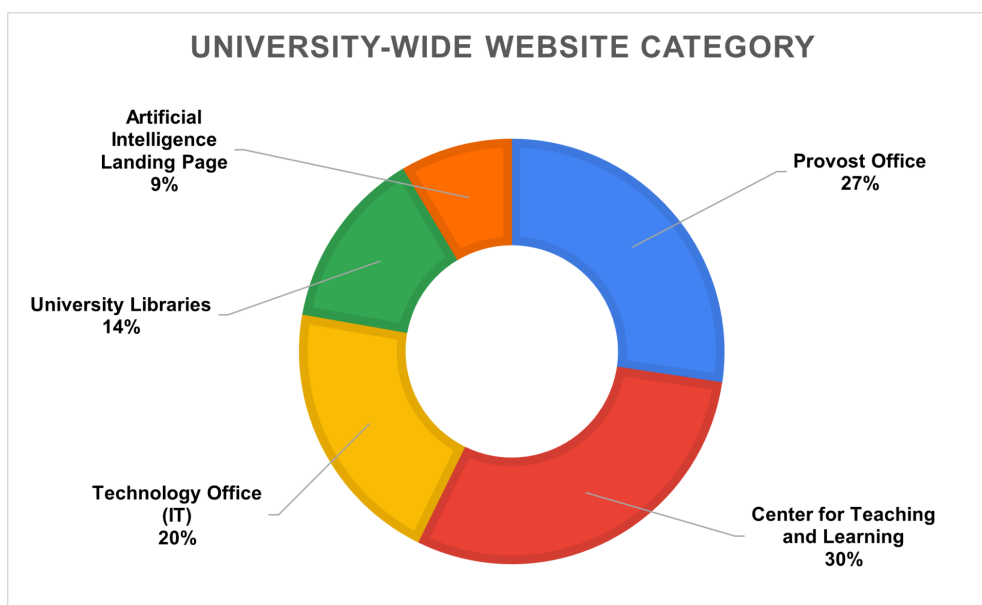


Figure 3 reflects the target audience of the information disseminated by the university as a response to the presence of GAI in higher education. University officials tried to disseminate information to their faculty members as their focus in addressing teaching and learning with the presence of GAI. However, at the same time, they also disseminated general information that served all their stakeholders gain a better understanding of GAI.

Figure 4 further underscores the central role of the Provost Offices and CTLs in supporting faculty with policy-oriented resources. This structured approach to policy dissemination reflects an institutional stance that prioritizes accountability, with administrative and teaching-focused offices assuming responsibility for outlining the acceptable use of GAI in classrooms.

Figure 3. Target Audience

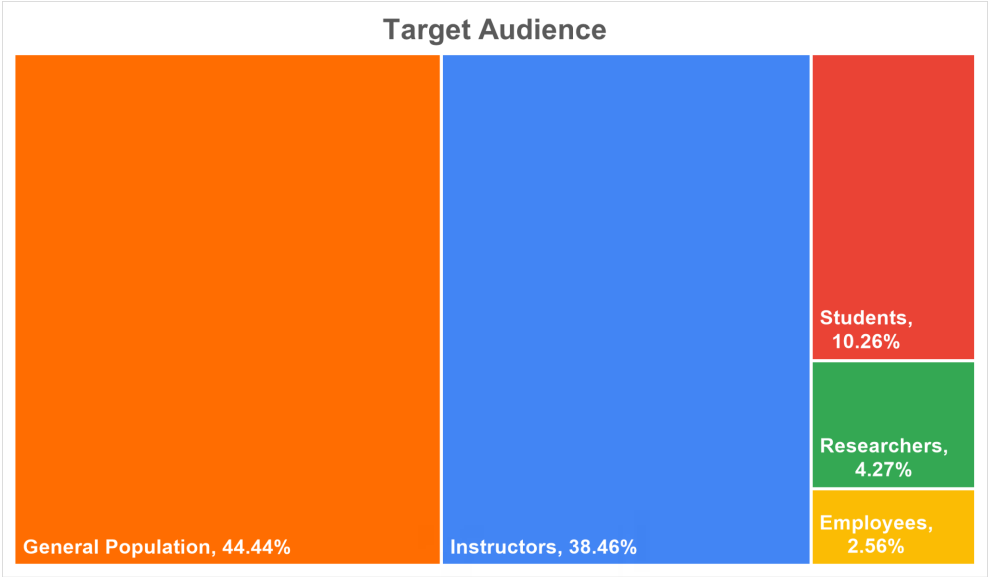
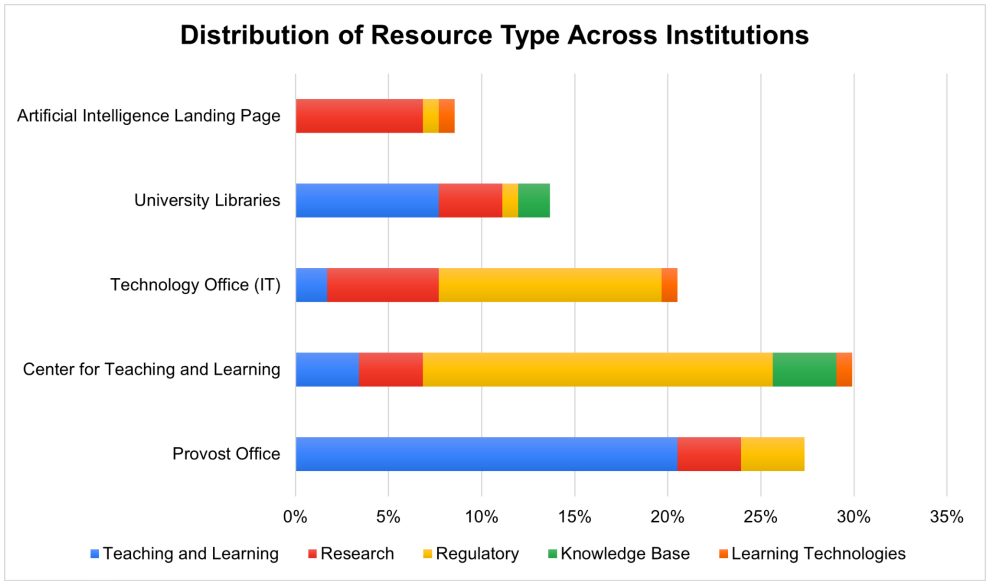


Figure 4. Distribution of Resource Type Across Institutions

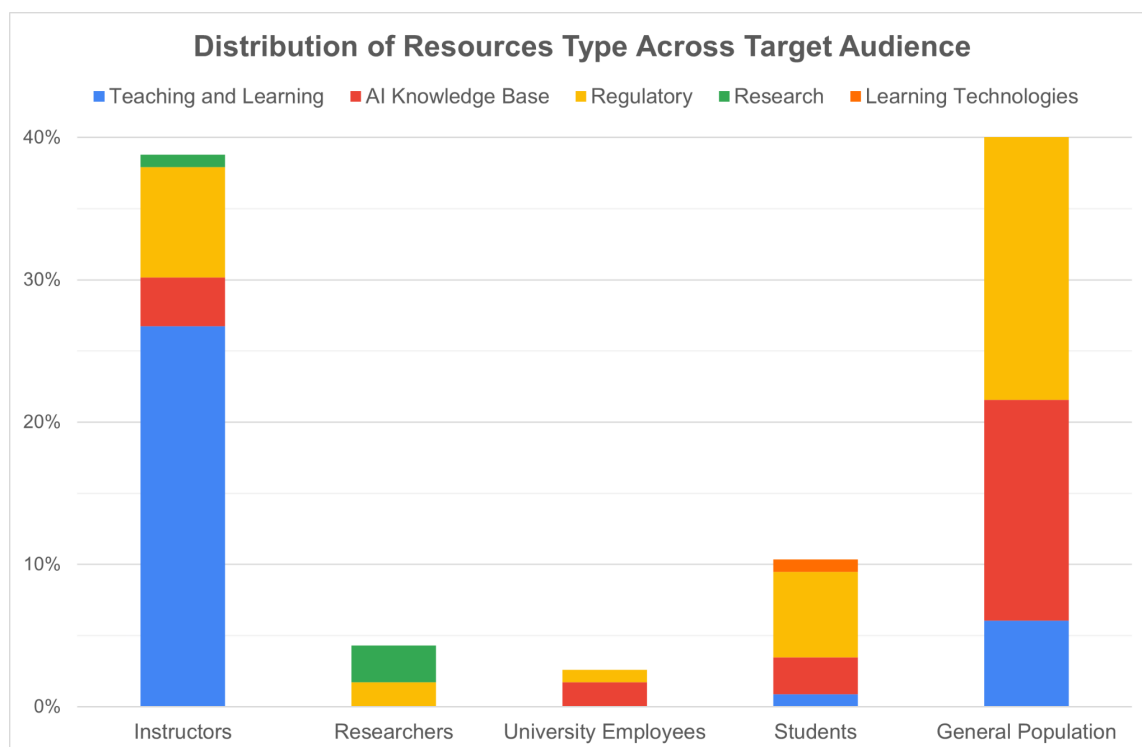


To answer research question number two, about how universities are positioning themselves regarding GAI adoption in educational contexts, the data suggest that universities are adopting a cautiously supportive stance on GAI in education, aiming to balance the potential benefits of GAI with the need for careful implementation. As shown in Figure 4, distribution of resource type indicates that the majority of GAI-related resources are spread through the Provost Offices, CTLs, and Technology Offices (IT),

with each office contributing unique expertise. This spread reflects a collaborative approach to GAI integration, where academic, instructional, and technological offices work together to establish a controlled environment for GAI use.

This positioning reflects a structured, phased approach to GAI adoption, where institutions are preparing faculty with foundational understanding and ethical guidelines before exploring broader applications. By focusing on both teaching

Figure 5. Distribution of Resource Types Across Target Audience



and learning and regulatory information to instructors (as shown in Figure 5), institutions communicate a clear stance: GAI can be a valuable tool for enhancing educational practices, but its use must be governed by strong ethical and regulatory frameworks.

Moreover, Figure 4 highlights that the involvement of Technology Offices and Libraries, though secondary to the Provost Offices and CTLs, signals an expanding scope of GAI's potential applications. Technology Offices often support faculty in implementing GAI technologies within the educational infrastructure, while Libraries may offer resources on GAI literacy and digital ethics. This broader office involvement reflects a cautious but expanding institutional stance on GAI adoption, signaling readiness to support GAI integration across multiple aspects of academic life.

To delve deeper into how the institutions approach GAI integration in higher education, we conducted further inductive thematic analysis of the web-based resources and policies of the universities. Through systematic examination of institutional websites, distinct approaches to resource development and implementation emerged, supported by specific evidence from various institutions.

4.1 Institutional approaches and resource distribution

The data reveal two predominant approaches to GAI resource management and distribution. The first demonstrates a centralized approach through dedicated GAI landing pages and unified resource centers. Six out of the fifteen institutions maintained centralized hubs serving as comprehensive resource centers coordinated through dedicated AI advisory committees, providing unified guidance across their institutions. Their approach emphasized standardized support, with clear pathways for different stakeholders to access relevant resources and policies.

The remaining nine institutions employed a more distributed model, with resources spread across multiple university units. This approach manifests through specialized pages maintained by various departments, including Centers for Teaching and Learning (present in 12 institutions), Technology Services (active in 9 institutions), and University Libraries (contributing to 10 institutions). Each unit contributes distinct expertise while aligning with institutional policies, creating interconnected support systems for faculty and staff.

4.2 Resource development and implementation

The development of GAI resources shows careful attention to both immediate practical needs and longer-term strategic goals. Four institutions implemented innovative approaches to faculty support through informal gathering series and peer learning communities, complemented by structured teaching technology workshops and course redesign consultations. Across all institutions, 82% of resources were delivered through informational articles, while 15% were offered as professional development programs.

Policy development and implementation emerged as crucial components of institutional responses. Thirteen of the fifteen institutions developed comprehensive policy frameworks, offering detailed guidelines for syllabus statements, assessment design, and academic integrity considerations. Eight institutions actively collected and shared field notes and instructor submissions, creating valuable repositories of practical implementation examples that informed ongoing policy refinement.

4.3 Resource types and delivery methods

Analysis of resource delivery methods revealed that twelve institutions employed a multimedia resource development strategy, combining written guides, recorded workshops, interactive training modules, and collaborative discussion spaces. Among these, ten institutions maintained dedicated library guides for GAI resources, while six established specialized AI landing pages.

Policy integration demonstrates systematic approaches to embedding GAI considerations into existing academic frameworks. Eleven institutions showed evidence of comprehensive integration into course design guidelines, assessment frameworks, research protocols, and administrative procedures, indicating comprehensive coverage of GAI considerations across academic operations.

These findings demonstrate that while institutions share common goals in supporting GAI integration, their approaches vary based on institutional context, resources, and strategic priorities. The Centers for Teaching and Learning lead these initiatives in 30.2% of cases, followed by Provost Offices (27.4%), Technology Services (19.8%), and dedicated AI initiatives (15.1%), with University Libraries contributing 7.5% of resources. This distribution suggests a balanced approach to technical, pedagogical, and policy considerations in GAI implementation.

To answer research question number three, about the different types of resources offered to support faculty in teaching with GAI, the findings show a predominance of informational resources, with fewer interactive or community-building resources available to faculty. The resource count by category (see Figure 6) demonstrates that informational articles along with informational videos combined are the most common type of resource, with a total of 82% of the resources. These informational resources serve as the backbone of GAI support, delivering structured guidance on GAI use, ethics, and teaching strategies. Professional development programs were also offered through the resources, which accounted for about 15% of total resources, allowing faculty to gain more in-depth understanding and hands-on experience with GAI tools.

However, open forums were the least commonly reported out of all types of resources, highlighting a potential gap in resources that promote engagement and collaborative learning. The scarcity of open forums in particular, suggests that institutions have not yet fully embraced interactive platforms for faculty to discuss and share GAI practices. This lack of collaborative resources may limit opportunities for faculty to learn from each other's experiences and collectively address challenges related to GAI integration.

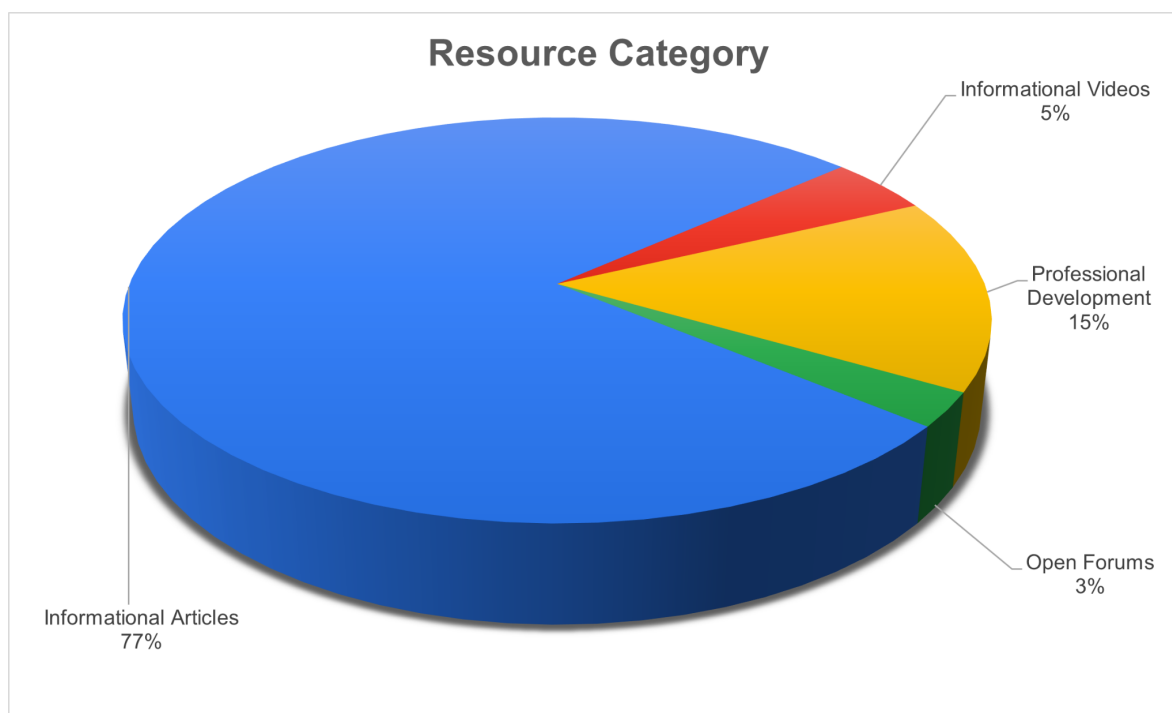
5. Discussion

This study's findings reveal complex patterns in how higher education institutions approach GAI integration, with significant implications for understanding institutional readiness, resource allocation, and policy development. The analysis extends beyond mere description to critically examine the effectiveness and implications of current approaches.

5.1 Critical analysis of institutional approaches

The predominance of regulatory (35%) and teaching-focused (33.3%) resources suggests a cautious, compliance-oriented approach to GAI integration. While this emphasis on policy frameworks provides necessary structure, it may inadvertently constrain innovation. Comparing these findings with Chan's (2023) observation of the need for flexible, adaptive frameworks reveals a potential misalignment between institutional approaches and the rapidly evolving nature of GAI technology.

Figure 6. Resource Category



The limited attention to research applications (5.1%) and learning technologies (2.7%) is particularly concerning when considered against Javaid et al.'s (2023) emphasis on GAI's potential for research innovation. This gap suggests that institutions may be overlooking crucial opportunities for advancing academic inquiry and technological innovation. The data indicate that while institutions are effectively managing immediate teaching and compliance needs, they may be underprepared for the broader transformative potential of GAI in research and advanced applications.

5.2 Research questions revisited

In terms of research question one, regarding available guidelines and policies, the findings reveal that while institutions have developed comprehensive guidelines, there is significant variation in their scope and implementation. The dominance of informational articles (82% of resources) over interactive engagement opportunities (3%) raises questions about the effectiveness of current delivery methods. This finding aligns with Krause et al.'s (2024) criticism of passive information dissemination in technology adoption, suggesting a need for more dynamic, engagement-focused approaches.

The findings also indicate that institutions are prioritizing regulatory and instructional guidelines, often distributed through central offices like the Provost Offices and the Centers for Teaching and Learning (CTL). As shown in Figure 1, teaching and learning materials make up 33% of resources, while regulatory content makes up 35%. This strong emphasis on structured guidance aligns with previous studies highlighting institutions' concerns about ethical GAI uses and the needs to uphold academic integrity (Chan & Hu, 2023). By providing policies that address responsible GAI use, institutions attempt to preemptively mitigate issues such as plagiarism, over-reliance on GAI, and potential breaches of data privacy.

To discuss research question two, regarding institutional positioning, the data reveal a more nuanced institutional stance than initially apparent. While six institutions maintained centralized hubs, suggesting proactive engagement, nine others employed distributed models indicating a more independent approach. This division challenges Xiao et al.'s (2023) assumption that centralization necessarily indicates more effective GAI integration. The evidence suggests that both approaches can be effective when aligned with institutional resources and culture.

The findings also suggest that universities are positioning themselves as cautiously supportive of GAI, with a balanced focus on educational potential and associated risks. As shown in Figure 4, key offices like CTL and the Provost Offices are active in resource provision, indicating a top-down approach that emphasizes regulatory control. This is consistent with existing literature that points to the need for administrative oversight in managing the ethical and instructional dimensions of GAI in education (Walczak & Cellary, 2023; Xiao et al., 2023). By positioning GAI within a regulatory framework, institutions seem to be signaling their support for GAI's potential, while ensuring that it is used responsibly.

In alignment with Rogers's Diffusion of Innovation Theory, institutions appear to be in the early majority phase, where they cautiously engage with GAI while managing risks (2003). To progress toward a more comprehensive GAI adoption phase, institutions should consider strategies that promote both foundational knowledge and exploratory innovation. Expanding resources in this way could encourage a more holistic integration of GAI, fostering an environment where faculty feel empowered to experiment with and apply GAI in diverse educational and research contexts.

To discuss research question three, regarding faculty support resources, the analysis reveals potential inadequacies in current support structures. While teaching resources are abundant, the limited availability of open forums and collaborative spaces (3% of resources) may hinder the development of faculty communities of practice, which Lee et al. (2024) identify as crucial for successful technology integration.

Figure 3 indicates that while the CTL and Provost Offices are leaders in GAI resource provision, Technology Offices (IT) and Libraries also play a role. This cross-departmental involvement suggests a shared understanding of the cross-cutting potential of GAI impact and the need for a collaborative stance on GAI adoption where different offices bring their expertise to foster a more comprehensive support system. According to Rogers's theory, this balanced involvement aligns with the early majority phase of adoption, where institutions actively engage with innovation while addressing concerns and uncertainties. However, the limited emphasis on GAI resources for research and learning technologies (as shown in Figure 1) suggests that while institutions are open to GAI adoption in educational contexts, they are primarily focused on instructional support rather than exploratory or

research-oriented uses. This focus may restrict faculty who wish to experiment with GAI beyond classroom applications, suggesting that institutional support is not yet fully comprehensive.

Furthermore, the findings reveal that informational resources, particularly articles and professional development programs, dominate the types of resources provided by institutions. As shown in Figure 6, informational articles are the most commonly reported resource, which reflects institutions' preferences for one-way communication methods in delivering GAI support. This prevalence of informational resources aligns with studies emphasizing the need for foundational GAI literacy among faculty, as institutions aim to establish a baseline understanding of GAI tools and their ethical implications before encouraging deeper integration (Lee et al., 2024; Yusuf et al., 2024). However, the limited availability of open forums and interactive resources indicates that institutions may be missing opportunities for collaborative learning and peer exchange among faculty. Open forums could allow faculty to share practical experiences, challenges and solutions, fostering a more dynamic and community-based approach to GAI learning.

In addition, Figure 1 highlights gaps in resource diversity, with limited focus on research (5%) and learning technologies (3%). This narrow scope suggests that while institutions are providing solid instructional support, they may not be fully addressing faculty needs for experimental or research-based applications of GAI. This gap is significant, as the literature underscores GAI's transformative potential not only in teaching but also in research and innovation (Chiu, 2024; Javaid et al., 2023). By offering limited resources for non-instructional GAI applications, institutions may inadvertently constrain faculty who are interested in pioneering new GAI-driven methodologies or exploring interdisciplinary research using GAI tools.

5.3 Theoretical perspectives observed

Theoretical perspectives on technology adoption, particularly Rogers's Diffusion of Innovation Theory, suggest that institutions often enter a *preparatory phase* during early adoption stages, where they focus on establishing guidelines to shape responsible usage (Rogers, 2003). The findings align with this theory, as institutions appear to be focusing on creating a controlled environment that supports responsible and ethical GAI adoption. The involvement of the CTLs and the Provost Offices as primary information providers underscores this structured approach, as these offices

traditionally set academic standards and oversee teaching quality. However, the absence of collaborative guidelines and the limited availability of open forums for GAI integration suggest that institutions may not fully embrace a participatory approach. This could limit faculty engagement and feedback on the effectiveness of GAI policies.

These findings indicate a need for institutions to expand their support structures for GAI integration. While institutions are making strides in providing foundational resources and regulatory guidance, there is room for growth in fostering community-based learning and supporting broader GAI applications. Institutions might consider implementing open forums or collaborative workshops that allow faculty to share insights and collectively address challenges associated with GAI. Additionally, expanding the resource scope to include research-focused and technological support would help institutions support faculty interested in innovative GAI applications beyond the classroom.

6. Implications and Conclusion

The findings of this study demonstrate the complex interplay between quantitative resource distribution patterns and qualitative institutional approaches to GAI integration in higher education. The quantitative data reveal that institutions heavily invest in regulatory (35%) and teaching-focused (33.3%) resources, which qualitatively manifest in comprehensive policy frameworks and structured teaching support systems. This emphasis on foundational guidance aligns with the thematic analysis that identified a cautious yet supportive institutional stance toward GAI adoption.

The distribution of resource types provides quantitative support for the qualitative finding of institutional caution. The predominance of informational articles (82% of resources) over interactive engagement opportunities (3%) reflects institutions' preferences for controlled, structured approaches to GAI integration. This quantitative pattern supports the qualitative theme of institutions prioritizing risk management and standardized implementation over experimental or innovative applications.

Our analysis of organizational structures reveals that Centers for Teaching and Learning (30.2%) and Provost Offices (27.4%) lead GAI initiatives, with Technology Services (19.8%) and Libraries (7.5%) playing supporting roles. This distribution quantitatively supports the qualitative finding of a centralized, top-down approach to GAI integration, where academic oversight and teaching support take precedence over technical experimentation.

The target audience analysis provides numerical validation for the qualitative theme of faculty-centric support, with 46.9% of resources targeting instructors, while general institutional resources comprised 35.4%. The limited resources for researchers (5.2%) and specialized staff (3.1%) quantitatively confirm the qualitative observation that institutions prioritized immediate teaching needs over research applications and broader institutional transformation.

Looking forward, institutions can enhance faculty support by addressing gaps revealed through both quantitative and qualitative analyses in terms of:

1. Resource Balance:
 1. Current quantitative distribution shows limited research support (5.1%)
 2. Qualitative analysis suggests need for more research-oriented resources
 3. Institutions should expand resources beyond basic teaching applications
2. Engagement Opportunities:
 1. Only 3% of resources were interactive
 2. Qualitative findings indicate the need for more collaborative learning
 3. Development of more peer learning and discussion forums are recommended
3. Cross-departmental Integration:
 1. Implications of current siloed distribution among offices (CTL 30.2%, Provost 27.4%) should be considered
 2. Qualitative analysis suggests need for better coordination
 3. More integrated approaches to resource development are needed
4. Innovation Support:
 1. Limited learning technologies resources are accessible (2.7%)
 2. Qualitative findings indicate untapped potential for innovation
 3. Greater support for experimental applications is recommended

However, this study has limitations that should be considered. The analysis was based on publicly available resources from a sample of institutions, which may not capture all internal or department-specific GAI support activities. Additionally, the study focuses on a specific moment in time, and

institutions' GAI policies and resources are likely to evolve as GAI technologies and educational practices change. Future research could explore longitudinal changes in GAI support within institutions and assess how these evolving resources impact faculty adoption and student outcomes.

Overall, these findings suggest that institutions could further support faculty by expanding interactive and collaborative resources, strengthening cross-departmental coordination, and fostering a balanced approach that encourages both ethical GAI use and innovative exploration. By broadening their resource offerings and remaining adaptable to the changing GAI landscape, institutions can create a more robust support system that empowers faculty to harness GAI's full potentials in educational and research contexts. Through these efforts, higher education can shape a new generation of educators equipped to navigate the complexities of a GAI-enhanced academic environment.

In conclusion, this study demonstrates through both quantitative metrics and qualitative analysis that institutions are developing structured approaches to GAI integration, with clear preferences for controlled, policy-driven implementation. The numerical distributions of resources align with and support the qualitative themes of cautious adoption and prioritized teaching support. By understanding these patterns, institutions can work toward more balanced and comprehensive support systems that maintain necessary oversight while encouraging innovation and experimentation in GAI applications.

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About the authors

Armanto Sutedjo



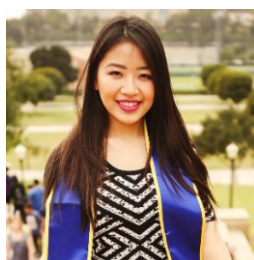
Armanto is a Visiting Lecturer of Learning, Design, and Technology and an Educational Consultant at the Texas A&M University Center for Teaching Excellence with experience in classroom technology integration and emerging technologies. His background in the IT industry and managing a small business nurtures him as a problem solver with a comprehensive approach.

Armanto considers himself as a life-long learner, eager to seek new understanding on emerging technologies in education, and a passionate educator. He is interested in exploring innovative adoption of emerging technologies in the classroom for a better learning experience for both faculty and the students. He collaborates with his peers in exploring the benefit of Generative AI for enhancing digital learning pedagogy.

Armanto received his PhD in Educational Psychology with a focus on Learning, Design, and Technology from Texas A&M University. Originally from Indonesia, Armanto earned his Bachelor's degree in Industrial Engineering from Trisakti University, expanded his management skills through his Master of Management from IPMI Business School, and built his pathways to education by obtaining his degree in Master of Education in Curriculum and Instruction in Educational Technology from Houston Baptist University. He likes travelling, enjoying nature and wildlife, and exploring culinary experiences.

✉ asutedjo@tamu.edu

ORCID [0000-0001-8737-5769](https://orcid.org/0000-0001-8737-5769)



Stephanie Peitseng Liu

Stephanie Liu is a doctoral student in the psychology school at Texas A&M University. Her diverse work experience in education includes roles as a teacher of Mandarin, a Mindfulness teacher, College access coordinator, and graduate assistant researcher at Texas A&M's Center for Teaching Excellence. Stephanie is passionate about researching the use cases and impact of generative AI on teaching, learning, and professional work, both within school psychology and across various disciplines. She aims to become a licensed psychologist and is currently enthusiastic about exploring the application of generative AI in psychoeducational report writing and therapy.

A native of California, Stephanie earned her Bachelor's degree in Biology from the University of California, Los Angeles (UCLA). She holds two Master's degrees in Educational Psychology, one from Ball State University and another from Texas A&M University. In her free time, Stephanie enjoys traveling, reading, cooking, and appreciating nature and wildlife.

✉ stephliu@tamu.edu

ORCID [0009-0001-9000-6902](https://orcid.org/0009-0001-9000-6902)



Mahjabin Chowdhury

Mahjabin Chowdhury, PhD, is an accomplished scholar in the field of curriculum and instruction, having graduated from Texas A&M University. As an educational researcher at the University's Center for Teaching Excellence (CTE), she is at the forefront of cutting-edge educational research and development. She spearheads the Interdisciplinary Design for Empowerment and Agency through the Learning Sciences (IDEALS) lab, driving innovative learning experience design projects. Mahjabin also plays a pivotal role in fostering and nurturing the IDEATE program within the CTE. This program brings together a dedicated community of academics committed to the collaborative exploration and propagation of Scholarship of Teaching and Learning (SoTL).

Originally from Bangladesh, Mahjabin honed her educational foundation at the University of Dhaka, earning her Bachelor's degree in English Literature and Language, and her Master's degree in Applied Linguistics and English Language Teaching (ELT). She then further expanded her pedagogical expertise with a Master's degree in Early Childhood Education from Louisiana Tech University. With over five years of experience across various levels of education, she is proficient in five languages and is passionate about reading, travel, cooking, and Zumba.

✉ mahjabin@tamu.edu

ORCID [0000-0003-0784-0726](https://orcid.org/0000-0003-0784-0726)

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