SPAI-CL: Student Practice with AI for Career & Learning

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DATA FELLOWS
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Introduction

Workplace use of generative AI is rising in the U.S., with 30% of hours worked today forecasted to be replaced by automated AI work by 2030 (Ellingrud et al., 2023). Studies have identified the following areas in the United States most altered by the emergence of AI applications (Kochhar, 2023; Zinkula & Mok, 2024):

- STEM Professionals: IT Security, Developers, Data Scientists
- Business and Legal: Lawyers, Marketing, Actuary
- Creatives: Design, Media, Entertainment

Integrating AI into higher education is not a futuristic vision but an inevitability. Colleges and universities must adapt and prepare students, faculty, and staff for their AI-infused futures.

Hodges & Ocak, 2023

CSULB's strategic priority calls to engage all students. The institution's goal is to prepare them for successful future journeys. Some academic areas have started to infuse generative AI discussion into their curricula and learning objectives, but the campus can benefit from attention to some curricular gaps.

Research Questions

These research questions guided our project:

- To what extent is CSULB currently preparing students for future careers in fields projected to utilize generative AI?

By understanding where infusing generative AI content into curricula and the diversity of the students in those courses, we hope to discover practice and strategic recommendations for academic leadership.

Our review of peer-reviewed research also contended with:

- What are the perceived benefits and challenges of incorporating generative AI into higher education curricula?
- How can program leaders (e.g., faculty, chairs, curriculum committees) navigate the challenges and opportunities presented by the integration of AI technologies?

Methods

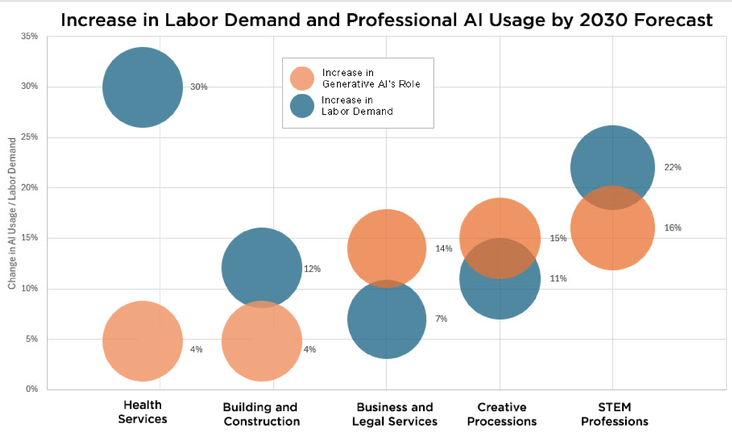
Our team analyzed the following content:

- CSULB Student Success Dashboard 2.0
- CSULB AI Steering Committee Survey Data (Fall 2023)
- Recent peer-reviewed research, datasets, AI discourse
- Campus curriculum (syllabi, outlines, degree requirements)

Initial analysis focused on careers most impacted by the emergence of AI, leading to a curricular review of associated CSULB undergraduate degrees. Our team focused on undergraduate students in Computer Science and Studio Art, assessing student information in SSD 2.0, as well as Catalog degree requirements, and objectives listed in outlines/syllabi. Further information was drawn from the general perspectives shared in the AI Subcommittee report.

Data and Analysis

Generative AI Applications will change the work activities significantly for many occupations (Ellingrud et al., 2023).



Based on the U.S. Bureau for Labor Statistics forecast for 2030, the United States will see significant employment growth in fields related to Health Services, Building & Construction, Creative Arts, and STEM Professions.

- While a significant increase in labor demand for roles related to nursing and therapy are expected, AI is only expected to have a small impact.
- However, creative and STEM professions such as art design and programmers, are forecasted to increase in both labor demand and AI usage.
- CSULB's Strategic Priorities notes the importance of cultivating resilience through the implementation of innovative and forward-looking action to strengthen the institution. The institution should be nimble and proactive to support transformation in learning and research.

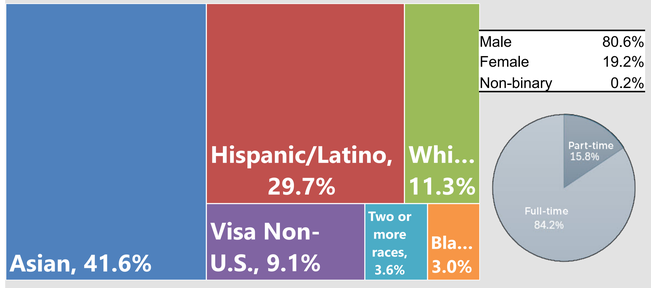
CSULB BS Computer Engr/Computer Science Majors

- High major-specific unit count – relies on GE double-counting within its requirements. Little wiggle room for adding new courses.
- Existing AI Curriculum: CECS 451. Artificial Intelligence course implemented in Fall 1994. Previous iterations of the course existed in the 1980s. Course is more about programming – than career.
- CECS BS career focus courses: CECS 343, ENGR 350

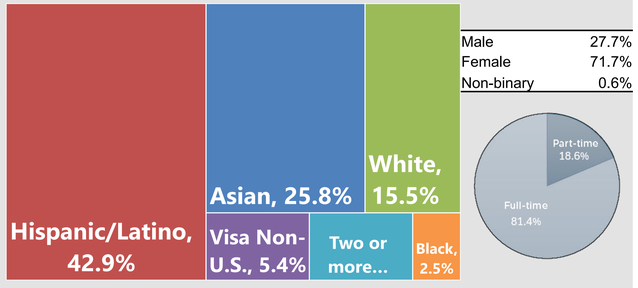
CSULB BA Studio Art Majors

- Low major-specific unit count – has wiggle room for curricular additions especially as a standalone degree.
- No focused "your future career" course in the upper-division.
  - ART 101 does bring in art professionals to discuss their work, and various studio discipline courses discuss careers.
- Art History majors have AH 300, which focuses on career growth in the field.

CECS Department Undergraduate Demographics, Spring 2023



School of Art Undergraduate Demographics, Spring 2023



Direct SLOs related to AI knowledge may be beneficial: "Students will demonstrate a solid understanding of core AI concepts, including machine learning, neural networks, natural language processing, and robotics."

Recent studies have found that disciplines with a higher proportion of URM or women students have less benefit currently from AI use toward scholarly activities – further exacerbating existing inequalities in STEM fields and may impact CECS students based on this demographic breakdown (Gao & Wang, 2023).

Ethical considerations for the use of AI in SLOs may be beneficial: "Students will critically analyze the role and impact of AI in the art world, discussing themes such as authenticity, authorship, and the transformation of artistic production in the digital age."

Recent research highlights various integrity concerns with AI's use for professional work, however AI-powered applications can promote brainstorming and interactive activities in higher education classwork (Fan & Li, 2023).

CSULB Data on AI Perceptions – *drawn from ATS/AI Subcommittee Survey Report*

(Student *n* = 793, Faculty *n* = 167, Staff *n* = 109, Administrator *n*= 15)

Students, faculty and staff share positive attitudes towards perceptions of AI such as...

- The importance of discussing topics such as ethics and bias regarding AI.
- Learning and teaching about AI and its impact on society.
- The benefits of AI relating to administrative tasks.

Yet differ on whether it's acceptable to use AI in work or classwork unless mandated by an instructor or the university...

- **50%** of staff agree that "AI tools are acceptable to use at work if not provided by the university."
- **40%** of students agree that "AI tools are acceptable to use if not provided by an instructor."
- **24%** of faculty agree that "AI tools are acceptable for students to use if not provided by an instructor."

Discussion

Demographic differences between CECS and Studio Art undergraduates highlight that careful consideration necessary for institution-wide AI policies, practice documents, and recommendations.

There is (and will continue to be for a few years) a lack of longitudinal research on the impact of AI used for scholarly activities in higher ed, and how students enter postsecondary education with significant experience using AI. Recent peer-reviewed research comes to different conclusions based on the perspectives of the author or student group:

- Increased reliance on GPT was associated w/higher levels of procrastination, memory loss & negative relationship w/academic performance reflected by GPA (Abbas et al., 2024).
- Students using AI were not sensitive to quality of information (Abbas et al., 2024)

vs.

- AI-power Calculus applications lead to improved performance in students (Fluck et al., 2020).
- Translation and captioning services powered by AI can bridge accessibility and equity gaps (Rusmiyanto et al., 2023).

Implications for Action

- Explore how professions are adopting generative AI (and other emerging technologies)
- Emphasize dedicating time to existing curriculum analysis within department/programs
- Ensure CSULB's Career Development Center and Academic Leadership teams communicate on potential curricula that can benefit students

Next Steps / Future Directions

The data from the AI Steering Committee Survey highlighted an additional need for dedicated research that can separate student perspectives on AI based on demographic, gender identity, financial history, generational status, and academic disciplines.

For example, the College of the Arts students can be impacted by generative AI much differently than College of Business students – and it is important that both perspectives are analyzed.

For future directions in consideration of preparing students for their careers utilizing AI, we also recommend:

- Provide focused generative AI training options for faculty, especially if being asked to infuse the emerging technology into their instruction.
- Establish dedicated time at department faculty and curriculum meetings (across the institution) to discuss emerging technologies and their potential impact on students. Appropriately adapting curriculum in a timely fashion can better prepare students for their future and serve as notice toward prospective CSULB applicants of CSULB student success commitments.
- AI is a rapidly expanding and transforming topic – practices presented now may not be valid in the future, especially when relying on third-parties hosting and administering the applications. Fluid language is necessary when discussing AI.