

Developing Inclusive Activities with Technology to Stimulate Apparel Student Engagement at a Hispanic Serving Institution

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Introduction

Based on primary challenges identified across a California State University system (CSU, 2021), we used practice-based approaches to address equity gaps among Under-Represented Minority (URM) students in the Apparel major who are of Hispanic, African American, and/or Native American backgrounds, and Non-URM students. This study is informed by Culturally Relevant Pedagogy (CRP) based on shifts in student demographics with minorities expected to be a majority and historical achievement gaps among these students (Brown-Jeffy & Cooper, 2011). CRP aims to address student achievement, while accepting and affirming students' cultural identities (Ladson-Billings, 1995). We aim to apply two CRP principles: (1) equity and excellence, which involves recognizing the distinct needs of students and holding them to high standards, and (2) student-teacher relationships which includes being caring, maintaining a connection, interaction, and creating a welcoming classroom atmosphere. The university is designated as a Hispanic Serving Institution based on the student population, and the project aims to improve "servingsness" by focusing on inclusive approaches for student retention (Garcia et al., 2019).

Purpose

The purpose of this project was to explore how faculty can use technologies to increase student engagement, inclusivity, sense of belonging, and cultural relevance of course content. With an assessment of barriers and opportunities, best practices were implemented in apparel courses with equity gaps. This project aligns with the college student success strategy to accelerate innovation in teaching, learning, and build student engagement in the context of being an HSI.

Literature Review

Factors that Inhibit Student Engagement

There are several factors that can limit student success, including assumptions of students' prior knowledge and skills. Transfer students may be at greater disadvantage based on prerequisites that were completed in a different college or university. Low grades in courses can impact students' sense of success, academic self-efficacy, sense of belonging, and how faculty perceive them (Singer-Freeman & Bastone, 2019), as well as persistence (Han et al., 2017).

Academic outcomes are being evaluated to address challenges with GPA equity gaps, D, F, or Withdraw (DFW) rates, as well as graduation rates. Scholars identify disaggregation of data as important to begin to identify performance patterns among students. In an evaluation of 88 courses with DFW rates of 30% or higher, classes were mapped out based on low stakes and high stakes assignments (Hobbs et al., 2021). Lower division classes primarily had tests and homework, while advanced courses had various assignments. Non-URM and non-transfer students received higher grades in assignments compared to URM and transfer students.

Creating a Climate that Supports Student Sense of Belonging

Faculty-student relationships and peer-to-peer student relationships can impact sense of belonging. Intentional interventions with attention to students' unique identities can have a positive impact on first-generation students' sense of belonging, hope, and create a growth mindset

(Mercado, 2023). A step towards this is faculty professional development to create a fearless classroom environment. “A Fearless Classroom” enables psychological safety in the class to support students’ academic performance, engagement, and commitment to their education that is inclusive and equitable (Heimler, 2020). A primary goal is mutual trust and respect where the instructor demonstrates empathy, compassion, and humility toward the students.

Inclusive Teaching Approaches

To reduce equity gaps, faculty are increasingly implementing inclusive pedagogical approaches. This includes being critically self-reflective, attention to student assets, acknowledging students as individuals, using best practices based on the student population, and affirming their potential (White et al., 2021). Among first-generation students who may come from collectivist backgrounds, active learning and group work can be especially helpful. This includes scaffolded learning, activities that address gaps in knowledge-skills that can benefit from immediate feedback, and repetition. This can improve students’ learning, problem-solving, confidence, socialization, and provide opportunities for collective learning.

Assignments can be evaluated based on their “utility” value and their “inclusivity” (Hobbs et al., 2021). This aligns with broader research, which conveys that students’ perceived value is a strong predictor of motivation, creativity (Wigfield et al., 2009), and persistence (Estrada et al., 2017). Creating equitable assessments can further aid to reduce equity gaps (Hobbs et al., 2021). This includes considering faculty positionality, agency, lived experiences, privilege, and biases. As students are expected to be technology-ready for their careers (NACE, 2024), use of accessible and inclusive technologies can be further explored to support Apparel students.

Methods

Practice-Based Approaches

Approaches included faculty discussions focused on implementing inclusive activities to create more equitable outcomes, specifically to increase student engagement with technology. We propose a process model to begin to address equity gaps in Apparel courses as shown in Figure 1. We aimed to reach 181 students in 5 courses during Spring 2024 based on awareness of equity gaps, discussing best practices, and updating an assignment with a common focus to use an inclusive technology. Based on Spring 2023 and Fall 2023 data, courses with equity gaps among URM and non-URM students (0.2 to 0.4) were identified for faculty to intentional address gaps. Several technologies were identified by faculty, including open access ChatGPT, computer aided design software (OnShape), and specialized tools for virtual draping and textile design (Browzwear, TUKA studio). Quality learning rubrics for assignments were also considered. Questions focused on cultural relevance, inclusivity, and technology use, and build on previous approaches (Trejo et al., 2024). Upon IRB approval (22-131), surveys were distributed to students during Spring 2024. A 5-point Likert scale (strongly disagree to strongly agree) was used, and Statistical Package for the Social Sciences (SPSS) was used for descriptive data analysis.

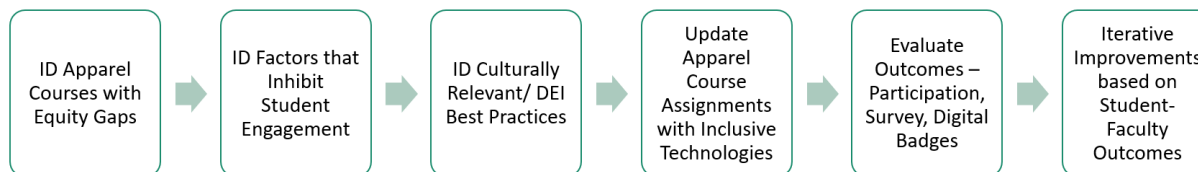


Figure 1: Process Model to Address Equity Gaps in Apparel Courses at a Minority-Serving Institution

Results

Student Participants

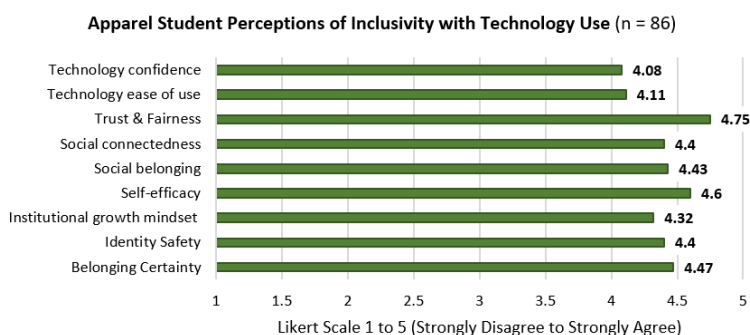
A total of 86 participants from 5 classes responded with a 47% response rate. Most of the respondents were female (n=63) and there were fewer male participants (n=18). Hispanic respondents made up the largest group (n=34), followed by Asian (n=25), White (n=12), Two or More Races (n=9), Black or African American (n=5), and Native Hawaiian Pacific Islanders (n=1). Students were primarily in the apparel major (n=60). About half of the respondents were working either part-time (n=37) or full-time (n=9). Approximately 37% of respondents self-identified as first-generation college students (n=32), and 28% were transfer students (n=24).

Cultural Relevance

Among the cultural relevant factors identified to help affirm equity and excellence in the courses, 89% of the participants (n=77) indicated that considering multiple perspectives was an effective approach taken by faculty. Approximately 76% of respondents (n=66) agreed that faculty recognized their distinctive needs, and 60% agreed that faculty held them to high standards (n=52). As for factors that helped foster relationships with faculty, 80% of respondents (n=69) agreed that faculty created a welcoming classroom atmosphere for a strong “community of learners,” 73% agreed (n=63) that faculty consistently interacted, and 70% agreed (n=60) that faculty were caring. Factors with less than 60% agreement and that can be improved include: attention to students’ unique identities, affirming diversity, and attention to their culture.

Inclusive Learning Environment & Technology Use

Survey responses indicated agreement with inclusive technology use. Technologies were easy to use (\bar{x} =4.11), and students felt confident using the technology (\bar{x} =4.08). Regarding inclusivity with the use of technology, the following indicates respondent agreement regarding: belonging certainty (\bar{x} =4.47), identity safety (\bar{x} =4.4), institutional growth mindset (\bar{x} =4.31), self-efficacy (\bar{x} =4.6), social belonging (\bar{x} =4.43), social connectedness (\bar{x} =4.4), as well as trust and fairness (\bar{x} =4.75). Minor areas for improvement can be with technology ease of use, improving student technology confidence, and connecting to the institutional growth mindset within the HSI.



Conclusion

The project activities were showcased in a Canvas site for future faculty reference and asynchronous use with a Digital Badging Pathway available through the university. Three badges (explorer, implementer, master) are offered in the “Inclusive Activities with Technology for Student Success” pathway to recognize faculty use of inclusive technology to foster student success and address equity gaps. This aligns with HSI “servingness” as an inclusive approach to support student retention that can be sustained for longer term use.

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References

- Brown-Jeffy, S., & Cooper, J. E. (2011). Toward a conceptual framework of culturally relevant pedagogy: An overview of the conceptual and theoretical literature. *Teacher Education Quarterly*, 38(1), 65–84.
- Cal State University. (2021). *Graduation initiative 2025: Equity goals and priorities*. <https://www.calstate.edu/csu-system/why-the-csu-matters/graduation-initiative-2025/Documents/gi-2025-equity-goals-and-priorities-2021-22.pdf>
- Estrada, M., Burnett, M., Campbell, A. G., Campbell, P. B., Denetclaw, W. F., Gutiérrez, C. G., Hurtado, S., John, G. H., Matsui, J., McGee, R., Okpodu, C. M., Robinson, T. J., Summers, M. F., Werner-Washburne, M., & Zavala, M. (2017). Improving underrepresented minority student persistence in STEM. *CBE—Life Sciences Education*, 15(3), es5. <https://doi.org/10.1187/cbe.16-01-0038>
- Garcia, G. A., Núñez, A.-M., & Sansone, V. A. (2019). Toward a multidimensional conceptual framework for understanding “servingness” in Hispanic-Serving Institutions: A synthesis of the research. *Review of Educational Research*, 89(5), 745–784. <https://doi.org/10.3102/0034654319864591>
- Han, C., Farruggia, S. P., & Moss, T. P. (2017). Effects of academic mindsets on college students’ achievement and retention. *Journal of College Student Development*, 58(8), 1119–1134.
- Hobbs, H. T., Singer-Freeman, K. E., & Robinson, C. (2021). Considering the effects of assignment choices on equity gaps. *Research & Practice in Assessment*, 16(1), 49–62.
- Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32(3), 465–491. <https://doi.org/10.3102/00028312032003465>
- NACE. (2024). *What is career readiness?* National Association of Colleges and Employers. <https://www.naceweb.org/career-readiness/competencies/career-readiness-defined/>
- Mercado, F. (2023). Difference-education intervention that promotes a sense of belonging, mindset, and hope in minoritized first-generation students. *Journal for Leadership, Equity, and Research*, 9(1), Article 1. <https://journals.sfu.ca/cvj/index.php/cvj/article/view/241>
- Singer-Freeman, K., & Bastone, L. (2019). Developmental science concepts guide effective support of underrepresented STEM students. *Biochemistry and Molecular Biology Education*, 47(5), 506–512. <https://doi.org/10.1002/bmb.21292>
- Trejo, H. X., Whang, C., Cañedo, J. C., Wong, S., Zamarripa Venegas, K. & Barajas, X. (2024). "Best fit for me": Exploring the role of cultural relevance to improve success for underrepresented minority students in the apparel major. *International Textile and Apparel Association Annual Conference Proceedings*, 80(1). <https://doi.org/10.31274/itaa.17546>
- White, K. N., Vincent-Layton, K., & Villarreal, B. (2021). Equitable and inclusive practices designed to reduce equity gaps in undergraduate chemistry courses. *Journal of Chemical Education*, 98(2), 330–339. <https://doi.org/10.1021/acs.jchemed.0c01094>
- Wigfield, A., Tonks, S., & Lutz Klauda, S. (2009). Expectancy-value theory. In *Handbook of motivation at school* (pp. 55–76). Routledge.