



## **The role of the co-curricular spaces in Engagement and success of minority students**

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# The role of the co-curricular spaces in engagement and success of minority students

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## Abstract

Identification of driving factors in progress and success of minority students at higher education levels in science, technology, engineering and mathematics (STEM) at four-year colleges and universities is of high importance. Innovative approaches that integrate the driving factors in education will inspire students with diverse backgrounds engagement for better learning and effective practice. The key role and efficiency of co-curricular spaces in creation, exchange, and development of knowledge in underrepresented groups is still a fluid subject area. In this study, we applied a qualitative research approach to fully analyze the social perception and experiences of minority groups at a university to understand the role of the co-curricular spaces in their success. Demographic data, accessibility, and frequency of use were analyzed in the framework of the motivation and driving factors. Briefly, the statistical data showed 67% of the minority students were using the co-curricular spaces. Among regular users, 80% of the students used spaces independent of their social group affinity. Students positively scored the role of the co-curricular spaces towards their success. Further, the students' challenge and preventing factors in using the co-curricular spaces by minority groups were analyzed. Further studies needed to conduct the role of student supporting center and integrated management of the co-curricular spaces. This study highlighted the necessity of attention in the integration and success of underrepresented students and the crucial role of co-curricular space development.

Keywords: co-curricular spaces, minority, STEM, progress, success

## Introduction

Hostile and uncomfortable study climates have shown drastic effects on the performance spectrum of underrepresented students (Yearwood & Jones 2012). The experience of group studying through selecting particular spaces of the university, including library lounge, college coffee shops spaces, and many more comfortable spaces, provides a center for the interactions with other fellows and increases the social involvement (Arriba et al. 2018; Garvey et al. 2018). The inclusive benefits of providing curricular spaces for the minority students powers the support for diversity and integrity in large institutes. Additionally, colleges and universities at a high education level have found the value and benefits of the diversity in the professional development of the school (Bowman et al. 2016). Therefore, educational institutes work to support and increase the racially diverse student groups (Crandall et al. 2019; Daddow et al. 2019). However, there is a public concern about how these schools can promote expressive engagement that center the establishment of diversity-related issues in the academic progress of students (Evans et al. ; Saelua et al. 2017; Arriba *et al.* 2018).

Therefore, there is an essential need to study, characterize, and document the potential benefits associated with racial and cultural diversity in the tendency to use curricular spaces. Co-curricular space may be described as a comfortable physical space where students perform group studies and share their knowledge. The main difference between the traditional classroom space with these spaces is more about the cultural and ideological learning between minorities that lead to transformational education. In many schools, it is unknown whether the efficacy of these spaces play a significant role in students' progress and engagement in social activities or even if it extends beyond the personal development after undergraduate studies (Cartile et al. 2019; Fosnacht et al. 2019).

Over the past years, American Universities and Colleges have progressively institutionalized diversity enterprises at higher education levels in curricular and co-curricular spaces (Lee & Matusovich 2016). Although encouragement of diversity through the curriculum and increasing the interpersonal exposure receives great attention(Crandall *et al.* 2019), many higher education institutes aim to extend the learning efficiency outside of the classroom and technically maximize it by developing co-curricular opportunities that foster diversity issues (Solis & Durán 2020).

However, do these study areas create an experience that challenges underrepresented students while they are new and then fades away over time? All of these questions and many more cannot be answered without a thorough analysis of a practical survey from underrepresented communities, who actively use the co-curricular spaces. A comprehensive study that could provide the foundation to extend the concept of the co-curricular areas beyond the freshman year of the undergraduate career is very imperative to secure the educational benefits of diversity.

The limited number of studies present information about the critical role of the co-curricular spaces (Vance & Perkins ; Rockenbach & Mayhew 2013) and demographical analysis of beneficiary underrepresented students during college or university (Lee & Matusovich 2016; Rosser 2019). Therefore, this study examined the effect of participating in a racial/cultural associated co-curricular space fostering four years of undergraduate students.

## **Method**

### **Data collection and sample**

Data for this study originate from surveying the underrepresented groups on the understanding of the College Station campus climate of Texas A&M University System. The mission of the school aims to foster overarching strategies and tactics that lead to success, promoting diversity among students and faculties.

This research used surveys to evaluate the feelings of upper-level students concerning inclusion and the utilization of co-curricular spaces across campus. In particular, the experiences of underrepresented groups (African-American and Hispanic) were assessed against their non-minority peers. Recruitment was conducted via campus-wide email, with additional identifying effort focused on race/ethnic-specific campus organizations (NSBE, SHPE, MANNRS, etc.). Students have met the requirements of 1) upper-level classification (not Freshman), and 2) declared major within either the College of Agriculture and Life Sciences (COALS) and the College of Engineering (COE).

To facilitate future group discussions, participating students were asked to complete pre-surveys to identify current knowledge areas and perceptions. Using scale/rank questions, students' awareness, and utilization of various co-curricular spaces were evaluated. For the purposes of this study, the data of respondents were received for further statistical analysis that (1) classified as undergraduate students and (2) indicated a willingness to complete the interview questionnaires. This research was performed under IRB number IRB2018-0187M and all participants signed consent forms before engaging in the surveys and focus groups.

### **Results and Discussion**

Co-curricular space in this study were qualitatively defined as a comfortable physical space in the school that is a center point for students gathering to study and share the knowledge with cultural and ideological encounters that lead to transformational education out of traditional classroom setting. Such space may support the physical presence of 4 to 10 people at the same time. The working hours may differ depending on the administration of each building. Figure 1 illustrates the majority of underrepresented groups, those who rely on using the co-curricular spaces. About 67% of surveyed students were using the co-curricular areas towards different activities, and 33% of them have never used those spaces. These results are very imperative for further analysis in using and identification of co-curricular spaces in the success of minority students. For example, the need to develop such spaces is more than before realized through these statistical results. However, there is a need for further analysis of the time frame that students spent during the academic year and how much of their daily, weekly, and monthly is allocated for using shared spaces. This information can be used for many different purposes, including the seminar or event advertisement, as well as providing additional supporting sources for educational purposes.

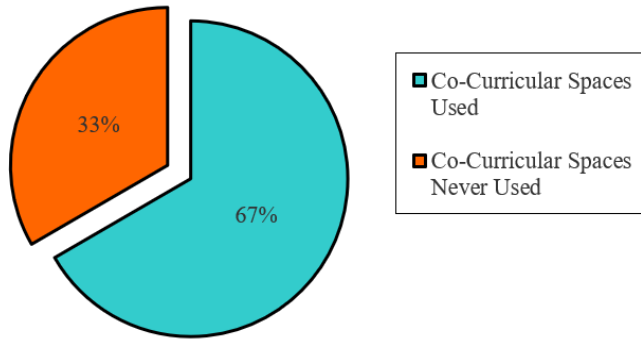
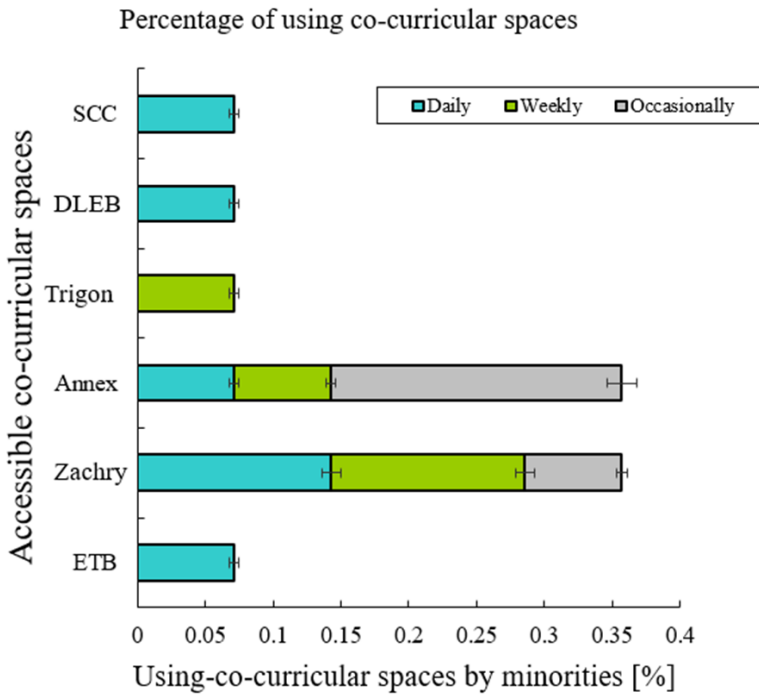


Figure 1. The usage of the co-curricular spaces in campus climate among the underrepresented groups

Figure 2 is a detailed analysis of the co-curricular spaces within a time frame of daily, weekly, and monthly uses. All the responses reflect the behavior of minority students towards using the available co-curricular areas. A comparison with the users that are not considered minorities is essential to understand the planning direction for future investment. But many incorporating factors make it a very confounding issue and that calls for further studies. Most of the results indicate an inevitable role of the co-curricular spaces in the daily activities of students. For example, students of the surveyed group responded upon daily usage of the spaces, in which the newly renovated space is among highly used regularly. The frequent use of the co-curricular areas of the library Annex and Zachry, suggested the interior design and environment in those two places resemble in different aspects. For instance, both locations have access to coffee shops and study resources. Also, the results further show the library Annex was a comfortable and accessible place for occasional use. Providing more resourceful co-curricular spaces is a need for fostering diversity and supporting the progress of undergraduate studies of underrepresented students. The table under the Figure 2, explains the potential resources that a co-curricular space could have to attract students.



Name	Type	Physical Location	Resources
Student Computing Center (SCC)	A relatively large two story computer lab	South/central campus connected to the back of the annex facing the Engineering Activity Buildings. Close to Southside dorms and the Commons	Lots of computers, a few study rooms but mostly open lab space, printing office, some vending machines
Annex	Large multi-story computer lab/study area/resource center	South/central campus adjacent to Evans Library	Study rooms, tables, chairs, computers
Zachry	Multipurpose building for classes, studying, and otherwise	Northeast campus at the corner of University ave and Bizzell St	Lots of tables, chairs, study rooms and spaces, labs to work in, and Starbucks
Emerging Technologies Building (ETB)	Multipurpose building for classes, studying, and otherwise	Northeast campus at the corner of University ave and Bizzell St (next to Zachry)	Lots of tables, chairs, study rooms and spaces, labs to work, coffee and sandwich shop
Dwight Look Engineering Building (DLEB)	Lobby used to have a cafeteria but now it's just open sitting space	Northeast campus next to Zachry on Spence St	Near the main engineering education building. Many group study areas, whiteboards, tables, chairs, computers
Military Sciences Building (Trigon)	Classrooms and offices for students of the Corps of Cadets	The central campus in between Heldenfels and Rudder Tower	Classroom spaces, not just for Corp classes. Offices for military staff, no food, tables, chairs, classrooms

Fig2. The response of 30 students of minorities on the daily, weekly, and monthly use of the co-curricular spaces. The table below the graph provides more information on the type, physical location, and available resources if the co-curricular areas.

However, data analysis (Fig.3) revealed that some spaces have lost their popularity in the past, and students don't consider it as a place to study anymore. This is an alarming outcome that leads to careful consideration and design of those spaces for long term activities. Although it is worth mentioning that some students preferred different areas that were opened just a few weeks before the interviews. The newly opened Engineering Complex attracts more students and encourages them to shift their activities in such a more resourceful place in terms of distance to multiple coffee shops, library and university buses. Also, this change calls our attention that in the near future they might be not enough physical spaces in more recently upgraded building.

Use of co-curricular spaces in past (not being used anymore)

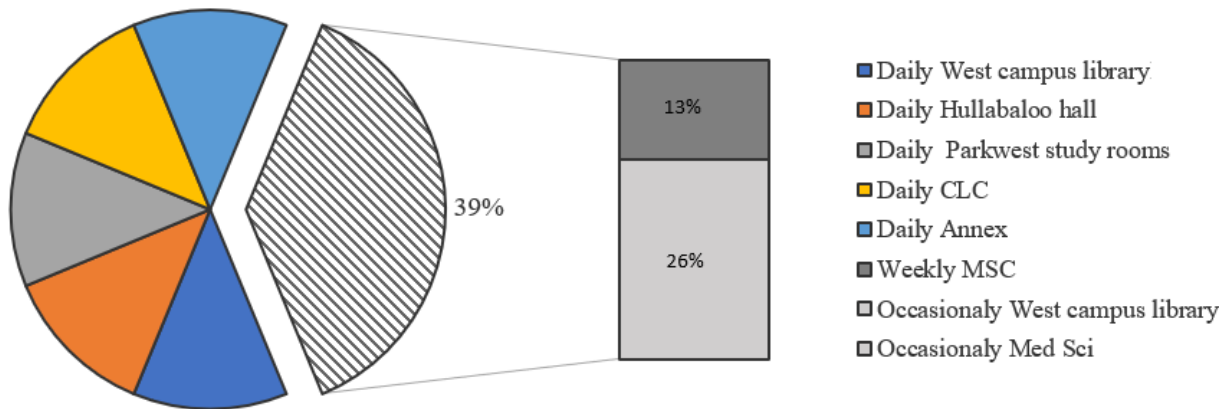


Fig.3 The usage of co-curricular spaces by minority groups in the past that are not being used anymore (n:30).

Despite the attractive facilities provided in each co-curricular spot, the social factor sometimes plays a fundamental role in attracting students to a specific place or abandon a place. For example, about 20% of students in underrepresented groups expressed a strong dependency on their social groups which can lead to abandon co-curricular spaces or shift them to using new places. As shown in Figure 4, approximately 80% of students are using the spaces independent of their social group tendency. This is an interesting outcome in better planning for the development of co-curricular spaces.

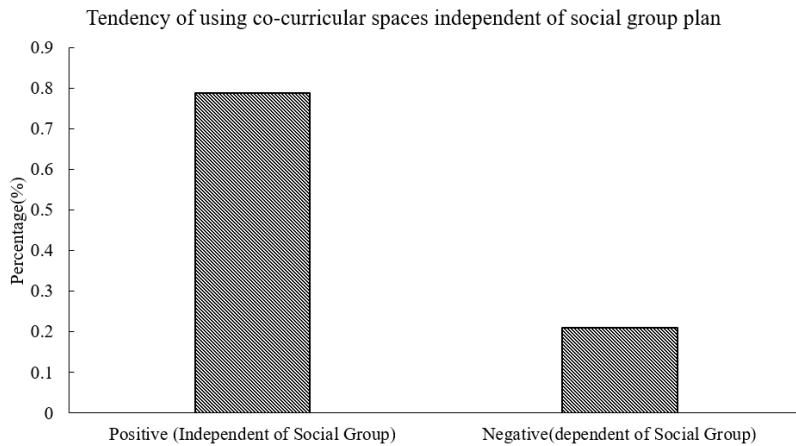


Fig4. The interest of the underrepresented groups, whether it follows the behavior of collective social groups or not (n:30).

Social factors in fostering the co-curricular spaces for underrepresented communities are driven by the level of diversity, which means the presence of multi-ethnicity groups instead of a single ethnicity group. Speaking with interviewees revealed when the presence of a single race (i.e. African American only) dominates in such space, it may have a negative impact on other factors such as psychological effects on student with other ethnicity (such as Latin students) that changes their feeling to be reluctant to come often to that place to study.

However, further analysis revealed that the majority of users of co-curricular spaces are promoted when there is higher diversity between races that at the same time working or studying in those spaces compared to the time when the most of the practical spaces are occupied by majority of single race. Figure 5 indicates the highest level of diversity by approximately 60% of users, while a single race presented about only 20% among the responses. This finding is very crucial for investment and development towards increasing diversity in the college station campus and may provide a baseline for other campuses in Texas.

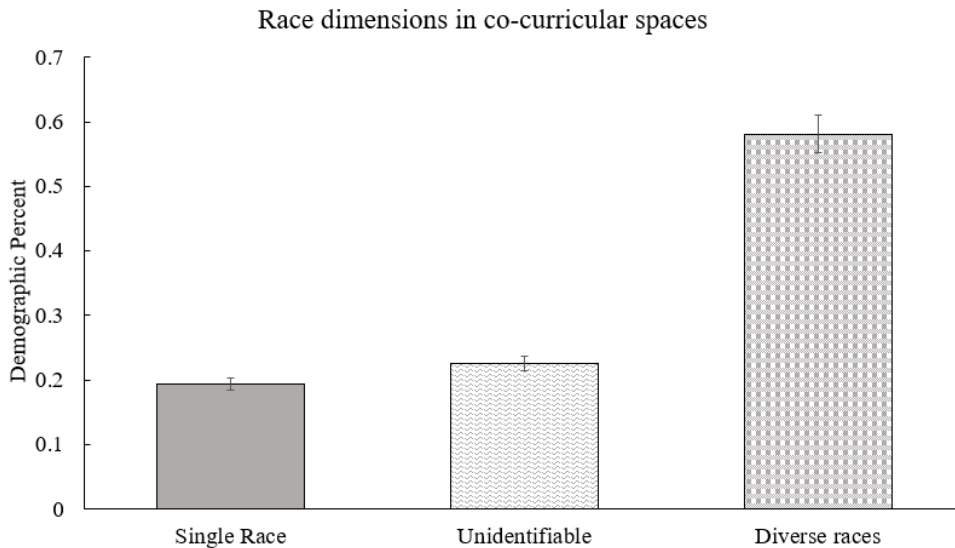


Fig5. Analysis of the co-presence of the multiple races (diverse), single race, and unknown groups that may be associated with the non-minority groups through frequent use of the co-curricular spaces.

The high level of diversity among the users of the co-curricular spaces led to investigate whether the presence of diverse groups or predomination by a single race will impact on tendency to use the spaces. Interestingly, the responses that received from student dictate that the use of co-curricular areas is highly independent of any race domination. Around 80% of students have shown a strong tendency to use the spaces regardless of any race domination in such spaces. A highlight from this finding is high intercultural exposure and social perception among the minority groups which needs further investigations.



## Conclusion

In conclusion, this study demonstrated that co-curricular spaces could have positive and negative impacts on educational experience undergraduate. Though students primarily responded positively towards the use of co-curricular areas, their responses reflected some negative issues. The qualitative elucidation of both positive and negative perspectives leads to a better understanding of incorporating factors in student's satisfaction. These specific areas can improve student's academic performance and promote intercultural education. These findings will help engineering colleges with the establishment of student interventions that could empower the performance and self-confidence of undergraduate students while considering the less considered negative issues. This research is a forward step for a better understanding of the role of co-curricular support and their future improvement to promote and encourage the underrepresented groups towards integration with institutional development.

## References

1. Arriba M., Lucas C.M., Goto K. & Labrador R.N. (2018) Engaging Filipinx Americans in Higher Education to Foster Student Success. *JCSCORE* 4, 1-37.
2. Bowman N.A., Denson N. & Park J.J. (2016) Racial/cultural awareness workshops and post-college civic engagement: A propensity score matching approach. *American Educational Research Journal* 53, 1556-87.
3. Cartile A., Marsden C. & Liscouët-Hanke S. (2019) Teaching and learning design engineering: What we can learn from co-curricular activities. *Proceedings of the Canadian Engineering Education Association (CEEA)*.
4. Crandall R.E., Morin S.M., Duran A., Rockenbach A.N. & Mayhew M.J. (2019) Examining institutional support structures and worldview climate for sexual minority students in Christian higher education. *Christian Higher Education*, 1-18.
5. Daddow A., Cronshaw D., Daddow N. & Sandy R. (2019) Strengthening inter-cultural literacy and minority voices through narratives of healthy religious pluralism in higher education. *International Journal of Inclusive Education*, 1-16.
6. Evans C.A., McReynolds M.E.J., Sharifan M.H. & Moore J.M. Connecting Specific Knowledge Areas Throughout Core Courses in Biological and Agricultural Engineering.
7. Fosnacht K., Graham P., Gonyea R.M., Hurtado S. & Fassett K. (2019) Revisiting the Impact of LLCs on Student Engagement and Success. *ACUHO-I Academic Initiatives Conference*.
8. Garvey J.C., Squire D.D., Stachler B. & Rankin S. (2018) The impact of campus climate on queer-spectrum student academic success. *Journal of LGBT Youth* 15, 89-105.
9. Lee W.C. & Matusovich H.M. (2016) A model of co-curricular support for undergraduate engineering students. *Journal of Engineering education* 105, 406-30.
10. Rockenbach A.B. & Mayhew M.J. (2013) How the collegiate religious and spiritual climate shapes students' ecumenical orientation. *Research in Higher Education* 54, 461-79.
11. Rosser C. (2019) Safe at Home: Co-curricular Spaces for Generative,(un) safe Conversations. *Atla Summary of Proceedings*, 222-33.

12. Saelua N., Ribera A., Brckalorenz A. & Museus S.D. (2017) Viewing higher education as a sea of islands: The impact of student engagement on cultural validation of Native Hawai'ian and Pacific Islander students. Association for the Study of Higher Education Annual Conference.
13. Solis B. & Durán R.P. (2020) Latinx Community College Students' Transition to a 4-Year Public Research-Intensive University. *Journal of Hispanic Higher Education*, 1538192719899628.
14. Vance C.C. & Perkins B. Work in Progress: An Investigation of a College of Engineering Underrepresented Minority Students' Perceptions of Inclusive Co-curricular Spaces and Student Support Programs Beyond the First Year.
15. Yearwood T.L. & Jones E.A. (2012) Understanding what influences successful black commuter students' engagement in college. *JGE: Journal of General Education*, The 61, 97-125.