

**What's Missing?:
Literature Review of Culture and Undergraduate Research**

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Introduction

Within classrooms, a mix of cultures can introduce new ways of thinking and create different expectations and approaches due to a difference in skills, norms, and values (Ramburuth & Tani, 2009). For this study, culture is defined as the “whole complex of traditional behavior which has been developed by the human race and is successively learned by each generation” (Mead, 1937, p.17). As students navigate culture in the classroom, they must also seek out opportunities including research. Mentored research can allow undergraduate students opportunities to gain hands-on learning experiences that can increase academic success and be beneficial for diverse groups of students (Haeger & Fresquez, 2016). Meanwhile, Haeger and Fresquez (2016) found a lack of diversity in STEM graduate programs leading to diversity problems in STEM professions. It can be argued that the lack of diversity in graduate programs occurs because Hispanic and Black students have significantly lower degree completion rates than their Asian and White peers (Shapiro et al., 2017). The difference in completion rate is alarming since graduates are expected to see an increase in employment opportunities in the food, agriculture, and natural resource (FANR) industry between 2020 and 2025 (Fernandez et al., 2020). Since undergraduate research helps students develop confidence, communication, and critical thinking skills necessary for postgraduate degrees (Parker, 2018), it can be beneficial to recruit more minorities into undergraduate research for the future success of FANR fields. To improve undergraduate research programs, it is valuable to understand the role culture plays in students' self-perceived views as researchers. With this research, we sought to determine if cultural perceptions and impacts on undergraduate researchers have been studied in empirical research.

Methodology

To achieve the purpose for this study, researchers conducted a qualitative descriptive literature review. A qualitative descriptive literature review allows researchers to gain insights from existing information to better understand new or poorly summarized phenomena (Kim et al., 2017). Exclusion criteria, established prior to data collection, included peer-reviewed, open access articles from the United States. To begin the search, researchers used the following search terms: undergraduate research, undergraduate research and culture, ethnic culture acknowledge undergraduate research, impact ethnic culture undergraduate research, cultural acknowledge and undergraduate research, ethnic diversity and undergraduate research, ethnic diversity impact on undergraduate research, cultural diversity in undergraduate research. After the initial search, 20 articles were selected. After a secondary review, two articles were kept for final analysis. Constant comparative methods were used to develop themes from the selected articles.

Results

Articles selected during the initial search focused on defining undergraduate research, the need for mentored research, the importance of creating a space for culturally diverse students in

universities and provided statistics of culturally diverse students in pursuing higher education degrees. These articles were excluded because they did not focus on culture's impact on undergraduate researchers. The two articles selected for final analysis led to three overall themes. The primary theme, "Awareness vs. Engagement", encompasses statements focused on awareness of research and statements about student's engagement or lack of perceived need to engage. Rodriguez Amaya et al. (2018) stated minority students are aware that research opportunities are available, but they choose to not engage. This can be due the typical environment in which research is carried out or the biases and discrimination they have previously encountered. Ahmad et al. (2019) stated that "Biases can negatively influence minority students in being provided opportunities in a research lab." (p. 2). The secondary theme, "Misconceptions of Research" is a culmination of statements about general misconceptions of research and a lack of student's perceived need to participate in research. This theme coincides with the initial theme as a cause of reduced or no engagement in research. Rodriguez Amaya et al. (2018) noted that "LatinX students are more likely to hold the misconception that research activities are only for future scientists." (p. 9). Having this misconception resulted in less participation of Latinos in undergraduate research experiences than white or black students. The third theme "Benefits to Minorities" encompasses statements about overall benefits minority students received through undergraduate research experience. Benefits included the broadening of students' perceptions of science, future careers, and maturity.

Conclusions

In conclusion, these themes highlighted two major issues for minority students engaging in undergraduate research, biases and improper environments and no perceived need for research engagement. The researchers of this study can confidently agree there is a large gap in knowledge when it comes to culture and its influence on undergraduate researchers as there were only two articles that provided information for analysis. While the articles yielded interesting findings, they did not directly address culture's impact on undergraduate research.

Recommendations

As a result of their findings, researchers extend recommendations for both research and practice. Further research must be done on students' perceptions of undergraduate research due to their culture. Investigations on student's self-perceived cultural identities and their interest in undergraduate research will guide future program decisions. For practice, research mentors should actively recruit a diverse set of students to participate in research projects. To do this, we recommend advertising the positions in multicultural centers to attract diverse students to the research programs. By taking intentional steps to include a variety of students in undergraduate research, we can improve the number of diverse, scientifically trained individuals in the FANR workforce. The benefits of undergraduate research can offer students the opportunity to change their misconceptions about research and potentially influence the decision of pursuing a higher education degree.

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