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The Influence of Power on Increasing Access to Undergraduate Research Experiences.

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OVERVIEW: Research experiences have been shown to increase engagement, but inequities in access exacerbate disparities. In this study, we expose the relational, political, discursive, and structural influences on integrating research experiences in undergraduate science courses.

AUDIENCE: Administrators (K-12), District science coordinators, Environmental educators, Evaluators, Formal educators, Instructional designers, Policymakers, Researchers/Researcher supervisors, Science education leaders, Biology educators, Chemistry educators, Physics educators, Earth science educators, STEM educators, Engineering educators

KEY POINTS

- Each of the four dimensions of power (relational, political, discursive, and structural) can facilitate or hinder efforts to expand access to undergraduate research experiences.
- Examining each dimension of power reveals different opportunities and barriers.
- Addressing these opportunities and barriers can move change forward and inform other initiatives seeking to implement course-based research experiences.

INTRODUCTION: Attracting and retaining students in Science, Technology, Engineering, and Mathematics majors, particularly those who are underrepresented is a national concern. While undergraduate research experiences have been shown to increase engagement and retention, inequities in access exacerbate existing disparities. Understanding what facilitates or hinders implementation of undergraduate research experiences is crucial. Using semi-structured interviews with project leaders and document analysis, the findings from this project expose the relational, political, discursive and structural power dimensions facilitating or hindering the integration of research experiences in undergraduate science courses. Revealing these opportunities and barriers will inform future initiatives focused on implementing course-based research experiences.

FINDINGS: Examining relational power revealed who was influencing whom to support or hinder changing the curriculum. For example, student frustration influenced instructors to hesitate to facilitate research experiences, but many faculty members created change together or inspired change in others. Likewise, each group had needs and objectives to be addressed to allow undergraduate research experiences to be effectively implemented, such as student academic needs, faculty tenure requirements, and administrators' enrollment objectives. In addition, the values and beliefs of different groups often either aligned with or hindered the project. For example, both faculty members and administrators value data for making decisions and some faculty members are concerned about preserving robustness and safety in the lab. Finally, disciplinary and institutional differences affected how and the extent to which research experiences could be implemented.

TAKEAWAYS: Most groups exerted some control, often well-intentioned, over other groups that either facilitated or hindered change. Gathering like-minded people is one of the most effective uses of relational power. Addressing the needs of each group can advance change, but fully addressing all barriers could advance it further. Likewise, harnessing the values and beliefs driving the actions of others can assist efforts to create change. Finally, leaders of similar initiatives should consider how their specific disciplinary and institutional differences affect how change can happen and how they might create the space for undergraduate research experiences.

Full Title: The Influence of Relational, Political, Discursive, and Structural Dimensions of Power on Increasing Equitable Access to Undergraduate Research Experiences