

# Team Science in Educational Research: Preliminary Findings

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## INTRODUCTION

- *Team science* refers to “scientific collaboration by more than one individual in an interdependent fashion, including research conducted by small teams and larger groups” (National Research Council, 2015, pg. 2)
- Team science promises major improvements in translational effectiveness, since what is difficult or impossible for one member of the team may be easy for a teammate with a different skill set (National Institute of Health, 2018)
- There has been recognition in general education and related services that multifaceted problems may benefit from multiple perspectives and interprofessional collaborations (e.g., Ogletree et al., 2017; Petscher et al., 2020; Solari et al., 2020)

## PURPOSE

- The purpose of this study was to examine researchers’ experiences in team-based science or collaborative research in education programs

## METHODS

- Using Qualtrics, a 29-item survey was developed to assess engagement in collaborative research and self-perceptions of readiness, knowledge, and skills related to team science
- Doctoral students, postdoctoral fellows, faculty and research scientists from 424 degree granting education programs; 980 individuals responded
- Descriptive analyses were conducted to describe the extent to which researchers in education engage in collaborative research, perceptions of readiness, quality of teaming skills
- Analysis of variance was used to examine potential group differences in responses by groups differing in gender, race/ethnicity, position type
- An independent-samples *t* test was conducted to assess differences in several factors on team membership and prior training
- A chi-squared test of independence was used to examine the relation between training and membership in cross-disciplinary teams
- Content and natural language processing analyses of open-ended responses was conducted to identify major themes in advantages and challenges to collaborative research with Leximancer v4.5



# Additional training opportunities in team science could support the degree to which research scientists in education engage in collaborative research.

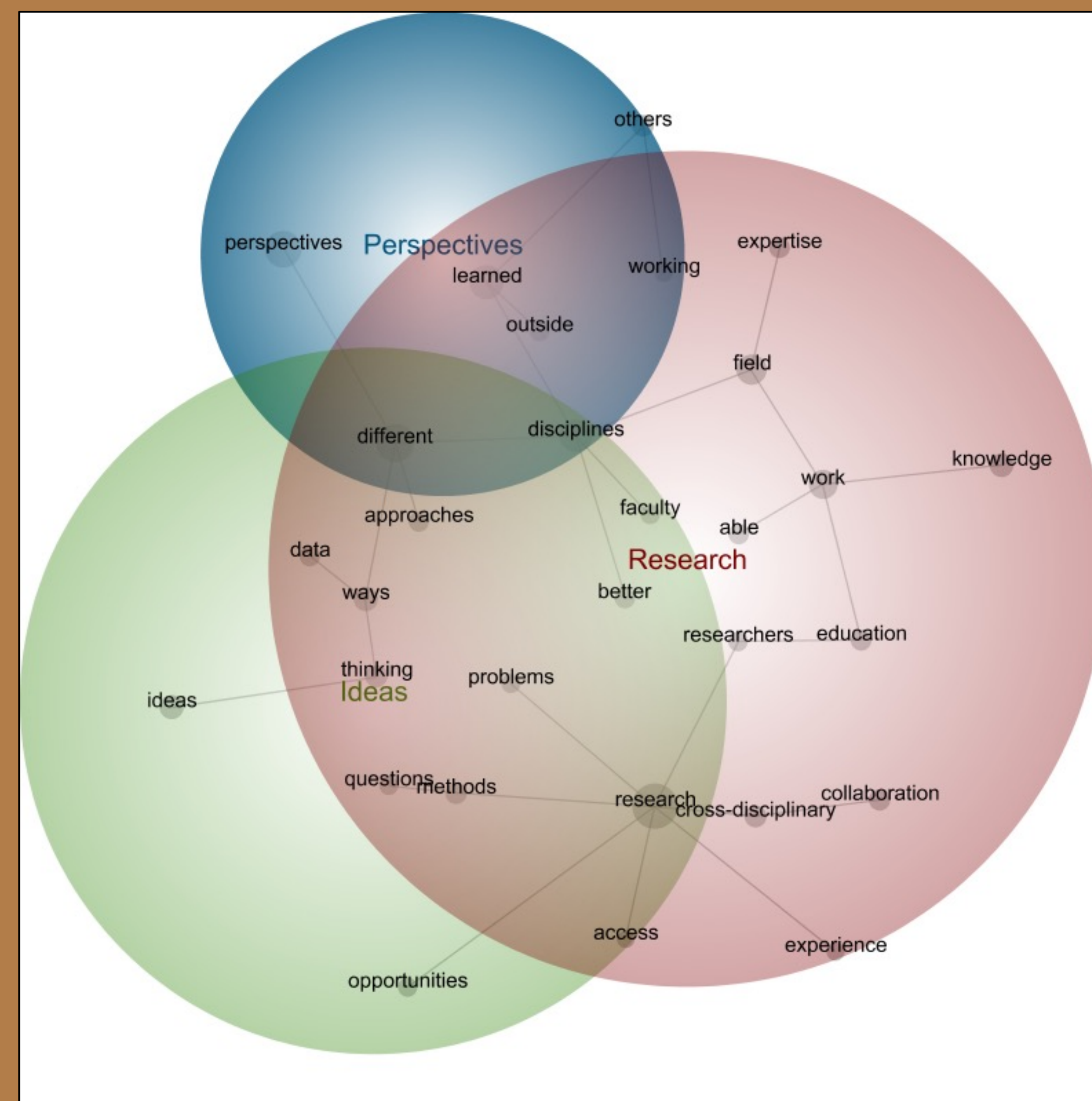


Figure 1. Thematic analysis of free-text responses regarding advantages of team science. Each word, depicted alongside a shaded circle, indicates a word that frequently occurred in free-text responses. The size of the circle reflects the frequency of occurrence with larger circles indicating more frequently occurring words or concepts than smaller circles.

## RESULTS

- 20% of respondents had engaged in team science training; 53% reported serving on a cross-disciplinary research team; 15% reported publishing with large co-authorship teams (4-10)
- Researchers from underrepresented racial and ethnic groups ( $M = 5.46$ ,  $SD = 0.99$ ) indicated significantly lower psychological safety compared to their white, non-Hispanic/Latine counterparts ( $M = 5.68$ ,  $SD = 0.87$ ;  $F(1, 768) = 8.76$ ,  $p = .003$ ;  $\eta^2 = 0.01$ )
- Non-tenured faculty ( $M = 6.12$ ,  $SD = 0.89$ ) reported engaging in collaborative activities more frequently than tenured faculty ( $M = 5.94$ ,  $SD = 0.98$ ;  $F(1, 510) = 4.31$ ,  $p = .038$ ;  $\eta^2 = 0.01$ )
- Engagement in cross-disciplinary collaborative research was higher for participants with prior team science training ( $M = 5.05$ ,  $SD = 1.56$ ) than those without training ( $M = 4.24$ ,  $SD = 1.52$ ;  $t(774) = -5.92$ ,  $p < .001$ )
- Researchers with prior training ( $M = 6.16$ ,  $SD = 1.03$ ) valued teamwork and collaboration to a greater extent than those without training ( $M = 5.91$ ,  $SD = 1.01$ ;  $t(774) = -2.76$ ,  $p = .006$ )
- Researchers with team science training are more likely to participate in cross-disciplinary teams than those without training,  $\chi^2(1, N = 784) = 22.9$ ,  $p < .001$

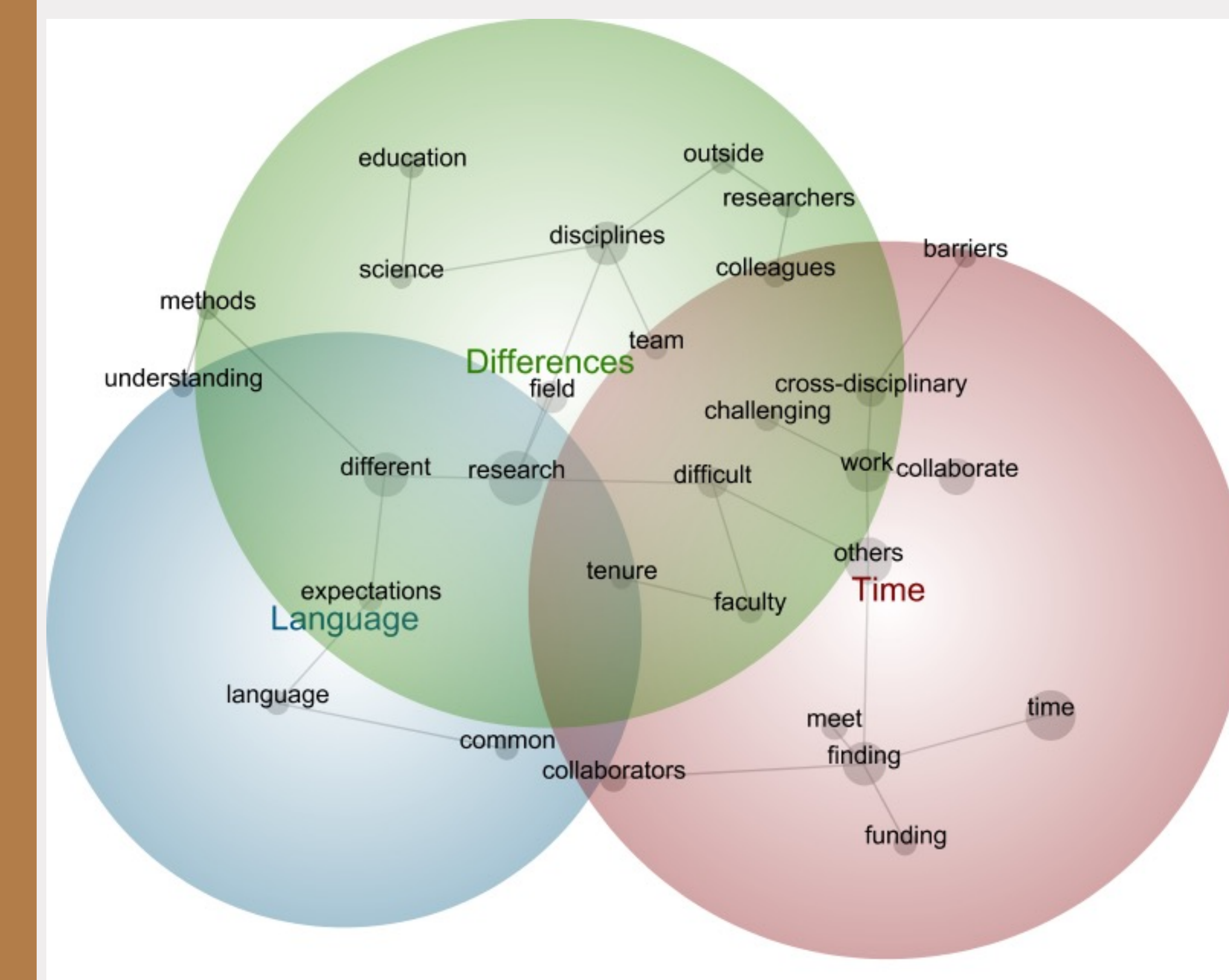


Figure 2. Thematic analysis of free-text responses regarding barriers to team science

## DISCUSSION

- More research is needed to identify ways to improve the execution of cross-disciplinary research practices in education and vet the underlying causes of the disconnect between research values and current practices
- Major themes of open-ended responses suggest collaborative research efforts have a high pay off with much to offer scientists in education
- Due to group differences in psychological safety, additional efforts may be necessary to ensure that imbalances in the power structure of members are not allowed to dissuade members from actively contributing to team activities



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