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Instructor Perceptions of How Axes of Difference Meaningfully Impact Equitable Team Functioning in Higher Education

Collaborative team-based projects are a pedagogical cornerstone in higher education. As a high-impact practice (Kuh, 2008), collaborative projects require that students negotiate their contributions, provide feedback to each other, and resolve conflicts in working toward a common goal, usually taking place over several weeks or months. Indeed, research has shown benefits of team-based learning in terms of both learning course content (Hughes & Jones, 2011; Swanson et al., 2019) and liberal arts learning outcomes like intercultural competence and critical thinking (Kilgo et al., 2015). Further, employers clearly desire that students develop teamwork skills during their undergraduate education programs (Hart Research Associates, 2013).

At the same time, team-based projects can be sites of dysfunction and inequity (Hsiung et al., 2014) where particular students dominate, where voices go unheard, and where team members play only to their strengths rather than taking advantage of opportunities to learn. Importantly, such patterns have been observed along the lines of identity characteristics like gender and race/ethnicity (Dickerson et al., 2024), among others. Henderson (2023), for example, in the context of first year engineering courses, has shown that women underreport their skills when negotiating team roles in comparison to men as well as that underrepresented racial/ethnic minority and Asian-American/Pacific Islander students on teams are less likely than White students to have their ideas enacted (Henderson, 2024).

Certainly, researchers and practitioners have explored various interventions over the years to disrupt these patterns of dysfunction and inequity, like creating team contracts and providing explicit instruction about successfully working on diverse teams (Dickerson et al., 2024; Shah & Lewis, 2019). Still, the work to assess and support evermore equitable teamwork is ongoing.

Objective

While the literature describes gender and race/ethnicity as clearly salient identity characteristics in teamwork outcomes, in this study we sought to examine *instructors'* perceptions about if and how they observed these (and potentially other) axes of difference as impacting equitable teamwork in their courses, if at all. That is, as part of a broader study exploring the impact of using a digital support tool on equitable teamwork, we wanted to learn more about the ways in which these axes of difference currently manifest for instructors in their courses. Specifically, we asked this research question: In what ways do instructors perceive axes of difference between teammates as meaningfully impacting equitable teamwork?

Theoretical framework

We draw our theoretical framing of equitable team behavior from our recent scoping review in which our goal was to explore how equity (and equality) are conceptualized in regard to teamwork (Authors, in press). The review covered academic literature over a five-year period (2017 to 2021) and resulted in a set of 42 articles, conference papers, and book chapters after an extensive and iterative process of searching for and filtering relevant publications. From these data, we generated a set of seven themes which we characterize and refer to as "facets" of team equity. The seven facets are alignment, dialogism, heterophily, ownership, participation, power, and risk, each of which provides a lens for understanding if and how teams (and teammates) are

experiencing equitable outcomes. The definitions for the facets (as reflected in Authors, in press) are as follows:

- *Alignment* reflects both cognitive cohesion (achieving common understanding of a task, for example) and affective or relational cohesion (via empathy and mutual understanding) among team members.
- *Dialogism* refers to back-and-forth processes requiring negotiated input from different team members, highlighting fundamental reciprocity, mutuality, and interdependence in team interactions.
- *Heterophily*, in contrast with homophily, reflects an inclination to value and engage with those different from ourselves, exhibited in team members fostering respect and appreciation for their differences.
- *Ownership* reflects possessive attachment and belonging with regard to the team, the task, and the product/outcome, particularly bringing together psychological ownership and sense of belonging.
- *Participation* reflects two broad perspectives regarding team members' contributions: participation as an individual responsibility, and participation as a right that may be denied.
- *Power* reflects the ubiquitous, ever-present social forces that create conditions for differential influence of some over others and ideas like power dynamics, status characteristics, and voice.
- *Risk* reflects important elements for team members to feel able to take interpersonal risks without fear of losing face or being devalued within the team.

In the current study, we use these facets of team equity to understand and categorize instructors' reflections about the axes of difference that are important to them in implementing teamwork in their courses.

Methods

This study was conducted at a large, public, primarily White research-intensive university (herein referred to as RIU for the purpose of review) and determined to be exempt from review by the Institutional Review Board.

The pool of potential interviewees was generated in two steps. First, the instructors ($N = 34$) using an educational technology called TeamCoach (a pseudonym for the purpose of review) in Fall 2023 were added to the pool. TeamCoach is a locally developed teamwork support system for instructors that aids with team formation, peer evaluation, and monitoring team health with an overall goal of supporting healthy and equitable team behaviors (Authors, 2021). TeamCoach users are easily identifiable internally and thus provide an accessible, purposive study population (Krathwohl, 2009) for exploring the experiences of instructors using teamwork.

Second, in an effort to balance the pool of potential interviewees, we identified "comparator" Fall 2023 courses to the TeamCoach courses and added those instructors ($N = 51$) to the pool as well; that is, we sought "near peer" courses using teamwork but not TeamCoach. Additional detail about how these comparator courses were identified will be provided in the full paper. Three instructors who taught multiple courses were identified via both the first and second steps; thus we solicited 82 unique individuals ($34 + 51 - 3$) by email in November 2023 and interviewed all who responded.

From this population, we conducted 27 interviews with 31 faculty representing 25 team-based courses; co-instructors of the same course were sometimes interviewed together and other times separately simply based on scheduling considerations. TeamCoach was used in 13 of the represented courses, whereas the other 12 either didn't use an educational technology to support teamwork or employed a different tool (e.g., CATME; Loughry et al., 2014). The courses represented a range of disciplines, including art and design, business, engineering, environment, information, kinesiology, and political science, as well as a range of course sizes, enrolling fewer than 10 to several hundred students (Table 1).

The interviews were conducted over a four-week period from mid-November to mid-December 2023, each about 45 minutes long and yielding approximately 20 hours of audio data for the study. Each participant received \$25 in compensation for their time. The interview protocol was primarily designed to elicit the challenges that instructors encounter with equitable team functioning and the extent to which, if at all, educational technologies help address those challenges. Secondary areas of interest were characterizing instructors' goals in forming teams and understanding how instructors assess team health over time. The specific prompts and probes in the interview protocol will be detailed in the full paper.

The recordings were transcribed by an automated third-party service and then combed to correct names, words, phrases, and acronyms specific to the instructors, teamwork, TeamCoach, and RIU. Participants were deidentified at this stage with pseudonyms. Emergent themes were identified through cutting and sorting (Ryan & Bernard, 2003) and constant comparison (Lincoln & Guba, 1985).

Analyses

To address the research question, we present the results of our analysis according to the three key axes of difference discussed by instructors: gender, race/ethnicity, and national origin. Connections to the theoretical framework are noted in parentheses. This presentation of results is brief due to space limitations and will be expanded—including with other axes of difference that instructors discussed less often—in the final paper.

Gender was the most commonly discussed axis of difference (though we note it tended to be referred to in a binary sense, exemplified by Jessica who said, "We have so few transgender [and] non-binary students that it's really, really hard to see any patterns there"). Some instructors noted apparently sexist interactions between men and women, like Jennifer who reflected on the tendency "for a particular male-presenting student to interrupt his female-presenting teammates when they were presenting" (*dialogism*) and Radim who said he "definitely sees male [students] speaking up more" than female students (*dialogism, power*). Tom described a more indirect example of a male student sending a strong implicit message to his two "very high-achieving" female teammates that (in Tom's words) "nothing you say is going to convince me that I'm not right" (*ownership, power*). Co-instructors Ashley and Chih-Cheng recounted a similar team of two men and two women that they "had to break up" along gender lines because "they just didn't get along." Unable to work together, each pair ultimately submitted their own final project (*alignment*).

Race/ethnicity was discussed by fewer instructors than gender, and usually in relationship with socioeconomic status or other status characteristics. Marco, for example, described how he "gets a lot of athletes" in his large, introductory course who are "often racialized, underresourced at

the same time, [and] overvalued [by] some social metrics on campus, like, you know, when you have the most promising wide receiver in a class" and that teams including these students can have "complicated dynamics that are [Marco hesitates] ... too complicated" (*power*). Co-instructors Michelle and William described a seemingly more explicit and problematic scenario where two Black teammates relayed to Michelle that the rest of their team would elect to "meet on Sundays when [they] have to work" (*participation*) and that they'd shut down the ideas for testing and contacts that the two Black students wanted to pursue (*ownership*).

Finally, *national origin* (i.e., international vs. domestic student status) was noted as a salient axis of difference by several instructors largely with respect to language barriers being problematic for communicating in teamwork. Emily, for example, said that students whose first language isn't English would "[in] lots of instances ... just hang back and not engage and people won't engage them" (*dialogism, participation*). An instructor of an upper-division technical writing course, Olivia explained how "especially with writing, native speakers often automatically assume that they have competencies that non-native speakers don't when that's actually often not actually the case" and more sadly that, in her experience, "non-native speakers kind of tend to go along with that" (*ownership, power*).

Discussion and significance

We asked instructors here for their retrospective assessment of equitable team behavior in their courses. The data are thus limited, subject to the pitfalls of retrospective recollection (Sosniak, 2006). Instructors were interpreting past events through their then-present lens, and the time gaps differed somewhat as some instructors were recollecting recent events whereas others were even harkening back to a prior term. Additionally, while interview responses help us understand the inequitable patterns faculty are aware of in student teamwork, they inherently miss those issues that are not salient to faculty, for any of a number of reasons like issues that happen in class versus out of class, issues related to visible versus invisible identity characteristics, and issues that are so rare as to be nearly impossible to notice and respond to.

Still, we contend that the contribution of this research is two-fold. First, we explicate the cases of inequitable teamwork that instructors are apt to notice and second, we relate these instances to an overall framework for equitable teamwork. Our findings provide a foundation for an understanding of effective pedagogies to support students in teamwork, from forming teams in identity-conscious ways to intentionally supporting and assessing teams. The ultimate goal, of course, is to promote effective team experiences for all students. A better understanding of common experiences of inequity in student teams can help us to understand (and avoid) the antecedents of inequitable teamwork as well as to be aware of and ideally repair or at least mitigate the consequences of inequity in teamwork processes.

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Appendix

Table 1. Characteristics of each course for which an instructor participated in the study.

Course discipline	Course level	Instructor(s)	Fall 2023 enrollment	TeamCoach course?
Art and design	Upper-division	Amanda	18	Yes
Business	Lower-division	Mike	644	Yes
Business	Upper-division	Erin	631	Yes
Engineering	Lower-division	Emily	38	Yes
Engineering	Lower-division	Sarah	52	Yes
Engineering	Lower-division	James, John	56	Yes
Engineering	Lower-division	Lori, Mary	57	No
Engineering	Lower-division	Marijn	58	Yes
Engineering	Lower-division	Karen	59	No
Engineering	Lower-division	Franz	68	No
Engineering	Lower-division	Ashley, Chih-Cheng	78	No
Engineering	Upper-division	Chris	8	No
Engineering	Upper-division	Olivia	16	Yes
Engineering	Upper-division	Jennifer, Nicole, Ryan	28	Yes
Engineering	Upper-division	Tom	33	Yes
Engineering	Upper-division	Ben	36	No
Engineering	Upper-division	Michelle, William	51	No
Environment	Upper-division	Yoselyn	5	No
Environment	Upper-division	David	27	No
Environment	Upper-division	Jessica	33	Yes
Information	Upper-division	Emma	19	Yes
Information	Upper-division	Brian	118	Yes
Kinesiology	Lower-division	Radim	86	No
Kinesiology	Upper-division	Daniel	20	No
Political science	Lower-division	Marco	90	Yes