Understanding Team Ethical Climate Through Interview Data

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The development of ethical awareness and ethical reasoning is a critical part of engineering education. Appropriate assessments are needed to determine if educational interventions are effective in developing these skills, especially within a team context. Although there are measures to assess general individual moral reasoning, such as the DIT2[1], they do not take into consideration the context of handling ethical situations in engineering rather than working through ethical situations in general, nor do they address the *team* climate in which much of this work takes place. Because most undergraduates learn to apply ethical reasoning to engineering through design courses that are taught in teams, it is important to understand the impact and dynamics of the team ethical climate.

This paper describes our efforts to incorporate qualitative data as a part of the development of instruments for assessing ethical decision-making in individuals and teams in engineering-centered project teams. These instruments are being developed as part of a larger grant seeking to understand the relationship between individual and team ethical climate in multidisciplinary project teams. This paper describes the development of the qualitative methods being used in this project, a discussion of the analysis we have conducted, and presents preliminary results. Finally, we discuss limitations of this method and offer future directions for this line of research in enriching our understanding of team ethical climate on multidisciplinary project teams in an engineering education context.

Team Climate and Small Group Communication

How individuals relate to one another and the development of team climate is an essential component of not only team members' satisfaction as members of their teams, but also the team's productivity. Team climate refers to a variety of factors that affect the atmosphere and functioning of a team, including how team members communicate, how information is shared, and how comfortable members feel to contribute to group discussions. Communication is the primary determinant of team climate,[2] with the emphasis not only on *what* people say, but *how* they say it.

Team climate can affect the productivity and effectiveness of a group significantly.[3, 4, 5] A defensive team climate, in which team members feel personally attacked, feel that their opinions and ideas are undervalued, or feel that there is a significant imbalance of power or intellect on the team will result in less effective decision-making and problem solving, lower levels of collaboration, and lack of innovation.[6] Conversely, if a team climate is supportive, with team members feeling comfortable sharing ideas, feel valued for their contributions, and feel that there is mutual respect among team members, this encourages openness, resulting in greater creativity and innovation as well as more effective decision-making and problem solving.[4] Group cohesiveness, or the level of attraction or comfort group members feel toward each other, is strongly related to a group's productivity.[7] Developing trust within the group, managing status or cultural differences effectively and avoiding dramatic power imbalances among members can all contribute to the development of a positive team climate.[8] It is essential that teams, especially

problem-solving teams with specific goals, encourage members to be open and productive in order to achieve group effectiveness.

Discursive Psychological Approach

This study examines students' talk about team climate in multidisciplinary project teams. We examine how participants explain and describe their experiences on these teams to explore how they understand and experience team climate, a largely intangible but extremely influential component of working on teams. Because of the highly communicative nature of group norm development and the emergence of team climate, we employ a discursive psychological approach to examine how the students discursively manage their experiences regarding team climate. This approach enables the researchers to examine how the students characterize and position ethics within their teams, as well as what perceived effects the handling of ethics and its associated characteristics have on ethical decision-making. A discursive psychological approach enables the researchers to examine discourse on two levels: "little d" discourse as language-in-use in everyday talk, as well as "big D" Discourses which refer to systems of language or other sensemaking practices that form our social realities.[9] These Discourses inform social practices by offering certain discursive resources that are evidenced in the "little d" everyday language of participants.

Discursive psychology relies on the belief that reality and psychological phenomena are constructed through language and acted out in social contexts. This approach locates the creation of meaning and reality *in* social interaction; individuals as social actors *actively create* reality and shape identity through their talk. Descriptions of psychological and social objects can be studied for the way social actors invoke them in the course of certain communicative activities, such as blaming or complimenting.[10] These descriptions, a kind of "mental thesaurus," can be studied as a toolbox of resources for doing things (p. 740). Given this understanding of psychology and social interaction, discursive psychology focuses on the way reality and the mind are *constructed* by people through language, throughout their everyday execution and description of practical tasks.[11]

Discursive psychological scholars differentiate between two levels of "discourse" by referring to "big D" or "little d" discourse.[12, 13, 14] "Little d" discourse refers to language-in-use, or the everyday talk and texts in social interaction.[15] "Big D" Discourse is viewed as the general and enduring systems of thought, historically and culturally rooted in systems of power and knowledge. Discourses order the world in certain ways, as well as informing social practices[15]. Scholars utilizing discursive psychology conceive of Discourses as "interpretative repertoires" for communicating actors, which are ways of talking embedded within larger societal or cultural Discourses, which supply linguistic resources to communicating actors in the form of habitual forms of argument[16], terminology, metaphor, and other language devices[17]. Through this understanding, researchers can view interpretative repertoires as discursive resources for social actors in their effort to understand and create identity within multiple competing Discourses.

Given this focus, discursive psychologists seek to analyze how a person's talk can create his or her own identity, shape the identity and position of others, and can do interactive work such as countering an undesirable image of the self.[18] Scholars using a discursive psychology

perspective analyze talk and interaction to see how individuals use characterizations and evaluative expressions to attribute identity and motive to others, how they counter and respecify others' descriptions of their identity or actions, and how psychological themes are handled and managed implicitly.[19] It is important to note that discursive psychology is not in itself a methodology. Rather, it is an analytical approach that is embedded in social constructionist assumptions, as discussed above. As such, the researchers focused on the text of these interviews to investigate how participants describe their experiences on their project teams, as well as how they draw from specific Discourses to frame their own experiences as well as those of their project team in relation to ethical concerns throughout the team process.

Method

To address the need to understand and assess moral reasoning in an engineering-specific context, our research team developed instruments to assess both individual moral reasoning and team ethical climate in an engineering context. The researchers collected data from four different institutions with engineering-centered student project teams offered to students. The team climate instrument is a new instrument adapted from Victor and Cullen's team Ethical Climate Questionnaire (ECQ) for the student project context. The ECQ consists of five scales: caring, law and code, rules, instrumental, and independence. The team climate instrument also includes items intended to measure the caring, law and code, and rules dimensions, as well as exploring dimensions of friendship, personal morality, self-interest, team interest, shared ethics model, interdisciplinary ethics, rule-orientation, and how the team responds under pressure. In the team climate instrument, students are asked to respond to 59 items as they relate to their project team in their respective program using a Likert-type scale (Strongly Disagree-Disagree-Neither Agree nor Disagree, Agree, Strongly Agree).

As part of the validation efforts, we conducted individual interviews and team observations of students who are participating in multidisciplinary project team programs to triangulate data from other sources and aid in data interpretation. The use of qualitative data to compliment the instrument development supplements the self-report measures by aiding in data interpretation, giving context and depth to the participants' experiences, and aid in data interpretation of the two instruments. These data also allow us to triangulate data from other sources in the greater process of validation of the instruments.[2]

We conducted a total of 51 interviews and numerous observations of students participating in multidisciplinary project teams at four different universities. Interviews lasted on average between 15 and 60 minutes, with 6 to 15 interviews conducted at each university based on student availability and desire to volunteer. The interviews were audiorecorded and later transcribed for analysis. Participants provided informed consent and were compensated for their time.

The interview protocol was designed to engage both individual and team considerations as the participants describe their experiences on their project teams. It was developed to probe elements of the individual and team climate instrument and give context and depth to the concepts explored in these instruments by eliciting information about how the participant prioritizes issues related to their individual and team decision-making. We also explore general

team processes and the student's perceived role to provide context on how the individual operates within the team. We explored the following overarching questions:

- How would you characterize your team interactions as a whole?
- What is important to or valued by your team? What are your team's priorities?
- What is your role on the team? Do you feel like you belong? Are your viewpoints listened to?
- How and when are decisions made by your team? Who was involved in those decisions?
- Do you feel as though any of these decisions or your team work involved ethical considerations?
- How do you define ethics? How do you make ethical decisions?
- Does your team seem concerned about professional codes and/or rules/laws?
- Does your team share a common understanding of "right and wrong"?

The researchers also made observations of team meetings and work sessions to provide context for the interviewer and help identify participants for the interviews. Observations were guided by a general observation protocol, with other interesting interactions being noted where appropriate. Several examples of the observation protocol include:

- What seems most important to the team at this time? What did you observe that made you answer in the way you did?
- Were there decisions made during team meetings? What were the decisions about? Who made the decisions?
- Did you observe interactions or language centered on how a decision or design aspect might affect individual team members?
- Did you observe interactions or language that centered on how team processes and deliverables align with moral or ethical stances that are up for discussion, shared and malleable, and/or act as appeals to ideals for human existence?

The authors developed a coding scheme that aligns with the constructs present in these instruments, and analyzed 51 student interviews using a typological analysis approach[2, 3]. Initial codes were generated from the constructs found in the instruments, and additional codes were added to capture additional themes that emerged from the data. Interview data were coded and analyzed independently for themes and insights related to team and individual ethical reasoning. As this research continued, interviews were compared to the participant's responses on the individual and team climate instrument to see how they align with, compliment, or contradict these scores.

This study analyzes the text of these interviews with a discursive psychological lens to examine team ethical climate as it is handled by the participants. By relying on the principles of discursive psychology, this analysis examines discourse on two levels, enabling the researcher to examine both the discursive practices of the participants as well as the relation of those practices to their respective institutional programs. We examined both the individual discursive practices of the participants, as well as identifying commonalities within each program that contribute to the development of specific characteristics unique to each program. The interplay of these findings offers insights into both how individual team members understand and discursively

handle ethics and team climate, as well as the potential influence of institutional factors on these perceptions.

The researchers looked for evidence of the interpretative repertoire offered by various Discourses in the form of familiar arguments, terminology, metaphors, themes, imagery, and various linguistic devices, and analyzed the way in which the participants draw upon them to describe, explain, or justify their statements and descriptions of both their ethical identity and their relation with the project. Through this method, the researchers focused on the text of these interviews to see how the participants use characterizations and evaluative expressions to attribute identity and motive to themselves and others, how they construct their own character as well as the character of their fellow team members, how they counter and respecify others' descriptions of their own or their team's identity, and how psychological themes are handled and managed implicitly through discursive practices (Edwards, 2004).

Findings

The use of interviews and observations gave us access to unanticipated aspects of team and individual ethical decision making and moral reasoning by allowing participants to go into greater detail about, and reflect on, the concepts probed in the individual and team climate instrument. Participants offered insights into aspects of ethical decision making that were not directly present in the instruments, as well as offering a richer description of the often complex team interactions as the participants experienced them. The interview data offered insight into both ethical issues encountered by the individuals and teams, as well as more general information about the team process and how individuals perceived these experiences. As a result, we found evidence of the categories probed by both the individual and team climate instrument, as well as new but important aspects of these processes. This paper discusses the findings about team ethical climate elicited from these interviews.

One result we found is that team climate is often unnoticed by team members or taken for granted, as it is an intangible and characterized by the general feeling or atmosphere of the team. This was evident in the interviews: the interviewer would ask participants to describe their team's interactions and atmosphere, and many participants responded with confusion as to what the interviewer was asking about. While many participants immediately began describing elements of team culture such as relations among members and whether the atmosphere was serious or fun, some replied with demographic descriptions of their team's composition; some discussed the division of tasks among members; some described the responsibilities and formal interactions among members. This level of ambiguity supports the idea that team climate is often difficult to envision and identify. Yet as this analysis shows, a team's climate has serious implications for how well the team is able to perform. Similarly, ethics was a mysterious concept to participants, who struggled both to define ethics when asked directly, and were unable to identify ethical situations their team had faced. This analysis found four major themes in participants' descriptions of their team's interactions: the interpersonal relations between team members, the collaborative nature of the design process, the interdependent nature of team process, and understandings of ethics as it relates to team climate. Some of these themes aligned with concepts that are found in the team climate instrument, while others were so interesting and pervasive that we generated new codes in order to account for them.

Analysis revealed evidence of team climate instrument categories in the participants' talk. Themes of friendship, shared ethical models, and care were evident throughout the data. These descriptions aligned with the constructs probed in the team climate instrument, and offered a more contextual understanding of how these constructs are perceived and discussed by the participants. Participants drew from a Discourse of Friendship in constructing images of their team's interactions, describing the positive relationships between the team members and often linking those to positive team outcomes. For example, one participant described his team interactions, saying: "with the five of us, we're kind of all getting along really well—throwing ideas, joking around, and it kind of—sometimes we get off topic, but usually it kind of just builds from good ideas and keeps going, and it kind of has a really good environment of being able to actually interact with one another and be able to openly express our ideas." This participant positions his team's friendly climate as an asset to their ability to generate ideas and progress with their project. Many participants described their team's interactions similarly, often linking the friendly, casual environment with improved productivity and effectiveness.

One of the most theoretically evocative codes that emerged centered on participants' experiences surrounding the design process. Many participants talked about specific design priorities as an element of their team climate. The aggregate code "Design" was created to identify portions of the interview text in which participants were focused on the project, the design process, and the various considerations they and their team took into account in these areas. The two major themes that emerged under this aggregate code were "Design as collaborative" and "Design priorities." The design as collaborative code refers to acknowledgements that the design process itself relies on the different skills and knowledge of each team member to produce the best possible end results. These descriptions frequently included an acknowledgement of different team members' skills and abilities, as well as acknowledgement that such traits enriched (or in some cases, hindered) the design process.

The diversity of team members in terms of culture, skill level, and interpersonal characteristics also emerged from this analysis as an important aspect of how students manage and perceive team climate. One of the strongest concepts is the interdependent nature of the teams, which rely on each member to contribute to team tasks and seems to have a major influence on team climate. Unlike the "design as collaborative" code, this code focused on the relational aspects of teamwork, reflecting the participants' view that the team process relies on each member of the team "doing their part" and working with each other well. This code is very task-related, with some examples including the division of tasks among team members, which frequently happened on a volunteer basis; decisions made by the team outside of those that were design-specific, and managing team members who were either shirking their duties or praising team members who excelled at keeping everyone on track.

Finally, across the interviews, a common thread in the respondents' talk is the complex way they understand ethics. Overwhelmingly, when directly asked whether their team has faced any ethical dilemmas, participants would initially say that they had not. Often ethics was only identified explicitly by the students if discussed in specific relation to ethical decision making or considerations. Indeed, a code for "evolution during interview" was generated to account for the frequent experience of a participant, on being pushed to consider ethical situations, would realize

that their team had indeed faced one, if not many, situations which included an ethical dimension. Their talk indicates that these teams are encountering a number of ethical situations that they manage in interesting ways. Often before being asked to reflect extensively on a situation, the participant would interpret it as conflict, annoyance, or simply a design consideration. After further consideration, some realized or acknowledged that their team's choices were in fact ethically grounded, such as one team's decision to choose one material over another in order to reduce the risk that a future user of their product might have their skin irritated by the former.

Conclusion and Future Directions for Research

This paper presents a first step in analyzing this rich data elicited through the interviews and observations. We believe that this line of research offers great potential for future use and development. The analysis presented in this paper offers researchers the ability to explore the constructs in these instruments from a qualitative vantage point, enriching our interpretation of the instruments and offering deeper understanding of how students themselves view and understand these complex issues. As we move forward, we are examining how interview responses align with instrument scoring, and continue to consider the complex and evolving issue of ethical development in multidisciplinary project teams.

This paper offers an exploration of ethics in an engineering context in a team setting. This study provides insight into the structures of engineering groups and the often overlooked ethical dimension of team projects. The findings contribute to our understanding of how ethics is seen by and impacts teams in an engineering education context, and especially highlights the potential areas in such work where ethics may be present but goes unnoticed or under-scrutinized. This line of research will contribute both to our theoretical and methodological efforts to understand teams and ethics in an engineering context, but could also be useful to engineering educators as they consider how to present ethics and team work to engineering students.

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