

Faculty Perceptions of Key Concepts in Degree Curriculum: Identifying the Role of Diversity, Equity, Inclusion, and Justice

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Introduction and Background

In recent years many universities have established initiatives specifically dedicated to advancing diversity, equity, inclusion, and justice (DEIJ) on their campuses, including Rowan University's establishment of the Division of Diversity Equity and Inclusion in 2018. However, there has been less focus in the scholarly literature on how faculty perceive DEIJ issues in the context of their academic disciplines. This understanding is critical to ensuring that students from all backgrounds are appropriately supported in pursuing their degrees and faculty are equipped to discuss these topics with their students. In this pilot project, researchers from Rowan University's College of Engineering and College of Education who were interested in exploring DEIJ implementation in the classroom in a cross-collaborative manner explored the following research questions: (1) What level of relevance do faculty members place on DEIJ as part of their degree program curriculum? and (2) How do faculty members' conceptions of DEIJ compare across disciplines?

There is scant literature on faculty members' conceptions of Diversity, Equity, Inclusion, and Justice (DEIJ) and how they believe these concepts are integrated as part of their curriculum and pedagogical approaches. Our study examined how faculty members in the College of Engineering and College of Education at Rowan University understand DEIJ's place and value in their curriculum. Understanding these faculty perceptions will help us as researchers to identify barriers that may exist for integrating DEIJ and propose potential solutions that address both cultivating faculty competence and comfort with DEIJ in curriculum, pedagogy, and assessment.

History and focus of DEIJ broadly across higher education

While diversity, equity, inclusion and justice (DEIJ) initiatives have increased tremendously across higher education, many faculty members continue to struggle to engage with these concepts in their curriculum and teaching. Research indicates that some students, particularly those who are racially minoritized¹ desire faculty members who are proactive in DEIJ issues, competent to intervene in socially unjust situations, and committed to ongoing advocacy that challenges and dismantles systemic discrimination [1]. Despite research indicating the need for faculty proactiveness around DEIJ issues, many faculty members fail to be proactive and/or intervene [4] due to a lack of training, experience, or willingness to engage in difficult circumstances [5]. Additionally, some faculty are apprehensive because they are unsure how to facilitate difficult conversations about social justice, fearing that addressing these topics will detract from the content of the course [6], [7].

Across higher education, the literature on DEIJ is primarily focused on creating environments and avenues for student success [8] but there has been little focus on the teaching tools and strategies for faculty to be facilitators of DEIJ learning in their classrooms. As higher education

¹ We use the term racially minoritized throughout to describe racially and ethnically diverse populations, as opposed to the term "minorities," in order to acknowledge and indicate the power of structural racism as a tool that seeks to divide and classify individuals with limited power based on social constructions of race, not an objective indication of quantity [2], [3].

institutions strive to effectively support an increasingly diverse student body, they will be called upon to provide their faculty with tools to teach more inclusively. This is especially the case across STEM fields where recruitment and retention of students from racially minoritized backgrounds present long-standing challenges [9]. This is also true for Colleges of Education, where students are being prepared to teach in classrooms, work with students from diverse backgrounds, and hold administrative positions in K-12 school districts and higher education institutions.

An emerging body of literature highlights the need for faculty to develop strong skills in designing and facilitating classroom dialogues that center diversity, equity, inclusion, and justice [6], [7]. Faculty are often viewed as custodians of knowledge, particularly in the classroom environment where, historically, the gatekeepers to knowledge were often white [10] - [12], as such faculty have a responsibility to ensure that their curriculum and pedagogical strategies move beyond a singular focus on *content* to ensure that DEIJ principles are front and center, especially as we understand the historical context of higher education, which excludes the history and lived experiences of racially minoritized populations. Faculty who successfully integrate DEIJ into their curriculum and teaching can positively impact both academic and diversity outcomes, including advancing critical thinking skills, self-confidence, motivation, cultural awareness, and civic engagement among students [13].

Perceptions of DEIJ in Colleges of Education and Engineering

Recent scholarship has begun to focus on faculty implementation of DEIJ practices in their curricula, as well as their perceptions and beliefs about DEIJ principles. While there are no specific studies that examine the perceptions of faculty members in Colleges of Education in relation to DEIJ principles, many colleges of education are steeped, both through the nature of the profession and historical/political contexts, in the history of DEIJ and social justice. In addition, social justice and inclusion are core competencies for many higher education/student affairs professionals in the competency areas published by the College Student Educators International (ACPA) and the National Student Affairs Administrators in Higher Education (NASPA) [14], while social justice advocacy and multicultural competency are core components of the American Counseling Association's [15] core competencies for counselors. Therefore, from teacher education to higher education/professional education, colleges of education frequently have a direct relationship to DEIJ principles and practice, and education faculty are urged - through research and professional organization - to incorporate matters of social justice and inclusion into their curricula to better prepare future educators.

Scholars in engineering education have explored avenues of measuring faculty interest in DEIJ concepts. For example, Secules et al. [16], recently developed a pilot survey protocol to measure engineering faculty attitudes towards DEIJ, including categories on motivation to improve pedagogy, empathy, personal and pedagogical values, comfort related to DEIJ topics, attitudes towards DEIJ in general, awareness of positionality, and narratives of identity blindness. Additionally, Handley and Marnewick [17] developed a model for following the ABET's recent guidelines on incorporating DEI principles into engineering education programs. The literature also points to a growing interest in developing DEIJ practices in engineering programs. Several studies have focused on successfully implementing DEIJ practices in the engineering classroom. Examples of these practices include explicitly incorporating discussions

of the intersection between DEI and civil engineering projects [18] or the importance of DEI in engineering as a whole through guest lectures and modules introduced at the beginning of a course [19]; adopting liberatory pedagogical practices [20] or inclusive pedagogical practices [21] in the classroom; professional development for engineering faculty on DEI topics [22], [23]; placing greater significance on equity issues in relation to student admissions and faculty recruitment [22]; encouraging students to engage with DEI concepts beyond their own experiences [24]; and developing co-curricular or peer mentor groups to foster student support, particularly for racially minoritized students in engineering [20] - [22]. In their study of student-faculty interactions that promote DEI in engineering, Pamulapati et al. [24] emphasized the importance of faculty preparation to not only engage with DEI as an important element of engineering education, but also as a foundation that should be embedded throughout a student's educational journey.

There are, however, some areas of disconnect. Casper et al. [25], for example, found that engineering students did not automatically connect their identity or concepts related to DEI to their position as future engineers, despite targeted curriculum on these subjects. Thomas et al. [26] found, in an extensive review of the literature on DEI practices and engineering faculty, that engineering faculty understood the importance of DEI, however did not have the resources or knowledge to implement these concepts fully in their curriculum. In addition, Wang's [27] exploration of the perceived divide between DEI pedagogy and technical rigor amongst engineering faculty points to a need for a better understanding of whether engineering faculty recognize DEI concepts as components within the engineering curriculum and, if so, how these concepts connect with other engineering content.

Research questions

The purpose of this exploratory study was to compare the relevance faculty members from Rowan University's College of Engineering and College of Education place on DEI concepts as part of their curriculum by addressing the following research questions:

- 1) *What level of relevance do faculty members place on DEI as part of their degree program curriculum?*
- 2) *How do faculty members' conceptions of DEI compare across disciplines?*

As described above, both the fields of education and engineering have historical and contextual needs to place value on DEI concepts. The College of Education was specifically chosen as a pilot site due to its role in training the next generation of K-12 educators, administrators, higher education leaders and other education professionals who will be charged with educating and supporting diverse student populations. The College of Engineering was chosen as a pilot site due to the engineering discipline's long-standing challenge with recruiting and retaining diverse students and faculty and the role of practicing engineers in developing technologies and products for all people.

Methods

The following sections will describe Rowan University, the setting for the study, and the data collection and analysis methods selected to address the posed research questions.

Setting/institutional context

Rowan University is a public institution located in the mid-Atlantic region of the United States. According to the university's website (blinded for peer review), 36% of students identify as under-represented/minoritized groups. Roughly 50% of the student population self-identifies as "woman." 63% of students self-identify as white. Rowan University has a Division of Diversity, Equity, and Inclusion, which oversees training and professional development opportunities for faculty, staff, and students. The Division of DEI also houses departments related to neurodiversity, student success, and social justice; and has initiated several campus-wide programs centered on anti-racist pedagogy, inclusion, and neurodiversity. The College of Education features programs that range from P-12 to Higher Education, as well as an EdD track in Nursing Education, with 80 full-time and ¾-time faculty members. The PhD in Education program, which started in 2016, specifically focuses on access, success, and equity. Rowan University's College of Engineering, founded in 1995, offers degree programs in biomedical, chemical, civil & environmental, construction management, electrical & computer, engineering entrepreneurship, engineering management, and mechanical engineering, with a total of 64 faculty members across the departments.

Study design

For this study, faculty from both the College of Education and the College of Engineering were recruited. Faculty members who agreed to participate were asked to attend a one-hour on-campus workshop on concept mapping. The purpose, as portrayed to the participants, was two-fold: a) participate in a study on topics faculty members from different disciplines prioritize as part of their curriculum, and b) practice concept mapping as a pedagogical tool to be used in their own teaching practice.

The researchers received responses from 35 faculty members with interest in participating in the workshop. Of those 35, 6 participants requested virtual access to the presentation, as they were still interested in participating in the study but could not be present at the on-campus workshop. In order to accommodate this, the research team recorded audio of the on-campus presentation and synced it with the presentation itself. This private video was shared to the interested participants. In addition, each participant who attended the workshop received a \$25 gift card as compensation for their time. Appropriate human subjects' approval was obtained prior to conducting the study.

Data collection

During the workshop, participants were introduced to the foundations of concept mapping and practiced creating a concept map as a group using a familiar topic (in this case, ice cream).

Concept mapping was selected as a means of data collection because, as a pedagogical and research tool, they allow for assessment of an individual's perception of a given topic. One of the advantages of this method is it provides a more direct measure of an individual's perception of a topic in comparison to in-direct measures such as surveys. Concept maps also benefit from being able to be analyzed both quantitatively and qualitatively, and they provide a means of capturing an individual's conceptual understanding of a specific content area [28], [29] - in this

case, the participants' programs of study. Concept maps provide individuals with a means of visualizing the relationships between concepts - a representation of their mental schema. Concept mapping has been used as a means of measuring student outcomes in engineering education [30], and was chosen both for its applicability to the study's purpose as well as its pedagogical relevance for the faculty participants. However, there were some limitations associated with the use of concept maps as a method, including that they can be time consuming to create and can pose difficulties with organizing concepts during initial construction.

After the initial scaffolding concept map activity, the research team reviewed how concept maps can be assessed, sharing examples from their own practice in the classroom.

Subsequently, participants were asked to develop their own concept map on their degree program's curricula. Participants were provided the following guiding questions:

1. What do you value in your curriculum?
2. What are your pedagogical/curricular goals?
3. What skill sets do students need to work in your field to be successful?

Participants were given blank pieces of paper and writing utensils, and were asked to place their degree program name in the center, and brainstorm a list of relevant topics that addressed the prompts provided. Then, participants were asked to create a concept map using these topics and linking items, based on their knowledge. Upon the completion of the hour-long workshop, with 20 minutes set aside for concept map creation, participants with interest in having their concept maps included in the research study submitted their maps to the research team.

24 participants shared their concept maps with the research team, and two virtual participants shared their concept maps, for 26 maps in total. Of those, 15 concept maps came from College of Education faculty (based on the programs written on the maps), and 11 concept maps came from College of Engineering faculty.

Data analysis

The concept maps were analyzed using a thematic analysis approach with categorical scoring [29]. First, the research team reviewed all concept maps, making note of any items that could fall under a larger umbrella of "DEIJ" concepts (e.g., "diversity," "access," or "gender"). From this list of terms, the research team developed five distinct themes (or overarching categories), with which to score each individual concept map. The five categories were:

- **Actions/Skills** - terms related to skill sets they associated their curricula with, or with actions they wanted to encourage in their students (e.g., "anti-racism," "critical theory," "work with diverse groups")
- **Identity** - terms specifically tied to identity categories (e.g., "class," "gender," "race," "religion," "LGBTQIA")
- **Systems and Structures** - terms related to an awareness of social structures and culture, without any associated identity or skillset (e.g., "culture," "power," "social context")

- **Umbrella Terms** - used when concept map items only referred to broad concepts (e.g., “DEI,” “diversity,” “social justice”), without specifics
- **Affective** - used when concept map items related to emotional well-being/sense of belonging (e.g., “belonging”)

After developing the list of categories, the researchers met to practice scoring as a group. A map with several DEIJ concepts and crosslinks was used to practice categorial scoring (see Figure 1).

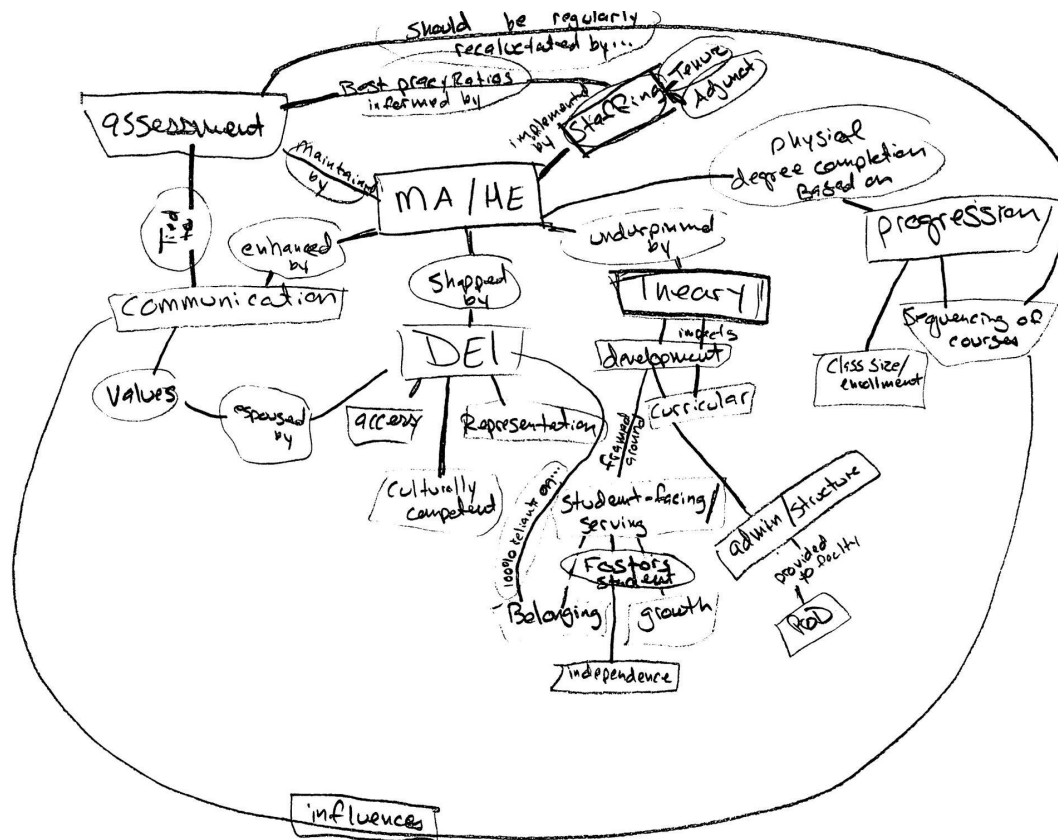


Figure 1: Example College of Education concept map (ID#7) with a high number of DEIJ concepts

In the concept map in Figure 1, first all concepts related to DEIJ were identified - DEI, access, representation, culturally competent, belonging, and values. The research team then worked to assign the concepts to their associated category. For this example, DEI was categorized as an umbrella term, belonging was categorized as an affective term, and the remaining terms were all categorized as actions/skills. Once the concepts had been categorized, the research team reviewed the concept map to identify where interlinks occurred - connections between a concept in one category and one in another category. For this particular concept map, there were interlinks between access, values, culturally competent, representation, and belonging with DEI leading to 5 interlinks. In the final step, the complexity score was calculated. Complexity scores (CO) were calculated using the following formula:

$$CO = NC * (NIL/N_{cat})$$

where NC represents the number of concepts, NIL the number of interlinks (or connections drawn between two concepts of different categories), and N_{cat} the number of categories [29].

Upon the completion of the training, each member of the research team worked independently to score each of the remaining 25 concept maps. After this was completed, the research team met as a group and discussed their scores on each concept map, working through any discrepancies until there was a group consensus. This process ensured that each member of the research team contributed in meaningful ways, and engaged more deeply with the data. Through this analysis, it was possible to determine how much emphasis faculty members placed on DEIJ based on the number of concepts that fell under DEIJ categories in comparison to those that were categorized as non-DEIJ. It was also possible to review across the programs to determine if faculty within one of the colleges under investigation showed more prevalent use of DEIJ concepts and/or more integration of these concepts within the hierarchies of non-DEI concepts than another colleges. As the majority ($n = 17$) of maps did not feature interlinks, the percentage of DEIJ concepts per map was also included in the analysis in order to better compare the presence of DEIJ concepts across the maps.

Limitations

While the findings of this study, discussed below, do provide unique insights into individual faculty members' conceptualizations of their programs of study, there are several limitations. First, this exploratory study is limited to one institution, and does not inherently reflect the state of DEIJ implementation in Colleges of Education or Colleges of Engineering broadly. In addition, the design of the study inherently led to limitations on the data collection process. Faculty members only had a limited amount of time to complete the concept maps; if given an unlimited amount of time to perfect their own maps, some participants may have incorporated DEIJ concepts more heavily into their concept maps. In addition, this study was designed to introduce participants to concept mapping as a whole, and unfamiliarity with concept mapping may have limited individual participants' amount of time to work on drawing out their maps. Finally, having other participant data, such as from follow-up interviews, would have provided a richer understanding of not only how faculty members interpreted the mapping prompts, but also why, or why not, DEIJ concepts were included in their maps.

Results

The results of this study provide insight into the relevance faculty members place on DEIJ and the differences observed between faculty that reside within the College of Education and Engineering. This section will address the two posed research questions and the insights gained from the analysis conducted.

Research Question 1

The first research question, *What level of relevance do faculty members place on DEIJ as part of their degree program curriculum?* was addressed by determining the presence, or lack thereof, of DEIJ concepts across the concept maps. A total of 564 concepts were present across all 26 concept maps; of those, only 60, or 10.6%, were identified as DEIJ-related. Nine maps featured no DEIJ concepts - three from the College of Education, six from the College of Engineering. Table 1 provides the individual scores attributed to each map across each category.

Table 1: Individual data for each concept map.

ID	College	DEIJ Concepts					Concept Map Characteristics				
		Actions/ Skills	Identity	Sys & Structs	Umbrella Terms	Affective	NC: DEIJ	NC: non-DEIJ	NIL	NC	CO
1	Ed	4	0	1	1	0	6	14	2	5	2.4
2	Ed	1	0	0	0	0	1	11	0	5	0
3	Ed	1	0	0	0	0	1	28	0	5	0
4	Ed	0	0	0	0	0	0	18	0	5	0
5	Ed	0	0	0	0	0	0	16	0	5	0
7	Ed	4	0	0	1	1	6	16	5	5	6
8	Eng	0	0	0	0	0	0	13	0	5	0
9	Eng	0	0	0	0	0	0	14	0	5	0
10	Eng	0	0	0	0	0	0	10	0	5	0
11	Ed	0	1	0	0	0	1	30	0	5	0
12	Eng	0	0	2	0	0	2	23	0	5	0
13	Ed	3	0	0	1	0	4	9	1	5	0.8
14	Eng	0	0	0	0	0	0	23	0	5	0
15	Eng	0	0	1	0	0	1	28	0	5	0
16	Ed	2	0	1	3	0	6	10	4	5	4.8
17	Ed	2	0	0	1	0	3	12	2	5	1.2
18	Ed	4	0	2	0	0	6	26	2	5	2.4
19	Ed	1	7	1	0	0	9	20	8	5	14.4
20	Eng	0	0	1	1	0	2	24	1	5	0.4
21	Ed	2	0	0	2	0	4	19	2	5	1.6
22	Ed	3	0	0	0	0	3	30	0	5	0
23	Eng	0	0	1	0	0	1	13	0	5	0
24	Eng	0	0	0	0	0	0	26	0	5	0
25	Ed	1	0	0	1	0	2	17	0	5	0
26	Eng	0	0	0	0	0	0	34	0	5	0
27	Eng	0	0	1	1	0	2	20	0	5	0

Figures 2 through 4 show examples of concept maps from the College of Education and the College of Engineering to help illustrate the types of organizational structures selected by faculty members and the placement of DEIJ concepts (when present).

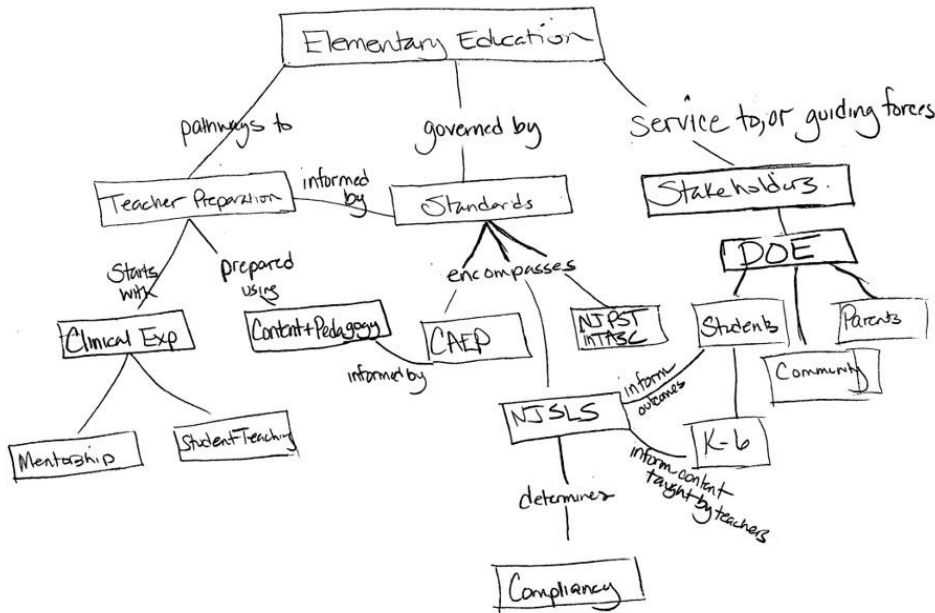


Figure 2: Example College of Education concept map (ID#22) with no DEIJ concepts

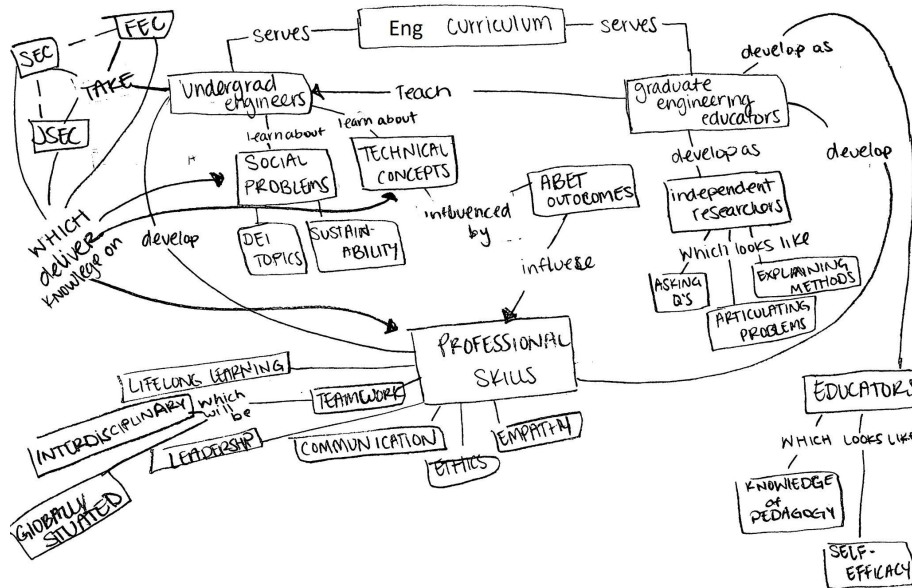


Figure 3: Example College of Engineering concept map (ID#20) with high number of DEIJ concepts

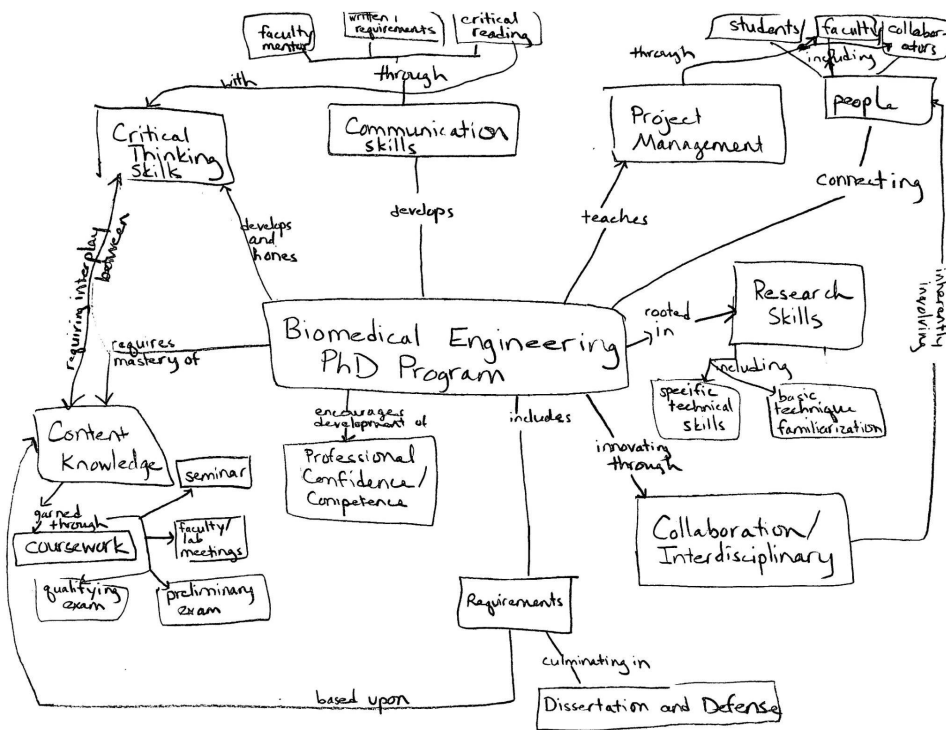


Figure 4: Example College of Engineering concept map (ID#14) with no DEI concepts

In the concept maps from each college that had a higher number of concepts (e.g. Figures 1 and 3), DEI concepts would typically mostly appear within a single branch although they would link to concepts in other branches through either actions/skills (such as values) or affective terms (such as belonging). The concept maps would typically also have the DEI topics in a branch related to learning outcomes or topics students would learn about or be exposed to through their curriculum. Despite the higher number of DEI concepts present within these concept maps, they still represented typically a small percentage of the total concepts present on the map with a high percentage of 60% DEI concepts achieved in College of Education concept map ID#16 and a high percentage of 10% DEI concepts in College of Engineering concept map ID#27. In the concept maps that had no DEI concepts the focus of the concept maps was more on specific topics to be covered as part of the curriculum, stakeholders involved in the curriculum development process, and accreditation standards. For example, the Elementary Education program (Figure 2) includes an emphasis on standards and their governing bodies while the BME PhD program, described in Figure 4, shows an emphasis on many skills described in ABET program outcomes [36].

Table 2 presents a summary of the breakdown of the percentage of DEI concepts across the two colleges, as well as the average complexity scores.

Table 2: DEIJ presence in concept maps

	College of Education	College of Engineering
Total Concepts	276	228
DEIJ Concepts	52	8
Percent DEIJ	18.84%	3.51%
Mean Complexity Score	2.24	0.04
Complexity Score Range	0-14.40	0-0.4

The distribution of DEIJ categories, however, was not equal across the maps. Table 3 provides an overview of the frequency of each DEIJ concept subcategory identified by the researchers. The only category with numerical overlap between the two colleges was “Systems & Structures,” or topics that related to societal considerations.

Table 3: DEIJ categories

	College of Education		College of Engineering	
	NC	% of College's DEIJ Concepts	NC	% of College's DEIJ Concepts
Actions/Skills	28	53.85%	0	0%
Identity	8	15.38%	0	0%
Systems & Structures	5	9.62%	6	75%
Umbrella Terms	10	19.23%	2	25%
Affective	1	1.92%	0	0%

The results suggest that College of Education faculty place more relevance on DEIJ concepts than those from the College of Engineering. It was also found that the faculty from the College of Education had more breadth in the DEIJ concepts they associated with their programs.

Research Question 2

The second research question, *How do faculty members' conceptions of DEIJ compare across disciplines?* involved comparing both the overall presence of DEIJ concepts across both colleges' maps as well as analyzing the frequency of the subcategories, or specific concepts, that were more common in one college compared to the other.

Table 4 presents the mean, standard deviation, and p-values for the total DEIJ concepts, percent DEIJ concepts, and total non-DEIJ concepts in both the College of Education and College of

Engineering maps. These findings suggest that, while the distribution of non-DEIJ concepts was not statistically significant between the two colleges, the number/percentage of DEIJ concepts as a whole was statistically significant. Table 5 presents a similar breakdown for the individual DEIJ categories identified by the researchers. These findings suggest that there was no statistical significance between the two colleges regarding the number of Non-DEIJ concepts, but the difference in the quantity of DEIJ concepts was statistically significant. In terms of the DEIJ categories, the only statistically significant difference between the two colleges was in the action/skills category.

Table 4: Group statistics (DEIJ concepts vs. non-DEIJ concepts)

	College	N	Mean	Std. Deviation	Two-sided p
NC DEIJ	Ed	15	3.47	2.70	.002
	Eng	11	0.73	0.90	
% DEIJ Concepts	Ed	15	0.16	0.13	.001
	Eng	11	0.03	0.04	
NC NonDEIJ	Ed	15	18.40	7.12	.432
	Eng	11	20.73	7.47	

Table 5: Group statistics (DEIJ Categories)

	College	NC	Mean	Std. Deviation	Two-sided p
Actions/Skills	Ed	15	1.87	1.45	<.001
	Eng	11	0	0	
Identity	Ed	15	0.53	1.81	0.272
	Eng	11	0	0	
Systems & Structures	Ed	15	0.33	0.62	0.427
	Eng	11	0.55	0.69	
Umbrella	Ed	15	0.67	0.9	0.079
	Eng	11	0.18	0.4	
Affective	Ed	15	0.07	0.26	0.334
	Eng	11	0	0	

In addition to the DEIJ compared to non-DEIJ concepts, the subcategories of DEIJ concepts differed in frequency between the College of Education and the College of Engineering. Figures 5 and 6 present word clouds that represent the DEIJ concepts used by faculty members from the

two colleges on their concept maps. These word clouds demonstrate not only the variety of responses across the two colleges, but also the most prevalent DEIJ topics. College of Education faculty members who included DEIJ concepts in their maps tended to gravitate more towards actions and skills, particularly language around cultural competency and becoming change agents. This perspective was missing from the College of Engineering maps, however faculty members who did include DEIJ into their maps prioritized social context and social structures.



Figure 5: College of Education word cloud



Figure 6: College of Engineering word cloud

Discussion and Implications

The results of this study indicate that although some faculty members from both the College of Education and the College of Engineering do, in some capacity, recognize the importance of diversity, equity, inclusion, and justice in their curriculum, it is evident that there is much work to be done. In general, based on this exploratory study, faculty members from the College of Education were more likely to incorporate DEIJ terminology into their concept maps. Faculty

members from the colleges also differed on the types of DEIJ terminology they associated with their degree programs. Not only did faculty members from the College of Engineering stand out in how few DEIJ concepts were present in their maps, but there was a limited breadth of the types of DEIJ concepts included.

The prevalence of “Actions/skills” and “Identity” concepts in the College of Education aligns with the history colleges of education have as a site with an explicit connection to DEIJ initiatives as the responsibility of (future) educators [31], [32]. It is worth noting, however, that explicit references to “Identity” only appeared on two maps - one that only referred to “identity” as a whole, and another that considered a key component of teacher education to be a critical awareness of identity categories such as class, race, gender, sexuality, religion, and language. No other map explicitly recognized identity as a meaningful category for consideration in pedagogical/curricular content. Based solely on the concept maps alone, it is unknown why this distribution occurred, however it may be due to a lack of familiarity or discomfort with identifying identity, from a DEIJ-lens, as relevant [4] - [7].

It is also evident from the findings that, despite their historical alignment with social justice and DEIJ initiatives [33] - [35], education faculty members - at least from Rowan University participating in this exploratory study - did not embed DEIJ into their concept maps at a deeper level. Two maps, both labeled as from the elementary education department, featured no DEIJ concepts, while four maps featured only one or two concepts. In the latter cases, the concept was either an action/skill, identity, or umbrella term. This suggests that even when DEIJ concepts are recognized as connected to these participants’ programs, they may not have them fully incorporated into their conceptualization of the discipline.

The lack of “Actions/skills” and “Identity” concepts present in maps from College of Engineering faculty aligns with the findings of Casper et al. [25] and Thomas et al. [26]. While (some) faculty members recognized societal considerations (“Systems & Structures”) as important to engineering curricula, they may lack the language or knowledge to bring that knowledge into practice. In addition, despite being a core competency for accreditation per ABET [36], the observation that six out of 11 College of Engineering concept maps lacked any reference to DEIJ is indicative of a need for broader awareness about DEIJ and its role in the curriculum.

Among the maps from the College of Engineering that did feature DEIJ concepts, the highest number of concepts observed on any one map was two, suggesting that even if faculty may have an awareness of DEIJ concepts, they may only be integrated into their personal conceptualization of their program in a minor way. As Cheville [37] argues, engineering not only requires, but has been historically grounded in, societal and ethical concerns to be at the forefront of its pedagogy, because “the things engineers do have consequences, both positive and negative, sometimes unintended, often widespread, and occasionally irreversible” [38, p. 6]. The engineering faculty members in this exploratory study were observed to place less emphasis on DEIJ concepts, which could impact their ability to help raise awareness of these concepts within their classrooms.

Through their comparison, the analysis of the College of Education and College of Engineering faculty responses illuminate potential avenues for faculty development through cross-training

and collaboration in individual college units, and also across colleges [24]. Through this approach, both education and engineering faculty members can share their experiences and strategies for incorporating DEIJ more intentionally in their curricula, but also leverage the expertise of faculty in both disciplines to facilitate various faculty development opportunities.

Conclusion

While we recognize that this exploratory study has not created sufficient data to be generalizable across all Colleges of Education and/or Engineering, it is a starting point for further exploration into how engineering and education faculty at Rowan University not only conceptualize the importance of DEIJ concepts in their curricula, but also how these faculty perceive DEIJ in concrete terminology. Through concept maps created by faculty workshop attendees, the findings suggest that faculty in Rowan University's College of Engineering, at large, do not consider DEIJ concepts as deeply embedded in the skills and concepts central to their discipline compared to faculty members in the College of Education. College of Education faculty members incorporated DEIJ concepts that referred to specific actions/skills, identity, and belonging, which were all lacking from maps made by the College of Engineering faculty. Both colleges, however, had maps that incorporated references to societal systems and structures, as well as "umbrella terms" that referred to DEIJ as a broad category of importance. Specific actions/skills, as well as more knowledge on how identity impacts engineering pedagogy, appear to be areas that could benefit the most from faculty development initiatives. Following this exploratory study, our goal is to expand upon these preliminary findings, using concept mapping methodology, across a larger sample of institutions/populations.

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