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I Have to Get Back in the Classroom: A Graduate Student's Journey Navigating Dual Academic Identities.

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Introduction

Many who endeavor to teach engineering in higher education pursue doctoral degrees to secure the minimum credentials required for their desired career. During their doctoral studies, some find they have to set aside the part of themselves that wants to be a "teacher" in favor of becoming a "researcher." Since "good teaching comes from the identity and the integrity of the teacher." [1], overlooking teacher identity could negatively impact the academic experiences of engineering students. In general, identity studies have become more prevalent in engineering education research, particularly as they relate to engineering identity or other related role identities such as research, math, or physics [2], [3], [4]. Identification with a role or profession, such as engineering, contributes to motivation, self-efficacy, and improved performance in those roles [5]. Understanding engineering graduate students' identification with the role of teacher and how that identity is developed or constrained could be important to improving educational outcomes for the students they will teach [6].

Studies of full-time faculty that consider both researcher and teacher identities find tensions between the two, with teacher identity being eclipsed by researcher identity [7], [8]. Some studies of faculty teacher identity suggest that teacher identity is not developed until after a few years of teaching practice or around the time of achieving tenure [9], [10]. A delay in teacher identity development is problematic because many newer faculty are assigned to teach foundational classes, and a student may progress through an entire 4-year undergraduate degree before a junior faculty member fully develops their teacher identity. Therefore, focusing on graduate students' experiences of professional identities could have a significant impact on engineering education [11], [12].

This research explores the professional academic identities of "teacher" and "researcher" as experienced by an engineering educator filling dual roles as a graduate student and full-time academic faculty. Specifically, this study aims to investigate both facets of professional identity in tandem, unlike many studies of graduate students that look at one or the other in isolation [13], [14]. Also, many studies of professional identity in graduate students take an etic viewpoint of an outsider to the phenomenon [15]. Using an autoethnographic approach supports an emic, or insider, perspective of teacher identity [16]. The project's overarching goal is to understand how engineering graduate students experience their academic identity in both roles and how that contributes to their motivation to become better teachers and researchers. Towards that aim, this paper takes an autoethnographic approach, looking inward at the author's own experiences of Teacher and Researcher identities by asking the following research questions:

RQ1: What are the social and technical aspects of teacher and researcher identity as experienced by one engineering education graduate student?

RQ2: What are the connections between identity and motivation as this graduate student navigates dual roles as researcher and teacher?

To help answer these questions, this paper will contribute to our understanding of what being a teacher and a researcher means in engineering education by presenting a thematic codebook of aspects of the autoethnographer's professional identities.

Background

Existing studies of professional identity in engineering education tend to leave out "teacher" as an aspect of graduate identity. For example, one study's measurement of Graduate Engineering identity includes components of researcher, scientist, and engineer, with the role of teacher conspicuously missing [15]. Studies of teacher identity in engineering graduate students tend to investigate it in isolation from researcher identity, focusing mainly on the experiences of GTAs (e.g., Kajfez & Matusovich, 2020). However, these two important roles must often be performed in tandem, both in full-time faculty and during graduate studies [6], [7].

Separating teacher and researcher professional identities in research neglects each identity's impact on the other. One study from Math education recognizes that "when two identities with contrasting meaning and expectations are activated at the same time, an individual is likely to encounter stress." [18, p. 38]. The antidote to this stress is to find shared meanings across the identities of researcher, teacher, or mathematician. The authors recommend developing role integration strategies to improve teaching outcomes and doctoral students' well-being. Although the paper's conclusion expresses a tone of disappointment that most mathematics Ph.D. leave grad school with no sense of how to be a good teacher, the authors counter with this hopeful thought. "The examples of exemplary university-level mathematics professors, those whose teaching practices are unique and engaging, make us realize that complete trivialization (of teaching) is not inevitable." [18, p. 38] Their more hopeful tone affirms that integrated teacher identity successfully exists and, therefore, is possible to help graduate students obtain.

With this in mind, the current study aims to find what shared meanings can be found that integrate the professional identities of engineer, researcher, and teacher using autoethnographic methodology. Autoethnography leverages personal (auto) experiences to study and interpret cultural or group (ethno) practices, beliefs, or identities [19]. The author and autoethnographer has strongly developed professional identities in all three categories, presenting a good case study for their integration.

Conceptual frameworks

The paper investigates how professional identity influences a graduate student's motivation to teach and how teaching practice reaffirms that professional identity. This study's Theoretical frameworks include Identity-Based Motivational Theory [20] and Teaching Dispositions in Action framework [21]. Identity-based motivation provides a structure for data collection and the making of connections between tasks and aspects of identity. The Dispositions framework is used to operationalize teacher identity as a set of responsive and technical repertoires of instructors and will be used in data analysis. Lastly, the interpretation of data will use cultural framing provided through bell hooks [22] writings on the higher education classroom.

The identity-based Motivation (IBM) framework will help inform the connections between data describing identity attributes and data related to motivation. This framework combines past, present, and future identities and tasks and their connections to explain the relationships between

motivation and identity with ten distinct constructs [20]. Six constructs explain identities or tasks based on time: Past identity-specific experiences, Past identity general experiences, Present Tasks, Present Salient Identities, Future specific identities, and future general identities. Four constructs describe the connections between time domains as ways individuals make meaning of the task at hand or their identity: Attribution of current task to past identity, Past identity experience to explain current identity, Perceived Instrumentality of current task on future identity, and Future Identity Goals impact on current task planning For data analysis, a particular focus was placed on the connection constructs and how identity and motivation impact each other. Data collection was structured to capture personal reflections on events and their motivations.

Another way of conceptualizing how identity motivates action is through teacher disposition. Along with teacher knowledge and skill, teacher disposition is a third essential element of teacher preparation in K12 education [23]. Dispositions are a collection of cognitive tendencies, habits of mind, or values and commitments that inform teacher judgment and performance [24]. While dispositions can be conceptualized in many ways, one useful framework is the Dispositions in Action framework [21], which looks at external behaviors to operationalize internal thinking tendencies. Those tendencies point to characteristics of the educator that "animate, motivate and direct abilities" and are "recognized in the patterns of one's frequently exhibited, voluntary behavior." [25, p. 146]. Dispositions are often interpreted as innate characteristics. However, they can be developed through an acquisition process like any other identity construct [24], making them a useful framework for connecting identity and motivation. Thornton categorizes teacher behaviors related to assessment, instruction, and classroom management to explain the thinking behind two different styles of disposition, Responsive or Technical. Responsive behaviors are associated with positive learning experiences and reveal thinking that is Critical & Challenging in Assessment, Facilitative & Creative in Instruction, and Empowering & Connected in Management. Technical behaviors, on the other hand, are less effective and indicate thinking that is Assuming & Accepting in Assessment, Directing & Repetitive in instruction, and Controlling & Disconnected in Management.

Since autoethnography seeks to find cultural meaning from specific instances [26], a cultural framework is also needed to fully understand the data. Throughout the book *Teaching to Transgress: Education as the Practice of Freedom* [22], cultural elements of the higher education classroom are discussed through multiculturalism, the connections between knowledge and power, and the idea of Praxis, where theory and practice work together. The transgressions described in the book align with "boundary-crossing events" from ethnography [16], making the cultural concepts in the book relevant to the current study.

Methods

An autoethnographic study design is used to explore the reflexive experiences of an engineering education graduate student through one semester of full-time teaching during the dissertation phase of a doctoral program. Autoethnography is appropriate for the current study, given its ability to describe a cultural phenomenon through the lens of personal experiences [27]. This method also allows a researcher to present cultural findings from an "insider" perspective, especially useful for a unique case but still reflective of broader cultural implications [28].

The autoethnographer and individual under study is an engineering educator and secondary math instructor with 15 years of combined classroom experience. She holds both a B.S. and M.S. in Mechanical Engineering and a Curriculum & Instruction Graduate Certificate. In year four of Ph.D. studies in engineering education, the autoethnographer applied for and was offered a position as a Math Lecturer at a separate R1 university beginning in Fall 2024. While this is an exceptional case, it is appropriate for autoethnography due to the unique insights that could be gleaned from her experiences [29]. Although she came to Ph.D. studies with a strongly established teacher identity, the autoethnographer faced pressures to abandon her teacher identity or give up pursuing a researcher identity.

Note that the autoethnographer will be referred to as "Miss" in the results and discussion, as this is how most students commonly addressed her throughout the semester of data collection. Students struggle to address a college instructor when uncomfortable using a first name, but "Dr." or "Professor" may be inaccurate. Since she has not yet earned a doctorate nor holds a ranked professorial position, this represents an important aspect of her identity.

In autoethnography, data collection echoes traditional ethnographic data, consisting of observation and reflective journaling or field journals [16]. Observation data is objective descriptions of what is seen or heard, and field journals are the researcher's reflections on their observations. Self-observational data collected for this study were artifacts and objective records of events such as photographs, emails, calendars, lesson plans, and personal correspondence. Self-reflective data was collected through reflective journalling on events throughout the week using the simple prompts "What is happening this week? How is my motivation?" The journaling was done twice a week for 16 weeks of the fall 2024 semester and recorded by dictation, handwritten in a notebook, or typewritten in Google Docs. Additionally, a 14-minute design empathy interview conducted by a student was provided to supplement the data. Personal memory data, reflections on past epiphanies (Ellis et al., 2011), and analytical memoing were used to augment the data during data analysis.

Data analysis for this study began with the goal of creating a codebook for future analysis. All data entries were consolidated into Google Sheets and reread for recurring themes, topics, patterns, and cultural meanings. Next, analytic memoing on the data focused on personal memory data invoked by the data set. Other ethnographic techniques, such as reflections on Mentors, proverbs, rituals, and values, were employed. Exceptional occurrences and boundary-crossing events from the past were added as they came up in reflection. From this reflection, emergent themes relating to identity and motivation were identified and categorized as either Technical or Social to answer the research questions.

The six resulting codes are presented in an analytic-interpretive write-up [16] to connect the specific case with a broader cultural context and the Identity-Based Motivation [20] and Dispositions in Action [21] frameworks. Looking through the lens of Identity-Based Motivation (IBM), connections to the past, present, and future were considered. Looking through the Dispositions in Action lens, one can see how actions reveal thinking or how thinking motivates actions. Cultural interpretation was provided through the lens of Praxis [22] to bring all of these ideas together.

Results and discussion

Data analysis began with inductive coding of observational and reflective data artifacts for repeated themes, topics, and patterns [16]. Six thematic codes related to identity emerged and were sorted into either technical or social aspects of identity. Technical aspects of identity were *Tempo*, *Nomenclature*, and *Diagnosis*. Social aspects of identity were *Voice*, *Volition*, and *Joy*. Two excerpts were selected from the data to demonstrate each code's identity aspects and motivational connections. Then, each code was evaluated for its connection to IBM, Dispositions in Action, and cultural significance. This section presents the findings as a finalized codebook.

Technical aspects of identity – Tempo, Nomenclature, Diagnosis

Tempo. *Being a teacher or researcher is… setting the pace.* The tempo theme is related to the timing or pacing of teaching activities or research tasks and the impact on identity. It was considered a technical aspect because it is a constraint and its math-adjacent definition of "rate of motion." This theme was the most prevalent within the data, especially in balancing responsibilities and decision-making. This excerpt shows how Tempo is a core attribute of the ethnographer's teacher identity:

> *"...it's kind of the metronome that I lived my life by, even when I moved [lessons] around. There's just something about making that list of dates 8/26. 9/2. 9/9. week by week. It's kind of like a drumbeat... it's the framework or the bookshelf that I put everything on. This type of planning started with going to teacher school and learning lesson plans." (Picture data: semester plan written on grid paper)*

Here, the Tempo of the present lesson planning task is connected to past specific identity experiences in teacher school as an example of IBM's past-on-present connectedness [20]. The contrast between the structured timeline for teaching and the unstructured time of research had varying impacts on motivation, as shown in the following two excerpts.

> *"...I feel very unmotivated to do research tasks. I kind of think it was because of the time pressure and immediacy of my teaching tasks taking precedence" (week 10 reflective journal)*

> *"... again, the time pressure, I looked at all these students, and I said, wow, I only have so much more time. My time here with these [students] is limited. At first, I was thinking of it: my time with the content is limited, but really, it's time with the students that's limited." (week 12 reflective journal)*

These quotes show a disposition of Connected thinking, where motivation comes from responding to each student as a unique individual with limited time to be impacted by Miss' teaching [21]. On the other hand, there is no immediate feeling of urgency for research tasks. As an aspect of professional identity, Tempo appears to create tension or competition between teacher and researcher identity. Motivation for both teaching and research tasks can be influenced by external temporal factors such as tomorrow's lesson or conference abstract deadline. However, the open-ended nature of the dissertation phase provides fewer constraints for Miss' research than for her teaching.

Culturally speaking, the tempo impacts on teaching and research identity are significant. The research culminates in one large deliverable that gets highly recognized, while the fruits produced by daily diligence in teaching tasks can go unnoticed [10]. Teaching with a Facilitative disposition may require a slowed-down tempo that gives students time to acculturate to different responsive teaching tactics [21], [22]. Research, often having less rigid timelines than teaching, can easily be paused, but a researcher on pause may experience a crisis of meaning and identity [22]. Notably, the decision to apply for her current teaching position was an effort to find motivation to persist in doctoral studies while waiting a prolonged time for advisor feedback (*week 2 reflective journal*).

Nomenclature. *Being a teacher or researcher is… naming things.* Nomenclature is a theme related to the naming of both things and people. It is a technical aspect due to the importance of precise language in STEM fields for defining terms or symbols such as variables. The Latin root "nomen" also refers to the family name in ancient Roman culture. This theme appears throughout the data in both contexts. The following excerpt connects naming with Miss' teacher identity.

> *"…they don't understand [what I mean when I say] binomial square and binomial cube. So, I decided to show them the long way of foiling out each, then the strength of using the FORM to expand a binomial of any type…first building the form, then using it. Everyone agreed. They understood WHAT to do when I say binomial expansion and WHY to do it. Both of these things felt very validating to me as a teacher." (week 13 reflective journal)*

The student's understanding of mathematical language directly impacted the teacher's identity. However, later in the data, it is revealed that the importance of precise language for Miss emerged from her engineering undergraduate experiences. The "given, let, find" procedure was used on homework assignments to define quantities, units, variables, assumptions, and objectives. Here, we see both the current task and general (in this case, engineering) identity experiences of the past that can impact the current salient (teacher) identity [20]. Although Nomenclature is a technical aspect, it also proves to motivate social constructs. This quote demonstrates a Connected and Challenging disposition that is connected to students and their distinction as individuals, but she also challenges herself to meet a standard she expects of her students.

> *"After hearing me greet a student by name, [the other instructor] said, "You know [the students'] names?" and I wanted to say, "Of course! How can I expect them to correctly identify things like factors and terms if I can't even correctly identify [my students]?" (week 4 reflective journal)*

Nomenclature, or shared language, symbols, and meaning are defining elements of any culture [16]. There is also implied power in naming and language; students who speak the language can become part of the conversation [22]. Those who define and redefine terms steer the conversation, and classroom instructors are in a position to invite students, by name, into a shared culture of learning. This is also true for research. With the theme of Nomenclature, Miss integrates her engineering identity and teaching practice to create a classroom culture that elevates both the technical competency and the social atmosphere of the classroom.

Diagnostic. *Being a teacher or researcher is… troubleshooting.* The last technical aspect of identity, diagnostic, refers to the investigation or analysis of the cause or nature of a situation in both the process and conclusion. This theme is strongly related to both identity and motivation within the data. In the following excerpts, Miss responds to questions about her approach to teaching tasks at different points in the empathy interview.

> *"I try to look at what problems, what specific tasks are they gonna be asked to do? And then see if I can reproduce those and discover what mistakes I make along the way. It's actually a very engineering approach. I'm trying to troubleshoot it. I'm trying to break it. By the way, my background is in engineering." (Design Empathy Interview)*

Here is another example of how Miss pulls from her past general identity experiences to inform her present task, citing her engineering identity as guidance for her teaching. Here, she displays a Critical disposition that is probing, concerned with quality and deep understanding [21]. This particular teaching disposition correlates strongly with her past experiences, specifically in quality engineering. A diagnostic approach is also motivating in and of itself in the following quote.

> *"I feel very motivated to be ahead of the game, and because everything's new, … I'm very effectively engaged with figuring things out. Again, engineer. Problem solver. So if I have a puzzle to work with, it keeps me engaged…" (Design Empathy Interview)*

Diagnosis requires observation and evaluation, both in and outside the classroom, representing a significant amount of labor [22]. It means taking in and processing information about the students, the opposite of transmitting information through lecturing that typically dominates higher education classrooms. A diagnostic aspect of teacher identity represents a deviation from cultural norms and is possibly one that is first to be diminished.

Motivational connections to technical identity constructs. Identity-based motivation explains how general identity experiences of the past can impact today's task planning and salient identity [20]. Pacing, naming, and troubleshooting as technical tasks reflect an identity that has come about from developmental experiences in Miss' past. Her expertise in these areas affirms her current identities as teacher, engineer, and researcher and motivates her to perform those roles. The cluster of technical identity codes aligned with Dispositions in Action that were Connected, Challenging, and Criterion-based. Although criteria and challenge are characteristic ingredients of technical disciplines, Thornton [21] categorized these positive teaching dispositions as "responsive," reserving the term "technical" for less desirable dispositions such as Assuming, Repetitive, or Disconnected. Nevertheless, the technical aspects of identity presented here motivated responsive teaching.

Social aspects of identity – Voice, Volition, Joy

Voice. *Being a teacher or researcher is… professing.* The first social aspect of identity, voice, refers to open expressions of wishes, choices, or opinions from students or the instructor. This theme incorporates the physical sounds and acts of speaking or writing. It is the social aspect

because this is how we interact with and present ourselves to others through communication. In the following quote, Miss responds to how she likes to teach.

> *"I like to build in my classes time for students to interact with each other… even if it's just like, okay, everybody looks like their brain is shut off, so I just want you to, like, turn your partner and have a conversation with them. So, I really try to get students active and involved. It's this idea that I'm not just the one up in the front doing something, but that the students are participating" (Design Empathy Interview)*

Although the quote does not directly address identity, it demonstrates how the ethnographic themes of virtues and values reflect how a person sees themselves within the context of a culture [16]. Here, Miss shows an Empowering disposition concerning student input and sharing [21]. In addition to connecting herself with students, Miss demonstrates how this disposition builds connections *between* students. The data revealed many implications of the value of voice on successes and further motivation for research and teaching, as shown in the following quote.

> *"They expressed sadness over the class ending because they wouldn't be spending time with the [people and] friendships they made. I wonder how much my teaching style contributes to students creating bonds with each other because I always ask them to talk to a neighbor. I wonder how that plays [out down the road], and maybe that would be a good research question…" (week 12 reflective journal)*

This expression of students' voices caused Miss to reflect on the meaning of their experiences related to her teaching and then triggered a desire to conduct research on their experience. This quote shows a future identity connected to a present task [20], as Miss sees the instrumentality of including student voices to galvanize her future as a researcher. Student voice instigated a progression in her future as a teacher when, at the request of several students, the department assigned her sections of the follow-on course (*week 14 reflective journal*).

Again, higher education classrooms typically make room for only one voice, and as the repetitive disposition shows [21], the lecturer's voice rarely changes to fit the audience. Authentic expression can be precarious for the instructor and even more so for the students [22]. Even in classrooms where a teacher desires the input of student voices, students risk judgment and embarrassment when they express themselves. Teachers are responsible for creating a brave space for student voice, modeling vulnerability, and responding to expressions in compassionate and validating ways.

Volition. *Being a teacher or researcher is… making the call.* Issues of power related to identity were coded with the theme of volition, which is the power of choosing or determining. Power, rights, and privileges are tightly wound with all kinds of identity constructs and have social impacts on motivation and how we see ourselves. Unlike agency or autonomy, which describe feelings or state of being in control, volition describes that power itself. In this excerpt, Miss describes her power by proclaiming her identity.

> *"I do have a lot more agency in my role as an instructor than I'm allowing myself to have. I think I'm kind of conflating these quote-unquote rules that the math department puts out*

as something I absolutely have to do. But I've taught college before. I know what power I have." (Week 15 reflective journal)

The previous quote was related to assessment, displaying a Critical disposition centered on criterion-based evaluation of student work [21]. In this case, she is questioning a departmental suggestion framed as a policy. She also solidified her power and identity by returning to an identity-specific experience from her previous university teachings [20]. This power to create and be in the driver's seat strongly motivates Miss to plan next semester's lessons, even though she still has reviewing and finals to complete for this semester. Elsewhere in the data, creative power is also motivating for research tasks. When Miss feels her power, she is motivated to tinker and make improvements, indicating Creative and Empowering dispositions.

"I work really hard at [my teaching]. I like to spend a lot of time curating and designing using my engineering skills and my knowledge of pedagogy to put together a meaningful experience that will result in the desired outcome, which is their learning. That's why, right now, my heart is being drawn more towards doing that design, doing that curated lesson plan, and setting up the next course. That design process of putting it together is part of what I love about it; it appeals to the engineer in me." (Week 14 reflective journal)

The teacher's authority to assign a grade is often thought to be their source of power, but their true power or ability to enact change in the world is through the learning process [22]. That process allows an educator to share power with students through knowledge. If this power is wielded to benefit students and their learning rather than to control them, this is how educators impact the world.

Joy. *Being a teacher or researcher is… relishing knowledge & learning.* The final theme and social aspect of identity is joy, meaning a source or cause of delight. While joy is an internal experience, it is sorted into social categories because it is often contagious, affecting those around us. Joy appears in the data as an integral part of identity and motivation. In the excerpt, Miss attributes these feelings as evidence for her identity.

"It's the best feeling in the world. It's so great when you see the light of understanding come on in the student's eyes, and they can even take it the next step and express that to you…[the reward is] I would say… it's an affirmation of my identity." (Design Empathy Interview)

Her attribution of experiencing joy to confirm her present salient identity is another example of past-on-present motivation for identity [20]. The theme of joy reflects a Facilitative disposition guided by inquiry, student understanding, and the exchange of ideas [21].

"...and suddenly, bang! I am a researcher…this re-informs me that I love research. I love where this curiosity takes me to new places…. the conversation. I love sorting things. Putting titles into Zotero is so satisfying. I love to sort them in different ways and classify them. I love finding trends and themes and performing analyses. I love the answers it brings and the new questions it inspires." (week 10 reflective journal)

Miss is reflecting on an upcoming conference presentation and recent abstract acceptance, reinforcing her researcher identity and causing her to reengage with research tasks. In doing so, her work is a source of delight, whereas before, it was drudgery. Here, we see how the Creative disposition that motivates teaching tasks [21] can also motivate research tasks.

"To be changed by ideas was pure pleasure." This is how hooks [22, p. 3] experienced her elementary years of schooling, but she left that behind when she was bussed to another school for desegregation. She spent the rest of her schooling through undergraduate, graduate school, and teaching practice trying to regain that joy. Encouraging excitement in the classroom was seen as a transgression of cultural norms. If joy is a part of teacher identity but not of prevalent teaching culture, this could be a powerful key to understanding why teacher identity diminishes in graduate students and academic faculty [8].

Motivational connections to social identity constructs. In contrast to the past attributions of the previous cluster, social aspects of identity aligned with future components of the IBM framework. Miss was motivated in her present tasks by what who she wants to be and her desire to create something new, as informed by her expression, her power, and her emotional experience. All three aspects of social identity are connected with Creative and Empowering dispositions. The motivating drive to create applies to all three professional identities since Researchers create new knowledge, Engineers create new products and processes, and Teachers create new experiences for learners. In creation, there is the power to show up and express our authentic selves, fundamentally binding our identities and motivations together.

Final codebook

The development of this codebook produced six themes related to the technical and social aspects of teacher identity. Technical aspects of the autoethnographer's teacher and researcher identity are Tempo, Nomenclature, and Diagnostics. Motivation from technical identity aspects was driven by Critical and Challenging dispositions and stemmed from past training and experiences in teaching and engineering. Social aspects of the teacher's identity are Voice, Volition, and Joy. Social aspects of identity are strongly aligned with creative and Empowering dispositions motivated by future hopes. All themes aligned with thinking patterns representing a responsive teaching disposition. The data showed evidence of the connection between teacher, researcher, and engineer identities, which share the same six attributes. The codebook will be applied to the entirety of the data set to group and analyze each code for emergent cultural application in future work.

> *"I had a student tell me yesterday that she could tell that I enjoyed what I'm doing. And I have not been in a classroom for about three years 'cause I've been in school, and it just feels right. Like it just feels like when a key fits in a lock or when … you get the right answer, it's just a good feeling." (Design Empathy Interview)*

Implications & future work

Both Identity-Based Motivation and dispositions in action framework confirm the codebook presented. The emergent codes connect identity and motivation through IBM's attribution and past-on-present processes. The codes align with thinking that is Critical, Challenging, Facilitative, Creative, Empowering, and Connected, all evidence of a Responsive teaching

disposition. These codes will be used to analyze a larger data set to discover new cultural implications of this view of teacher identity. Later, an inductive qualitative investigation of teacher identity in engineering graduate students will be conducted and compared to this specific case. In practice, this way of conceptualizing teacher identity within a STEM context beyond knowledge and skill could be useful for navigating cultural pressures that attempt to diminish teacher identity.

Conclusion

This paper describes the technical and social aspects of how graduate student experiences their professional identities by navigating dual roles as a Researcher and a Teacher. Using an autoethnographic approach, a codebook was developed, revealing technical identity themes of Tempo, Nomenclature, and Diagnosis. Motivational connections to the technical components of identity are related mainly to past experiences and a disposition that is both Critical and Challenging. Social aspects of identity were found to be Voice, Volition, and Joy. Social identity constructs related to motivation for future tasks and identity were informed by Creative and Empowering dispositions. Teacher, researcher, and Engineer professional identities were prevalent in the data, and each was addressed by all six codes, providing meaningful connections between these identities. The themes were connected to motivational constructs confirmed by identity-based Motivation processes and reflected responsive dispositions from the Dispositions in Actions Framework. Cultural considerations show that these identity themes represent an apparent deviation from the traditional or dominant higher education classroom.

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