2023 Annual Conference & Exposition
Baltimore Convention Center, MD | June 25 - 28, 2023
The Harbor of Engineering Education for 130 Years
ASEE
Paper ID #38373

Work in Progress: Caring Means Clear Explanations—The Epistemic Value of Engineering Students' Descriptions of Good Teaching

Dr. Todd M. Fernandez, Georgia Institute of Technology

Todd is a lecturer in the Wallace H. Coulter Department of Biomedical Engineering at Georgia Institute of Technology. His research interests are engineering students beliefs about knowledge and education and how those beliefs interact with learning engineering.

Shayla Ellington, Georgia Institute of Technology

Shayla Ellington is a Georgia Institute of Technology graduate. Graduated in May 2022 with a bachelors in biomedical engineering.

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Introduction and Background

This work in progress paper explores engineering students' beliefs about teaching and learning in the context of ongoing efforts at educational innovation. Within the literature on education, there is a clear consensus on the principles that increase learning. At the core is a shift in principle from the post-positivism of 'instructor-centered' teaching practices to the constructivism of 'student-centered' ones, often implemented via 'Research Based Instructional Practices' (RBIS) [1,2]. Efforts to improve engineering education often focus on increasing the use of such RBIS strategies in classrooms (e.g., PBL [3]). Such a change in practices and principles portends fundamental shifts in the role of teachers and students in a classroom [4]. Evidence is clear that RBIS contribute to learning. However, evidence *also* suggests that students' own theories of learning and knowing may not perceive the shift in roles, practices, and theories of learning that come with that greater learning [5].

As researchers, we are interested in students' perception of educational role(s) and their perception of what makes good teachers and good teaching[1]. We see the authentic voice of students as too-often missing from research on the shift to student-centered teaching. Prior research shows how faculty experience the shift [6,7] and the positive impacts the shift has on learning [e.g., 8]. However, less work has looked at how students perceive and make sense of the shift. Our opinion is that prior research too often situates students as objects examined for increased performance, which fits with the factory metaphors common in engineering education [9]. Improved performance is important but does not make visible how students see, understand, and relate to both their learning process and the learning environment they experience [10,11]. Instead, such evidence; in the form of preference, enjoyment, or comfort; is often held up as less rigorous measures of improvement than objective performance.

Our interest is understanding students' experience and perception of learning as intermingled. That interest comes from the, seemingly paradoxical, studies showing that students believe that they learn more from a lecture than from 'active' pedagogies [5]. Such a belief is interesting because we see the falsehood as paralleling theories of personal epistemic development. In those theories, it is normal for undergraduate students to view the information as right and wrong, not interpreted, as coming from authority figures, and the role of students as absorbing and providing information when requested [12,13]. Further, research shows that K-12 science teachers and engineering faculty often hold similar beliefs [14,15]. Scholars, with good reason, have expressed concern about the lack of epistemic development in engineering students. However, perceptions of learning that are shared among faculty and students, internally consistent, and (often) validated by individual students' academic success suggest a number of questions that are valuable to disentangle and likely require different types of interventions.

This study is a pilot to inform broader research design about how engineering students and faculty's epistemic beliefs interact and affect their interpretation of learning environments. The present results focus on one aspect - students' perceptions of what makes teaching 'good' and 'bad'. The pilot uses qualitative interviews and our intended outcome is the development of a coding scheme to understand and track longitudinal change in students' reactions to traditional and innovative learning experiences. We attempt to center students' experiences as their truth while focusing on two research questions:

(1) What are engineering students' stated and unstated expectations of their educators?
(2) What types of examples about faculty do engineering students use to differentiate good and bad educators?

Study design

Study context and participants

Participants are enrolled in the college of engineering at a large, public, research university in the US South. The university is classified as highly research productive, highly selective, and doctoral granting. Average SAT scores are above 1400 with an ~20% acceptance rate. We include those statistics as we expect prior experiences in education, especially performance, to impact students' perceptions. We plan to explore that further in future work.

Participants from any year and engineering major were recruited via email through a variety of channels including emailing student groups, courses, and Greek life organizations. Our choice of all majors was in hopes of pursuing a sufficient sample to perform some cross-disciplinary analysis. However, we saw high dropout between the

[1] Our use of the term 'good teaching' would generally align with 'ways to create better learning' in field discourse. However, as we address in the discussion, students' use more closely aligns with dualist notions of 'right' and 'wrong' in reference to faculty actions. We see this potential ambiguity as important to highlight for readers.

interview scheduling (n=20) and completion (n=7). Interviews began in Spring of 2020 and were completed in Spring of 2021. We attribute dropout issues to COVID, student stress, and busyness based on email exchanges about skipped or rescheduled interviews. Because we are not performing any comparative analysis, we chose not to report demographics at this stage. We note participants came from a variety of disciplines and identities. All data collection occurred under an approved IRB protocol.

Positionality

Given the nature of students' beliefs and experiences, we approach positionality as a source of both information and bias [17-20]. The first author, who performed all interviews, was an undergraduate student at the time of the interviews. The second author is a faculty member with training in engineering education. As stated, our goal was to prioritize engineering students' lens and voice not because we see it as more accurate but instead because we see it as a useful alternative perspective on our shared reality. As opposed to attempting to eliminate positionality, we intentionally integrated the disparate experiences of the research team. Alternative explanations, potential ambiguity, and differences in word choice were discussed extensively, actively, and openly as part of the analysis process. The first author provided significant insight into common discourse of students, what could and could not be inferred, and why. In contrast, the second author was able to bring knowledge (and terminology) from theory or teaching experience that helped identify links to and differentiation from scholarly understandings of teaching. Throughout analysis, the difference in perspective was a useful tension in meaning making. We embraced that tension throughout analysis and found it particularly helpful to settling on consensus understanding as well as potential ambiguity. We address specific cases of reflexivity in situ throughout the results and discussion.

Data Collection

The interview protocol was based on an work by Kang [14]. Kang's protocol was developed to explore the epistemological and ontological beliefs of pre-service science teachers (i.e., participants similar in age and educational level to ours). Because we are interested in linking to work by Monfort et al., [15], we also drew on their methods. We added and adjusted questions to fit the participants' primary stance as learners as opposed to emerging educators and to fit the disciplinary shift from 'science' into 'engineering'. We sought to use broad, general, terminology to avoid evoking a socially desirable response from participants (e.g., 'good teaching' as opposed to 'effective learning')[21]. Such concerns also motivated having an undergraduate peer with lower power distance to participants be the interviewer [22,23]. The major interview questions appear in the appendix.

Participants were interviewed once using typical interview techniques that included asking probing questions to gather specific examples and deeper explanation of ideas from participants. Interviews were audio recorded and professionally transcribed. We primarily used transcripts for analysis and referenced recordings when needed to uncover nuance, clarity, and conversational timing that might affect interpretation [24,25].

Data Analysis

Our process focused on developing an emergent coding scheme using an iterative analysis process to help establish the credibility of our interpretations and codes. Each author individually coded 4 of the 7 interviews to develop initial code ideas and supporting quotes. We then met and merged their observations into a unified codebook containing labels, descriptions, and example quotes. We focused on balancing participants' direct word choice alongside the apparent intended meaning from their examples and descriptions - a topic we return to in the discussion. As a second stage, we both coded 3 of the interviews and individually coded 2 more. We compared results in the three dual-coded interviews, reviewed coding in the individually coded interviews, and determined consensus codes. While inter-rater reliability of code assignment was lower (60%-76%), we see it as appropriate for this stage and type of research and note that the inter-rater reliability on the identification of coded chunks was above 80%. We see inter-reliability as important but the opportunity in the different positionality we bring to this research motivated the consensus approach.

We intentionally adopted a critical perspective, rather than a more typical interpretivist or grounded theory approach, in our analysis. Our critical perspective acknowledges the existence of theories of learning and teaching but sought to center participants' voices, perspectives, and realities as a lens on them and the power they hold in describing education [26,27]. Doing so helps us avoid projecting our own knowledge of the dominant scholarly narratives of good and bad teaching onto participants' understanding of their own experiences. It also provides a path to hold those perspectives in tension with the dominant narrative 'reality' of good teaching when they differ, which we found to be useful in understanding the experience students have in classrooms.

Results

In keeping with our work in progress/pilot focus, our results share initial findings but also share observations about the process of analyzing our interviews. The results are organized by research question.

RQ 1 - What are engineering students' stated and unstated expectations of their educators?

Our final codebook contains two nested hierarchical levels of codes. Three *first-level codes* represented general categories participants used to describe teaching. The *second-level codes* represent common manifestations of first-level codes. We found it most effective to apply second-level codes to excerpts, with the associated first-level code automatically attached. This approach allows us to respect seemingly minor differentiations that participants found important (e.g. participants clearly differentiated flexibility manifested through interpersonal interaction from adaptability manifested through structural course design choices). We, as did reviewers of our draft, note these as potentially hard to distinguish, we (the authors) agree to an extent in that our perspective treats course design and faculty interactions related to course design choices as far more integrated than our participants seem to. We acknowledge the potential that readers may see some codes as closely related or difficult to distinguish. The results represent a choice here that comes from our goal of an authentic critical perspective - separating things as participants do, even when we (or educational research) may otherwise collapse them. A summary of the codes appears in Table 1, an expanded version containing examples for each second-level code in the appendix.

The first level codes, from most to least frequent, were interpersonal, structural, and cognitive. Participants' descriptions of the interpersonal aspects of teaching centered on students' well being via emotional, social, and relational aspects of teaching - including the participants' perception of passion for a topic or teaching in general. The second level codes under *structural* often seemed to infer an information transmission paradigm of teaching, but consistently focused on categories that could also be interpreted as doing any form of teaching well. For example, *clear communication* did include non-lecture examples, but most examples centered teachers' explanations of concepts or ideas as the key indicator of clear communication. The least frequent top level category was cognition - centering teachers' thinking about teaching. In cognition, participants highlighted the ability of a teacher to understand and adapt to students' thinking more often than other aspects. Beyond the codes themselves, three themes that link the codes and data stood out to us.

The first we termed *unstated expectations* - things participants did not mention that we found surprising. A prime example of unstated expectations was topical knowledge. Only once was teachers' topical knowledge or expertise mentioned without interviewer prompting. The decision to prompt on the topic, near the end of interviews to avoid introducing bias, was an intentional choice made after pilot testing the protocol. We were interested in how participants' perceived the role of topical expertise because research suggests engineering faculty see it as critically important [15]. When asked about the role and importance of a teacher's topical knowledge, participants' consensus was that it could be assumed, rather than being something that differentiated good or bad teaching. We see this as important, and likely contextual. Upon reflection, we see it as unsurprising for participants in our institutional context to see faculty as *inherently* experts to the point that it can be unspoken. To many participants, assumed expertise is reputational and a motivation for attending their institution.

The second theme was the frequent invocation of the word *care*. Every participant used the word care in describing teaching, but their use spanned multiple codes. However, most participants' initial invocation of care was highly summative and required significant unpacking and exemplification to fully understand. Some discussed teachers showing care for students as people. However, others used care to describe structural aspects - e.g., caring enough to prepare organized classes. Still other uses of care were cognitive in nature and centered responsibility for students' learning - e.g., *"...I'm not going to say make sure all of your students learn because some people aren't in the right mindset when they go into it. And it's like my [class] teacher* ***who cared so much*** *and then he couldn't make certain kids care. ... you can't force people to learn, but like giving them all of the resources and the help they need."* In other excerpts, participants invoked the word to describe a passion for teaching itself as well as efforts to share passion for the topic they are teaching with students. During our analysis, both authors noted that without interviewer probing for specific examples, we would have classified discussions of caring as primarily an interpersonal consideration, given the more socially normative context of the word.

Finally, building on care as invoking a broad set of specific expectations, we noted patterns of codes in our data. Table 1 highlights that most codes appeared in many of the interviews. However, a code's presence in many interviews is poorly relates to the frequency of *occurrences* of codes in individual interviews. Participants tended to focus on a small number of codes, which we refer to as *dominant categories*. For example, one participant's interview had five excerpts coded as *supportive*. While ten other second level codes were also applied to their interview, none were applied more than twice. Overall, three of seven interviews had a second-level code that appeared at least twice as often as any other. The dominant codes were consistent when both coders coded the same interview. In future research we plan to explore whether dominant categories reflect an organization of the complex experience of learning in general categories (e.g., care) that the student finds tangible *and/or* reflect the importance an individual places on that specific aspect of good teaching.

Table 1: Summary of codebook developed from analyzing interviews, quotes selected by undergraduate researcher and first author to as closely as possible represent authentic interpretations of student intent. We accept/embrace that there are potential ambiguity readers may see and treat that as valuable to perceiving the challenge in situating students' perspectives within the large body of research on teaching. As a reminder, second level codes are hierarchical and nested specifically within the broader umbrella of the linked first level code.

Code names *(count, # of Interviews)*		**Description and Example quotes**
First level	**Second-level**	***(second level code, semantic direction)***
Cognitive *(68 , 7)*	Alignment *(17, 6)* Difficulty *(12, 6)* Creates Ownership *(9, 6)* Knowledge about Teaching *(7, 5)* Knowledge about Topic *(11, 5)* Presumptions *(8, 4)*	***Relates to a teacher's ability to understand and appropriately manage aspects of learning related to thinking, understanding, ability, and related processes.*** *"I would also say effective teaching also takes into account like for me, I like to think of the way the things I was struggling with when I was learning something. Maybe a teacher who takes into account where the problems and understanding might come in and directly solves them before they even start."* (Alignment, Positive) *"And even just looking at a problem, like if I had a blank problem, for example, and the professor or somebody solved it, I probably wouldn't know where to start. I'd probably look at it. I'll be thinking of different ways. I'll probably give you five minutes I probably know where to start. But if you wrote up the whole problem and the answer with the whole thing, then I will look at it and I could just sit there and be looking at it and then I will know what you did."* (Difficulty, Negative)
Interpersonal *(103 , 7)*	Supportive Environment *(24, 7)* Passionate about Teaching *(19, 6)* Personal Connection *(14, 6)* Communicates Care *(10, 6)* Empathetic *(8, 6)* Passionate about Topic *(11, 5)* Active Recognition *(4, 4)* Flexible *(4, 4)*	***Relates to a teacher's ability to engage with the emotional, social, and relational aspects of education and the student experience.*** *"But even more than that, it was just in general, he's very passionate about teaching and he cared a lot and you could tell that he was putting in a lot of effort, and that he was just passionate about what he was teaching."* (Passion-Teaching, Positive) *"Well, most of my teachers in my high school... Well, half of them didn't really care about... Well, maybe they cared, but my perspective of them was that they didn't really care about our learning, they just were there because it was their job and that's it."* (Communicates Care, Negative)
Structural *(83, 7)*	Adaptability *(10, 4)* Multimodal *(14, 5)* Clear Course/Structure *(6, 5)* Organized *(7, 4)* Engaging *(28, 7)* Relatable *(12, 5)*	***Relates to how a faculty member designs, implements, and adjusts learning experiences - specifically the presentation of information*** *"Good question. Real life examples is the number one. I think with math, for example, if you learn an equation, that's awesome. But, it would be great for me to see how to use it in the real world. That's the top priority. The second priority is for me to actually retain the information, which I don't know if that's pertinent to this question."*(Relatable, Positive) *"Well, I found that there's a difference between learning classes online and classes in person because for me, having someone standing in front of me talking, and for me to be actually sitting there and listening to that person speak, I've learned that I am thinking actively as he is talking and everything. And for me, when I am in an actual in-person class, while the teacher is talking, I can make connections and can be actively listening to that person, rather than just notes or other classes online where they're just like, "Oh, here's a homework. Do the homework. We'll meet in a week."* (Engaging, Negative)

RQ 2 - What examples about faculty do engineering students use to differentiate good and bad educators?
During analysis, we noted that participants frequently differentiated, *good* and *bad* teaching in pursuit of defining good teaching. To capture this information, we added an identification of *valence* (positive, negative, comparative) to each excerpt as part of the codebook. Positive valence involves examples of teaching done well or things that must be done exemplified by a teacher doing them. An example comes from a participant experiencing a teacher using organization well: *"Calculus is the same no matter where you go,* ***but it just so happens to be that this particular calculus teacher is great. But, why? It's like, because they prepared it super well****. That's what I would say. The number one responsibility of a teacher is to organize and prepare the information for the information to be more easily digested on the student's end."* Purely positive valenced examples were generally more common than negative ones, but less common than comparative examples.

Rather than solely a finding of interest, we see valence as an indicator of data quality. The frequent use of comparative examples suggest that, no matter the content of participants' conceptions of teaching, they possess the ability to make meaningful sense of, articulate, and differentiate good and bad examples of a phenomenon in ways our analysis can access. The comparative examples in particular provided insight into participants' meaning and helped place their meaning in the context of their language. That does not necessitate us or others to agree with participants' conceptions, but is useful in analysis to understand participants' meaning accurately.

The types and depth of examples provided vivid illustrations of aspects of teaching that participants' conceptualize. The examples provided deep insight into how they experience those aspects, how they feel in those classes, and how they perceive their learning to be impacted. One participant's description spoke to the impact teachers' non-cognitive actions matter: *"Oh, definitely having an engaging teacher has made all of the difference, talking to my peers and my classmates. For example, back in high school, the teachers who were engaging and who knew what they were talking about and expressed it properly, everyone in their class, not only did really good in ratings, grades, but they sat properly in their chairs, they were engaged, they didn't look at their phones…"*

Discussion

Our goal was an initial step in understanding the role of students' epistemic beliefs about teaching and learning in engineering education. We reject the idea that this data can establish the accuracy of students' evaluation of good teaching. What we can do is look at how students' concepts align with other research. Given our interest in the impact of these perceptions - we see accuracy as less relevant and likely unanswerable. As a pragmatic takeaway, we would be remiss if we did not note the consistent impact of even small gestures on students' relationship to courses and their own learning we saw in interviews. Students especially centered teachers that humanized them and acknowledged both students and teachers can be flawed. The importance of feeling understood and respected as they learn, develop, and grow was apparent throughout all seven interviews.

Our results support engineering students as having a meaningful conceptual structure for evaluating learning experiences. The codes are not identical, but are quite similar, to theoretical conceptions of teaching - including top level codes that are quite close to guides for designing learning experiences [28]. Participants often explicitly linked teacher actions to learning in both good and bad ways. While some such links may be inaccurate [5], our results show that the connections are at least consistent across participants. Finally, highlighted through the use of 'care', we see a risk that participants' lack of scholarly vocabulary for teaching may mislead about the depth, structure, and content of their concepts of it. Not unlike learning the structure of a physics problem, students' understanding, and language, of the phenomena of being taught is bounded by their prior experiences as students and inseparable from their explanation [29,30]. We plan to explore this in future work, particularly whether summative words reflect prioritization, an organizational schema, and/or limitations in explaining experiences.

We also see multiple connections to existing literature for future exploration. The first is work on personal epistemologies and cognitive development during postsecondary education [12,13]. Participants' central narrative of good teaching most closely aligned with the information transmission paradigm. In that paradigm, the role of teachers and students makes lecture not just dominant but logically coherent [31,32]. Linking that narrative to existing research suggests several questions for future work. Is students' adoption of this narrative revealing a stage of epistemic development (e.g., [13]) or does it reflect a constructed experience from success in educational experiences where the information transmission paradigm is the norm? In parallel, do the stages or experiences explain participants' presumption of teacher expertise? Given concerns about engineering students' epistemic development, we are curious about how students' beliefs about teaching and learning interact with faculties' beliefs and teaching practices - which are a projection of those beliefs [14]. Existing work on student expectations of learning environments is similar in its findings here [33,34]. We think deeper exploration is potentially fruitful so as to understand if/how students separate teachers from the learning environments they create.

Finally, such studies education provide a basis for understanding the interactions of beliefs, teaching, learning, and the perception students rely on to integrate them. Do participants' descriptions reflect a model they simply perceive as better [5], an active stance about the roles in education [36,37], or result of the (still) dominant modality of the education they have experienced [38]? In some of these areas, there are potential links to metrics useful to both researchers and educators (e.g., measures of learning vs. grade orientation, fixed vs. growth mindset, and others [e.g., 37, 40,41]). However, we suggest caution in expecting what they can predict and the potential for these variables to be measures of a similar underlying construct [39,40]. We see appeal in such approaches, not merely as a way to seek generalizable answers after qualitative analysis, but as a possible approach to better uncover unstated expectations. Especially those about the roles of teachers that may not emerge in a reflective interview specifically because they are part of students' master narratives of education.

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1. Appendices

Interview protocol

Introduction (consent, recording request, introductions, explanation) - omitted from appendix

Priming

- Can you describe your elementary, middle, and high school learning environments...what were those schools like, what stood out, what do you remember in detail, what did you like, and what did you dislike?
- What makes you like and dislike learning?
- Who is your favorite teacher and what about their teaching did you like and dislike?

Main interview

- In your experiences as a student, what helps you learn better?
- What are your expectations of your teachers?
- What things that teachers or professors do help you learn?
- In your opinion, what is good or effective teaching like?
- What characteristics of a topic motivate you to learn about it?.
- Is learning different for different topics?
- How do you know when you really learn something, what does it mean to learn something?
- What does it mean to think/know?
- What does it mean to think like an engineer?
- In how you think about learning, where does being confused fit?
- Can you describe a classroom situation where you felt you really learned well?
- Overall, how do you think learning occurs?
- How do you learn when there is no one able to teach you?
- Overall, what do you believe are the responsibilities of a teacher/professor in your courses?

Standard follows and probes

- Do you have any examples of that
- What do you mean by _____
- Can you tell me more about _____
- Is that a good or a bad thing?
- Are you saying _____
- [Use silence]

Wrapup

- Is there anything else we didn't ask you about these topics that we should have?
- Are there any other personal examples or experiences that you want to share?
- Do you have any other questions for me?
- *Thank the participant and read outro script and consent reminder*

Expanded code book with descriptions and quotes for all second level codes

Code Names		
First level	**Second-level**	**Description and** *Example Quotes*
Cognitive		**Relates to a teacher's ability to understand and appropriately manage aspects of learning related to thinking, understanding, ability, and related processes.**
	Alignment	**Ability to comprehend students' level of understanding and communicate their personal knowledge about a topic in a way that is digestible to students.** *"I would also say effective teaching also takes into account like for me, I like to think of the way the things I was struggling with when I was learning something. Maybe a teacher who takes into account where the problems and understanding might come in and directly solves them before they even start."*
	Difficulty	**Understands students sufficiently to create problems of appropriate complexity or difficulty for the level of student understanding.** *"And even just looking at a problem, like if I had a blank problem, for example, and the professor or somebody solved it, I probably wouldn't know where to start. I'd probably look at it. I'll be thinking of different ways. I'll probably give you five minutes I probably know where to start. But if you wrote up the whole problem and the answer with the whole thing, then I will look at it and I could just sit there and be looking at it and then I will know what you did."*
	Creates Ownership	**Thinks about teaching as building a students' sense of being more than a passive participant in the classroom.** *"Just, like, blatant cheating, or not taking things seriously and just failing a class, and still getting a B -- so, like, that kind of coddling, whereas, like, I didn't have to learn that lesson as much when I got to college. I just had to learn the lesson of, like, you actually have to try now, rather than no one's going to, like, fix this for you, because I hadn't really had that happen to me so much. But I guess that's what I mean by coddling."*
	Knowledge about Teaching	**Possess the knowledge about instructional methods necessary to best fit students' learning needs.** *"Yeah, CS 2340, I remember like it was a class that was supposed be like project-based. We were learning the theories of like app development, or how to do that properly, and our teacher just really like sat at the front of the room and he like pointed at the board and clicked through a PowerPoint, and it just wasn't very engaging."*
	Knowledge about Topic	**Has a thorough understanding of the topic they are teaching.** *"Well, my expectation isn't that teachers will know who you are because it's a huge school, or will care about you personally. But it matters to me that teachers care about what they are teaching and they know what they're doing, and they are passionate in what they're teaching."*
	Presumptions	**Doesn't presume students' knowledge or understanding and doesn't put students on the spot about their prior knowledge.** *"But like I was saying, this teacher, he would talk about the simplest things that they're not a problem for me, for example, but maybe the guy next to me doesn't understand this and this little comment that he makes, keeps him from misunderstanding something big about what you're learning."*
Interpersonal		**Relates to a teacher's ability to engage with the emotional, social, and relational aspects of education and the student experience.**
	Supportive	**Develops a learning experience that communicates their approachability and support of students' process of learning.** *"The only negative thing was the pressure. Because even though he was like, 'I'm here for you and like we succeed together.' It's like if you fail, he takes your failure as 'We fail, but I'm counting on you to not fail.'"*

	Passionate about Teaching	**Demonstrates a genuine interest in teaching and students' learning.** *"Well, most of my teachers in my high school... Well, half of them didn't really care about... Well, maybe they cared, but my perspective of them was that they didn't really care about our learning, they just were there because it was their job and that's it."*
	Personal Connection	**Creates a learning environment that humanizes both the teacher and students to foster mutual trust and respect.** *"Well, first I'm going to tell a little bit about a teacher that I found teachers that are good, then compare them. Because most of the teachers who are engaging tell you about their personal life, I've seen that. Of course, not the whole class, but I think that having a connection with teachers makes it more personal. Even though they're saying it to the entire class, it's them saying, 'Oh, my favorite food is this,' or just random things about them, but I don't know, makes you have a connection with that teacher. And I feel like teachers who never mention anything, not even a very simple fact about themselves, you don't feel that much of a connection. For example, my least favorite classes, they never mention anything about themselves."*
	Communicates Care	**Shows a genuine interest in students' well being inside and outside of the classroom.** *"Make sure you prime your students for learning. I'm not going to say make sure all of your students learn because some people aren't in the right mindset when they go into it. And it's like my Apress teacher who cared so much and then he, couldn't make certain kids care. But it's not necessarily on you to make people care and to make people learn, you can't force people to learn, but like giving them all of the resources and the help they need."*
	Empathetic	**Actively pursues an understanding of the student experience and accounts for how it affects students.** *"I have a lot. So I would say Mr. [blinded]] who was my AP World teacher. And I'll say he's my favorite teacher in the teaching-wise versus teaching style. Teaching-wise, being my teacher, grading my papers, being lenient and stuff. That was amazing about him that he graded stuff fast, he graded stuff fast too and he gave me feedback on it. And he was lenient if you turned it in a little bit late or et cetera, et cetera, your homework and stuff, you turned it in a little late, he was lenient in with that."*
	Passionate about Topic	**Demonstrates a genuine interest in the subject matter being taught as well as its applications and its importance.** *"I had really few... At least for me, I perceived it that way, I had very few select teachers who were there, teaching that class because they really liked what they taught."*
	Active Recognition	**Consistently acknowledges the vulnerability that comes with participating in learning.** *"I will say that one thing I dislike ... I think that public praise and private ... What is it called, private discontent, or something like that? Or, private disagreement is a great way to handle things. I do, generally, think it's bad when a professor downplays a student in front of the class.mOr they say, 'That's not a good question,' or something like that. But when someone says, 'Oh, that's a great question. Thank you for asking,' you're jacked. Versus, 'Sorry, Jack, I'm not going to answer that. You should know that by now,' or something like that. I would say that that's a gripe, too."*
	Flexible	**Willing to adapt courses based on their empathic understanding of students' needs, emotional states, and experience in the course.** *"It was kind of like watching from that perspective how all those things would go on with my classmates, and there would never be any, like, discipline or consequences of things like that. "*

Structural		**Relates to how a faculty member designs, implements, and adjusts learning experiences - specifically the presentation of information.**
	Adaptability	**Ability to sense confusion or understanding of material being taught and adjust instructional methods both in planning and in real-time.** *"Know how the students are feeling. If they don't understand the topic they don't move forward and just it's better [inaudible 01:13:46] make sure they're on the same page, a majority students are on the same page. ...So it makes sense why they lean forward still because you're on their schedule. So it's also a student's responsibility. But I also understand you can't really know, since no one rose a hand when you asked the question, you know they didn't really understand it fully, they didn't learn it yet. So you know what I mean? That's probably a hint that they didn't... Either one, they did read it and they just don't understand it. They thought this was going to solidify, but he was going over what they just read. And so that's different from you just going over what I just read and you teaching it. "*
	Multimodal	**Uses multiple methods of communicating and demonstrating material to students (e.g., lecturing, board writing, activities, and practice problems).** *"Yeah, what I would say for this one is, I feel like many students don't just learn one way. It's not like, "Oh, once I explain this to you, I don't need to talk about it again." No, approaching it from different angles, the writing on the board or showing PowerPoint slides, they're also talking to me and they're also giving me activities to do hands-on. I think a combination of different sensory teachings, it's very important to get stuff across."*
	Clear communicator	**Creates a structure and disseminates information about the course and how to succeed in ways that make sense to students and make information readily available.** *"That's a good question. I don't know. Responsibility ... preparedness. They should definitely have a structure that's easy to navigate, whether that's through assignments, or tests, expectations, topics that you'll learn, like the PowerPoints and the actual stuff. If it's not bulleted well it's difficult, on the student's end, to make sense of it. Because, what you're paying for is not the knowledge."*
	Organized	**Creates a class that gives students confidence they understand expectations, class activities, and connections between expectations and activities.** *"You're paying for the presentation of the knowledge. ...Hypothetically, I could just go on my phone and learn everything I needed to know, but it would just take so long, because this is not organized whatsoever. We're paying an organization to organize it for us. Calculus is the same no matter where you go, but it just so happens to be that this particular calculus teacher is great. But, why? It's like, because they prepared it super well. That's what I would say. The number one responsibility of a teacher is to organize and prepare the information for the information to be more easily digested on the student's end."*
	Engaging	**Creates a learning environment that encourages interaction and participation by students as opposed to just lecturing.** *"If a teacher can make an appeal to something that I enjoy as a side interest, then that engages me a lot, and that motivates me to learn. For example, we were learning signals processing. And, I felt really engaged with the content when it focused around language, and language interpretation. Because, we were talking about cochlear implants, which was the cross-section of that class' contents, signals processing, with the biomedical science that I love, with languages."*
	Relatable	**Creates learning experiences that link classroom content to its application in real world scenarios or future courses/learning.** *"Good question. Real life examples is the number one.* *I think with math, for example, if you learn an equation, that's awesome. But, it would be great for me to see how to use it in the real world. That's the top priority. The second priority is for me to actually retain the information, which I don't know if that's pertinent to this question."*