BOARD # 19: WIP: Students' Perceptions of an Innovative Attendance Policy for a Biomedical Engineering Seminar Course

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Work in Progress: Students' Perceptions of an Innovative Attendance Policy for a Biomedical Engineering Seminar Course

INTRODUCTION Conventional wisdom encourages students to attend class consistently. Class attendance is one of many non-cognitive factors contributing to students' success in undergraduate courses. This reason explains why researchers are interested in the relationship between students' course attendance and their performance, measured by grades. However, college students ultimately have the free will to choose to attend class (Credé et al., 2010; Macfarlane, 2013; Pintrich, 2004), and students may miss class for various reasons (Macfarlane, 2013; Supiano, 2022; Zhu et al., 2019). Missing class negatively impacts students as they miss out on critical aspects of the learning experience and may indicate challenges students are experiencing in their personal lives. Students' attitudes towards course policies, including attendance policies, are complicated. In one of the few studies examining students' perceptions of and reactions to attendance policies, Bailey et al. (2016) found that the research participants preferred being exempt from the course policy when it was not in their favor (e.g., requesting an extension). However, they recognized that strictly adhering to the policy was fair to all students. In addition, mandatory attendance erodes students' motivation to learn. Despite recommending mandatory attendance policies, Zhu et al. (2019) suggested motivating students by explaining the benefits of attending class and encouraging them to take ownership of their education.

Engineering seminar courses are a unique environment to study students' attendance behavior and perceptions. In the U.S. context, these courses are one of many required classes students need to earn an engineering degree. These seminars target professional development to complement the technical content and skills covered in core engineering classes. Engineering students may view seminar courses as less important than demanding core courses. Further, a missed class is more consequential when in-class learning is active, collaborative, and hands-on (Supiano, 2022). Students' ability to stay engaged in these courses despite the competing demands for their time and attention is an example of motivated behavior (Pintrich & Zusho, 2002).

Through this Work in Progress paper, we present our interview protocol and preliminary data, which aims to answer the following research questions: (**RQ1**) Did students perceive the new attendance policy as equitable, why or why not? (**RQ2**) Did students perceive the new attendance policy as agency-supporting, why or why not? We developed and piloted an interview protocol to explore these questions with two students enrolled in a biomedical engineering seminar (BME) course. Our preliminary findings indicate that the interview protocol effectively captures students' perceptions of the attendance policy; however, our preliminary findings also raise questions regarding students' intrinsic versus extrinsic motivations for attendance and learning. Ultimately, investigating students' perceptions of attendance policies contributes to broader efforts to promote equitable, scalable, and manageable classroom cultures in engineering education.

RESEARCH METHODS The primary objective of this pilot study is to evaluate the effectiveness of the interview protocol in capturing students' experiences and perspectives related to the attendance policy. By refining our data collection methods through this pilot, we seek to ensure that future research yields meaningful insights into the role of flexible attendance policies in engineering education.

Course Context. The Experiential Learning Seminar II is a 14-week, ½-credit required course for BME majors at Cornell University. Students often take this course in the fall semester of their third year at Cornell University. During the Fall 2024 semester, 54 students were engaged in weekly team-based design activities and reflections on BME design, research, and practice. The course

aims to help students develop engineering design skills, equip them to become reflective biomedical engineers, and engage in life-long and life-wide learning. The class met once a week for 50 minutes, with a reflection assignment due before the next class. Students' grades were determined by attendance (20%), weekly in-class deliverables (40%), and weekly reflections (40%). Attendance was a key feature of this class, and failure to attend the class meant that students did not achieve the intended learning objective (LO). Two of the authors were course instructors for this course. However, they were not involved in the data collection or analysis process.

The "Creative Solution" Attendance Policy. The instructors designed an attendance policy to ensure that students who passed the course achieved the required LOs, minimize students' abusing the attendance policy, and eliminate the administrative burden of policing students' absences (A.2). Beyond the first excused absence, students were responsible for *s*ufficiently demonstrating how they had achieved the LOs in their absence (one solution per absence). These LOs were written broadly to aid students in interpreting them. The creative aspect of this policy refers to the freedom students had in choosing how to respond to the LOs. They were not restricted to submitting in-class activities but could draw on relevant experiences in other classes and extracurricular activities. In this way, the policy allowed students to miss class, whether they needed to attend a student competition or a mental health break. At the same time, it also discourages persistent absenteeism because it is challenging for students to create an assessment that adequately addresses the LOs.

Research Participants and Procedures. We recruited research participants via email during Week 12 of the semester. We initially received 12 responses and finally conducted two virtual interviews. Two women voluntarily participated in this study (i.e., we did not offer any incentives for participation). To protect their confidentiality, due to the small sample size, we intentionally omitted their racial/ethnic identities. The first participant, Emmy (pseudonym), used the creative solution policy, while the second participant, Sara, did not. The research study was approved by Cornell University's Institutional Review Board (IRB014943), and all participants signed the consent form before participating.

Theoretical Framework and Interview Protocol Development. The development of our interview protocol was informed by the Self-Regulated Learning (SRL) theory of motivation (Pintrich, 2004; Pintrich & Zusho, 2002; St. Clair, 1999; Sund & Bignoux, 2018), which provides a framework for understanding students' decision-making processes regarding class attendance. SRL theory (Figure A.1) posits that learners are active agents who set goals, employ strategies, and navigate challenges to achieve desired outcomes, even in the face of setbacks and challenges (Pintrich, 2004; Pintrich & Zusho, 2002). As students self-regulate, they develop a sense of agency (Kipp & Clark, 2022; Pintrich, 2004), which can be influenced by their learning environment, including attendance policies. Martin (2004) described agency as the intentional and creative force an individual exerts on themselves and their sociocultural environment to achieve desired results. Given that absence from class can itself be an expression of agency (Credé et al., 2010; Kipp & Clark, 2022; Sund & Bignoux, 2018), our interview protocol examines whether students perceive the flexible attendance policy as supporting or hindering their ability to exercise control over their learning decisions. Additionally, we incorporated equity considerations into our review protocol, drawing from frameworks in educational research that distinguish between different approaches to equity (Rodriguez et al., 2012; "The Research Agenda for the New Discipline of Engineering Education," 2006). Some models emphasize closing the achievement gaps between majority and historically marginalized groups (equity of parity). Others focus on treating all students equally (equity of fairness) or addressing students' unique circumstances without direct comparison to

majority groups (equity of individuality). Depending on how they are communicated and enforced, attendance policies can accommodate students' diverse needs or enforce uniform expectations that may disadvantage certain students. We aimed to explore whether students perceived the policy as equitably supporting their attendance decisions. Our interview questions (A.3) were designed to probe students' motivations for attending or missing class, their understanding of the policy, and how they perceived its fairness, flexibility, and alignment with their learning needs. Using this interview protocol we interviewed the participants using our structured interview protocol and asked clarifying questions as needed (A.3). These interviews took an hour to complete and were conducted via Zoom. The interview transcripts were coded and clustered thematically.

PRELIMINARY RESULTS AND DISCUSSION. We asked the students to evaluate the creative solution policy compared to other attendance policies they had experienced. Overall, both participants perceived the creative solution policy as equitable and in support of student agency (Table A.4, A.5.3, A.5.4, & A.5.5). However, their perspectives differed based on their experiences with the policy. Sara viewed the policy more favorably because it aligned with her beliefs about learning (A.5.6). However, since she had never personally used the policy, her perspective was based on its theoretical benefits rather than direct experience. In contrast, Emmy, who used the creative solution, had a less favorable view. She felt that the policy was not as flexible, fair, or well-suited to her needs as an optional attendance policy (A.5.7). Instead, she preferred a "middle ground" approach—one that provided more flexibility than a mandatory policy while also incorporating more accountability than an entirely optional policy (A.5.8). Specifically, she referenced other courses that allowed students a set number of excused absences (e.g., five "freebies") before attendance began impacting their grade. This perspective is somewhat incongruent with earlier findings suggesting that students generally viewed the creative solution policy as equitable and agency-supporting. While Emmy valued a balance between structure and flexibility, her dissatisfaction with the creative solution policy raises questions about what aspects of accountability and flexibility are most important to students. It also suggests that while some students appreciate the opportunity to exercise agency, they may still prefer a predefined structure that allows for limited absences without additional steps or requirements. These findings prompt us to further explore students' motivations for attending class. Specifically, we aim to investigate whether her attendance decisions are driven more by **intrinsic motivation** (e.g., a desire to engage in learning) or **extrinsic motivation** (e.g., a desire to earn a good grade). Understanding this distinction could help clarify why she perceived the creative solution policy as less fair or suitable despite its flexibility.

FUTURE WORK. To build on these insights, we plan to refine our interview protocol to include more direct opportunities for students to describe other "middle ground" attendance policies they have experienced. Additionally, we will encourage participants to provide details on the course contexts where these policies were implemented and to share any alternative attendance policies they believe would be effective. These modifications will allow us to better capture students' diverse perspectives on attendance policies and their underlying motivations for attending class.

Furthermore, we will continue to explore students' learning experiences in this BME course. We will also investigate the overlap between the theoretical constructs and the implications for classroom policies and management tools. Some of the limitations of this study were the small sample population and the unique institutional context that shapes these participants' views on equity and agency.

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APPENDIX

A.1 Model of Student Motivation and SRL in the College Classroom
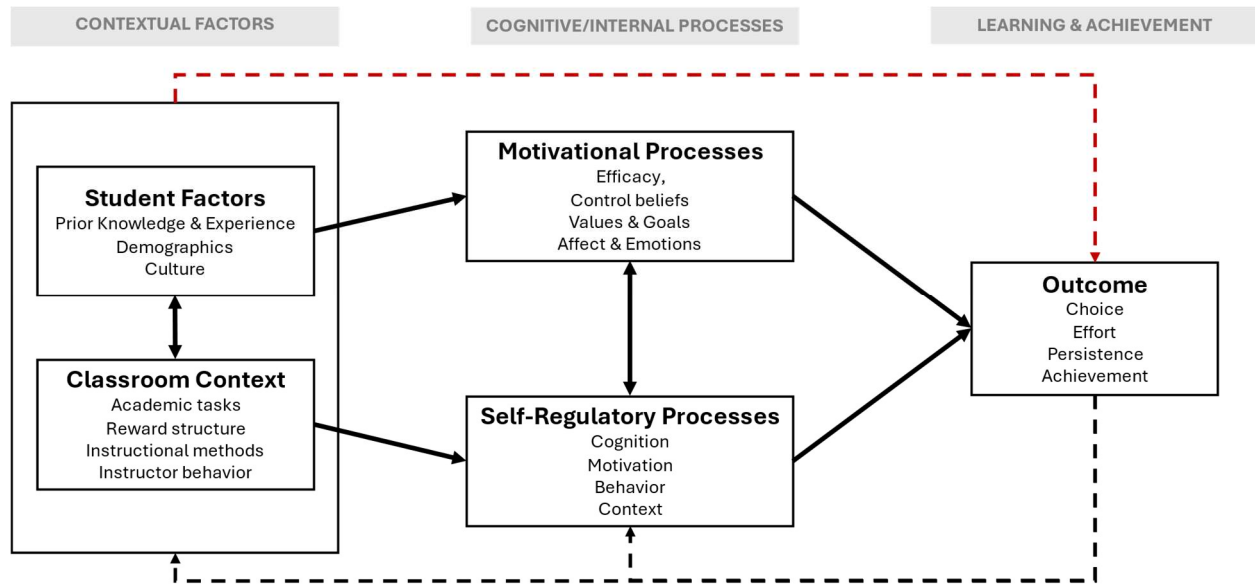

Figure A.1: Model of Student Motivation and SRL in the College Classroom

A.2. Creative Solution Attendance Policy

Attendance and Absences: In-class attendance is critical to your success in this class. I take attendance at the beginning of class and look forward to seeing you there on time. One (1) absence this semester will be permitted without penalty. Any additional absences, regardless of reason, will not be excused. Credit can be received for missed classwork through sufficient evidence of achievement of learning objectives. Please note that this policy is subject to change at the discretion of the instructional team. Please come and see me if you have special circumstances (e.g., illness, difficult life events) that affect your participation to find creative solutions.

A.3 Interview Protocol

- What did you enjoy about The BME Class? (warm up question).
- Can you define the word "EQUITY" in your own words?
    - What does an equitable classroom (course) look like?
- Can you define the word "AGENCY" in your own words?
    - What does a classroom (course) that supports agency look like?
- Are you familiar with the creative solution (attendance policy) in this course?
    - Interviewer clarified the policy
- (Interviewer) Attendance policies range from lax, where attendance is optional (excused absences), to strict policies, where attendance is mandatory (you lose points if you miss class). Many courses have solutions that lie between these two extremes, for example the creative solution policy in BME 2081.

I want you to reflect on your experience in BME 2081 (this semester), BME 2080 (the previous semester), and your experiences in other classes at Cornell University as you answer the following set of questions.
1. Which policy is most flexible or accommodating? Why?
2. Which policy is most reasonable or practical? Why?
3. Which policy is most fair? Why?
4. Which policy is most demanding? Why?
5. Which policy makes you feel more in control? Why?
6. Which policy helps you learn? Why?
7. Which policy allows you to express yourself? Why?
8. Which policy makes you feel more anxious/stressed? Why?
9. Which policy keeps you accountable? Why?
10. Which policy is most flexible or accommodating? Why?
11. Which policy is most suitable for your (physical, emotional, and mental) needs? Why?
12. Which policy do you prefer? Why?

- Based on your definition of equity, do you think the creative solution in this course was equitable?
- Based on your definition of agency, do you think the creative solution in this course was equitable?

A.4. Students' perceptions of the creative solution policy relative to an optional and mandatory attendance policy

Table A.4: A Summary of students' perceptions of the creative solution policy relative to an optional and mandatory attendance policy.

	Optional	Creative	Mandatory	Other
Reasonable		Both		
Sense of control		Both		
Supports Learning		Both		
Sense of Stress			Both	
Supports Accountability		Both		
Flexible	Emmy	Sara		
Fair	Emmy	Sara		
Demanding		Emmy	Sara	
Supports Self-Expression		Sara		Emmy
Suitable	Emmy	Sara		
Preference	Sara			Emmy

A.5. Interview quotes

A.5.1

Emmy "Equity is providing people with the same opportunities and providing a more stable foundation and maybe even extra supplements for students who need more help. So that could be like working with SDS accommodations to make sure that people who struggle a little bit more with classes get the extra help that they need."

A.5.2

Sara "...Equity is giving people what they need in a certain situation so that everyone [can] accomplish the same thing [goal]… where people are given what they need so they can accomplish [a/the task] to the best of their abilities."

A.5.3
Emmy "[The BME course] was fairly equitable… to be the most equitable… [I] really needed support. I felt like I couldn't ask what exactly I needed to submit because it was a creative solution. But then, when I did submit what I thought I needed to submit, I was told it wasn't enough. So, I guess what I would have liked was more open channels of communication… so that everybody knew exactly what they needed to do."

A.5.4

Sara "…The most equitable [policy] is [the] creative solution, because it allows people to think about their circumstance and still address the [learning] goals of the day…because [there's] still the accountability of like going to class…"

A.5.5

Emmy "…To have agency in a classroom is to be able to generate ideas outside of what the coursework is expecting of you… and to take ownership of your own work.

…For this class [The BME course], if you miss a [class], then you can go through the objectives that were demonstrated in the [class] and just complete an assignment of your own design that demonstrates how you met those learning objectives and how you're keeping up with the rest of the class. I think it takes a lot of agency to design your own assignment that you're turning in, because it's literally a completely blank slate. So, in that case, agency is like creativity and motivating yourself …"

A.5.6

Sara   "Honestly, as a student, I would prefer the optional, but as [a] tutor… I know that you really need to be encouraged to do your work, and I believe that the creative solution will do that the best…

… As a student, as in the general populace, who does not really want to go to class, then the optional policy where everyone's not… [penalized] for not going to class… like no one's checking, and that is probably the most comfortable space for most students to be because no one's really holding them accountable. But education is all about accountability, so it's not going to work in the long run."

A.5.7

Emmy   "I don't feel like there's any room for self-expression in mandatory or optional, that's just kind of you go to class or you don't, but with the creative solution, I know it was advertised as being really flexible and you had a lot of creativity with it. But there were kind of certain guidelines that you had to follow or you weren't going to receive full credit. So, like at the beginning of the year, they told us, you know, you could submit a poem or a video essay or something like that, but in reality, if you submit a short poem, you're not going to get full credit for meeting the learning targets, like you have to demonstrate that you've done work, and so you can't just write a poem that says, hey, I did work."

A.5.8

Emmy   "I think I do prefer the middle ground. And I don't know if a creative solution is always what I'm talking about. But like, like, I have an attendance-based class where, like, you can have five absences, and it's like, no questions asked, and it doesn't impact your grade unless you go over the five absences. It's more flexible, but it still holds me accountable to go to class whenever I can, which is really good."