

Empowering Student Voice: Lessons from Implementing Participatory Course Policy Design in Engineering Education

Dr. Daniel Selvakumar Raja, Greenville College

Daniel Raja is an Assistant Professor of Engineering and Program Director at Greenville University. He specializes in mechanical engineering, with a particular focus on solid mechanics and computational solid mechanics. His academic journey and professional career are marked by a dedication to advancing engineering education and research.

At Greenville University, Professor Raja is known for his engaging teaching style and his commitment to mentoring students. He actively involves his students in research projects, providing them with hands-on experience in the field of engineering. His work not only contributes to the academic community but also aims to solve real-world engineering problems.

Professor Raja's research interests include the development of new materials and the application of computational methods to understand and predict the behavior of solid materials under various conditions. He has published several papers in reputable journals and presented his findings at international conferences.

Outside of his academic responsibilities, Daniel Raja is passionate about community service and often participates in initiatives that promote STEM education among young students. His dedication to both his profession and his community makes him a respected and valued member of Greenville University.

Natalie Schleper, Saint Louis University

Natalie Schleper is an instructor in the Department of Chemistry at Saint Louis University. She holds both a B.S. and an M.S. in Chemistry from Southern Illinois University Edwardsville and researched student misconceptions and their effects on student understanding of chemistry. Natalie is dedicated to fostering a deep understanding of chemistry among her students. At SLU, Natalie is known for managing large class sizes averaging between 600-800 students per semester. She has taught various classes such as Fundamentals of Chemistry lecture, General Chemistry 1 & 2 lecture, recitations, and laboratory, Analytical Chemistry lecture and laboratory, Organic Chemistry laboratory, and Physical Chemistry Laboratory. Natalie's research contributions focus on innovative teaching methods to enhance student engagement and learning outcomes. Research interests include student misconceptions, instructional materials, and integration of technology to STEM courses. Outside of the university, Natalie has a passion for theater and architecture. Before finding her passion for chemistry education, she was a theater major and has an associate's degree in computer aided Drafting and Design.

Empowering Student Voice: Lessons from Implementing Participatory Course Policy Design in Engineering Education

Introduction

The traditional engineering classroom often operates under a top-down governance model where course policies are delivered as static mandates. However, research in Inclusive Pedagogy, Student-Centered Learning (SCL), and Self-Determination Theory (SDT) suggests that a lack of student agency can hinder need satisfaction and academic motivation. While “Student Voice” (SV) is often defined as consultation with students regarding their learning experiences [1], it is more effectively viewed as the practice of involving students as “educational planners” [2] in decision-making to democratize the learning environment. Faculty can elevate the impact of SV by transitioning from passive listening to a model of co-construction, where students and instructors work together to shape classroom governance. Effective SV implementation requires a nuanced understanding of which components of curriculum design students can and want to influence. Typically, SV falls into three categories: content (topics), evaluation (assessment), and lesson practicalities (classroom policies) [3]. SV is a foundational element of personalized learning, necessitating a shift in power dynamics where learner perspectives carry significant weight. By providing students with freedom over work methodologies, educators transition from top-down mandates to shared governance that prioritizes learner autonomy [2]. This transition ensures students are treated as genuine partners rather than mere consultants. However, scholars caution that while involving students can foster local improvements in mutual understanding, it often fails to dismantle entrenched institutional hierarchies or resolve the inherent power imbalance between staff and students [4]. Furthermore, lecturer-led redesigns often suffer from divergent views of effectiveness when compared to student perceptions; staff may rely on “coercive” attendance policies that unintentionally deter engagement, whereas students respond more favorably to “pull-factors” that enhance personal relevance and trust [5]. When SV approaches fail to correspond with students’ desires for voice, they risk undermining the very autonomous motivation they seek to cultivate. This paper details a study that implemented participatory course policy design across three undergraduate engineering courses: one first-year introductory course and two upper-level courses. By inviting students to deliberate and vote on select “lesson practicalities” via a Microsoft Form, we sought to determine if this “democratized” approach would result in a stronger sense of belonging and greater investment. This study serves as an empirical case study for faculty developers aiming to integrate sustainable, democratic teaching strategies into professional development and instructional design.

The Practice: Participatory Policy Design

The participatory design was implemented across three engineering courses to test the “shared governance” model. Following the categorization by Robinson [4] and Strating [3], the

intervention focused on “lesson practicalities,” which allow students to act as “educational planners” [2] without requiring advanced disciplinary expertise. Content and learning outcomes remained fixed to satisfy ABET accreditation requirements and FE exam preparation. During the initial course meeting of “Introduction to Engineering” (23 students), “Engineering Thermodynamics” (13 students), and “Fluid Dynamics” (17 students) in the Fall semester, the instructor initiated a tiered approach to governance by distinguishing between institutional requirements and flexible classroom norms. While certain “non-negotiable” policies (e.g., academic integrity, attendance, sickness and bereavement policies) remained fixed to satisfy university mandates, a significant portion of the syllabus was designated as “negotiable.” These negotiable items primarily focused on “lesson practicalities” such as late work grace periods (No late work vs 10% reduction per day vs allowing 24 hours grace), technology etiquette (use of laptops, tablets, and cellphones during class hours), extra-credit opportunity (yes or no), instructor communication policy (LMS Announcements vs Emails and maximum response duration), group work team member selection process (students choice vs instructor assignment), and influence of team member scores on individual scores were presented as opportunities for shared decision-making. To ensure the process was sustainable and minimized the biasing effects of the instructor-student power relationship, deliberations were followed by anonymous voting via Microsoft Forms. This digital “pull-factor” allowed for the emergence of authentic student perceptions that are often silenced in traditional, lecturer-led feedback routes. The implementation followed a three-step protocol:

1. **Transparency:** The instructor explicitly identified which policies were open for debate, framing the exercise through the lens of Self-Determination Theory to emphasize student autonomy.
2. **Deliberation:** Students engaged in peer-to-peer discussions to consider the collective impact of different policy choices, ensuring that the “student voice” was not just heard but critically examined by the students themselves.
3. **Ratification:** A formal vote was conducted via a Microsoft Form to ensure anonymity and to mitigate the “hidden domination” of vocal minorities.

The results were tallied in real-time and immediately incorporated into the official course syllabus. To maintain sustainability and minimize workload, negotiable items were presented as a pre-defined menu, allowing for immediate syllabus integration post-vote. This straightforward approach provides a high-impact intervention without being resource-intensive for faculty. This process served as a visible unsettling of traditional power dynamics, transforming the syllabus from a top-down contract into a communal agreement. The three engineering courses were delivered in an in-person modality. While this study focused on face-to-face interaction, the use of digital tools like Microsoft Forms for anonymous voting suggests that this model is highly transferable to asynchronous or synchronous online environments, where digital “pull-factors” can help mitigate the isolation often felt in virtual spaces.

Methodology & Preliminary Lessons

To evaluate the efficacy of this participatory framework, the study employed a mixed-methods survey assessing student perceptions of agency and the instructor’s adherence to the negotiated

“social contract.” This approach specifically examined whether students felt their voices were authentically integrated or merely co-opted by the existing power structure. Data collection consisted of two primary streams administered at the conclusion of the semester to allow students to reflect on the full duration of the negotiated social contract:

- **Survey Instruments:** Students were surveyed on their perceived influence over course dynamics and their assessment of whether the instructor successfully fulfilled the obligations defined by the class-ratified policies.
- **Informal Behavioral Observation:** Additionally, the instructor observed behavioral trends in an informal manner to substantiate the survey data. These observations focused on the degree to which students adhered to the specific policies they had voted to implement.

By triangulating formal survey responses with these real-time behavioral observations, the study attempted to capture the “micro-processes” of trust and power essential to a democratic classroom. While formal analysis of the qualitative data is showcased in the section below, several “Lessons Learned” emerged during the implementation phase that are critical for faculty development:

1. **Instructor Vulnerability:** A key lesson for faculty is the necessity of letting go. The transition from a unilateral authority to a partner in a “democratic school” model requires the instructor to be comfortable with outcomes they might not have chosen personally.
2. **Power of Transparency:** The act of using a Microsoft Form for anonymous voting was a small technical step that yielded a large cultural lesson. It mitigated the risk of a few dominant voices “co-opting” the class agenda and ensured that the final policy was a true reflection of the collective.
3. **Professionalism vs. Personal Gain:** Students did not simply vote for the “easiest” policies. Instead, deliberation often centered on professional accountability, with students arguing that strict policies would better prepare them for engineering industry standards. To mitigate tension between lenience and rigor, students were granted agency. Interestingly, they often advocated for stricter professional standards, prioritizing career preparation over personal ease.

Descriptive & Comparative Data

The study involved a first-year course ($n = 23$) and two upper-level courses ($n = 17, n = 13$). To ensure data integrity, students enrolled in both upper-level courses were required to complete the survey only once, resulting in a unique population of $N = 38$ student participants. While initial observations suggest similar trends across all levels, this paper focuses on the aggregate results ($N = 38$) to highlight broader pedagogical lessons. The total population offers a substantive foundation for this “Lesson Learned” case study, the authors acknowledge that the relatively small sizes within the individual upper-level courses may limit the statistical reliability and broader generalization of the quantitative trends. However, this scale aligns with the description of “sustainability” and a straightforward approach to curriculum development [5]. Thus, allowing for high-impact interventions that are not overly resource intensive for faculty. Table 1 in appendix A shows the mean and the median values on a 5 point Likert scale (1 = Strongly Disagree to 5 =

Strongly Agree) for the combined cohort of ($N = 38$) students representing student agreement with prompts such as **“I feel that my opinions are valued in this classroom”**. These metrics represent only student perceptions; instructor observations were used only to substantiate these findings qualitatively and are not included in the quantitative values shown in Table 1. To address these population limitations, the study is currently in an expansion phase, with additional data being collected in subsequent semesters to further substantiate these preliminary observations. Despite the current data constraints, the findings serve as an essential empirical starting point for investigating how “lesson practicalities” can be used to navigate the “micro-processes” of power in technical disciplines.

The student feedback overwhelmingly suggests that participating in the decision-making process facilitated a transformative shift from passive recipients to active partners in the learning environment. This policy-voting exercise fostered a heightened sense of personal responsibility and a voluntary adherence to course norms, as students perceived the class-ratified rules to be more meaningful and equitable than traditionally mandated policies. Furthermore, the intervention mitigated the traditional power imbalance, creating what students described as a “safe space” as indicated by the high “Valued” and “Engaged” scores, where they felt authentically supported by the instructor. This perception aligns with the “pull-factors” identified by Brooman et al. [5], where a sense of being cared for by the faculty replaces coercive structures. Students explicitly contrasted this model of “shared governance” with the rigidity of standard engineering courses, expressing a concern that they would miss this level of involvement in future curricula. Ultimately, the data indicates that students felt a stronger “social contract” and an obligation to adhere to their choices, leading to a greater investment in course work and a commitment to the communal standards they helped define.

Practical Recommendations & Conclusions

This study demonstrates that unsettling traditional power dynamics in the engineering classroom is not merely a theoretical exercise but a vital evolution for fostering student agency. By transitioning from “push factors” to “pull factors”, instructors can move beyond passive consultation to treating students as genuine “educational planners”. Our comparative data across three cohorts ($N = 38$) indicated that all levels responded positively to the transparency of a “social contract”. While the sample size is limited, the ongoing collection of data aims to further substantiate these preliminary observations. Ultimately, this intervention serves as a sustainable, low-resource model for faculty developers to integrate democratic governance into rigorous technical disciplines, ensuring that students are not just participants in a curriculum, but active partners in its constructions. Expanding on this study’s focus on classroom climate and agency, future research should explore deeper participatory design, such as allowing students to negotiate grading schemes and rubrics. To move beyond qualitative benefits, subsequent iterations should employ quasi-experimental designs with control groups to measure the direct impact of these practices on technical mastery and learning outcomes. Additionally, future longitudinal studies will incorporate disaggregated analyses to compare the experiences of different student cohorts as sample size grows more robust.

References

- [1] A. Cook-Sather, “Tracing the evolution of student voice in educational research,” in *Radical collegiality through student voice: Educational experience, policy and practice*. Springer, 2018, pp. 17–38.
- [2] A. Fletcher, *Meaningful Student Involvement Guide to Students as Partners in School Change*, 10 2005.
- [3] E. Strating, K. Vanlommel, and M. Vermeulen, “Student voice in educational change: Approaches to enhancing motivation within the classroom,” *Review of Education*, vol. 13, 07 2025.
- [4] C. Robinson and C. Taylor, “Student voice as a contested practice: Power and participation in two student voice projects,” *Improving Schools*, vol. 16, no. 1, pp. 32–46, 2013.
- [5] S. Brooman, S. Darwent, and A. Pimor, “The student voice in higher education curriculum design: is there value in listening?” *Innovations in education and teaching international*, vol. 52, no. 6, pp. 663–674, 2015.

A Appendix

Table 1: Student Perceptions of Participatory Policy Design ($N = 38$)

Metric	Mean	Median
Valued	4.7	4.8
Influential, & Invested	4.4	4.3
Ownership, Motivation, & Less Risk Averse	4.5	4.5
Engaged	4.6	4.7
Participation	4.3	4.5
Policy Relevance, & Increased Confidence due to Respect	4.4	4.3
Increased Confidence due to Trust	4.2	4.0
Increased Confidence	4.1	4.0
Commitment	4.2	4.3
Policy Understanding	4.5	4.7
Responsibility	4.4	4.5