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BOARD # 264: IUSE: Using Strategic Planning to Drive Curriculum and Cultural Change

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IUSE: Using Strategic Planning to Drive Curriculum and Cultural Change

Introduction

Implementing change in higher education departments is often challenging, especially when related to curriculum and/or cultural issues. Faculty members often have deeply held beliefs about how curriculum should be structured. They bring individual and unique experiences to the table that frame their thoughts and approaches about courses, pedagogy, and curriculum. Further, change can lead to a sense of loss, perhaps of an individual course or how a course fits into the overall curriculum or simply of how things were taught in the past. Similarly, culture is generally deeply engrained in the faculty, staff, and operations of academic units. To overcome these challenges, Borrego and Henderson [1] describe change as most effective when multiple change strategies are employed across four overlapping dimensions. Their matrix identifies the category of creating a "shared vision," in which leaders work to develop an organizational culture that facilitates change and create organizational conditions that increase the likelihood of productive change. They observe that change in complex systems, such as academic units, occurs through collective action.

For context, the School of Civil and Environmental Engineering (CEE) at the Georgia Institute of Technology (Georgia Tech) received a National Science Foundation (NSF) Revolutionizing Engineering Departments (RED - Adaptation & Innovation track) award in September 2020. The primary focus of the RED project is to address program deficiencies through developing courses to engage students earlier in the curriculum, integrating professional and advanced computational (i.e., applied artificial intelligence, machine learning, and data analytics) skills, and revamping the sequence and structure of the curriculum with an overarching goal to enhance the sense of belonging to the School, the major, and the profession. In addition, the School, in partnership with three other programs at Georgia Tech, received a Kern Entrepreneurial Engineering Network (KEEN) grant from the Kern Family Foundation in March 2021 with the objective to develop more holistic engineers with entrepreneurial mindset, which dovetailed beautifully with the RED project goals.

This paper describes the process and outcomes of cultivating a shared vision among the faculty, staff, and students by integrating the RED and KEEN project goals into the School's comprehensive strategic plan.

Description of planning process

The School started work on a comprehensive strategic in Spring 2021. For context, the COVID pandemic continued to influence operations significantly at this time, as vaccines were just becoming available. However, the School leadership had paused the planning process for a year at that point (due to the pandemic), and it was clear that the process needed to start both because the previous plan had naturally run its course and because the post-pandemic world was going to require new strategies. The School's research focus and emphasis were already established via a prior process, which was an intentional aspect of the initial strategic planning stage. Rather than

focusing the planning on research directions, the perspective was naturally much broader to address all aspects of the School: student, faculty, and staff experiences; organizational effectiveness; and culture. Both the Institute and the College of Engineering had relatively new strategic plans in place; hence the School also had these documents to serve as guideposts. The overall effort took about 18 months with a formal launch of the strategic plan in Fall 2022.

The initial steps were to perform a strengths, weaknesses, opportunities, and threats (SWOT) analysis at a faculty retreat. Further, the School's external advisory board was engaged for detailed conversations about potential philanthropic priorities. A core team was established to lead the development of the strategic plan. This group included faculty, staff, two graduate students, two undergraduate students, and one alumna. The group was diverse in terms of age, expertise, gender, ethnic group, role, and other attributes.

Stakeholder engagement was an important and intentional aspect of the planning process. School leadership purposely engaged with numerous groups of constituents - faculty, staff, undergraduate students, graduate students, recent alumni, industry partners, advisory boards, and the College of Engineering Dean's office. Modes of engagement included "focus group" meetings, surveys, discussions, and retreats. Each of the constituent groups was engaged at multiple time points in the process and their feedback was formative for the final product.

The initial work of the core team focused on defining the vision, mission, and tagline statements, as well as updating the core values of the School. Previous versions were dissected and re-built, and it was fascinating that some elements stayed similar to previous versions with relatively minor updates, whereas others were replaced entirely. Stakeholder input was critically important to develop and finalize these statements. For instance, student focus group meetings were a primary driver to finalize the tagline statement with a more modern interpretation and meaning.

With these statements near completion, the core team embarked on a PEST analysis. A PEST analysis is a tool that helps organizations understand and evaluate external factors and strategic risk that influence their operations [2]. The acronym represents political, economic, social, and technological factors. The core team collected and shared data, articles, and other documents that relate to higher education, the professions of Civil Engineering and Environmental Engineering, the State of Georgia, and the City of Atlanta, etc. The sources of information included institutional data, articles from thought leaders, white papers, economic data, and reports from the National Academies, industry, agencies, and professional associations. With these critical input sources collected, considered, and discussed, the core team moved to identify and prioritize trends based on a matrix of high-medium-low likelihood of occurrence vs. high-medium-low impact. This stage involved generating a comprehensive list of important (i.e., high-likelihood/high-impact) factors emerging from the PEST analysis, then refining, consolidating, and prioritizing those factors. Five themes emerged naturally from this process, and the core team generated related objectives and initiatives for each theme.

During Summer 2022, School leadership worked to organize the draft themes, objectives, and initiatives that the core group had generated. The bottom-up development process had led to many useful elements, but they, frankly, lacked organization and structure. The effort included

grouping the themes/objectives/initiatives into three broad umbrellas of Community, Student Experience, and Discovery & Service. Further, the components were edited to reduce redundancy that resulted from core team sub-groups working in parallel and to harmonize the language. Efforts were also made to ensure alignment of the School's draft plan content with the College of Engineering and Institute plans. A critical realization at this moment was that the framework was set up perfectly to include a sixth theme, the final version of which reads "Foster a sense of belonging to the School and the CEE profession." The addition of the sixth theme at this stage allowed School leadership and core team to re-arrange the objectives and initiatives slightly to include elements that had emerged organically from the PEST analysis as well as the major goals of the RED and KEEN grants.

A critical step at this near-completion point was to meaningfully engage with the School's faculty and staff regarding the draft plan content. A joint faculty/staff retreat was arranged in September 2022. Again, for context, this time-point corresponded to the period when people were just starting to appear, in large numbers, on the Georgia Tech campus without wearing masks. Nevertheless, School leadership felt it was important to have an in-person retreat, with the necessary safety protocols, to include face-to-face break-out sessions to review and debate the draft plan content. Remarkably, roughly 80% of the School's faculty and staff participated in the in-person retreat, which effectively served as a final editing session of the strategic plan content. Combined with the previous continual engagement with the School's key constituents, this final retreat served as an important reflection and buy-in session that effectively codified the plan content as well as the inclusion of the RED and KEEN-related initiatives. After incorporating this final set of feedback, the School's strategic plan was formally launched in Fall 2022 via printed and digital collateral and a launch event for faculty, staff, and students.

RED and KEEN content in the strategic plan

Figure 1 presents a brief summary of the themes, objectives, and initiatives of the School's strategic plan. In the interest of brevity, the other objectives and initiatives are not presented, and Fig. 1 specifically focuses on and highlights the elements related to the RED and KEEN projects. The full plan is available at https://ce.gatech.edu/strategic-vision. The main conclusion is that the goals of the RED and KEEN projects are woven into the strategic plan either through initiatives directly related to the curriculum or via initiatives addressing the School's culture.

The RED and KEEN related content appears most prominently under Student Experience Theme A. Here, the initiatives flow directly from the RED project, such as Student Experience A1a (i.e., theme capital letter – objective number – initiative letter) in Fig. 1. Similarly, the initiative focusing on the development of two pedagogies (Student Experience A2b) follows directly from the KEEN project. Initiatives under Community Theme A also relate to the RED's overarching goal to create a sense of belonging. Figure 1 again highlights these objectives and initiatives, specifically relating to cultivating an inclusive environment. Similarly, initiatives under Student Experience Theme A Objective 3 address creating a sense of belonging via promoting a psychologically safe culture.

Community

Themes:

A: Recruit, retain, and develop diverse, service-minded students, faculty and staff who build and support a community fostering excellence, equity and inclusion

Objectives:

2. Retain our most valuable resources—students, faculty and staff—by cultivating an inclusive environment and developing opportunities for advancement, recognition, and support.

Initiatives:

a. Recognize and celebrate cultural differences within the School.

b. Encourage continuing education of faculty and staff by incentivizing professional development that is beneficial to the employee and School operations.

d. Promote a school culture that values collaboration and contributions of our people.

B: Improve access to financial resources and enhance opportunities to support the needs of the School and the financial wellbeing of the CEE community.

Student Experience

Themes:

A. Foster a sense of belonging to the School and the CEE profession.

Objectives:

1. Implement early and vertically-integrated engagement of CEE students.

Initiatives:

a. Create a spine of sequential problem-based learning courses

2. Develop holistic and collaborative engineers who know how to discover and solve real-world problems while creating value.

Initiatives:

a. Integrate skill development in teaming, reflection, and computational development at maturing levels of technical proficiency.

b. Incorporate entrepreneurially-minded learning (EML) with a primary focus on two pedagogies: Story-Driven Learning (SDL) and Value Sensitive Design (VSD).

c. Implement faculty development initiatives related to problem-based learning, applied computational skills, teamwork, and reflection.

3. Promote a psychologically safe culture, where all members of the CEE community can be their authentic selves.

Initiatives:

a. Cultivate connections through engagement opportunities among faculty, graduate students, and undergraduate students.

b. Provide support for community building initiatives within the School.

B. Pioneer learning opportunities that empower the CEE community to reach their educational goals and meet emerging and long-standing challenges.

Discovery & Service

Themes:

A. Conduct innovative cross-cutting research to create new knowledge in natural, built, socioeconomic, and information systems with local and global impacts.

B. Develop innovative research, education and service initiatives to support equitable economic development throughout the State of Georgia, the nation, and the world.

Figure 1: School strategic plan content highlighting the RED/KEEN-inspired initiatives.

https://ce.gatech.edu/strategic-vision

Concluding remarks

Borrego and Henderson [1] note that effective leaders form conditions to allow complex, fluid organizations to thrive. The inclusive approach of weaving the goals of the RED and KEEN projects into the School's strategic plan had the intended effect of legitimizing, by forming a shared vision, the ambitious goals to transform the School's educational programs. Adopting the projects' goals in the School's formal plans, programs, and processes provides authority in the eyes of all stakeholders and the changes are more likely to be sustainable. In this regard, integrating RED and KEEN goals into the School's strategic plan marked the beginning of a different phase of the change initiative. For instance, more faculty members have joined the initial (relatively small) RED/KEEN group of innovators to develop and deliver courses, curriculum, and cultural changes.

Significant progress has been made on numerous initiatives related to the RED and KEEN projects. For example, the faculty voted in February 2024 to formally approve the newly-developed courses for the RED project, which had been piloted as special topics courses for several semesters. At the same time, the faculty voted (nearly unanimously) to adopt the new curriculum for both the B.S. Civil Engineering and B.S. Environmental Engineering degree programs to include the new spine of sequential problem-based learning courses. The new curriculum includes a first-year engagement course called "Exploring Civil and Environmental Engineering" with the purpose of engaging students with cutting-edge content framed around the School's cross-cutting research themes. The course also starts the professional formation experience with the overall intention of developing a sense of belonging early in the students' studies. The new course sequence also includes a course that applies modern computational tools (i.e., artificial intelligence, machine learning, and data analytics) to Civil and Environmental Engineering systems. These brief examples are illustrative of a broader realization of the effectiveness of building a shared vision through the strategic planning process.

Acknowledgement

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References

[1] M. Borrego and C. Henderson, "Increasing the use of evidence-based teaching in STEM higher education: A comparison of eight change strategies," *Journal of Engineering Education*, vol. 103, pp. 220-252, 2014.

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