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From Classroom to Career: Designing a Program to Foster Building Professional Competencies (Work in Progress)

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Abstract

Building professional competencies is a key aspect of the higher education student experience. At the University of Michigan, a central unit has created a tool that helps students plan and track their academic, co-curricular and professional experiences, build core competencies, and assemble all the pieces to tell their story, their way – to employers and beyond.

The tool is adaptable to the needs of the programs partnering with the central unit to develop this platform – currently engineering, business, and public health. As a first step, the tool allows each program to determine which competencies they want their students to engage with, and how. The engineering college, for example, has some integration with coursework to automatically move students through different levels of the program, but the primary focus is directing students to engage with the tool to reflect on their experiential learning activities such as project teams, study abroad or research so they can build a story bank of their growth and development to prepare for interviews or other employer interactions. In the business school, the tool is integrated into the undergraduate curriculum, and students achieve different levels of each competency through the courses they take, with some direct interaction with the tool. Lastly, public health has fully integrated the tool with a masters program, where students use the tool to explore the pathways to different careers as they gain proficiency in various skills, and much of what happens in the tool is automated through the courses the students take.

In all implementations, students can earn a badge that can be shared as a LinkedIn credential that highlights their mastery of specific competencies for public view. The visual design of the credential is the same across the units, with custom text and graphics paired with the university logo.

This work in progress paper will share the background and development of the tool as well as discuss the various implementations and future plans.

Introduction

Building professional competencies – or "soft skills" – is a key aspect of the higher education student experience, and students engage with these competencies both in and out of the classroom. However, some students may not initially recognize the importance of these non-technical skills, even though employers deem them critical to the success of new employees [1]. Additionally, students may not know the best way to communicate these skills to employers in interviews or other interactions, and may have limited mechanisms to verify their effort and skill development in these areas.

At a large public university such as the University of Michigan, the professional competencies needed by students vary depending on their field of study, so any tool used campus-wide needs to be flexible to the requirements of the different units. At the same time, a single tool used by all is easier for the university to support, and has the advantage of building brand recognition with both employers and students. Additionally, because various units are working together to develop the tool, they are all learning from each other, and feature requests from one unit can be implemented by any program. This also leads to cost sharing for the units involved and a better scaling mechanism for the institution.

On this campus, a central unit has created a tool that helps students plan and track their academic and professional experiences, build core competencies, and assemble all the pieces to tell their story, their way – to employers and beyond.

Development of Spire

Since 2015, the Center for Academic Innovation (CAI) has developed and implemented GradeCraft, a "gameful learning" tool that can be incorporated into any class at the university to support student autonomy, engagement, and intrinsic motivation. Courses using GradeCraft are designed to allow student autonomy in choosing which in a set of assignments they complete, for example, and Gradecraft recognizes the progress students make through mechanics like unlocks, level ups and badges [2]. In 2016, this tool was implemented as an integral part of a competency-based professional development program at the University of Michigan-Dearborn. In this implementation, students were asked to reflect on academic, personal and professional experiences and connect those to the National Association of Colleges and Employers (NACE) competencies in order to move through the program. This program also incorporated scaffolding, structuring the program design such that engaging in certain experiences unlocked the opportunity to take on others. Ultimately, engaging with the program enables students to earn a designation on their student transcript and campus recognition [3].

Over the next few years, demand for a competency-based tool grew, with multiple academic programs on campus requesting that the Center for Academic Innovation build technology of this type, including the shift from solely course-based activity to encompass learning from

experiential opportunities across multiple semesters as well. The decision was made to build upon the foundation of existing tools GradeCraft and ECoach (a platform for delivering tailored just-in-time content to students) and design a new product to intentionally support competency-based development programs. This new tool, called Spire, would have many of the same gameful elements (levels, unlocks, badges), but would be built from the ground up and support multi-year experiences where students could explore how program-specified skills relate to a myriad of activities available to them, be encouraged to make a personal plan, have space to reflect on their experiences, and be recognized formally for their growth, thereby enabling them to demonstrate their mastery of skills over time.

Implementation of Spire

When a unit implements Spire, the first step is to determine what competencies are relevant to the program, and therefore what learning objectives students will be asked to engage with. Competencies can be grouped into categories – for instance, one program chose to group them by careers, such as Data Analyst, Biostatistician, and Environmental Consultant – and they can also be broken down into sub-competencies. Additionally, each competency or sub-competency can have different levels of achievement. For example, a **Communication** competency could be part of an **Interpersonal Skills** category (in a program where other categories might include Leadership Skills and Analytical Skills) and have sub-competencies for *Listening*, *Presenting*, and *Writing* that all have levels of expertise such as Beginner, Intermediate, and Master. This flexibility allows for units to customize the student experience to best fit their objectives.

Because the development of professional competencies can take place in the classroom as well as during experiential learning opportunities such as project teams, research, and study abroad, or work experiences like internships, students are encouraged to consider all of their academic, personal, and professional experiences and reflect on individual "opportunities." *Opportunities* are meaningful experiences in which students can practice and grow their professional skills, such as the examples listed above. Students can choose from staff-created opportunities or create their own. Encouraging students to reflect on their professional skill growth no matter where it takes place reinforces that these skills are not siloed, but rather carry across all aspects of their lives and throughout their college career.

With the competencies designed and curricular and co-curricular opportunities documented, programs then determine how students can advance to the various levels, which can be any combination of the below:

- Automatic advancement in a competency based on students writing reflections of associated opportunities they have engaged with in the system
- Staff members manually reviewing student reflections on their engagement with opportunities and either approving them for advancement or requesting the student engage in more substantive reflection

- Automatic advancement based on grades in courses that have been identified as being relevant opportunities for students to learn and demonstrate growth on specific competencies (enabled by an integration with the campus learning management system, Canvas)

In the engineering program, for example, students can advance in all three ways. They can advance to the first level of expertise by completing reflections. Then, as they complete more reflections, students are prompted to submit a request to move to the next level by answering specific questions related to the competency, their experiences, and their growth. Additionally, there are some courses that already incorporate competencies into the coursework. For example, in a design course, students may be developing skills such as communication, teamwork or critical thinking, but these skills may have received less attention than the technical skills they are learning. By working with the Spire team, faculty can determine which specific competencies students gain in the class, and students can automatically level up based on their final course grade through an integration with the learning management system [4].

Other programs have more prescribed paths. For example, in the business and public health programs, students advance through Spire based primarily on grades they receive in specific courses. Similar to the engineering program, students in the business program can also choose from program-defined opportunities to reflect on such as conducting research with faculty, attending specific events or workshops, or completing certain courses. Business students can also create their own opportunities and then reflect on those experiences.

Each program can also decide if there should be any badges, and if those badges can be shared outside of the system – to LinkedIn, for example. If programs turn on this functionality, Spire leverages the LinkedIn Profile API to let students share badges in their LinkedIn page's *Licenses and Credentials* section, automatically including information about what it was for and who authorized it. The visual design of the credential is the same across the units, and includes competency-specific text and graphics that are then paired with the university logo. Focus group input from both students and employers at this institution showed that both groups supported the use of a LinkedIn credential. Additionally, studies of both engineering and business students show students' interest in showcasing their professional or employability skills in platforms like LinkedIn in the job application process [5], [6]. This type of credential also offers employers an insight into potential candidates abilities that may not be apparent via a traditional transcript [7].

Based on the initial survey students complete when they first log into the tool, students receive personalized tips on their Dashboard. Additionally, these behavioral cues are used in the monthly progress message students receive to tailor the emails for the students to suggest possible opportunities to complete, to continue reflections they've started, or to nudge them towards submitting a level-up request.

Current and Future Partners

As of fall 2024, three programs have implemented Spire: the College of Engineering, the Ross School of Business, and the School of Public Health. Each unit implements Spire in unique ways, and this drives innovation that benefits all of the units. For example, Engineering wanted sub-competencies to represent the different dimensions of a competency, such as the Communication example above, with *Listening*, *Presenting*, and *Writing* as the dimensions. Similarly, Public Health wanted students to be able to use the tool to explore pathways to different careers as they gain proficiency in various skills. This required the competencies to be clustered into categories and then mapped to various careers. These features are now available system-wide for any program to use.

Program representatives meet regularly with CAI. Although coordinating schedules is challenging, the CAI also arranges two meetings per year where representatives from all units come together to discuss new features and priorities, and to share updates on the progress of implementations.

There are several other programs that have shown interest in Spire, including the liberal arts and information schools, and so engagement with Spire will likely continue to grow. Additionally, the College of Engineering is creating a new program for graduate students that will leverage Spire. The goal of this initiative is to provide graduate students with a framework to intentionally explore learning opportunities, expand their knowledge and intellectual horizons, engage in meaningful experiences, reflect on what they have learned, and benefit from the value of the core competencies they have developed by utilizing them in the service of society.

The College of Engineering is also developing an Engineering Leadership Center, the mission of which will focus on developing student leadership skills (including self-direction in one's own life, as well as leading peers and teams) through personalized roadmaps which integrate evidence-based transformational experiences (inside and outside the classroom), cutting-edge content, reflection, and coaching. Spire will be a key piece of the Leadership Center and provide support at scale for goal setting and reflection to advance professional development.

Measuring Success

Each program has unique measures of success based on their needs. Because this is still a new tool, assessment of student satisfaction, engagement with the tool, etc. is still on-going but a brief summary of engagement is below.

College of Engineering

Spire is available to any undergraduate or graduate engineering student, though the target audience is undergraduates. As of February 2025, there are 94 staff-created opportunities and 189 individual students have created their own unique opportunities. Additionally,

- 46% of all undergraduate engineering students and a small number of graduate students have engaged with the system
- Of those, 54% have planned to complete at least one activity
- 736 students have levelled up in the system, including those that were conferred through course-integrated level ups, and the vast majority (93%) have achieved more than one, for a total of 3,741 level ups awarded
- Two students have earned a LinkedIn credential

In the fall of 2024, two electrical engineering and computer science courses, one robotics course, one post-study abroad course, and four technical communication sections integrated automatic leveling in the tool based on course grades (combined student enrollment for these courses was just under 400 students). The engineering program has set a goal of achieving 50% engagement from their undergraduate students and encouraging more students to earn the LinkedIn credential. To reach this goal, one aspect the team will be assessing is comparing the engagement of students who were automatically advanced to those who were not, considering questions such as: *Did this automation prompt more students to engage with the tool? Are students who experienced automated advancement more or less likely to earn the LinkedIn credential?*

One challenging aspect to measure is the value of student reflections on their experiences. Even if students do not advance far enough to earn the LinkedIn credential, their engagement in reflection and self-assessment is crucial for personal development [8]. As one student said, "You're always going so fast here, there's always the next thing to be looking at, another thing to do, and homework assignments to turn in. You get lost in the jungle of assignments and project deadlines. You never see what you've accomplished until you've written it down and take the time to recognize how you've grown." As more students engage with Spire, we will be conducting additional focus groups and surveys to assess their perception of its value.

Ross School of Business

The Business School has made Spire available to all of their undergraduate students. The platform is introduced to students in coursework during their first year. The program highlights 12 competencies, which were intentionally selected to align with the NACE competencies. The business program's core design relies primarily on students' progressing through the program via leveling automatically granted through engagement in their coursework. A core impetus for the launching the program was the frequency with which students reported not understanding how the assigned coursework related to their career goals, and so the program was conceptualized as a

dashboard to help students relate course-based learning explicitly to their development of career-necessary skills.

Across the business school's implementation of the program:

- 94% of the undergraduate business student population have engaged the system
- 91 distinct opportunities have been identified for students to engage with in the curricular, co-curricular, and extracurricular space
- 4,323 level ups have been awarded in the system, including those that were conferred through course-integrated level ups
- Two students have earned LinkedIn credentials, one of them has earned two!

School of Public Health

Public Health's implementation is the most recent, launching in Fall 2024, and required the most substantial changes to the platform to support. This included a new feature to show students potential careers in public health and explicitly connect them to specific competencies, which are then connected to the learning objectives for specific courses (consistent across all programs described). Because the program is so new we are not reporting engagement metrics until the end of the first year.

Campus-wide Credentialing Efforts

Spire represents three programs' efforts to engage with competency-based development across their curricular, co-curricular, and extra-curricular ecosystems. A variety of other programs on campus have expressed interest in leveraging the program, with ideas ranging from using it to support the campus career centers, to creating a campus-wide co-curricular transcript, to using it to offer lifelong learning to alumni.

Conclusion

As the skills needed in the world of work continue to evolve, so does the development of our students. This competency-based tool provides students with a place to reflect on their personal growth and build a story bank for interview prep, a way to explore the pathways to different careers, and the ability to showcase their mastery of professional competencies in platforms such as LinkedIn. As an institution, teams will continue to collaborate, learn from each other, and build brand recognition with both students and employers as the tool scales to other units.

The multi-year cross-campus effort to establish Spire has resulted in a centralized campus platform that can access both in-course progress and extracurricular event attendance, and sensemake student engagement through the lens of program-specific competencies and connect them to both coursework and future career paths. Spire presents a unique opportunity for a higher education institution to actively engage students in the metacognitive effort to consider key

professional competencies, seek out opportunities to develop them, and craft a career-ready professional presence.

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