Creating value for entrepreneurs through a transdisciplinary experiential program

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Abstract

New entrepreneurs and startup companies typically have genuine needs but sometimes need more resources to execute them promptly. This could delay a product or service launch, leading to a missed opportunity to gain market share. Some of the needs are beyond their expertise and may require multidisciplinary teams to help them reach the next level. To help the startup companies and entrepreneurs in Dayton, the Stitt Scholars Program (SSP) at the University of Dayton was instituted to provide opportunities for multidisciplinary teams to work with entrepreneurs, startup companies, and government organizations to provide value for them while learning about innovation and entrepreneurship. This paper presents the framework of the program and analyzes the feedback from the major stakeholders. The program started with a generous donation from an alumnus to support programs that help to break the silos in academia. Consequently, the SSP, piloted in the fall of 2021 with business and engineering students, now includes students from the College of Arts and Sciences at the University of Dayton. The students have their regular course loads and, in addition, put in 10 hours of work each week by working on projects for the entrepreneurs. The students are paid from the program's fund. During the 2021/22 academic year, the students' work helped to secure financial support from the PNC Bank to support minority-owned businesses in the Dayton area. The program's success has led to the donor donating an additional $100,000 to sustain the program. Generally, the students have enhanced their communication, leadership, and problem-solving skills. Most students indicated that the program helped them critically review problems and communicate effectively in multidisciplinary teams. Additionally, the clients expressed satisfaction with the students' work ethics and the quality of project deliverables. Thus, the program offers students an experiential learning opportunity to enhance their entrepreneurial and problem-solving skills while providing value for community partners through transdisciplinary learning.

1. Introduction

The Stitt Scholars Program at the University of Dayton was started to create an opportunity for transdisciplinary teams of Arts, Business, and Engineering students to collaborate with entrepreneurs and startup companies in the Dayton area. With a generous donation from Jim and Carrol Stitt (of Cutco Corporation), the first cohort was recruited to start in the fall of 2021 semester. The program requires students to commit to one academic year (fall and spring semesters) of experiential learning, where they work in transdisciplinary teams with startup companies and entrepreneurs. The students, who are sophomores, juniors, and seniors maintain their regular semester schedule while engaging in the program. Each student puts in ten hours of work each week by working in transdisciplinary teams on projects with an entrepreneur or a startup company. The students are paid for the amount of time they work in the program.

The program works collaboratively with Crotty Center for Entrepreneurial Leadership. Students and entrepreneurs in the Dayton area rely on the Entrepreneurs' Center and the Crotty Center for Entrepreneurial Leadership for various entrepreneurial help. Therefore, there is a huge ecosystem

of entrepreneurs and startup companies with project needs. Since the Entrepreneurs' Center and the Crotty Center for Entrepreneurial Leadership cannot conduct all the technical work, the Stitt Scholars work with them to execute the projects at no cost to the entrepreneurs. During the 2021/22 academic year, the students completed eight distinct projects in the fall semester and six during the spring 2022 semester.

Through the Entrepreneurs' Center and the Crotty Center for Entrepreneurial Leadership, the director of the program meets with clients to learn about their project needs, and also share information about the capabilities of the students. If the students possess and potential and skills to execute the project, a project description form, which states the background of the project, scope, deliverables, target completion date, and major stakeholders will be prepared. The program prioritizes projects that can be completed in four to eight weeks. This leads to a lot of frequent interactions between the student teams, faculty mentors, and their clients. This way, each student gets the chance to serve as a team leader and works with different clients during the academic year. It also presents the opportunity for different forms of experiences for the students. A couple of the projects also last an entire semester with several phase reviews.

After projects are assigned to the students, the team leader reaches out to schedule a kickoff meeting with the client. The team prepares a brief project chatter and reviews it with the client during the kickoff meeting. The project then continues with weekly project updates with the client and the instructors. Depending on client availability and preferences, the weekly project updates are either in-person, virtual, or via email. At the end of the project, the students give a final presentation to the client and other interested stakeholders. In addition, the students also present their experience in the program at the Stander Symposium at the University of Dayton during the spring semester.

2. Brief Literature Review

Startup companies face many challenges in their entrepreneurial life cycle that may transcend traditional academic disciplinary boundaries. Through the entrepreneurial continuum, entrepreneurs typically require transdisciplinary approaches to catalyze their growth. Transdisciplinary learning involves three or more entities [1]. In the Stitt Scholars Program, students from the business school, engineering, college of arts and sciences, and entrepreneurs and other stakeholders from Dayton, Ohio, form transdisciplinary teams and work collaboratively on projects for startup companies. This enables the teams to execute multifaceted projects that meet the needs of startup companies.

Transdisciplinary teams have been utilized in various professional settings. Transdisciplinary teams of engineers, scientists, policymakers, and the citizenry have worked on several projects. However, transdisciplinary teams do not always succeed in their quest to solve complex problems [2]. Barrett et al. explain that "simply bringing highly skilled students (and faculty members) together to generate real-world solutions and policy recommendations for complex problems often fails to consistently create the desired results in transdisciplinary settings" [2].

Transdisciplinary learning differs from interdisciplinary and multidisciplinary approaches [3]. While they have a lot in common with transdisciplinary learning, they typically focus more on

solving problems through enhanced communication among multiple sectors [3]. A transdisciplinary approach requires participating stakeholders to engage in deep collaboration through a common vision. It utilizes experiential learning to ideate, create, innovate, and address problems [4]. In the Stitt Scholars Program, the transdisciplinary teams iteratively work with their clients and other stakeholders to achieve the project deliverables. The projects, as an experiential learning tool, serve as the core foundation for transdisciplinary learning. The projects and the deep collaboration with the entrepreneurs make the experience authentic. The students also see the relevance of their input towards their professional formation and the growth of the entrepreneurs and their startup companies. Another principle of experiential learning is the student's ability to connect their experience to their professional formation through reflection [5, 6].

The students submit weekly reflection papers about what they have learned about innovation and entrepreneurship. They do this by reflecting on their interactions with industrial speakers and their experiences from their projects, as well as the book they read. The projects also make learning active. This principle of experiential learning helps to "fully engage" [5] the students in their learning. They develop professional relationships with their clients due to the weekly touchpoints and can negotiate where necessary. This flexibility empowers the students to own the project, which typically leads to an enhanced learning experience [7]. Thus, students in the program get the opportunity to engage in a transdisciplinary experiential learning program that is active, authentic, connects the experience to future opportunities, and is relevant. Jacoky-Volk et al. [8] emphasize the synergistic effect between project-based learning and a transdisciplinary approach.

Barrett et al. [2] explain that the exposure that transdisciplinary teams get through the projects they execute, or the experiential learning opportunity may not necessarily lead to the acquisition or enhancement of transdisciplinary skills. They propose the application of Vygotsky's zones of current and proximal development [9] as one of the conduits to ensure that students in transdisciplinary teams succeed in their acquisition of transdisciplinary skills [2]. The students have different backgrounds and experiences, hence, understanding their Zone of Proximal Development is essential to their learning and value creation. Therefore, teams are introduced to different types of projects and leadership tasks at different times during the year-long program. As Barrett et al. [2] noted, the scaffolding of the experience helps to manage the student's physical and cognitive workload, which leads to a better transdisciplinary learning experience.

Barrett et al. [2] identified four main areas that transdisciplinary instructors must provide support: collaboration, communication, conflict, and teamwork [2]. Clients who worked with the Stitt Scholars highlighted their effective communication skills, which will be discussed later in this paper. The student teams also engage in deep collaboration. By empowering them to own their projects, each student was able to fully engage in the project work, discussion forums, and reflection sessions. They comment on each other's forum posts and project output respectfully even if it was not within their traditional discipline. Teams are also encouraged d to resolve conflicts internally and involve faculty members only when it is necessary. As higher education

continues to evolve, educators must continue to reflect on their pedagogical approaches to ensure that students will be prepared to solve multifaceted societal problems that transcend the traditional disciplines. Societal problems are becoming more complex, and so is the demand for students who have the capacity to solve such complex problems [10, 11]. Educators must understand how to train students to acquire transdisciplinary skills for the next century [11].

3. Program Objectives

The main objective of the program, as envisioned by Jim and Carol Stitt is to create an opportunity to utilize transdisciplinary collaborations to create value for entrepreneurs in the community. Through the learning process, the students are expected to cultivate entrepreneurial spirit by applying creative and innovative thinking, communicate (oral and written) effectively, and demonstrate professional and ethical responsibility. The program objectives are shared with prospective students during the recruitment process.

4. Recruitment

Students in the program commit to participating in the SSP for one academic year. Each spring, we visit freshmen, sophomore, and junior seminar classes to talk to the students about applying to the program. To apply, a student, who can commit to one academic year as an undergraduate student must submit a 500-word essay, a letter of recommendation from a faculty member or an academic advisor, and a current resume. Since the program was designed to give students the opportunities to engage in transdisciplinary experiential learning while creating value for their clients, we seek students who: work well or are interested in working in diverse teams; have experience or completed course work in innovation and/or entrepreneurship; have taken a design (CAD) course (if engineering student); are driven by creativity and innovative thinking; want to make a positive difference in the community. In addition, we ask applicants to highlight their desire to support diversity, equity, and inclusion, leadership abilities, and desire to engage in deep collaboration.

The application window typically lasts for three to four weeks, after which the competitive applicants are scheduled for a 15-minute interview. This allows the applicants to learn more about the program and also for the committee to learn about the applicant's potential to succeed in the program. Once the next cohort is selected, they are hired as student employees through the University's student employment office. To ensure that the program objectives are achieved, various assessments (discussed below) were conducted as explained below.

5. Assessment

At the end of each project, clients complete a seven-question survey about their perception of the student's performance on the project. The program is deliverable-oriented, thus, creating value for entrepreneurs. Therefore, the first question asks the clients if the goals or deliverables of their project were met. Clients respond with a *yes, no,* or *maybe*. This helps to ensure that clients are getting results for their time in mentoring and working with the Stitt Scholars. The clients then respond to two 5-point Likert scale questions about the team's ability to communicate effectively, and a demonstration of the ability to be creative and innovative. The clients are also

asked to reflect on the student's work and assign a letter grade (A – F) to the team. Finally, the clients respond to an open-ended question asking them "what could the student team have done better during the project?" The survey can be completed in less than 5 minutes, and it was designed to get insight (from the client's perspective) into the attainment of the program objectives.

A different survey is also completed by the students at the end of the semester. In addition, students complete two peer reviews for each project they work on. Moreover, their writing and oral communication skills are assessed through weekly project updates and final presentations. Weekly reading quizzes are also developed from the biography of Steve Jobs (by Walter Isaacson), The Secret of Apollo (by Stephen B. Johnson), and Inviting Disaster: Learning from the edge of technology (by James R Chiles). The Biography of Steve Jobs provides a great example of the importance of collaboration in innovation and entrepreneurship. Students who join the program read this book during their first year in the program. Those students who are able and permitted to do a second year in the program read and take quizzes from Johnson's book during their third semester in the program. In their fourth (final semester), the students read and take quizzes from Chiles' book. The other piece of assessment tool used is a weekly reflection. This paper only reviews the data received from the client survey.

6. Data Collection and Analysis

The client survey was designed to collect feedback that gives insight into how the program was meeting its objectives. As described above, one of the objectives of the program was to create value for local entrepreneurs and startup companies. Therefore, the first question asked about the project deliverables. At the end of each project, clients or their representatives received a link to complete the Google survey. Responses were received for 14 out of the 16 projects completed. Clients who responded indicated that the students achieved the project deliverables. One of the clients, a startup company (Lunnie) that recently launched a new postpartum bra utilized the results from one of the projects a team worked on at the University of Dayton's Flyer pitch competition and won first place with over $25,000 cash award. The transdisciplinary student team of students and their clients conducted market research to understand how the competitors were marketing and selling their products.

They also conducted a social medial audit and advised the client on the best days and times to post ads and videos. This helped the client to be strategic with her social media posting. The social media plan led to increased interaction (views, likes, and comments) with potential customers. However, there are no indications that the interactions translated into purchases. In addition, the team designed an experiment to test and compare the absorbency of the postpartum bra with the nearest competitors. They concluded that the postpartum bra, made by Lunnie was six times more absorbent than the nearest competitor. Another client also utilized the deliverables from a community project to secure $15,000 from the PNC Bank to support minority-owned businesses in Dayton. The success of the program in creating value for stakeholders led to an additional donation of $100,000 by the original donor to further support the program.

Another object of the program was for the students to cultivate entrepreneurial spirit by applying creative and innovative thinking. Even though this is difficult to assess from the client's perspective, 86% of the clients either agreed or strongly agreed that the students demonstrated an ability to be creative and innovative. Two clients noted that the students did not demonstrate creativity and an entrepreneurial mindset. Moreover, thirteen clients agreed or strongly agreed that the students communicated (orally and written) effectively during the project. As part of this program, student teams delivered weekly oral and written project updates. They also submitted final written reports and delivered final oral presentations. Finally, a question was asked about the student's ability to conduct themselves professionally with ethical responsibility. This was also one of the program's objectives, and all but one client agreed or strongly agreed that the students showed ethical responsibility and were professional. Below is a quote from Lunnie's founder.

"I was very impressed with the students' professionalism, communication, and enthusiasm throughout the project! I appreciate their eagerness to learn more about nursing bras and the maternity industry, a topic brand new to them. Their lab tests and marketing research added a huge benefit to my business, especially as I continue to compete in pitch competitions and talk with investors. I really appreciate their hard work, as well as the leadership of the instructors. I hope to have the opportunity to work with the Stitt Scholars again!"

Another client also commented that "*I was very impressed with the team. They listened well and I was happy with the attention to detail (regarding) our strengths and weaknesses. They were also polite and professional and prompt!*

When asked to respond to "what could the student team have done better during the project" most of the clients pointed to the student's ability to communicate effectively and their professionalism as seen in figure 1. They alluded that they were impressed with the students' work. However, one client indicated that the team they worked with can improve their time management skills during project updates. There were instances where agenda items were not necessarily discussed because non-agenda items took over the discussions and meetings went longer than originally scheduled. This was not surprising as each student was allowed to lead different projects at different times.

Figure 1: Word Cloud Summary of Client's Feedback

7. Conclusion

New entrepreneurs and startup companies typically have needs but sometimes lack the resources to execute them promptly. This could delay a product or service launch, leading to a missed opportunity to gain market share. Some of the needs are beyond their expertise and may require transdisciplinary teams to help them reach the next level. To help the startup companies and entrepreneurs at Dayton, Ohio, the Stitt Scholars Program at the University of Dayton was instituted to provide opportunities for transdisciplinary teams to work with entrepreneurs, startup companies, to provide value for them while learning about innovation and entrepreneurship, while enhancing their transdisciplinary skills. This paper presents the framework of the program and analyzes the feedback from the major stakeholders. Through the program, students enhanced their transdisciplinary skills while creating value for startup companies. Deliverables from one of the projects aided in securing $15,000 from the PNC Bank to support minority-owned businesses. One client also utilized a transdisciplinary project outcome to pitch and win $25,000 to support her startup company. Generally, clients expressed satisfaction with the level of creativity and innovation demonstrated by the transdisciplinary team. Thus, the program offers students an experiential learning opportunity to enhance their entrepreneurial and transdisciplinary problem-solving skills while providing value for community partners.

8. References

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