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Empowering Innovation and Entrepreneurship: A Cutting-Edge Curriculum Through the VIP+ Program

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An entrepreneur at heart, Dr. Fakhoury constantly seeks out new ideas that can improve lives. His leadership at the LAU Industrial Hub involves fostering innovation and collaboration between academia and industry, positioning the Hub as a center for research and development. In addition to his academic and entrepreneurial pursuits, he is deeply committed to mentoring the next generation of engineers, bringing his expertise in immersive technologies into the classroom to enhance student learning.

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Abstract: The Vertically Integrated Projects (VIP) model offers a transformative approach to higher education by bringing together undergraduate and graduate students with faculty in interdisciplinary teams to tackle complex, long-term and large-scale projects. At the Lebanese American University, this model has evolved into the VIP+ program, an innovative initiative aimed at cultivating entrepreneurial confidence and fostering innovation. By embedding entrepreneurial education within the curriculum, VIP+ empowers students to transform ideas into viable startups. The program integrates advanced startup labs and industry co-mentorship, providing real-world experience through internships and workshops, while enhancing leadership and problem-solving skills beyond the traditional classroom. This paper presents a novel curriculum approach that promotes interdisciplinary, research-driven education aligned with the United Nations Sustainable Development Goals, all within a Liberal Education framework. By working on shared research topics under the mentorship of both academic and industry professionals, students in the VIP+ program gain critical skills necessary for the modern workforce. The integration of VIP+ at the university offers a distinctive educational experience that boosts student employability and enhances their entrepreneurial and innovation capabilities. This innovative program ultimately aims to prepare the next generation of leaders to thrive in a rapidly evolving job market.

Keywords: Innovation and Entrepreneurship, Sustainable Development Goals, Research-Based Education for Sustainable Development, Vertically Integrated Projects

Introduction

Higher education is undergoing a paradigm shift as institutions integrate innovative educational models to address the demands of an evolving job market. Traditional classroom methods often fail to provide students with the interdisciplinary knowledge, practical skills, and entrepreneurial mindset required to excel in today's workforce. To bridge this gap, the Vertically Integrated Projects (VIP) model has emerged as a transformative approach, fostering collaboration among undergraduate and graduate students and faculty to solve complex, long-term, and large-scale challenges. The VIP model was initially introduced by Purdue University [1] and later expanded by Georgia Tech Institute of Technology to address gaps in interdisciplinary education and research [2]. Since then, the model has been adopted globally, with variations tailored to institutional goals and cultural contexts. VIP programs emphasize collaborative learning, long-term project engagement, and mentorship, which have been shown to enhance student engagement and retention [3]. Entrepreneurship education has gained significant traction in recent years as institutions strive to foster innovation. Kuratko [4] highlights the importance of experiential learning in cultivating entrepreneurial skills, while Gibb [5] argues that embedding entrepreneurship into curricula

prepares students for uncertainty and complexity in modern markets. Research demonstrates that programs integrating entrepreneurial training with practical experiences significantly improve student employability [6].

The United Nations Sustainable Development Goals (UN SDGs) [7] provide a compelling framework for higher education institutions to align their research and educational practices with global priorities [8]. Programs like VIP, which integrate sustainability into education, equip students to tackle pressing societal challenges [9]. Liberal Education, with its emphasis on critical thinking, communication, and interdisciplinary knowledge, forms the foundation for programs like VIP [10]. By combining Liberal Education principles with experiential learning, VIP offers a holistic educational approach that addresses both academic and practical dimensions of student development [11]. However, there is limited research on the integration of VIP models with entrepreneurship education. This paper aims to fill this gap by presenting the VIP+ program as a novel approach to fostering innovation and entrepreneurship within a sustainable and interdisciplinary framework.

At the University, the VIP model has been adapted into the VIP+ program, which integrates Entrepreneurial education into its curriculum. This innovative initiative empowers students to transform ideas into viable startups while simultaneously fostering critical skills such as leadership, problem-solving, and teamwork. To conclude, the VIP+ program at the Lebanese American University (LAU) builds on the traditional VIP model by embedding entrepreneurial education, startup labs, and industry co-mentorship into its curriculum. The program aligns with the United Nations Sustainable Development Goals (UN SDGs) [7], providing a unique framework for interdisciplinary, research-driven education within a Liberal Education model. This paper introduces the VIP+ program and its integration at LAU, and presents a review of relevant literature. It concludes with recommendations for scaling the model to other educational institutions.

Program Structure

The VIP+ program at LAU adopts a multi-faceted approach to innovation and entrepreneurship by integrating interdisciplinary projects with structured entrepreneurial training. Students from diverse academic disciplines collaborate in teams to address real-world challenges aligned with the UN SDGs [7]. Teams are mentored by both academic faculty and industry professionals, ensuring a blend of theoretical and practical insights.

Central to the program is the Entrepreneurship Certificate of Completion, a formal recognition awarded to students who meet specific entrepreneurial milestones within the VIP+ framework. This certificate is awarded to students upon successful completion of 6 credits of interdisciplinary VIP+ projects and 3 credits in Entrepreneurship courses. This prestigious certificate highlights their active engagement in research, innovation, and entrepreneurial skills development, preparing them to lead in both technical and business environments. To be awarded this certificate, the participating students in this VIP+ program must fulfill the following requirements:

- **Completion of 6 Credits** of VIP+ Projects:
    - Students must enroll in and complete at least **6 credits** of VIP+ projects over the course of their academic journey.

    - These credits can be earned through participation in interdisciplinary research projects, problem-solving tasks, or innovation-based collaborations under the VIP+ Program.
    - Students must meet the minimum project requirements, which include active participation, contribution to project deliverables, and fulfillment of their role within the team.
- **Completion of 3 Credits** in Entrepreneurship:
    - Students must successfully complete **3 credits** from courses focused on Entrepreneurship and Leadership. A diverse selection of courses is offered on our website, featuring topics such as Entrepreneurship, Leadership and Startups.
    - This course develops entrepreneurial skills, including business model criterion, innovation strategy, and project commercialization.

Students must demonstrate consistent engagement in VIP+ program activities, including workshops, seminars, and team meetings. They should contribute effectively to group work, research outputs, and innovation-related tasks. Moreover, the students must receive satisfactory evaluations from their project supervisors and course instructors. This includes both performance in their respective projects and the entrepreneurship course. All 9 credits (6 credits from VIP+ projects and 3 credits from the Entrepreneurship course) must be completed within the student's degree timeline unless special permission is granted for an extension. Additionally, the students participate in specialized workshops covering topics such as business model development, market analysis, and financial planning. Surveys are conducted to assess student learning outcomes, including confidence in entrepreneurial abilities and teamwork skills. Project outputs, such as prototypes and business plans, are evaluated for innovation and feasibility. Entrepreneurial training is embedded within the broader VIP+ curriculum, ensuring alignment with academic goals while fostering practical skills. The students earn academic credit for their participation, further incentivizing engagement. These credits are usually substituted in their curriculum such as Free Elective, Technical Elective, Signature, and Engineering Elective, in relation to the concerned department.

After fulfilling the requirements, the students must apply for the certificate through the VIP+ Program Office at our University. The application should include a transcript showing successful completion of the required credits and a recommendation from the project supervisor. This methodology section outlines the key components of the program and how they collectively contribute to fostering innovation and entrepreneurship.

Results and Discussion

The program attracted students from diverse disciplines, fostering interdisciplinary collaboration. Survey data indicated that the majority of participants felt more confident in their entrepreneurial abilities, while more than 90% reported improved teamwork and leadership skills. These results align with studies by Kuratko [3] and Fayolle et al. [5], highlighting the value of experiential learning in entrepreneurship education. The pilot phase yielded several successful projects, including sustainable energy and artificial intelligence startups. These projects demonstrated the program's potential to translate academic knowledge into practical solutions aligned with the UN SDGs. Industry mentors played a crucial role in refining project ideas and enhancing their market viability. However, challenges included resource constraints, faculty and departmental resistance, and the need for continuous mentorship. Addressing

these challenges requires institutional commitment and external partnerships. Scaling the program will involve streamlining administrative processes and enhancing infrastructure, such as dedicated startup labs and funding opportunities.

Figure 1 illustrates the enrollment of students in the VIP+ Program per semester at LAU, for the period between Fall 2021 and Fall 2024. The figure shows that enrollment in this program is increasing, with 53 enrolled students for Fall 2021 and 114 enrolled students for Fall 2024. However, the majority of the proposed VIP+ projects are engineering-oriented. This affects the enrollment of students in different schools. For example, in Fall 2024, 84% of enrollment in VIP+ program is from the School of Engineering, 10% from the School of Arts and Science, and 6% from the School of Business. For the entire period between Fall 2021 and Fall 2024, 71% of enrollment is coming from the School of Engineering, 20% from the School of Arts and Science, 8% from the School of Business, and 1% from the School of Nursing and the School of Pharmacy.

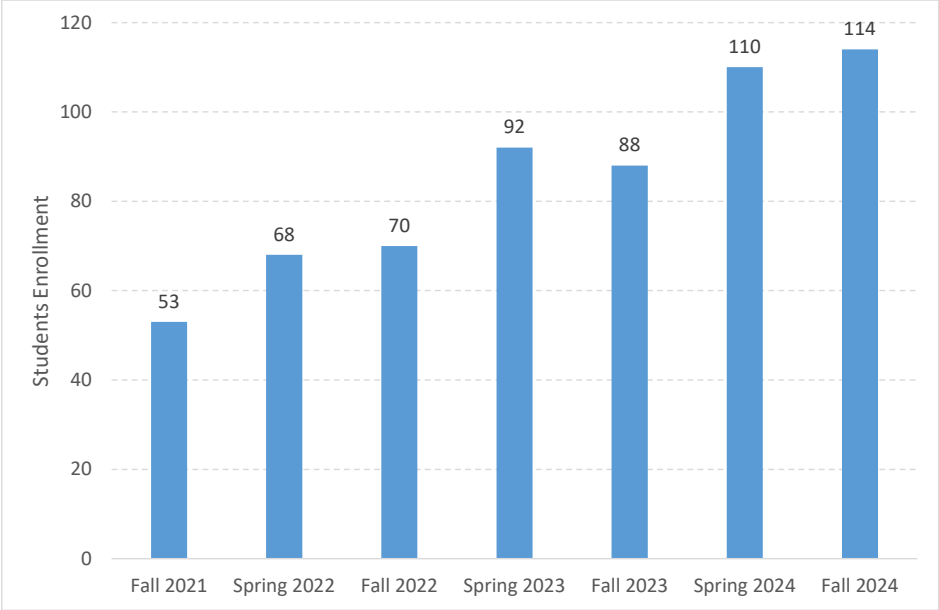

Figure 1. Students' enrollment in VIP+ Program from Fall 2021 to Fall 2024

By embedding the Entrepreneurship Certificate within the VIP+ program, the university provides students with a structured pathway to develop entrepreneurial competencies. This integrated approach ensures that students not only gain technical knowledge but also cultivate the mindset and skills necessary to succeed in dynamic professional environments.

To replicate the success of the VIP+ program, other institutions should consider the following recommendations:

- Establish dedicated administrative support and secure funding to ensure the sustainability of the program.
- Encourage participation from multiple academic departments to promote diversity and inclusivity in project teams.
- Build strong relationships with industry partners to provide mentorship, resources, and real-world insights.

- Embed entrepreneurial training and project-based learning into the academic curriculum, ensuring alignment with institutional goals and student career pathways.
- Invest in infrastructure such as startup labs, co-working spaces, and funding for prototype development.
- Design the program to be scalable by allowing credits to substitute for elective courses across various departments, accommodating diverse academic requirements.
- Implement regular evaluations, including surveys and performance reviews, to refine the program and ensure alignment with learning outcomes.

By adopting these strategies, institutions can effectively implement the VIP+ model, empowering students to innovate and lead in today's dynamic professional landscape.

Conclusion

The VIP+ program represents a significant step forward in higher education by combining interdisciplinary research, entrepreneurial education, and sustainability within a Liberal Education framework. Preliminary findings indicate that the program successfully enhances student skills, promotes innovation, and aligns educational practices with global priorities such as the UN SDGs. To further its impact, the program must address scalability and resource challenges while fostering stronger industry partnerships. By sharing best practices and encouraging collaboration among institutions, the VIP+ model can serve as a blueprint for empowering the next generation of innovators and leaders.

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