University-based Innovation for Technical Students

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Prepared by

KisStartup

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FOREWORD

During 5 years of collaborating with universities, including technical universities, at KisStartup, we realized that solutions from students' scientific research findings have the potential to become commercial products accepted by the market. Most of them, however, have stopped after the leading students graduate from university. Meanwhile, local businesses are looking for locally-built technology solutions but struggle to access them due to the lack of commercialization.

In 2021, we launched the C-Plastics Incubator for plastic replacement solutions (C-Plastics) in partnership with the Ida C & Morris Falk Foundation (ICM Falk Foundation), Spring Activator, and The Incubation Network. Through the program, we successfully tested the incubation model for early-stage startup projects, as early as the research phase of engineering and technology students. After the program, 100% of the projects validated their business models, attracted customers - including large corporates, significantly improved prototypes, and had the potential for actual market testing at a small scale. Based on the results obtained from C-Plastics, we want to focus more on innovative startup activities in the university ecosystem, starting with startup projects from engineering and technology students.

We had the opportunity to exchange with student project leaders, supervisors of scientific research projects, and entrepreneurship and innovation (E&I) trainers for students from technical universities. We aimed to understand the challenges and opportunities in innovation among engineering and technology students. Combined with the experience from C-Plastics, we proposed some recommendations to develop innovation capacities among technical students to their full potential.

ACKNOWLEDGEMENT

We would like to express our most sincere thanks to the lecturers, students and entrepreneurs supporting organizations in technical universities for their support with our *University-based Innovation for Technical Students* report.

The report was carried out in partnership with the Ida C. & Morris Falk Foundation (ICM Falk Foundation)

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DISCLAIMER

The report presents the opinions of a small group of students and lecturers. Therefore, statements in the report may not reflect the entire innovation activity among engineering and technology students in Vietnam.

ABOUT US

KisStartup

KisStartup was established in 2015 with the mission to accompany entrepreneurs and startups in enhancing their innovation capacity, to support them to innovate more effectively and bring more practical benefits to the community.

Our vision is to become a flourishing community of innovators, rooted in Vietnam and acting globally, that creates long lasting impact.

Find out more about KisStartup at
>> www.kisstartup.com

The Ida C. & Morris Falk Foundation

The Ida C. & Morris Falk Foundation (ICM Falk Foundation) is a US-based, 501c3 private family foundation with a strong legacy of supporting innovation, leadership, and entrepreneurship. The foundation is funded through its own endowment fund. We have supported brave innovation on an international scale over the past 50 years and are now focused on driving human-centric, environmentally focused initiatives within Asia.

The ICM Falk Foundation wants to empower Vietnamese students and more particularly engineering students who have great innovative ideas to step up and reach out in order to be equipped with impact business knowledge and be able to adequately address the waste and pollution challenges in their home country.

Find out more about ICM Falk Foundation at
>> www.icmfalkfoundation.org

METHODOLOGY

1.1. Subject

Lecturers

Lecturers are currently supervising technical students at universities. In addition, lecturers had experience in training E&I for technical students.

The list of lecturers was collected and screened through the participation lists from the Training-of-Trainers (TOT) programs coordinated by KisStartup, partnering with Hanoi National University, Hanoi University of Science and Technology. University of Industrial Technology - Thai Nguyen University, University of Technology and Communication - Thai Nguyen University, VinTech City (Vingroup) from 2018 to 2021.

Students

Students are leaders and members of scientific research projects, start-up projects in the technical fields at universities.

The list of students was collected from the Student E&I Training program's participation lists, coordinated by KisStartup and the above partner, the Seed Your Ideas contest organized by VinTech City within Techfest Vietnam 2020, and from lecturers' reference.

Entrepreneurs Supporting Centers

Entrepreneurs Supporting Centers/Organizations are entrepreneurs clubs and technology transfer centers located in technical universities.

The list of ESOs was built through the above programs.

1.2. Methodology

We collected primary data of the above subjects through a survey using Google Form. Then, we proceeded to conduct in-depth interviews with lecturers, representatives of ESOs, and students.

The survey consisted of four parts: (i) general information about research subjects, (ii) current status of students' scientific research projects, (iii) existing support for this scientific research projects, and (iv) future support needs.

We distributed 140 samples, obtained 127 samples including 76 invalid ones. Based on 51 samples, we conducted 12 interviews with lecturers and representatives of ESOs and 7 in-depth interviews with scientific research project student leaders. Each interview lasted from 30 minutes to 1.5 hours via Zoom and was recorded for data analysis in the research.

CURRENT GAPS
IN PROMOTING INNOVATION AMONG TECHNICAL STUDENTS

The innovation startup ecosystem includes the following 06 domains: (i) policy, (ii) market, (iii) human resources, (iv) support system, (v) culture innovative start-ups, and (vi) capital and finance (Isenberg, 2010). Amongst these domains, universities play a key role in providing high-quality human resources, experiential knowledge and skills for learners to start a business. In addition, universities also have a direct impact on the support system by providing advisors and technical experts (Hoang, 2020), while also contributing to the development of mechanisms and policies to promote the innovative startup ecosystem. Besides, universities also play an essential role in cooperating with businesses and understanding the needs of the market (Nguyen, 2018).

Lecturers and support centers would be the main actors in universities to create an environment for learning and practicing E&I within universities. Meanwhile, students would be equipped with the right tools and mindset to test their ideas. Therefore, within the framework of this report, we assess the current status of innovation activities in universities, focusing on technical ones which are considered the center of innovation, from perspectives of students, lecturers and entrepreneurs supporting centers/ organizations in universities.

2.1. Students’ scientific research projects lacking research independence

Scientific research activities among students are an indispensable part of all university training programs, especially for technical ones. Students’ scientific research projects usually fall into a larger scientific research project by lecturers or university researchers.

According to 78% lecturers who directly supervised scientific research projects in universities, most of the students' research ideas have been suggested by them or been a part of a large research project**. Students' scientific research projects all end at the low-fidelity Minimum viable product (MVP)**

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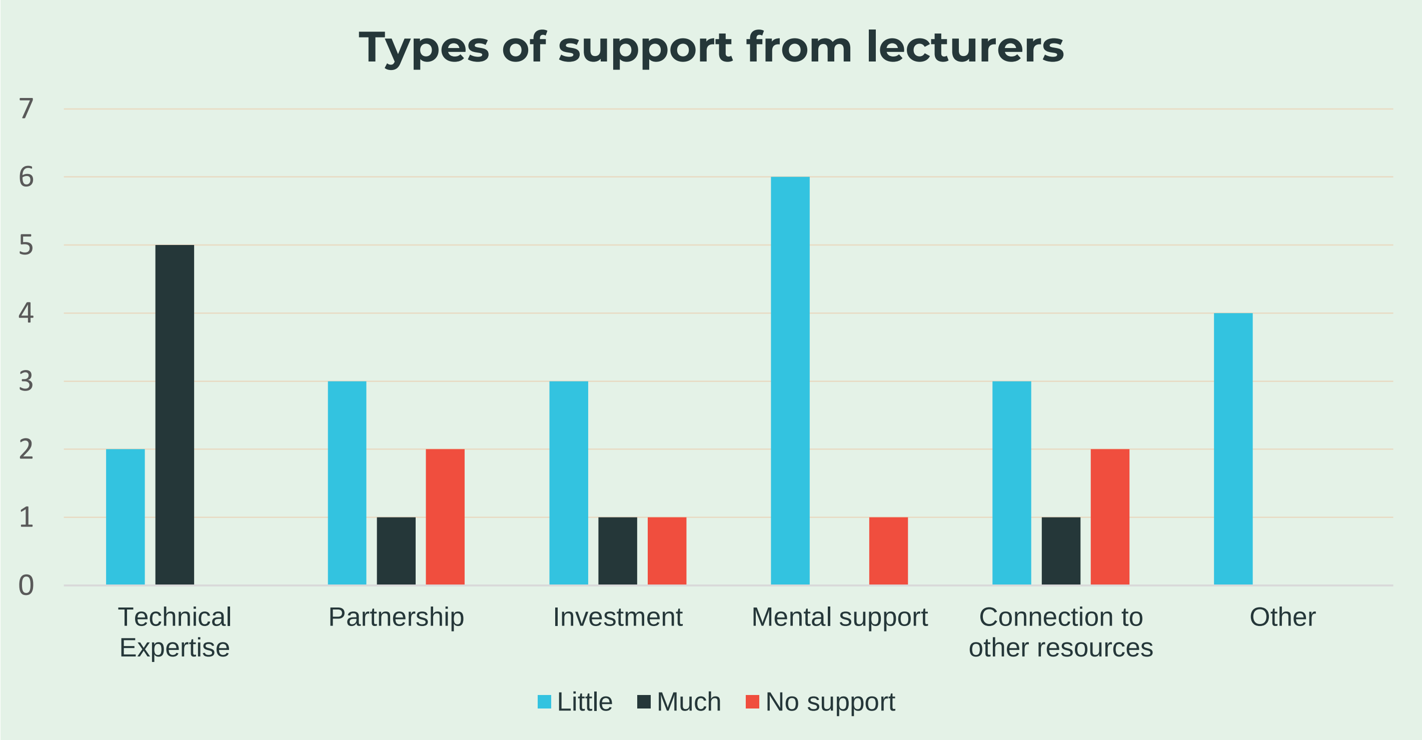
2.2. Soft support mostly provided for student-led projects

When asked about the support that student-led projects have received, the most common types of support from teachers, startup clubs and universities in general remain **soft support such as expertise and encouragement to student teams' leaders**.



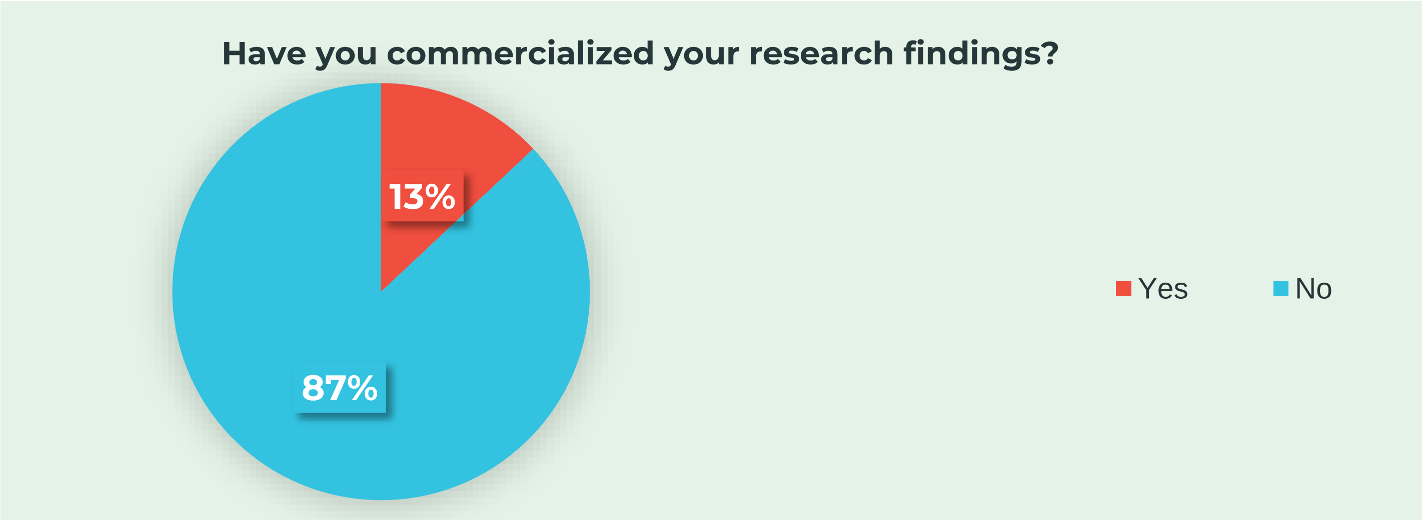
Entrepreneurship-related activities at universities and running scientific research projects as a startup project have been found to be invaluable assets to young Vietnamese student innovators. In addition to new knowledge about E&I, young student leaders all assessed that their soft skills (including teamwork, networking, etc.) have considerably improved thanks to those activities and projects. They also found themselves more persistent with what they pursue instead of being easily discouraged and giving up as before.

Through startup-oriented scientific research projects, students were also able to expand their networks with alumni and teachers within the university, but also businesses and customers outside of their university.

2.3. Lack of business orientation for early-stage student research projects

Only 13% of the surveyed students said that they further developed their research findings into a finished product to go to the market.

One of the main reasons why the surveyed students' scientific research project did not move towards commercialization was **due to the student project owner lacking specific business orientation**. 3 out of the interviewed 7 students planned to go to work for companies, factories, instead of becoming self-employed entrepreneurs. 2 out of 7 had no career orientation.



This finding also coincided with the lecturers' comments: 100% of the interviewed lecturers acknowledged that students simply did not have an intention to run their own companies after graduation, hence leading to the lack of student-led startup ventures.

According to them, projects led by students also fail to proceed to the next growth phase due to the following challenges:

- **No readily-available strategy or action plan to apply students' scientific research projects' results outside of the university:**

Student research projects' outcomes that are also part of lecturers' projects tend to be used for academic purposes, rather than for business application. In addition, research activities are still mainly used as means of improving training, learning quality and research abilities among students. The application of research findings into business fields, both by students and lecturers, have not been yet prioritized by the universities according to surveyed lecturers.

Although the E&I movement among students has flourished in recent years, according to survey respondents, E&I activities are mainly in form of competitions and short-term training programs. Universities have not yet had a clear plan for the commercialization of student research results. This finding is strongly supported by previous research stating that the link between universities and industries (Nguyen, 2019) would largely serve academic and employment goals for students, and commercialization for businesses would only be a secondary priority.

- **Low motivation from students to participate in students' scientific research:**

Scientific research activities in universities are voluntary activities, hence the commitment level from students remains low, and the number of students participating in scientific research is limited. Although, some universities have developed mechanism to encourage scientific research activities among students, it is still not attractive enough to promote scientific research activities, especially towards high applicability. This problem is also closely related to the students' career orientation issue previously mentioned. As a result, the quantity and quality of student-led scientific research have remained limited while those projects are not pursued beyond their graduation.

In addition, choosing to publish scientific articles instead of developing research projects into finished products that businesses need is also a mindset barrier to commercializing students' scientific research results.

- **Field-specific features**

For example, in the Information Technology field, products tend to inherit the legacy of previous products, making it difficult to build an entirely unique product in a short period of time (1 to 2 years of research). For teaching and academic purposes, lecturers would tend to prioritize novelty projects for students so that they can put learned theories into practice.

The Chemical Engineering field shares the same pattern. A lot of time and knowledge is required to create a functional product based on research findings. With limited capacity and resources, it is proven to be challenging for students to develop a product that can be commercialized in a short period of time. For Civil and Industrial Construction, the final project requires students to complete a complete model of a house on paper. Therefore, if the student's scientific research topic is not directed towards this project, the project will be on hold for the final year of university.

- **Limited implementation funds:**

Due to the voluntary nature of student-led projects, the project implementation costs are usually self-funded by the project members and supported by the teachers to maintain the project. For example, in the Engineering field, the cost of purchasing electronic components for a product alone could cost from 15 to 50 million Vietnam Dong (VND), depending on the source of the components. The research cost could also fluctuate depending on the specific industry characteristics. With the university support usually amounting to 1 million VND per project, it is difficult for student project owners to cover the development costs for high-quality products, on top of operating costs for other projects and without reciprocal capital.

After nearly 7 years of working with students, KisStartup also realized that the mindset of "business is not for technical students" represents a big obstacle for engineering students. to actively bring their research products to the market. This finding was also shared by members of Edifilm team when joining the C-Plastics Incubator program in 2021. Before the program, Edifilm members majoring in Food Engineering thought that the Edifilm project would end after the Bach Khoa Innovation competition held by the Ho Chi Minh City University of Science and Technology. Thanks to the program, the students were able to uncover the market, career and technical opportunities to become more ambitious with their project.

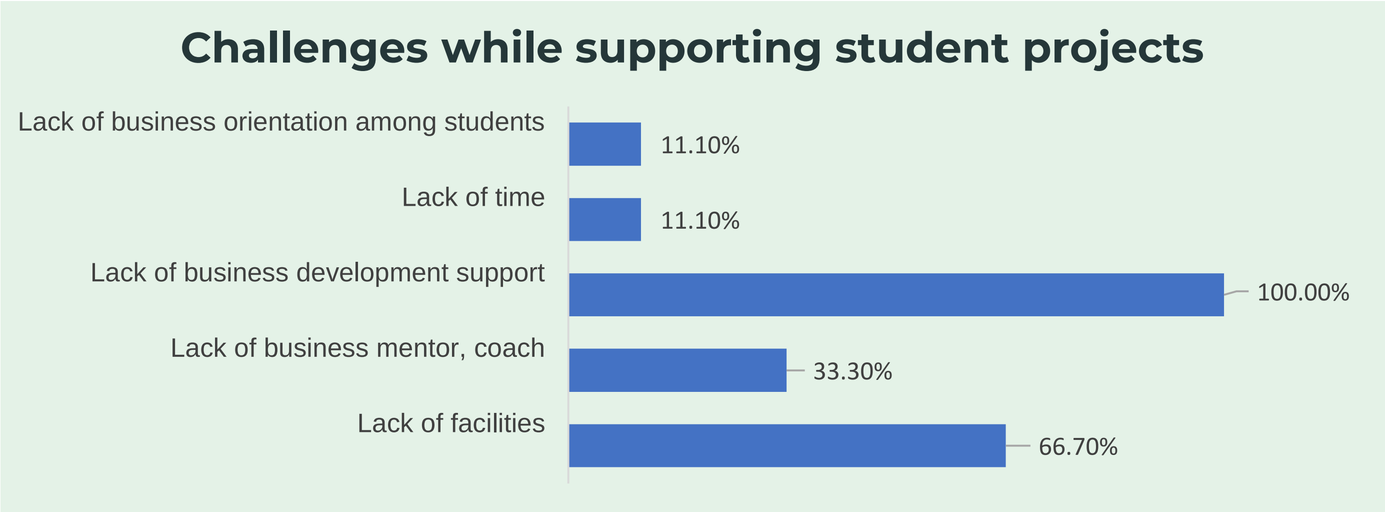
2.4. Lack of support mechanism for lecturers to help turn scientific research projects into startups

On average, lecturers will guide from 1 to 2 scientific research projects by Bachelor students on a yearly basis. After finishing these research projects, they will: (1) stop and (2) continue to be developed in the following classes if there were aspects unexplored in the previous class. Most of the students' scientific research topics, according to the lecturers' assessment, would fall into group (1).

To turn a scientific research project into a startup requires a great deal of time, capital and effort. Meanwhile, due to the requirement of ensuring both teaching and scientific research in their universities, lecturers usually run into several logistical challenges to help students turn their research projects into actual startups. In addition to the students' difficulties mentioned in the previous section, most of the surveyed lecturers found that available support mechanisms for lecturers to have time to support students in implementing startup projects are usually lacking. **100% of supervisors are supporting their students to continue their research projects as startup projects on a voluntary basis**. Supervision of scientific research topics is considered a research activity unlike guiding scientific research topics into start-up projects which is not counted in the volume of hours of scientific research. Therefore, it remains challenging for lecturers to allocate time and devote themselves to long-term mentorship in bringing student-led products from scientific research to the actual market.

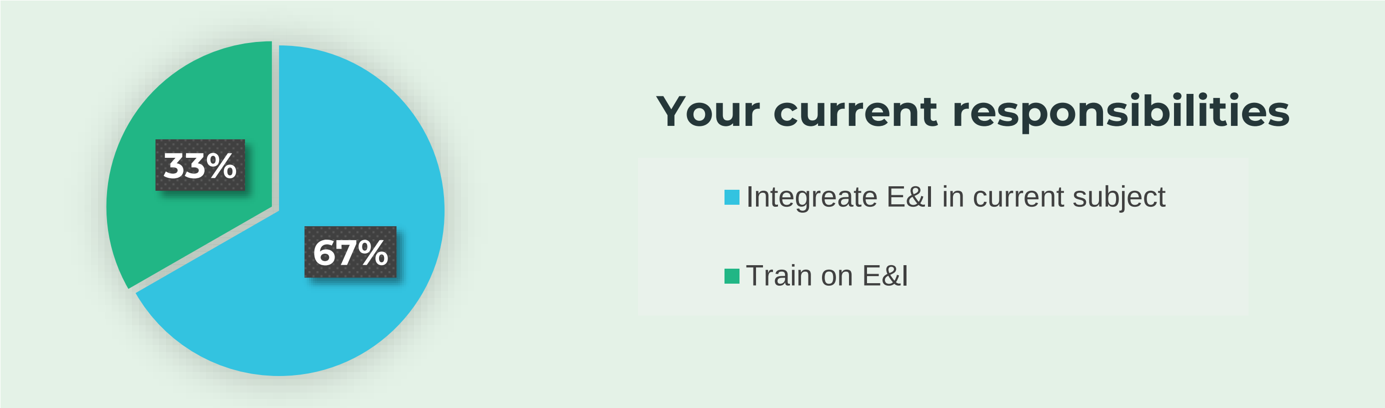
2.5. Lack of a business development support network aimed at university-based projects

Besides aid mechanism to better allocate and manage faculty members' resources, the lack of business support network for the project also represented a major obstacle for lecturers while supporting student-led projects. In addition, the lack of equipment, machinery and laboratories for research adds another layer of hindrance for lecturers and students when implementing scientific research projects.



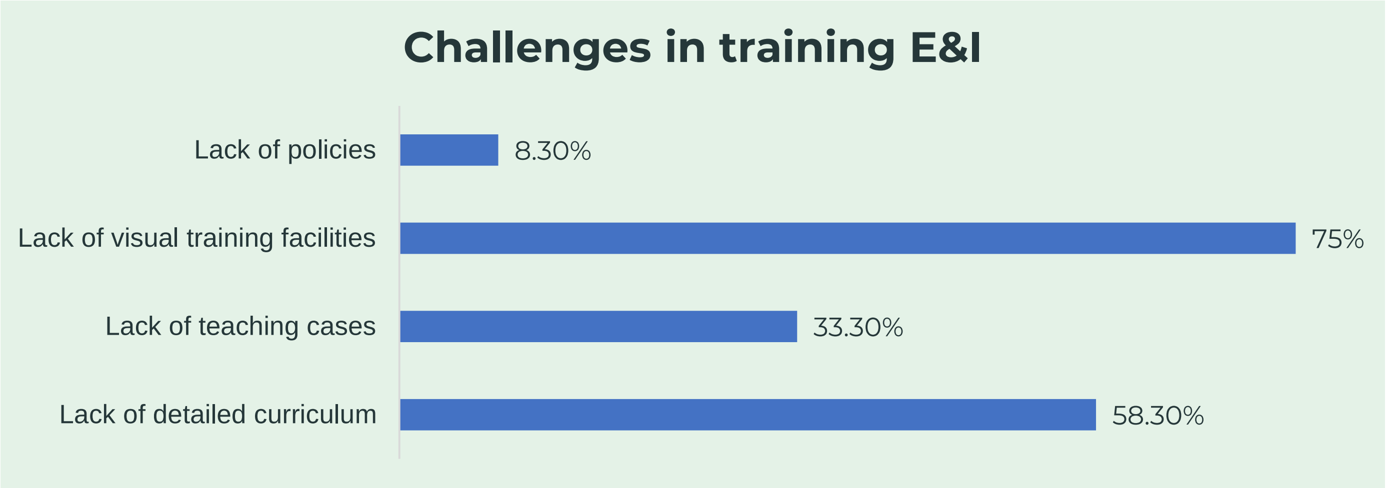
2.6. Limited visual teaching tools on Innovation Startup

66.8% of lecturers are currently integrating E&I knowledge into their teaching subjects. Only 33.2% of the surveyed lecturers are directly teaching this subject in universities.



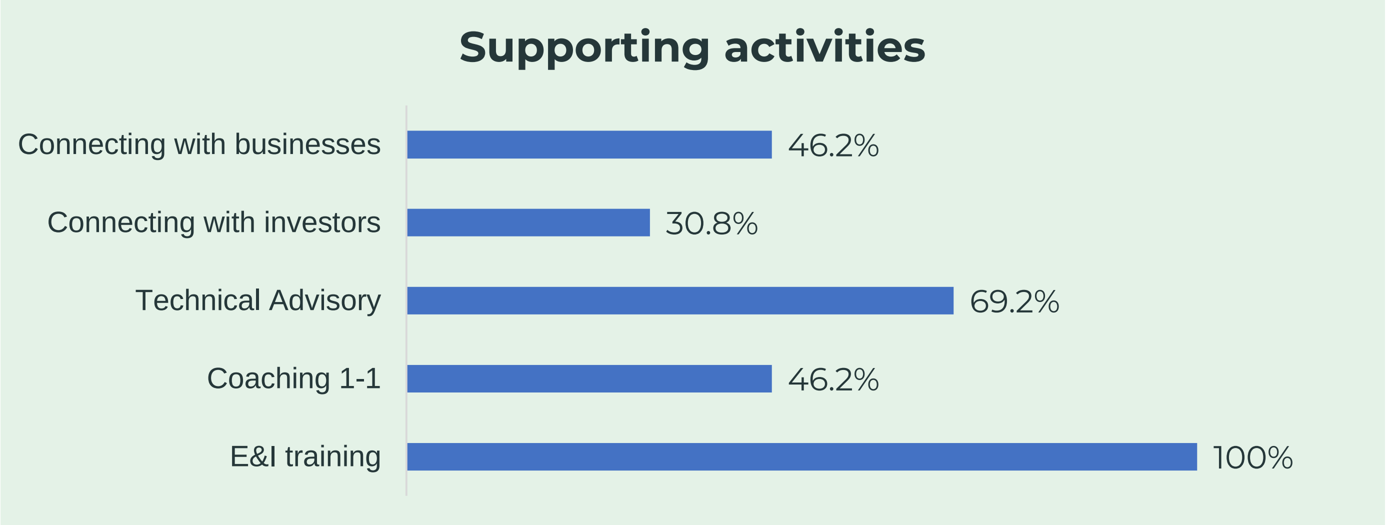
Lecturers with no or little business/start-up experience could not speak the same language as the market (Nguyen, 2018). In addition, a big difficulty mentioned by many lecturers is the lack of visual teaching tools designed for each application domain.

Although open-source materials exists in Vietnam (e.g., Finland Innovation Partnership Program (IPP)), the surveyed lecturers believed that this type of material has not been unified for wider spread. When searching for typical case studies to illustrate during class, a lot of time and effort is required from resource-strained lecturers. Moreover, E&I courses in some universities remain an elective course which in turn makes the subject less enticing to overworked students.



2.7. Limited training diversity provided by in-house entrepreneurs support centers/organizations

E&I training remains the most popular support activity by entrepreneurs support organizations (ESO) in universities of engineering and technology (accounting for 100%), followed by professional advisors for projects (69.2%). Only 46.2% of participants said that in addition to the above activity, their organization connects projects with investors.



Through the support activities provided by the ESO, the commercialization level of scientific research projects from students increased. The projects were more realistic in calculating operating costs and adjusting the products according to customer feedback. The activities also provided a better version and understanding of the market, and the product's potential to grow from the laboratory scale to a field application context. In addition, the supported potential projects had more chance to participate in and win startup competitions and exhibitions at the provincial, city and national levels, providing much needed visibility and publicity.

For example, after the Lab2Market program of BKHoldings, up to 5 out of 50 projects (ie., 10% of the cohort) continued their journey after the competition with at least one project per year eventually going to market.

LESSONS LEARNED FROM C-PLASTICS INCUBATOR

3.1. About C-Plastics Incubator 2021

Starting from June to November 2021, C-Plastics Incubator (C-Plastics) was held and included 03 sub-programs:

- **Training of Innovation Coaches:** 04 trainers who joined the previous Training-of-trainers (TOT) program on E&I were selected to participate in the Training of Innovation Coaches sub-rpogram. The program aimed to increase the number of startup coaches while supporting the promotion of entrepreneurship projects from students once lecturers return to contribute to their university's entrepreneurship activities.
- **Incubation program for plastic alternatives:** 09 early-stage projects were selected to participate in the 14-week incubation program. 05 projects eventually went to Demo Day 2021 to meet investors, partners and customers. Main activities included training, 1-on-1 coaching, meeting with expert advisors and businesses on plastic alternatives to validate the business models, impact modelling, and prototype improvement. Trained coaches were engaged in this program to put what they learned into practice. Each coach was supervised and co-coached with the main KisStartup coach to learn and improve startup coaching skills for the project, session by session.
- **Angel investor training:** 03 individual investors participated in the training program to learn about impact investing, angel investing, and due diligence.

Learn more about C-Plastics 2021 HERE.

3.2. Lessons learned

3.2.1. A successful incubation program requires customization and regular adjustments

Based on assets from previous incubation programs for impact startups, we designed and customized the structure and content of this incubation program targeted at plastic alternatives. This was the first time we integrated impact measurement and management into the incubation curriculum since projects were aiming to solve socio-environmental issues, hence the need to quantify and measure the created impact and sustainability claim. Impact measurement and management remain new to small and medium enterprises in Vietnam, especially to projects in early stages such as the ones participating in C-Plastics.

One of the curriculum design challenges was ensuring that the program could provide general knowledge about E&I, which is usually a novel topic for technical students, through the C-Plastics training and coaching activities in an accessible manner.

Our solution was to take advantage of the self-study platform (see more in section 3.2.4) to provide basic knowledge on E&I and impact models, then focus on 1-on-1 coaching for each project. Whenever they iterated their business model, students were asked to review and adjust according to the course's relevant parts. In addition, this content was also included in the angel investor's training program in order to provided similar topic understanding levels. After connecting with investors, teams were asked to review and adjust their impact and business model one more time.

In addition, we adjusted the program structure and content to meet the arising needs of each participating project. Supplementary activities were also added according to the status of each project. For example, when Edifilm received a meeting invitation from a large corporation to explore collaboration opportunities, we held separate sessions on working experience, cooperation models and general mindset to work with corporates. Thanks to those sessions, Edifilm were able to position themselves adequately in the meeting and gained more experience in working with businesses and corporations.

3.2.2. Innovation coaches are key to the success of the incubation program

After 7 years of working with hundreds of startups, we understand the importance of a dedicated innovation coach (coach) in promoting projects and help startups breakthrough in a short time. As an outsider looking at the project, a coach asks the right questions and provides the right tools for the business or project to find a solution to their problem. Simultaneously, a coach creates positive pressure for the project or business to iterate their business model in a timelier and more agile manner.

During C-Plastics, thanks to the team of coaches, 100% of the projects made remarkable strides each week. For example, The Blastic student team, after only the first 3 coaching sessions, pivoted its direction from biodegradable take-away bags to a more potential and niche market - biodegradable nursery bags. At the end of the program, the project immediately got a trial order from a high-tech plant nursery in Binh Duong, Vietnam.

3.2.3. Industry advisors are required to assist in product improvement

The C-Plastics program marked our first time involving industry experts as active advisors in an incubation program for early-stage projects. In addition to sharing sessions with industry advisors, all projects were matched with advisors based on their specific requirements and needs, which in turn helped improved their product fidelity dramatically. For example, Edifilm managed to improve the solubility of their cassava-starch film by almost 2 times after receiving advice on adjusting the production process from a local technical advisor.

With new projects and especially student projects, limitations in knowledge and experience make the project difficult to improve their products. With the participation of curated and adapted technical advisors, along with the supervision from the coach, the projects were able to shorten their development time and optimize their research.

3.2.4. Combining self-paced and virtual training increase students' capacities

Although the program only ran for 14 weeks, with an average of 1 hour of training per project, per week and 1.5 hours of online training via Zoom (if any), the C-Plastics curriculum conveyed 16 topics on innovation skills to students. To achieve this, we combined online training via Zoom with an e-learning platform, enabling students to actively obtain the necessary knowledge to implement projects according to their individual schedules.

Each participating student had a different level of understanding about E&I; focusing on group virtual learning would not be beneficial and useful for all students. We did not implement 100% e-learning training but still organized online training sessions via Zoom alternately to maintain the engagement level between peers and the program. We also aimed to create a safe space for each project to share their respective difficulties encountered during the week in order for us to provide timely support and enable cross-learning opportunities.

3.2.5. Seed funding is critical to commercialize scientific projects

According to the survey, for engineering majors, it took about 15-50 million VND for students to develop an MVP. This amount represents a considerable investment for students to simply develop a prototype. Meanwhile, early-stage projects are not attractive to individual investors due to their legal status, potential survival rate and overall higher level of investment risk. Therefore, seed funding in the form of grants represent a catalytic tool to help early-stage projects develop, improve and test their prototype product, and at the same time, verify the product to de-risk for investors in the later stage.

During the C-Plastics program, 03 projects received nearly $1,500 in grant funding from the ICM Falk Foundation; 02 of the 03 projects received initial funding equivalent to $200 per project through the BK Innovation competition at Ho Chi Minh City University of Science and Technology. Thanks to this grant, 03 projects all developed low-fidelity prototypes and 02 out of 03 projects got closer to a high-fidelity prototype after several rounds of improvement.

3.2.6. Individual angel investors in Vietnam need an lead angel investor/investment fund to lead the way in impact investments

Through the angel investor training program provided by Spring Activator and our experience in implementing gender-lens angel investment training series for nearly 40 angel investors in Southeast Asia and South Asia, we found that individual angel investors in Vietnam are as hesitant to invest in early-stage start-ups as professional angel investors.

The recruited investors in our sub-program usually source and select more mature businesses with proven products and revenue streams, ensuring higher survival rates and faster break-even times. There is not yet a standard, professional angel investment model or case study in Vietnam for new investors to train and learn from, and eventually co-invest with. Having an experienced impact angel investor to follow and co-invest with would help new impact investors validate the profitability of their investments in an innovative start-up project at an early stage, compared with that in small and medium-sized enterprise.

Based on these findings, KisStartup officially established the KisStartup Innovation Fund (KIF) to invest in early-stage projects and expect to become a standard, professional angel investment group to attract and promote the formation of other angel investor groups in Vietnam in the coming time.

RECOMMENDATIONS

4.1. FOR UNIVERSITIES

#1 – Universities should develop a strategy in which innovation activities are an important and inseparable part of the university

As discussed in our survey findings, innovation activities among students or lecturers are still voluntary activities and not officially included in a long-term strategy of the university. Because of the lack of a guiding strategy, all innovation activities from the university ecosystem remain a bottom-up initiative. Short-term pilot activities led by many universities have yielded lackluster results, leading to a lack of investment in additional necessary resources. Only with a clear, collaborative and guided innovation strategy aiming to turn a university into an innovation hub, can the rest of the university ecosystem follow with mechanisms and strategies in a synchronous and effective way.

#2 – A university-based policy mechanism should be developed to encourage lecturers and students to participate in innovation activities through scientific research

For students, scientific research is still a voluntary activity. For lecturers, activities to support students in starting a business are also after-class activities. However, those E&I activities are recognized as the driving force for any research university to become an innovation-oriented educational institution. Vietnamese universities should seek to develop more policy mechanisms to recognize the work of lecturers and the results of projects run by students to increase both the quantity and quality of innovative activities in universities.

As lecturers suggested in our survey, universities can simply include the number of hours dedicated to start-up project support in scientific research findings into the lecturers' science research time. For students, universities can cooperate with businesses to build an assessment framework for scientific research results' applicability and officially recognize students' efforts in order to encourage the research and innovation spirit in students.

#3 – Universities should cooperate with a third party to build a comprehensive innovation promotion program, and increase networking opportunities for innovative solutions from the school

As noted in our survey findings, the difficulty teachers face when supporting students' startup projects was the lack of business support networks. In addition, the in-house ESOs in universities lack operating personnel and general resources. Therefore, an external third party with specific expertise and resources could help the school save time and money in developing successful startup projects from students, while ensuring the professional integrity of the university. In parallel, universities can gradually enhance the capabilities of their core personnel by offering customized internal training programs for their faculties.

Third parties can also provide access to networks of businesses, corporations and investors in order to increase the commercialization opportunities of solutions coming out of the universities' laboratories. This type of collaboration can also ensure the harmony of interests between the parties to avoid unnecessary legal problems, while reducing risks and costs during negotiations with corporate and investment partners in the case of research solutions' licensing or patent sales.

#4 - Lecturers as both startup coaches and technical advisors should be more involved to increase the commitment and sustainability of student projects

Most of the student research projects are usually a sub-project in a lecturer's broader scientific research but lack an innovation coach to support them through their growth journey. By leveraging their existing technical expertise, lecturers can improve students' capacities by training to become innovation coaches similarly to external incubation and acceleration programs. The participation of lecturers as both a coach and an advisor would benefit research projects in terms of long-term technical and business support and ensure the project's post-graduation survival rate.

4.2. ENTREPRENEURS SUPPORTING CENTERS/ ORGANIZATIONS

#1 – Support programs should be long enough to allow scientific projects enough time to accumulate adequate experience and resources for commercialization

Despite the success with C-Plastics after only 14 weeks, we realized that turning a student project into a business required a longer companion program for the project in order to develop project management capabilities, the necessary resources (financial, human, network) and eventually become a viable, innovative start-up which would have proven product-market fit.

In April 2022, we officially launched the RnD Vietnam program to accompany startup projects for a 2-year period. The program is divided into several phases - pre-incubation, incubation, pre-acceleration and acceleration, designed to provide adequate and tailored support for ventures at different growth phases.

The goal of the program is to improve research project's capacities to commercialize their university-based research results through technological transfer or ventures creation.

#2 – ESOs should provide more 1-on-1 coaching for early-stage projects

In Vietnam, the quantity and quality of innovation coaches are still limited (Nguyen, 2019). As seen in part 2, the activities of ESOs in new universities mainly focus on providing E&I knowledge to students. Coaching only accounts for a small amount of support time. Therefore, in the future, support organizations should build their own team of innovation coaches or collaborate with an organization that provides a team of professional startup coaches to gradually influence many aspects of the project such as business model, finance, etc. in addition to knowledge.

#3 – ESOs should expand their network of partners, investors and other business support organizations to improve the ecosystem's connections

The lack of capital and low market demand are the two main reasons leading to the failure of innovative startup projects (CB Insights, 2021). ESOs face certain limitations in terms of resources, while needing to prioritize their core activities. Therefore, in addition to their main activity, ESOs would need to build, verify, and expand a network of quality partners, investors, and other business support organizations in order to ensure the incubated projects' capacities to verify market demand quickly, efficiently access necessary capital and build other necessary business capacities. ESOs should collaborate with other ESOs in the value chain to create cross-funnels of innovative projects that could benefit from a diverse and unique partner network provided by various ESOs.

Lastly, an effective network management by ESOs would be necessary in order to coordinate and monitor the outcomes between university projects and external partners to ensure the interests of all parties, measure and evaluate the effectiveness of their network, and then adjust accordingly.

CONCLUSION

The research has partly shown the overall picture of the Vietnamese startup ecosystem around engineering and technology-oriented universities. While tech startups are thriving on interdisciplinary trends, the rise of smart hardware and tech-enabled environmental solutions, etc., Vietnamese universities are still struggling to catch up and build an equally-promising innovative ecosystem.

If universities have not shifted their growth strategies to become an innovative hub or simply put innovation within their culture, innovation will remain a difficult topic to comprehensively and synchronously develop within local universities. Technical universities, with their advantages in core technology development, need to reposition themselves as leading innovation hubs and have subsequent effective and pragmatic strategies to solve both local and global issues and challenges.

At the project and individual levels, more focus should be put on improving subjective factors in engineering students such as career orientation, risk-taking and entrepreneurial mindsets. Universities also need to consider objective factors such as their research environment, project implementation and incentive mechanisms as levers to support their students and lecturers' innovative activities.

Finally, involving ESOs (both inside and outside of the university), businesses, and investors is essential to help universities to identify market demands to package, and commercialize their intellectual properties stemming from their innovation activities, and doubling down on the necessity of involving universities in the innovation startup ecosystem.

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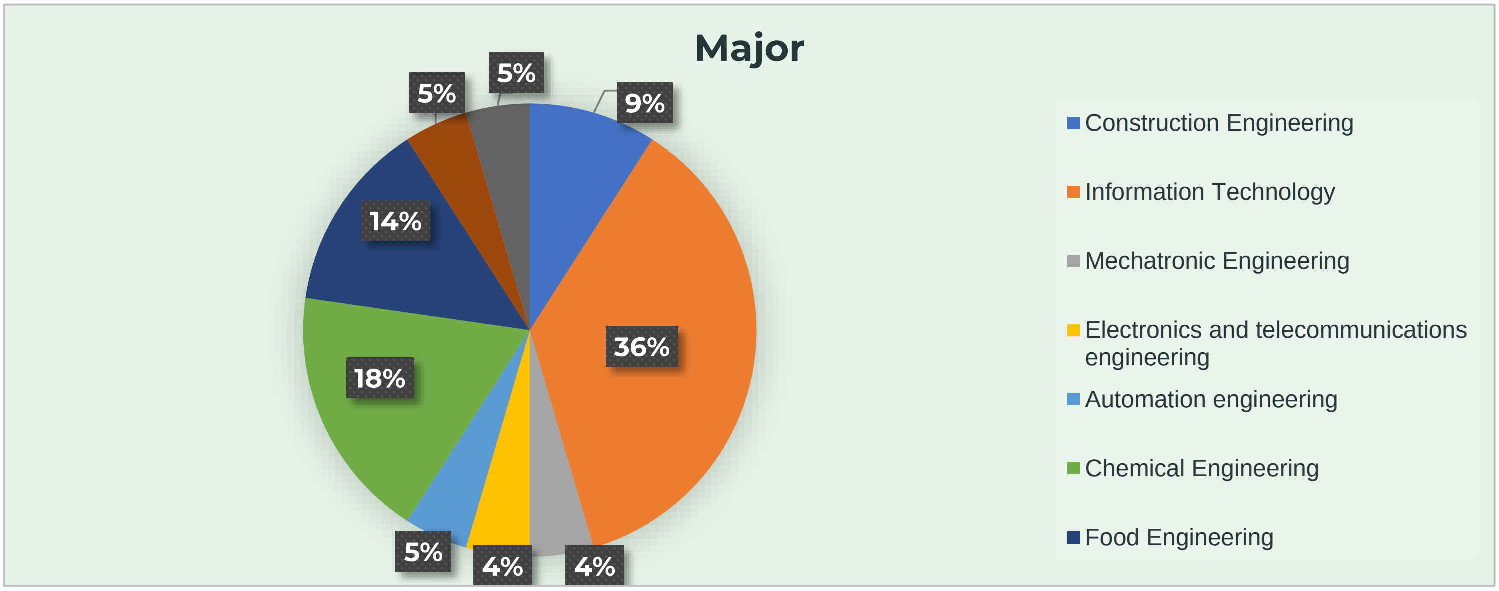
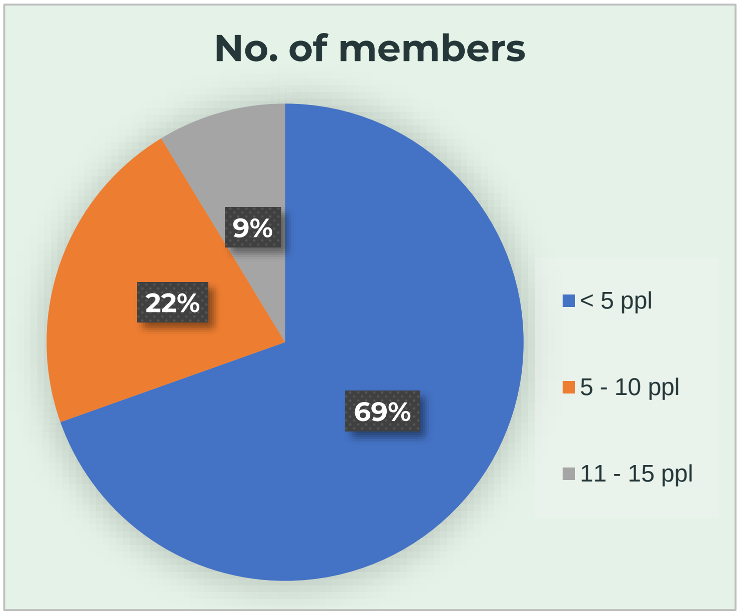
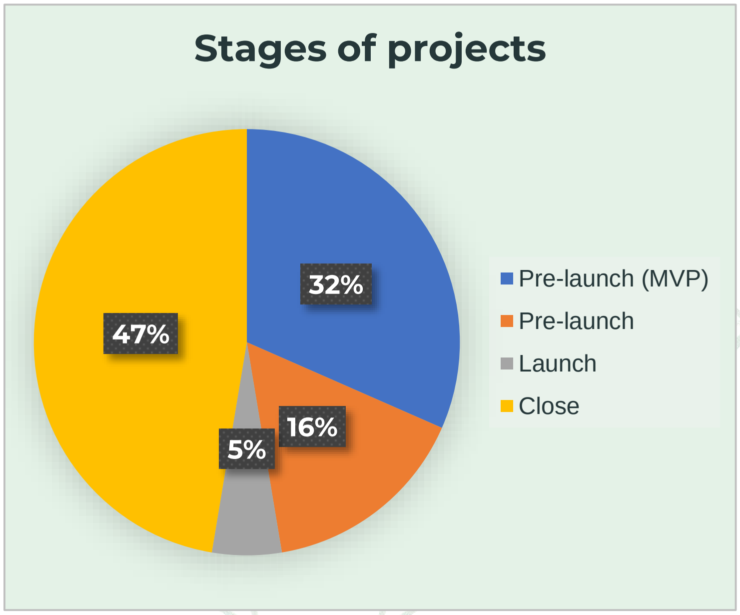
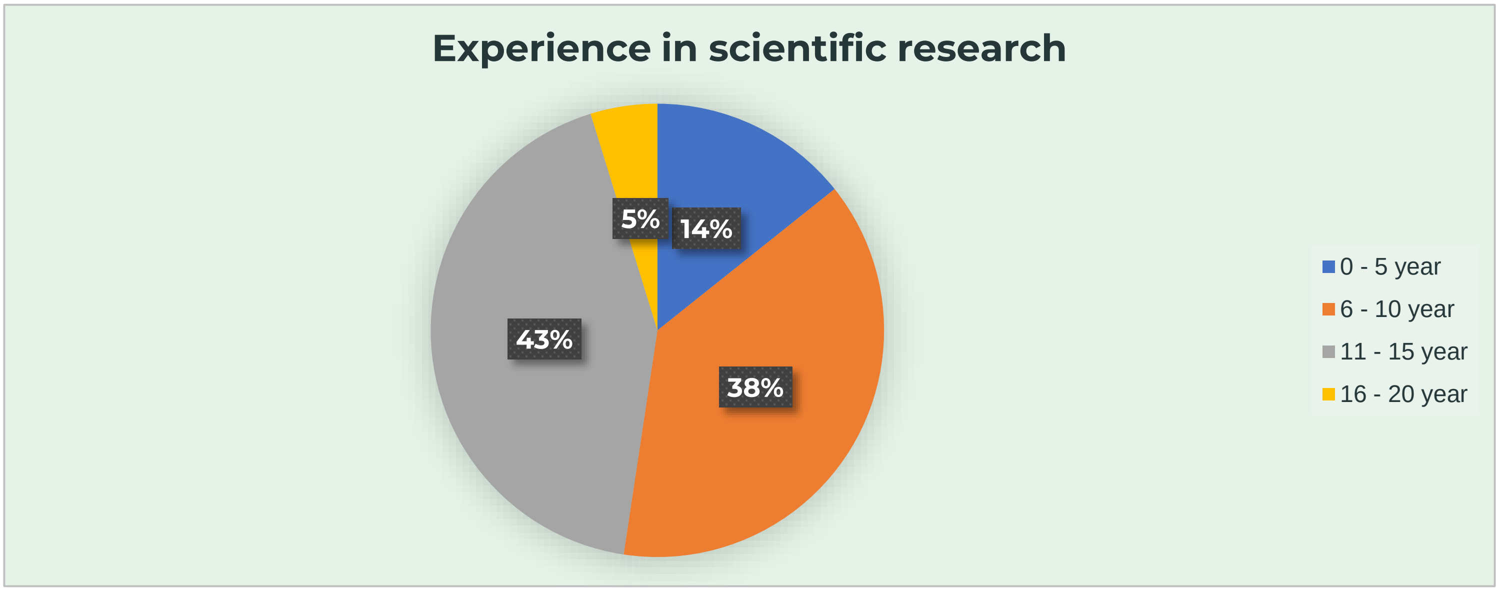
Appendix 1
Students Project Profile

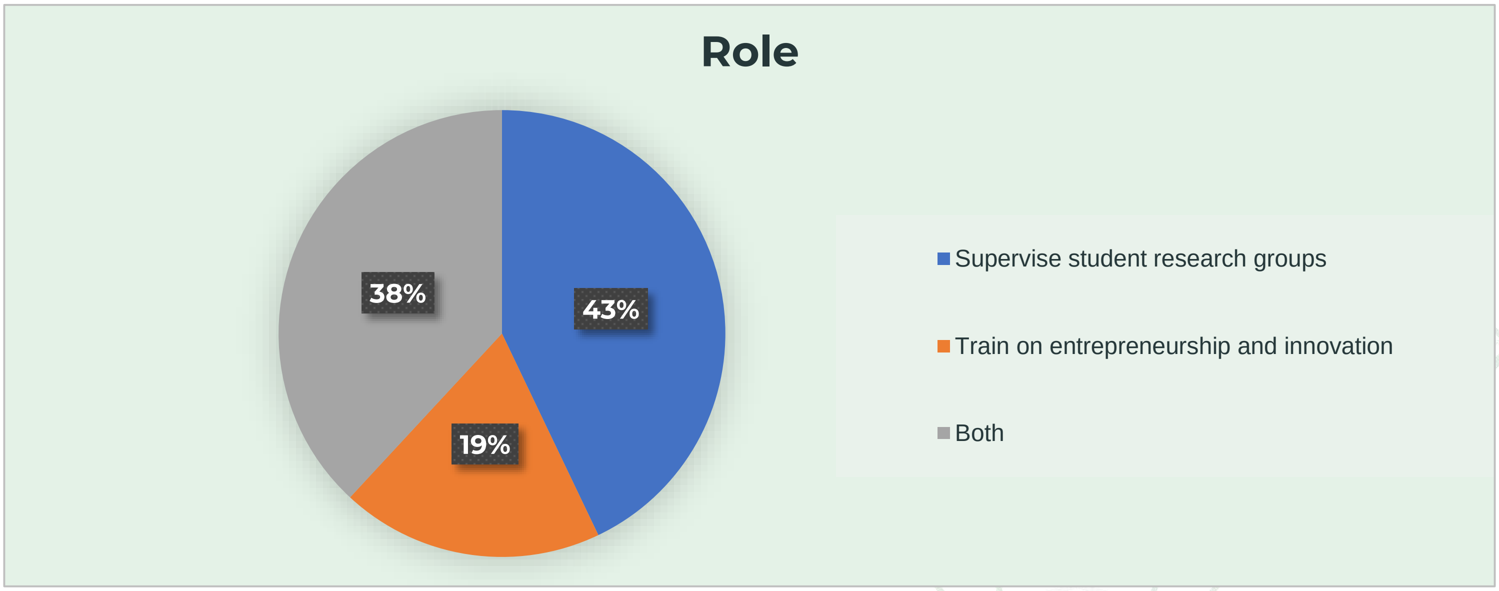




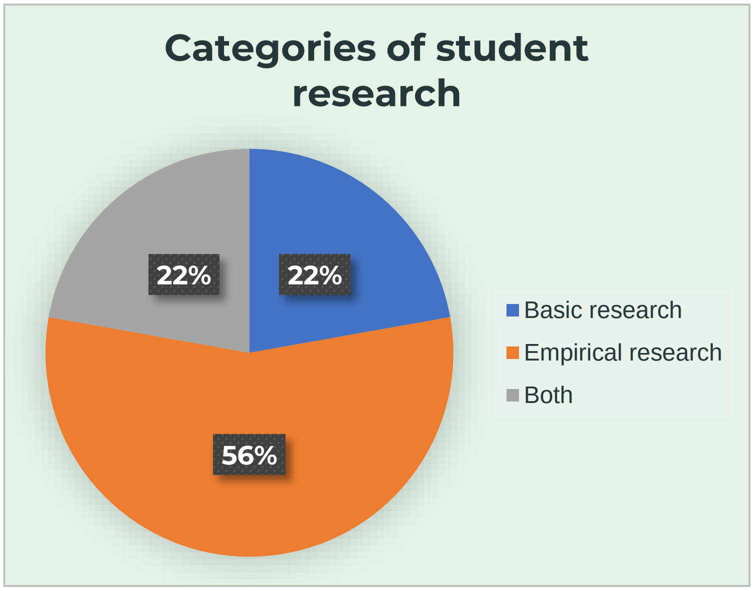


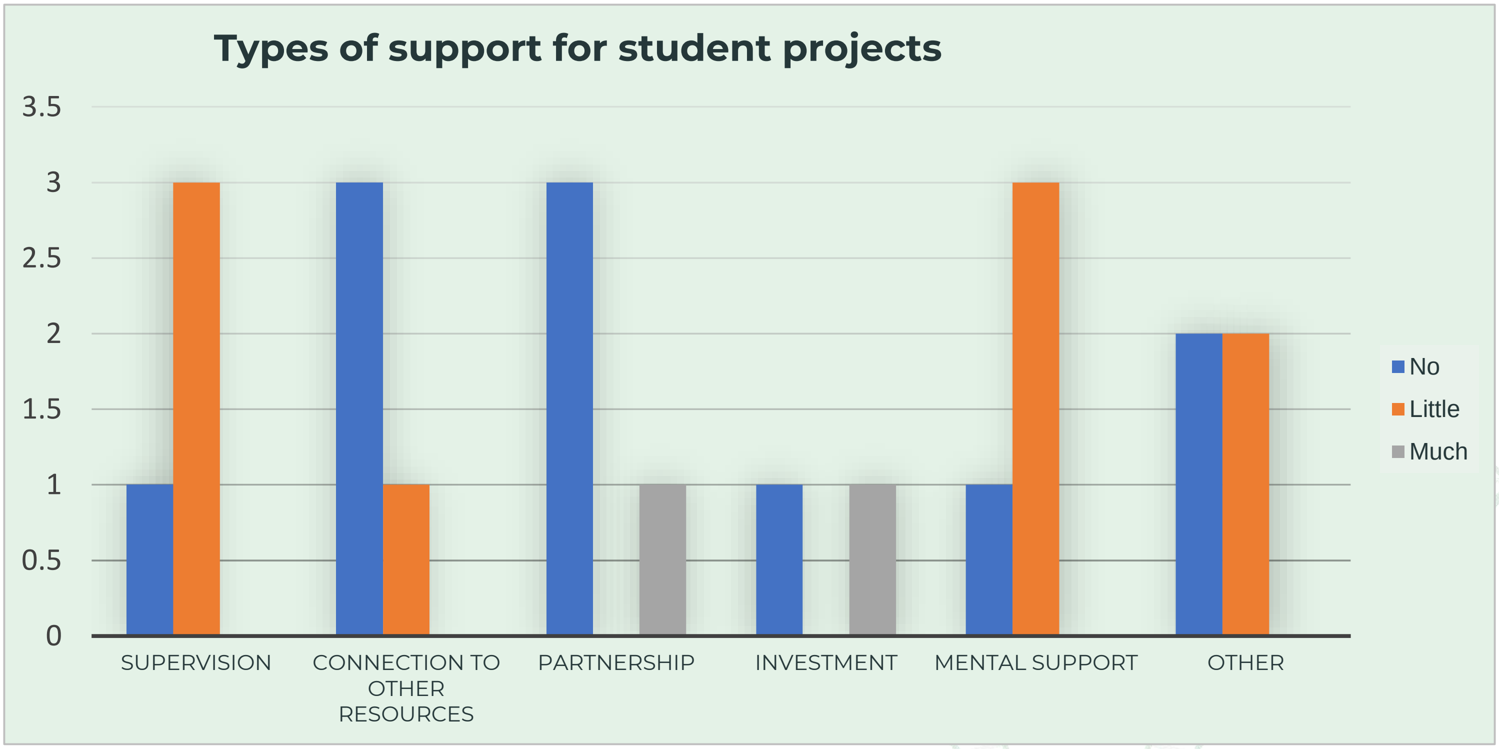
Appendix 2
Lecturer Profile



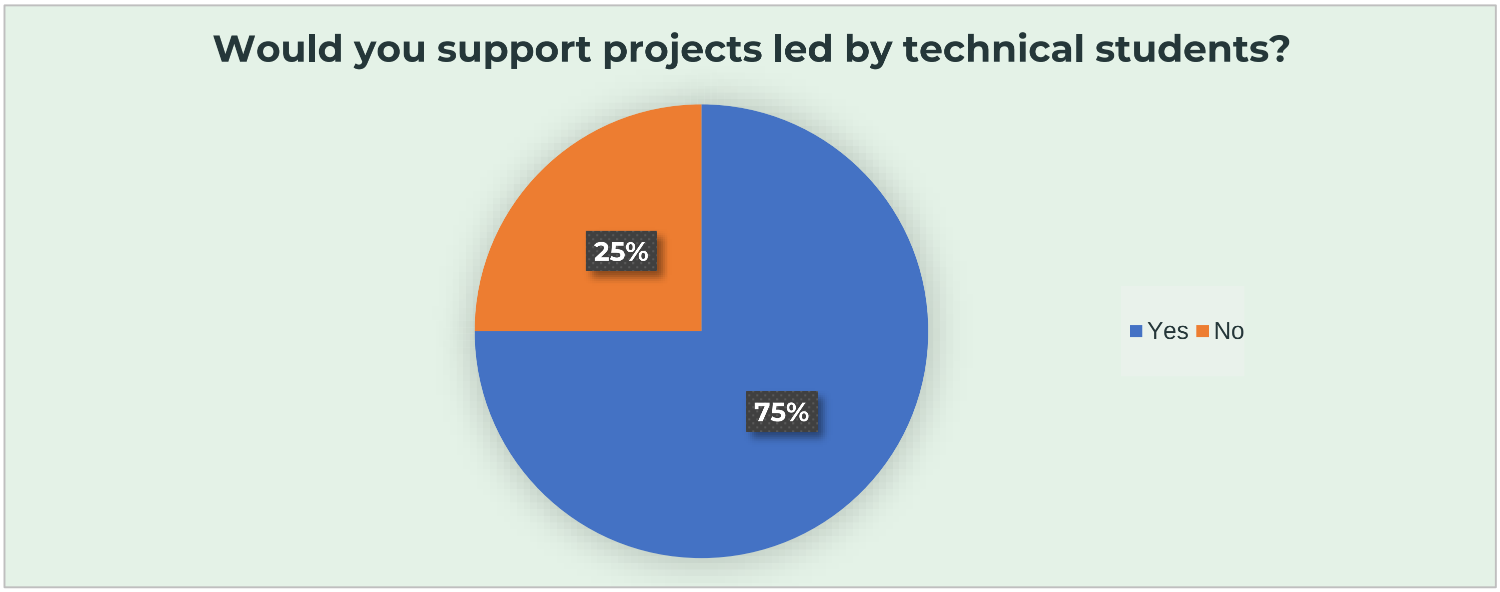


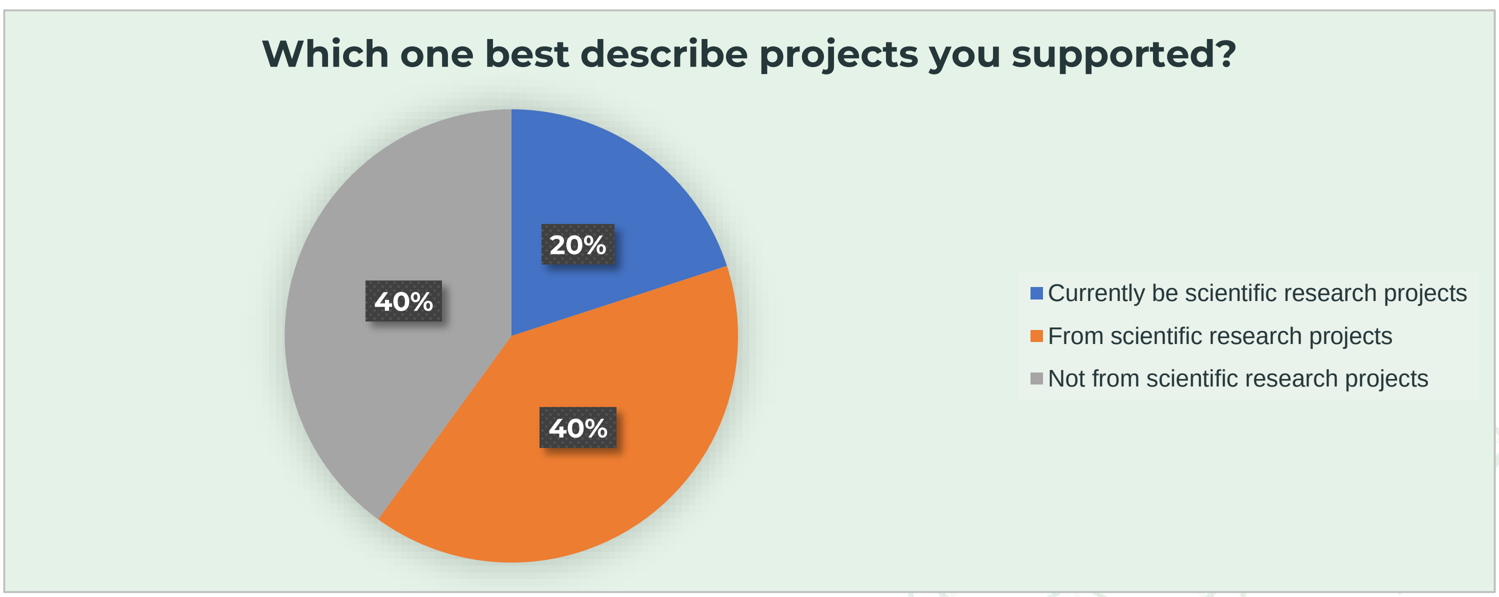
Supervisors



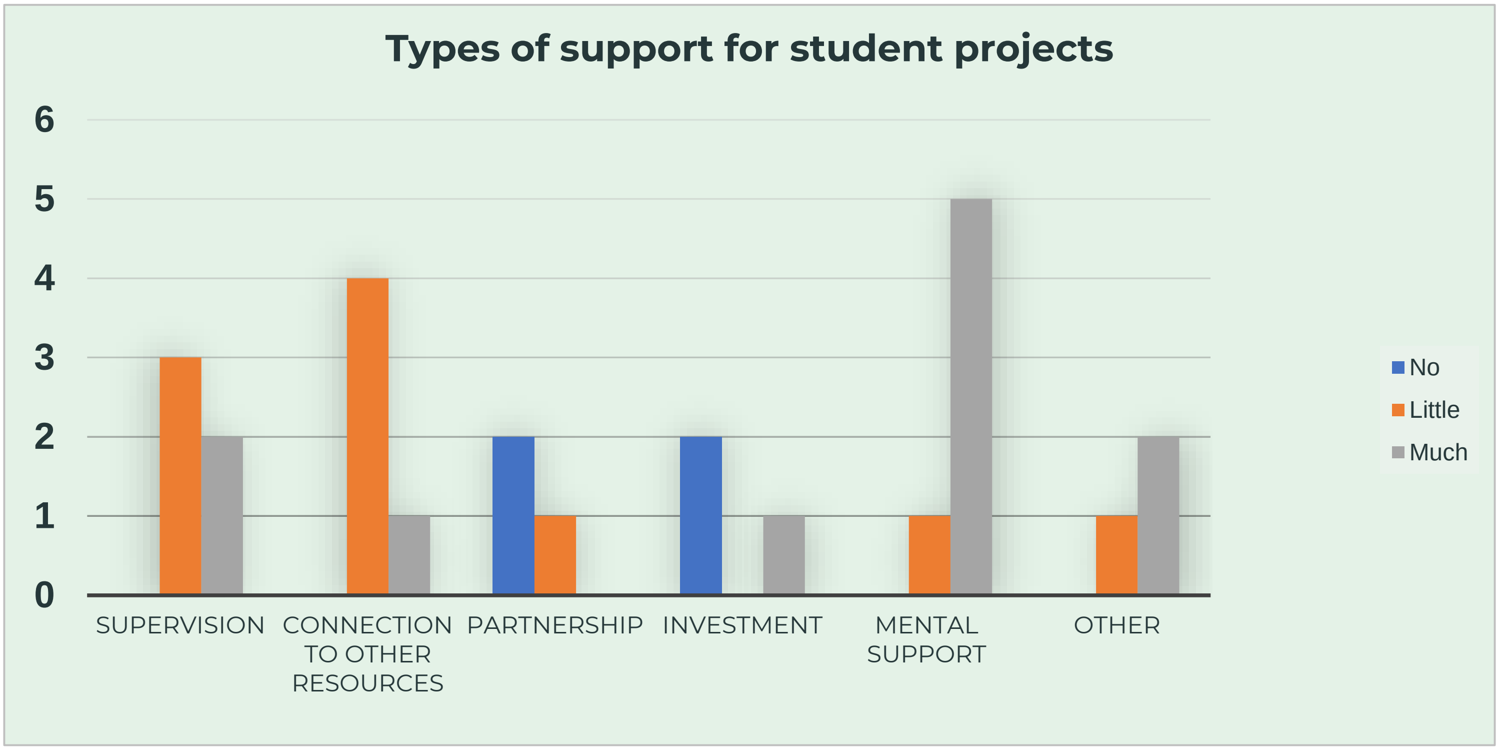


Trainers


Would you support projects led by technical students?
25%
75%
Yes
No


Which one best describe projects you supported?
20%
40%
40%
Currently be scientific research projects
From scientific research projects
Not from scientific research projects

Trainers


Types of support for student projects
6
5
4
3
2
1
0
SUPERVISION
CONNECTION TO OTHER RESOURCES
PARTNERSHIP
INVESTMENT
MENTAL SUPPORT
OTHER
No
Little
Much


Would you join entrepreneurs support centers/organizations?
42%
58%
Yes
No