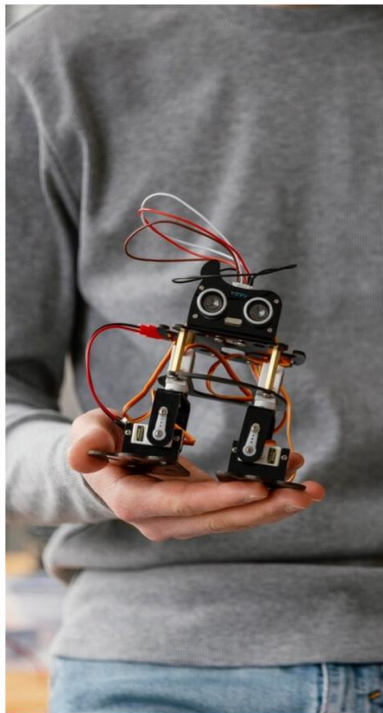


BANGLADESH REPORT 2024

**UNIVERSITY-BASED
ENTREPRENEURSHIP ECOSYSTEM DEVELOPMENT:
INDUSTRY-ACADEMIA COLLABORATION**

 **iSocial**TM



Bangladesh Report 2024

University-Based Entrepreneurship Ecosystem Development: Industry-Academia Collaboration

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Abbreviation/Acronyms	Details
ADB	Asian Development Bank
BAN	Bangladesh Angels Network
BUET	Bangladesh University of Engineering and Technology
BWIN	Bangladesh Women Investors Network
DIU	Daffodil International University
DUIEDC	Dhaka University Innovation and Entrepreneurship Development Center
EDC	Entrepreneurship Development Center
EGC	Expert Group Consultation
FGDs	Focus Group Discussions
GPA	Grameenphone Accelerator
HEAT	Higher Education Acceleration and Transformation
HKUST	Hong Kong University of Science and Technology
HR	Human Resources
ICT	Information and Communication Technology
iDEA	Innovation Design and Entrepreneurship Academy
IEH	Innovation and Entrepreneurship Hub
ILO	International Labour Organization
IP	Intellectual Property
IPO	Initial Public Offering
IUC	Industry-University Collaboration
KIIs	Key Informant Interviews
LDC	Least Developed Country
MVP	Minimum Viable Product
NDA	Non-Disclosure Agreement
NSU	North South University
NUS	National University of Singapore
PR	Public Relations
R&D	Research and Development
RISE	Research and Innovation for Sustainable Enterprises
SBL	Startup Bangladesh Limited
SINE	Society for Innovation and Entrepreneurship
SME	Small and Medium Enterprise
SNU	Seoul National University
SSE	Sydney School of Entrepreneurship
TTO	Technology Transfer Office
UBEE	University-Based Entrepreneurship Ecosystem
UCB	University of California, Berkeley
UGC	University Grants Commission
VC	Venture Capital

University-based Entrepreneurship Ecosystem Development: Roles of Industry-Academia Collaboration

A. Introduction

Bangladesh has achieved commendable economic growth in the past decade and is now a lower-middle income country and on the way to graduating from least-developed country (LDC). Despite such progress, there remains an argument that the country has not been able to effectively translate the growth experience into its employment market. The declining trend in employment elasticity of growth in recent years demonstrates a *jobless growth* period for Bangladesh.¹ Jobs diagnostics by the World Bank (2017), International Labour Organization (ILO), and Asian Development Bank (ADB) (2017) also suggest that the ability of the economy to generate enough employment seems to have declined over time. Annual employment growth declined from 3.32 per cent, during 2005 to 2010, to 1.33 per cent during 2013 to 2016-17. Although the economy generated about 1.15 million jobs per year over the past decade, growth in the working-age population has been argued to have outpaced job creation rate. The country gains an average of approximately 2 million new entrants in work force annually, of which only 5% receive formal training before entering into the labour market (GoB, 2016). The National Employment Policy 2022 (GoB, 2022) targets to create 30 million jobs by 2030. However, government jobs can accommodate a little over 5 percent of the total workforce, while the private sector is also not generating enough employment opportunities (World Bank, 2024). The political and economic crisis, both domestic and global fronts, have further exacerbated the existing challenges, related to the sustainability and inclusivity of Bangladesh's growth performances, hitting the most disadvantaged and vulnerable - including women, minorities, and young people - the hardest.

One of the major challenges of the Bangladesh labour market is the high youth (population aged 15-29) unemployment rate and a high share of the NEET (not in Employment, education, or training) youth of the total youth population. The Labour Force Survey (LFS), 2022 (BBS, 2023)² data reveals that the size of the youth labour force was 26.8 million in 2022, with an estimated 2.15 million (8.0 per cent) of them are unemployed. Overall, 83.2 per cent of total unemployed population are youth, with a significant gender divide. The unemployed male youth was 1.39 million and female youth was 0.76 million. In addition, more than one-fifth of the youth population in Bangladesh is not engaged in education, employment, or training (NEET). Although the youth NEET rate has declined since 2016, it remains elevated at 22 percent

In general, the low human capital endowment of Bangladesh labour force is reflected by the low labour productivity in all sectors. This has also been identified as one of the key reasons behind high youth unemployment rate. Latest LFS data shows that only 3.8 per cent of the labor force have received tertiary level education. However, the problem further extends to graduate level individuals too. The share of unemployed tertiary-educated youth within the total unemployed population in Bangladesh increased to 27.8 percent in 2022 from 9.7 percent in 2013. An increasing level of competitions and pressures on graduating youth can be sensed from the surge of number of youths applying for a limited number of jobs created in the market: around

¹ During 2005-06 to 2009-10 employment elasticity was 0.55 which has fallen to 0.25 during 2009-10 to 2017-18.

4,43,000 applicants for 1800 posts for government official jobs while an average of 43,000 applicants for 70-10 job postings.

Delinking education from employment causes disequilibrium in the supply of and demand for educated manpower in the labor market and when this gap persists or widens, this may lead to many negative consequences (Islam, 2008). A large body of literature indicates a growing mismatch between the competencies of graduates and the demands of the job market. There is a lack of skills and knowledge demanded by employers, as the education system often fails to provide industry-relevant training (Ehsan, 2021; Rahman, Farooq, & Mohamad, 2021, CPD 2024). Many recent graduates do not possess essential employability skills such as problem solving and independent thinking, work attitude, and positive personality traits (World Bank, 2019).

It has been pointed out that university programmes and curricular in Bangladesh do not include trainings on key employability skills as well as the university administrations are quite conservative and unresponsive to the required modifications to the evolving market demand and labour market scenario. This is the underlying reason of the growing level of skill mismatch between the university graduates (supply side) and the requirements of the different industries (demand side). The low skill sets of graduates restrict the capacity of the industries to employ more graduates [Figure A1].

One way to address this gap in the employment generation is to promote entrepreneurship among the youth, with the help of multiple support actors as mentioned in the conceptual framework of Figure A2. The academic institutions and the industries are two key actors attached to the journey of a graduating youth. This journey of the graduates of transitioning from a student to an employee or a self-employed entrepreneur is majorly facilitated by these two support actors, where the academia stands on the supply end and the industry stands on the demand end [Figure A1]. From the academia end, the students receive support in the form of curriculum and theoretical knowledge received through the university faculties and relevant representatives of the university administration. The academia also creates facilities to convert their ideas through R&D into intellectual properties (IP) and/or successful ventures. The industry, on the other hand, is represented by predominantly private organizations, employers, business leaders, where it requires the graduates to have both theoretical and practical understanding of the market to comprehend the operational dynamics within the industry, and an entrepreneurial spirit to flourish the industry with innovations and solutions. This requirement of the industry creates a gap in the demand and supply of skills among the graduating youth and the employed youth.

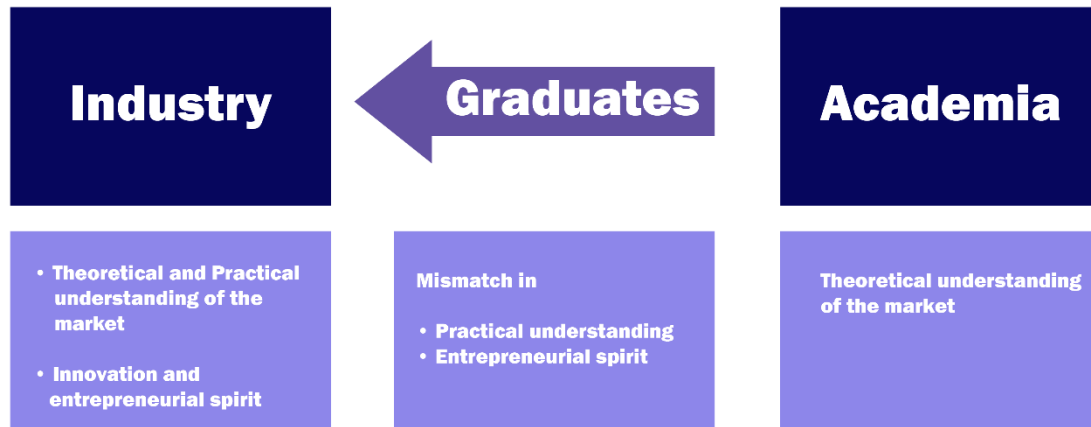


Figure A1 Gap in Skills of Graduates

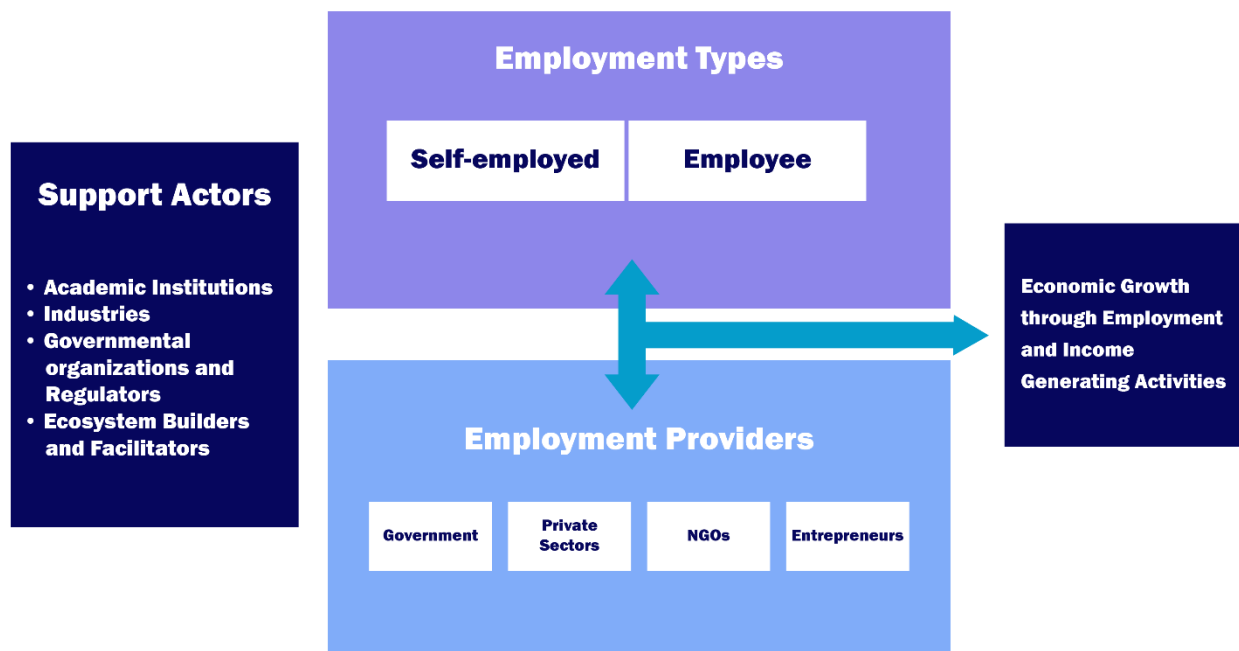


Figure A2 Conceptual Framework: Employment Generation through Entrepreneurship Development

With a collaboration between these two ends of the employment journey of a graduate, this mismatch in skills can be largely overcome, given that the right ecosystem is in place. This collaboration could be further extended to engaging the students with activities that will equip them with entrepreneurial skills and resources and the support system could include contents or activities as mentioned in Figure A3, where focus needs to be provided more on experiential and active learning through which students can receive project experience and problem-solving skills, and develop hard skills to design solutions, soft skills to communicate, collaborate and lead their teams and professional qualities to deal with business and compliance matters. Thus, the pipeline of inducting the students into being entrepreneurs can be strengthened through a

collaborative approach, and the industries will benefit from the dual effect of having more innovations within the system and being able to accommodate more graduates through employment opportunities created by the entrepreneurs.

Innovation Support for Students



Figure A3 Innovation Support System for University Students

This research report presents an understanding of these aspects of the industry-academia collaboration in strengthening the pipeline-building process for the entrepreneurship ecosystem of Bangladesh. Subsequently, we propose an ecosystem model based on tertiary educational institutions in Bangladesh, focusing on the role of the industries and academic institutions.

B. Problem Statement

Evidence suggests that young graduates enter the job market without adequate preparation and skills, with a low success rate of being financially independent. On the other hand, we observe a low level of engagement between the industries (demand side) and universities (supply side), especially to address the urgent need of demand-driven upskilling of university students. Anecdotal evidence suggests that this sub-optimal IUC activities contributes to deficiency in skills and culture amongst the tertiary-level graduates.

Our core research problems are: (a) to investigate the current state of the IUC in Bangladesh and what are the challenges that are restricting an increased level of IUC with impact in Bangladesh, and (b) to explore possibilities of IUC in developing and promoting a university-based entrepreneurship ecosystem which will prioritize to address the skill mismatch issues in Bangladesh.

This study has particularly focused on identifying the areas through which the industry-academia collaboration of Bangladesh, in the context of entrepreneurship pipeline building, can be strengthened through enabling opportunities of skills development, knowledge and network

building, and availing necessary financial and/or capacity building resources. For this, we looked into gaps in curriculum, resources, and facilities available within academic institutions, barriers in choosing innovation and entrepreneurship journey, appropriate incentives for students for innovation and entrepreneurship, barriers for academic institutions in fostering innovation and entrepreneurship culture. The research also has looked into bigger ecosystem issues, especially the readiness of industry to accommodate students and teachers in the innovation process and business process of industry, which hinder entrepreneurship as a career by the graduates of the academic institutions. The research proposes an actionable agenda for entrepreneurship ecosystem building within tertiary educational institutions and industry-academia collaborations in equipping the students with necessary entrepreneurial skills and resources, in terms of programs, delivery of programs and accessibility of the programs, especially for the female students and for the students from rural areas.

C. Rationale of the Research

With the current number of graduates, there is a high possibility of entry of new entrepreneurs into the ecosystem given that systematic, structural, and functional challenges are addressed for key stakeholders. In general, the quality of the academic training available in the higher education institutes of Bangladesh is quite poor, and the universities are quite unresponsive to reflect the industry demand in their academic programmes. As a result, university graduates lack modern technical knowledge and critical employability skills leading to a mismatch in the demand and supply of skillsets of university graduates. The low human endowments and lack of required skills have long been echoed by employers from different sectors. A UNDP (2021) study on the youth entrepreneurship ecosystem of Bangladesh, has identified this gap in skills as one of the key workable areas in strengthening the ecosystem.

To reduce the skill gap, contributions are required from both the academic institutions and the industries. A collaborative and participatory approach from these two parties will entail a better approach to defining and identifying the obstacles behind the existing gaps and designing efficient initiatives to help the students. Such collaborations will help to prepare and benefit more students to enter the ecosystem with the necessary skills and resources and a higher probability to sustain.

The purpose of our study is to identify existing major concerns in developing the entrepreneurship ecosystem within tertiary educational institutions and to explore the industry-academia collaboration as a pathway to strengthen the pipeline by guiding the graduates to the entrepreneurial ecosystem. In this research, we aim to strengthen the understanding of the effectiveness of the existing industry-academia collaboration initiatives in equipping university graduates with entrepreneurial skills and resources for youth entrepreneurship in Bangladesh.

Targeting the tertiary-level students, we propose a University-based Innovation and Entrepreneurship Ecosystem Model for R&D capacity building and entrepreneurship development in Bangladesh. We believe that our proposed model is a practical, sustainable, accessible, and scalable solution of the problem.

D. Methodology

D1. Research Objectives and Questions

Research Objectives

- a. To understand the current status of R&D and entrepreneurship ecosystem within tertiary educational institutions and industry-academia connections in the context of entrepreneurship pipeline building in Bangladesh
- b. To identify the gaps in the pipeline and explore the prospective areas of industry-academia collaboration through which the pipeline-building process can be strengthened.
- c. To propose a R&D and entrepreneurship ecosystem model based in tertiary educational institutions.

Key Research Questions

- a. What is the current status of the R&D and entrepreneurship ecosystem within tertiary educational institutions?
- b. What is the current status of the industry-academia connections in the context of entrepreneurship pipeline building in Bangladesh?
- c. What are the gaps in the entrepreneurship pipeline-building process of Bangladesh?
- d. What is a workable model for developing an ecosystem within universities by creating an entrepreneurship pipeline as well as meeting industry demand for skilled human resources through industry-academia collaboration?

D2. Research Process

To meet the objectives stated above, the scope of the research identified is as follows:

- a. Collecting, organizing, and reviewing necessary relevant secondary documents and literature.
- b. Preparing a detailed data collection mechanism with the development of appropriate data collection tools.
- c. Conducting KIIs, as much as possible, with academics, business leaders, industry experts, and representatives of different trade associations and entrepreneurship programs.
- d. Analyzing the gathered insights and preparing a draft report, which will offer a specific actionable agenda for relevant stakeholders.
- e. Finalizing the report with feedback from iDEA.

The research process is presented in Figure D1.

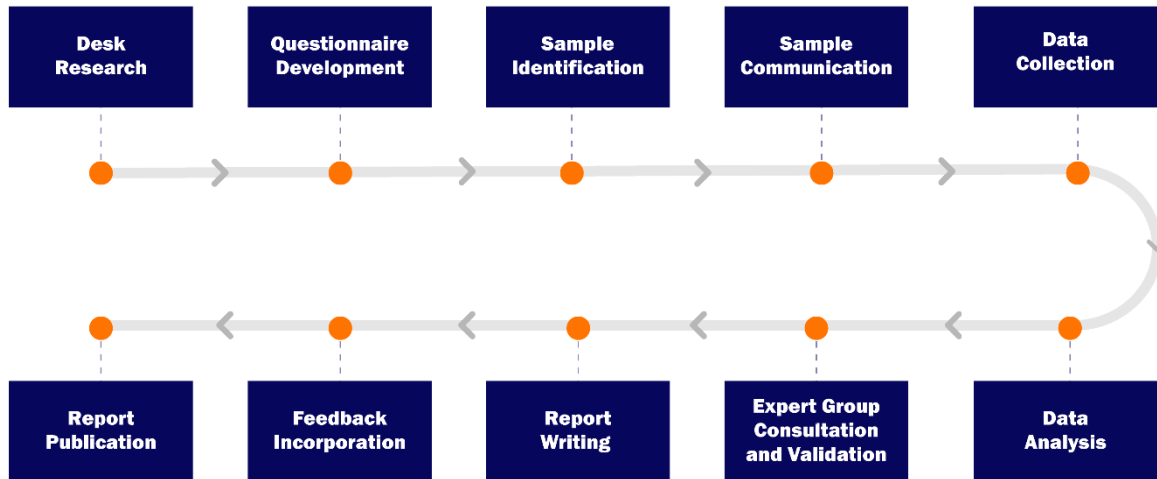


Figure D1 Research Process

The study has followed a collective, context-driven knowledge generation, with a certain degree of judgment of the researchers.

D3. Research Instruments

With the definitive scope mentioned above, the research questions have been answered by adapting a qualitative approach, using the following methods:

- a. **Desk research:** The desk research was conducted with a thorough literature review on entrepreneurship ecosystem development in tertiary educational institutions in countries of Asia, Europe and North America. The research also has captured good practices of industry-academia collaboration on R&D and their commercialization with active engagement of industry. The desk research has captured the gap in entrepreneurial skills and resources among the students and the role of industry-academia collaboration in addressing such gaps in Bangladesh. It has also looked into the additional collaboration areas in preparing the students for entrepreneurship. The desk research has also gathered insights about what worked and did not work in other countries, where industry-academia collaboration brings benefit to both parties.
- b. **Key Informant Interview:** The research conducted interviews with key stakeholders from industry and academia as well as practitioners in Bangladesh and abroad. The list of Key informants, Checklist for KII and interview summary is presented in Annex A, B and C. The KII checklist was developed based on the secondary review of literature. The KII checklist covers the areas of innovation support through industry-academia collaboration, as reflected in Figure D2.

Innovation Support through Industry-Academia Collaboration			
Connectivity	Skill Development	Knowledge and Guidance	Others
Recruitment and Placement	Entrepreneurship and Commercialization	Commercialization of Research Outcomes	Gender-lens Initiatives
Competitions	Business Design, Strategy, and Operations	Funded Research and Innovation Projects	Commercialization Opportunities
Networking Events	Legal and Compliance Issues	Incubation Centers	Stories of Ventures
Networking Platforms	Intellectual Property	Workshops	Accessibility of Opportunities

Figure D2 Framework for Innovation Support through Industry-Academia Collaboration

- c. **Focused Group Discussion [FGD]:** Two focused group discussion were organized with participation of students of various disciplines of multiple universities.
- d. **Consultation Meeting:** A consultation meeting titled ‘Industry-Academia Collaboration for Entrepreneurship Development: What's Appropriate for Bangladesh?’ was held on May 31, 2023, with participation of ecosystem leaders and project authorities. The consultation meeting provided valuable guideline for research and proposal of a model for tertiary universities.
- e. **Data collection:** The sources of data, instruments for data collection and their description are presented in Table D1.
- f. **Data curation:** The collected data was cleaned, organized, and analyzed in order to derive quality information, and determine the answers to the research questions. The research guideline of DataSense at iSocial is followed [See Annex D].
- g. **Data analysis:** The curated data was analyzed using qualitative data analysis software NVivo, and the outcome of the analysis will be presented in a constructive report.

Table D1. Data Collection

Type of Data Collection	Instruments	Quantity	Description
Secondary Data Collection	Desk Research	NA	Secondary data are extracted from various sources and analyzed through this process, where the research team went through the followings: Literature Existing policies and programs related to Entrepreneurship and R&D University Curriculum Published reports
Primary Data Collection	Key Informant Interview	07	KIIs are conducted with Academics from the target disciplines Industry leaders Start Accelerator Leader University-based Startup Program Leader in US See Annex A.
	Focus Group Discussion	2	FGDs were conducted with university students
	Expert Group Consultation	1	An online collaborative discussion session was organized with academics, industry leaders and representatives and students, where the aspects of strengthening the industry-academia collaboration can be discussed in-depth and validated.

E. Context Setting: Literature review

Bangladesh has made significant development in recent decades, with an average annual growth rate of more than 6.3% during last four years. Notably, the country's GDP per capita has more than doubled from 2009, to USD 2,521 in 2024. This expansion has been supported by the stability of its vital sectors mainly: textiles, agriculture, and remittances, which have traditionally formed the backbone of the economy. However, as Bangladesh tries to move from a low-income to a lower middle-income country, there is a rising realization of the importance of diversifying its economic base to sustain growth and enhance resilience against global shocks. Especially through diversifying the skill sets of the future graduates which need to be aligned with the demands of the industries.

It is undeniable that Bangladesh holds tremendous potential in leveraging future economic development through its workforce. The total labour force of Bangladesh has increased to 73.69 million of which 48.25 million are male while 25.44 million are female. While this statistic may at first seem to paint a rosy picture, we can see that the future predictions show a dire state as

there will be high unemployment amongst the graduates. A World Bank study found that more than a third of university graduates remain unemployed for one or two years after graduation. The unemployment situation is dire for graduates of National University (colleges offering degrees in tertiary education), as 66% of these graduates are unemployed, according to a BIDS study. This phenomenon contributes to the high levels of graduate unemployment, with many educated individuals struggling to find suitable job opportunities. This situation is further amplified as there is a lack of collaboration between industry and academia which can bridge the gap between the skills possessed by graduates and the requirements of the job market. For this many graduates with entrepreneurial mindset and aspirations do not embark on their entrepreneurial journey which in return increases the unemployment rate.

The low rate of entrepreneurship among graduates is a concerning issue as the potential students get into formal and informal job markets as many graduates are hesitant to embark on entrepreneurial paths. Many potential entrepreneurial ventures are forgone which fails to create employment opportunities and drive economic growth. Moreover, the industry often raises concerns about the skill set of graduates from universities. Employers feel that graduates lack the practical skills and industry-specific knowledge required for the workforce. According to one study by the Centre for Policy Dialogue (CPD) in 2021, a shortage of skilled applicants for professional positions had been reported by 46% of employers.

Simultaneously, industries are criticized for their low level of R&D expenditure and limited collaboration with educational institutes. Most industries in Bangladesh spend less than Tk 500 per year on research and development (R&D) per worker, according to the Centre for Policy Dialogue (CPD), a scenario that may hold back a country aiming to become a manufacturing hub and a developed nation in less than two decades. Raising competitiveness and productivity through R&D and innovation are deemed as vital for nations that want to ensure sustainable wage growth, create jobs and stay ahead of competition in export markets. Higher R&D spending also leads to higher innovation, which contributes to higher per capita income. However, in Bangladesh, the overall R&D investments stood at 0.03 percent of gross domestic product (GDP) in 2022-23, according to data of the planning commission. It was 0.54 percent in Vietnam, 0.70 percent in India, and 2.55 percent in China. Furthermore, the current business environment is more complex than before due to intense competition, fast changes in customer preferences, globalization, shorter product life cycle, and volatile customer satisfaction. Enterprises are under increasing pressure to address these issues effectively.

Collaborating with educational institutions can provide industries with access to research expertise, fresh ideas, and innovative solutions, enabling them to adapt and compete effectively in the market. On the other hand, the Universities face its own set of challenges, including rising costs and funding crises. Universities often grapple with societal pressure and increasing competition among institutes. To address these challenges, industry-academia collaboration can play a significant role in enhancing funding opportunities, knowledge exchange, and resource sharing between universities and industries. This collaboration can help universities meet societal expectations, align their academic programs with industry requirements, and create a more conducive environment for innovation and entrepreneurship. The fundamental problem of a constant increase in unemployment which emphasizes in an immediate response in creating ways for employment leads to highlighting the existing weak collaboration in the

entrepreneurial pipeline of Bangladesh and one of the potential ways to solve this problem is by establishing an Innovation Hub within the university as part of the academic program.

As a developing nation, there are several barriers to implementing a widespread industry-university collaboration (IUC) in Bangladesh. The two most common barriers are a lack of funds and a stringent regulatory system. The availability of funds has paved the way for regulatory easing in the developed countries which is, in many ways, not practical for Bangladesh. These two issues negate the development and nurturing of a strong entrepreneurial landscape in Bangladesh.

Another set of problems is the inherent disinterest in the collaborative environment. As established before, the developed countries implement and specialize in IUC as a symbiotic relationship that aggregates the development of both academia and industry. However, in the context of Bangladesh, the lack of a collaborative environment has created polarizing effects – the academia is stagnant with little to no visible innovation to the curricula, and the dependence on the industry for knowledge spillover from developed countries, often by sourcing C-Level foreign executives to fill the existing knowledge gap (Khaled, 2020).

The existing state of curricula and that of the industry could be analyzed separately from the socio-economic perspective of Bangladesh. Bangladesh has historically been an agrarian country with a majority of the population living in rural areas that are directly or indirectly related to agriculture. The economic growth of the nation has mostly been based on agriculture and the service sector with hindered priority to rapid expansion to industry. The high level of competition and existing monopolistic behavior by the industry leader along with strict regulatory structure makes it difficult for any business to penetrate as a new player. For example, the tea sector of Bangladesh where Ispahani Mirzapore, KK, and Fresh Premium controls almost 90% of the domestic tea production from the estates. A total of 167 tea estates have a combined arable area of around 115820.33 hectares of which only 54106.24 hectares are used to cultivate tea. The rest are non-cultivated which are either controlled by the market leaders or barred by creating entry barriers for new players (LightCastle Analytics Wing, 2022). This is just one example of hindered opportunity in the industrial sector of the country. A similar situation exists in most of the sectors which paved the way for the rapid development of the service sector. Rather than prioritizing industrialization, Bangladesh got inclined toward manufacturing and RMG exports which only widened the gap in the GDP share.

The weak socio-economic structure paved the way for a “secured earning” mentality which was provided by the service sector. Even though the outcome is negligible compared to the potential output through rapid industrialization and decentralization of barriers, the status quo paved the way for a metronomic workforce that got stuck in the service cycle (Pramanik, 2016). The economy in turn became dependent on foreign workforce for high-level management. Study shows that foreign workers take away about \$6 billion each year from high-level executive position owing to the lack of local talents to fill the position (Islam and Uddin, 2019).

As has been the case with the early industrial revolution in Europe, the need for industry paved the way for innovations from academia. However, in the context of Bangladesh, the workforce is disseminated into low-skilled repetitive jobs. The lack of demand from industry ultimately

resulted in the stagnation of the curricula in academia. Because there is no demand for innovation or funds to realize the innovation.

A look at the rise of the developed nations shows that it was made possible by decades of industrial growth which intertwined with the growth of new knowledge and skills to complement frontier industries (Nsanzumuhire and Groot, 2020). But things are different in the case of Bangladesh. In a sense, both industry and the academia are shortsighted. The product of IUC is not something that can have short-run implications. It will take years, sometimes decades, for positive results. However, the myopic loss aversion tendency of the industry sees investing in a foreign workforce as beneficial compared to long-term investment for local workforce development. It is a classic case of taking the spillover rather than developing a knowledge base of our own.

A similar implication is held for academia as well. The existing resources are repackaged to create new graduates each year, despite the fact the knowledge base and the skillset of these graduates are not on par with global standards (Sarker, 2022). Service sector-oriented education is failing to promote an entrepreneurial mindset with limited industry exposure. The existing collaborative environment is also limited to minimal engagements with the likes of business competitions and limited internships. Overall, academia is not able to create a channel for entrepreneurial mindset development due to the inherent socio-economic bias against it and the lack of support from the industry.

The entrepreneurial landscape of Bangladesh is growing at a fast pace. However, compared to its global counterparts, it is still at its early stage. Several factors contribute to the lack of entrepreneurial mindset starting from the traditions, economic landscape, academics, and even industry penetration. Some of the respondents for the KII identified the regulatory barriers as one of the key negators in the entrepreneurial pipeline development of the country. From the perspective of Bangladesh, the lack of intellectual and guideline resources combined with nascent angel investment ventures only limits the opportunities of an entrepreneur. The FGD conducted with the university students also entails this lack of opportunity in the entrepreneurial sector. Globally, over 350 million startups are being born each year. Among them, the success rate is limited to just 10%. The chances of becoming a unicorn are somewhere around 0.00006% which only amplifies the aversion for the sector (Kapoor, 2023). According to the respondents, the lack of support, high risk of failure, and lack of second chances in the entrepreneurial landscape are some of the pressing problems of the sector.

As a consequence, potential talents move away from entrepreneurship and enter into the service sector or move abroad for better opportunities. The latter creates an acute brain drain situation for the country which is another pressing concern. A report by UNESCO Institute for Statistics shows that about 44,338 students went abroad for higher education in 2020. The numbers are almost double compared to the 24,112 students that went abroad in 2015. The majority of these students settle abroad with very few coming back to Bangladesh. The ones that are coming back are either joining the academia, service sector or the industry in managerial positions (Ananthanarayanan, 2023). In any case, the entrepreneurial sector is failing to draw potential and talented individuals.

According to several KII respondents, the regulatory barrier combined with the lack of ‘rule of law’ in the business environment is raising negative stakes in the entrepreneurial sector of Bangladesh. Entrepreneurial ventures and initiatives are being bogged down by regulatory and bureaucratic processes which are creating a barrier at every step.

The high level of regulatory support and funding needs to be matched by innovative ideas and business plans to execute the same. This is where University-Industry collaboration played a huge role in the entrepreneurial pipeline development of Singapore. Almost all the leading countries have different policies to ease the entrepreneurial process. However, one common ground among the leading nations is the high importance placed on IUC (Dooley and Kirk, 2007). The Industry-University Collaboration acts as the nurturing process in the pre-budding stage of a potential venture. The conducive regulatory and business environment would be of no use unless there is an innovative idea and a trained talent pool to execute the idea.

The leading economies of the world treat IUC as a symbiotic relationship. In essence, university and industry are interdependent for idea and talent generation. Academia can be considered a place where ideas are born. A breakthrough in frontier tech or an efficient allocation for an existing process is like a hypothesis that is developed in a theoretical environment. These hypotheses need to be implemented in the industry to validate their credibility. An addition of new tech or efficient processes will thrust the industry forward, as has been the case for the last several centuries (Audretsch, Lehmann and Paleari, 2014).

Again, academia is dependent on the industry to fund research. The development of new research requires input and monetary support from industry to develop new hypotheses. This back-and-forth relationship between industry and academia is often neglected in developing nations. As a result, most developing nations aren’t at the forefront of innovation. Rather they are left with knowledge spillovers from the developed nations. Study shows that there is an average gap of 10 years between an innovation that is implemented in a developed nation and later adopted by an underdeveloped or developing nation (Berbegal-Mirabent, Sabaté and Cañabate, 2012). This existing gap reaches all spheres of the economy including the entrepreneurial pipeline development of a country.

F. Bangladesh Startup Ecosystem: State of the art

Bangladesh's startup ecosystem is gradually witnessing growth in angel investments, although it is still in its early stages. A few years ago, the number of investors was limited, although recently, the pace of investments has been increasing. According to the Bangladesh Startup Investment Report of 2022, Bangladeshi startups managed to raise an impressive USD112 million during that year. Among the 47 startups that secured funding, 39 presented unique service propositions.

On average, early-stage startups received angel investments of approximately USD 588K. The total angel investment amounted to USD 2.5 million, which constituted around 2.3% of the cumulative funding raised. These figures suggest that Bangladesh is still at a lower tier in terms of securing venture funds, and the relatively low angel investment ratio indicates that angel investment is still in its infancy in the country. The cumulative funds raised in 2022 stands at around USD 415 billion across the globe. Bangladesh’s share of USD112 million puts it on the

lower end of the spectrum in terms of funds raised in both early and later stages (Morshed, Kabir and Hamid, 2023). The situation can be considered proportional to the lack of ease of doing business and as well as absence of strong law and order that assists in the operation of ethical businesses.

Youth-led innovation and entrepreneurship emerge as key drivers of transformative change in Bangladesh's economy. Initiatives such as the government's Innovation Design and Entrepreneurship Academy (iDEA) project, introduced in 2016, have helped to develop an entrepreneur-friendly ecosystem by offering startup capital, incubation support, and access to mentorship networks.

Notable success stories, such as Pathao, a ride-sharing network, and various e-commerce businesses, serve as sources of inspiration for prospective entrepreneurs, demonstrating the transformative power of youth-led ventures in transforming the economy. Despite these achievements, substantial difficulties remain, impeding the full fulfillment of young innovation and entrepreneurship in Bangladesh. Limited access to capital, limited infrastructure, and a lack of entrepreneurial education continues to be strong impediments, especially for prospective young entrepreneurs from marginalized communities and rural locations. Furthermore, the COVID-19 pandemic exacerbated existing disparities and disrupted entrepreneurial ecosystems, highlighting the need for specific actions to help youth-led businesses during crises.

A closer look into Bangladesh's startup landscape shows that Bangladesh does not rank anywhere near the top of any entrepreneurial index globally. There are currently around 1200 startups in the country with about 200 being founded each year. The concentration of the startups is mostly based in the major cities of Bangladesh. Leading areas of startups include Edtech, Fintech, delivery, and logistics support. There are currently 200 angel investors in the country with 20 accelerator programs acting as the main support mechanism. The cumulative funds raised by Bangladeshi startups stand at around USD 1 billion from local and international venture firms (Startup Bangladesh, 2024). bKash, one of the leading MFS solutions of Bangladesh is the first and only startup till date to achieve the unicorn status (startups that are valued at over \$1 billion or more).

The numbers are a stark contrast to the numbers from our neighboring country India. There are over 86,000 startups in the country with around 108 unicorns. The contrast between Bangladesh and India is not just because of the economic and population difference. Bangladesh ranks 83rd among 119 countries in Global Startup Ecosystem Index 2024, moving 6 steps ahead of other countries. The same year, India ranked 21st, Pakistan and Sri Lanka in South Asia are also ahead of Bangladesh. The Ease of Doing Business Index ranks Bangladesh at 168th which is near the bottom tier whereas India stands at 63rd position. Beyond the scope of industry-academia collaboration, the existing status quo is making a significant difference in the entrepreneurial landscape of Bangladesh.

F1. Initiatives by the Government

Box F1.1. iDEA, A long Term Investment for Promoting Tech-based Startups in Bangladesh

Innovation Design and Entrepreneurship Academy (iDEA) is working to provide a national platform for entrepreneurship so that Bangladeshi startups may innovate, generate new possibilities, improve their technical capabilities, and contribute to creating new ventures and thus, creating more jobs. Some of the key activities of iDEA are:

- a. Create an incubation system with pre-seed and seed funding for the startups at idea, pre-seed and early seed stage. This program in ICT Division identifies promising startups in the fields of education, agriculture, health, financial services, e-commerce, e-governance, environment, transport, and infrastructure and evaluates them based on potential impact, potential for commercialization, execution strategy, and public benefit.
- b. Offers pre-seed and seed fund up to BDT 1 million and endorse them for acceleration and raising bigger funds.
- c. Offer selected startup entrepreneurs mentoring, funding, co-working spaces, marketing assistance, and legal support to help them fulfill their goals.
- d. Establish collaborations between business, academia, and government to promote innovation and maintain transformational efforts.
- e. Promote Bangladesh as a worldwide hub for cutting-edge startups and establish the necessary legal framework to support its goals.

iDEA provides the following services:

- **Mentoring:** iDEA offers mentoring to the startups through a network of knowledgeable mentors, national and international business executives, academics, angel investors, prosperous entrepreneurs, and subject-matter specialists
- **Academic Programs:** the iDEA academy offers a variety of courses to prepare entrepreneurs operating in many areas. The academy offers both long-term and short-term training at various levels in order to meet the needs of entrepreneurs.
- **Networking:** As the focal point of Bangladesh's startup ecosystem, iDEA works with local and international partners who support startups. Startup Circle was established to promote cooperation between its member organizations. Matchmaking events between investors and startups are often scheduled.
- **Legal and IP support:** iDEA advises and aids entrepreneurs in defending their legal and intellectual property rights. The members of Startup Circle are also available to assist the startups if necessary.
- **Funding:** Startups can apply for iDEA grants as well Bangladesh Innovation Grants (BIG). Startups in the pre-seed or idea-stage can apply for the BIG, which offers up to 1 BDT 10 million. Startups in the seed and growth stages are eligible to seek for funding from the venture capital firm of Startup Bangladesh Limited.
- **Lab Support:** For the startups, iDEA and Startup Bangladesh Limited (SBL) have built a cutting-edge lab facility. Startups can test their goods or services and receive professional advice.

Source: iDEA, ICT Division

Box F1.2. Government-led Venture Capital Fund: Startup Bangladesh Limited

Startup Bangladesh Limited (SBL) is the flagship venture capital fund of ICT Division. It started its journey in March 2020 with a capital allotment of BDT 5 billion. The SBL Fund invests in pre-seed, seed, and growth stage startups through grants, convertible debt, and/or equity. It makes investments through co-investments, act as a fund-of-funds and asset manager, and give companies and stakeholders other in-kind support. The Fund assists technological advancements that lead to new employment opportunities, the promotion of underrepresented tech groups, and the encouragement of an entrepreneurial culture.

The Startup Bangladesh Fund also intends to lend money to high-tech startups and expanding businesses in the form of convertible debt or equity (the Investment). With the help of investment, technological advancement and commercial success are expected to be accelerated. The Fund is dedicated to promoting technological innovation and sustainable development through a procedure that is open, responsible, and gives everyone the equal chance to participate. It looks into investment in non-listed, Bangladeshi-registered businesses with significant development potential. Early-stage tech startups with significant growth potential are expected to be the investees. Investment exit is anticipated to occur between three and five years after investment.

The core activities of Startup Bangladesh are:

- a. Support Technology-Based Innovation
- b. Create New Employment Opportunities
- c. Develop Technical Skills
- d. Promote Under-Represented Tech Groups
- e. Connect With Non-Resident Bangladeshis
- f. Foster an entrepreneurship culture
- g. Attract foreign investment and expertise.

Some of the funded startups by Startup Bangladesh are:

- a. Pathao
- b. Chaldal
- c. Pickaboo
- d. Truck Lagbe
- e. Eduhive
- f. Moner Bondhu

Source: SBL

F2. Initiatives by Private Sector

Box F2. Corporate-led Program: Grameenphone Accelerator (GPA)

Grameenphone Accelerator (GPA) is an innovation platform working for enabling and empowering tech startups with the resources they require to flourish. Sheba.XYZ, CMED, Cramstack, Dhaka Cast, BankcompareBD, AlterYouth, Repto are some of the startup companies graduated from the GPA program. Among them Sheba.xyz and Repto could make to the next level for growth.

Features of GPA:

GPA provides the startups with the following facilities:

- Expert mentors
 - Curriculum
 - Periodic cohort
 - Access to investors
 - Equity free grants
 - Partnership opportunities
 - Media exposure
 - Office space at GP House
 - Advice for In-house development.
- 50 startups have graduated from GPA in 7 batches and GPA released grants of more than BDT 162 million. The average growth rate of the program is 10 times now.
 - Any applicant above 18 years old with a vision of being at least one full time cofounder from any gender, nationality and education level can apply for the program.
 - Industry focus of GPA: Healthtech, Edutech, Fintech, Cleantech, IoT, Cloud Service, Hardware, Gaming, Entertainment, Enterprise, M-Commerce and Mobile Application.

Source: Grameen Phone

G. Current State of R&D and Entrepreneurship Ecosystem in Universities

Despite the progress in the startup ecosystem, university-based research and development (R&D) is limited. In Bangladesh there are 55 public universities and 115 private universities. Bangladeshi scholars in both public and private universities reached the milestone of ten thousand publications (11,477) in 2021. Most of the publications are in English (11,476). There are also few publications in Spanish (7), French (5), and Bosnian (1). Out of 11,477 publications, 10,380 are finally published, and 1,097 articles are still in Press. The top three subject areas of publications for 2021 are Engineering (2,368), Medicine (2,305), and Computer Science (2,136). Environmental sciences have emerged as the fourth largest subject area, with 1,692 publications this year. Only one patent in 2021, which is part of the multinational patent application in music composition. This shows the disproportionate focus on publication of scientific articles compared to patent. The primary reasons are incentives for patenting vis-à-vis publications. The publications are connected to promotion. The other factors are the lack of R&D facilities,

funding and incentives. Professors and students who are involved in R&D and file a patent, there is no stake if that the commercialized.

On the other hand, despite many startups are in the market, only 13% of them are launched by students or faculty members of the universities. The leading startup founders are mostly studied and groomed abroad.

With an estimated 5 million students enrolled in public and private universities across Bangladesh, there is a significant opportunity to harness entrepreneurship and innovation within the local economy.

Most of the universities do not have entrepreneurship curriculum and it is not connected to building real venture. The focus on university entrepreneurship programs, where it is available, are theoretical, with limited emphasis on concrete venture creation. While curricular education emphasizes enterprising behavior and thinking, extracurricular support, particularly through incubation programs, offers a more direct pathway to entrepreneurship by focusing on the practical aspects of starting a business. Globally, university incubation programs have proven to be effective in fostering entrepreneurial skills and supporting the growth of innovative startups and small and medium enterprises. Despite the success of established incubation programs in top universities worldwide, there has been relatively little emphasis on helping students in Bangladesh commercialize their business ideas. This gap underscores the importance of extracurricular support, such as incubation programs, in nurturing entrepreneurship and innovation among university students and graduates in Bangladesh.

Through FGD, a set of barriers and motives for entrepreneurial intention is identified in Table G1.

Table G1. Barriers and Motives of Entrepreneurial Intention

#	Stuck between job and entrepreneurship	Barrier of Entrepreneurial Intention	Motives of Entrepreneurial Intention
1	Social stigma	Limited understanding of risks	Inheritance
2	Self confidence	Access to capital	Academic influence
3	Lack of access to capital	Lack of appropriate set of skills	Desire for independence/ change
4	Fear of complex legal and bureaucratic system	Lack of support services	Self-motivation
5	Complex legal and bureaucratic system	Complex and unpredictable regulation for compliance	Motivation from media
		Bureaucracy, bribery and corruption	Creativity

#	Stuck between job and entrepreneurship	Barrier of Entrepreneurial Intention	Motives of Entrepreneurial Intention
6	Social Support	Lack of family and social support [especially for women]	Professional dissatisfaction
7	Infrastructure	Access to infrastructure and facilities	Poverty
8	Economic Prospect	Market demand	Unemployment
			Job insecurity
			Opportunity in the market

Source: FGD

As mentioned, a few universities, mostly private, have launched entrepreneurship program, not necessarily connected with R&D activities [Table G2].

Table G2. A Few University-based Entrepreneurship Programs

Name of the Institute	Program	Description
AIUB	American International University-Bangladesh Innovation Center (AIUBIC)	Provides programs and resources
BRAC University	Centre for Entrepreneurship Development (CED)	Provides workshops, seminars, and competitions
BUET	Bangladesh University of Engineering and Technology Innovation Hub (BUET iHub)	Provides a platform for students to work on technology-driven startup ideas
Daffodil International University (DIU)	UBEE	A complete ecosystem starting from courses, programs and funding
East West University	Entrepreneurship Development Center (EDC)	Provides support by organizing events, workshops, and competitions
North South University	NSU Startup Next	Organizes events and workshops And Provides networking opportunities
University of Dhaka	Dhaka University Innovation and Entrepreneurship Development Center (DUIEDC)	Provides support through mentorship, training programs, and events to encourage the development of startup ventures.

The most extensive entrepreneurship program is run by Daffodil International University (DIU) [see Box G1], followed by North South University. However, none of them any technology

transfer office, which is essential for connection R&D with entrepreneurship. BUET, with its RISE, there is significant volume of R&D activities, however, they are not collected to entrepreneurship. Only BUET has a technology transfer office, for nurturing R&D with intellectual property (IP).

Box G1. University Based Entrepreneurship Ecosystem (U-BEE): A Model from Daffodil International University (DIU)

Objective:

- Analyze the conceptual framework of global university based entrepreneurial ecosystem (UBEE) to find out the elementary actors within a university framework.
- Propose a cultured UBEE framework developed by Daffodil International University to support and boost entrepreneurship in a university framework.

Method:

- Secondary data were used for developing literature
- A case study of Daffodil International University has been analyzed by qualitative observation methods.
- For proposing a cultured model, the authors used focus group discussion with the faculty members, administrative officials and relevant people.

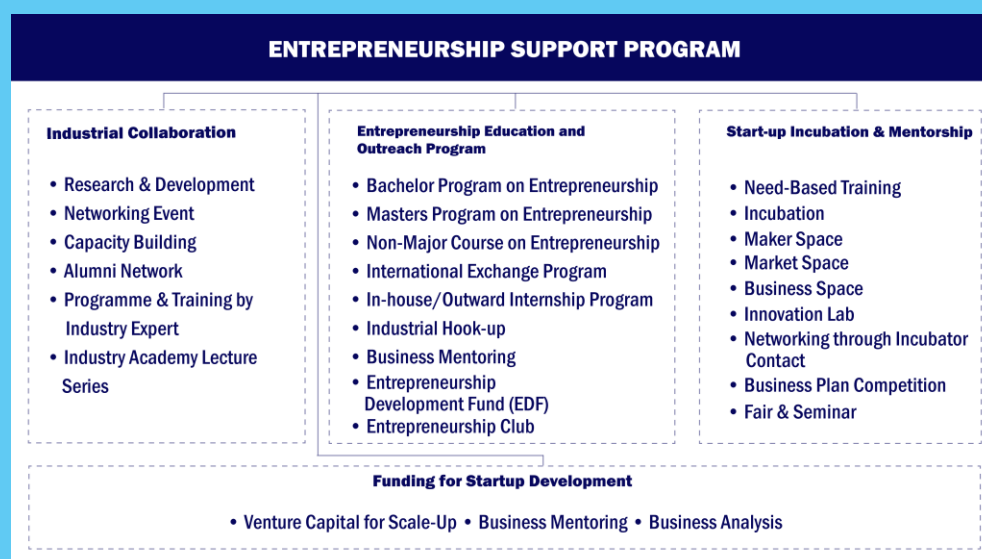


Figure F1: Entrepreneurship Support Program of DIU

Findings:

- U-BEE ensures the nurture of the budding businesses to transform into sustainable growth
- Developing entrepreneurs within the university framework will enhance the industry academy relationship and bring direct impact on new employment generation in the country
- recommends a supportive framework to develop, nurture, initiate and implement the idea throughout the university to effect in creating ventures.

Recommendation:

- The university may implement its strategy on the students of engineering background at first because of their innovative project rather putting emphasis only on business graduates.
- With the cooperative model govt.-industry-university can work in the **triple helix nexus** [Figure F1] in order to create more university-based ecosystem in Bangladesh.
- Industry-academia collaboration can create an entrepreneurship support program

through four main facilities (DIU Model):

- i. Entrepreneurship education and outreach program
- ii. Startup incubation and mentorship
- iii. Funding for incubation development
- iv. Industrial Collaboration

Limitation:

- This study was based on focus group study only, Further research can be carried out to identify the real impact of these U-BEE initiatives through quantitative research

Source: DIU

H. Global Scenario of University-based Entrepreneurship Ecosystem

Globally, universities are the cradle of startups. According to Pitchbook, University of California tops the list of universities in terms of number of founders graduated [see Table H1]. PitchBook's annual university rankings compare schools by tallying up the number of alumni entrepreneurs who have raised venture capital in the last decade. The rankings are powered by PitchBook data and are based on an analysis of nearly 167,000 VC-backed founders. Among the top 100s, there are seven Indian institutions. Bangladesh is not present in the list.

Table H1. Top 10 Universities by number of founders and capital raised

Ranking	University	Founder count	Company count	Capital raised
1	 University of California, Berkeley	1,811	1,642	\$59.7B
2	 Stanford University	1,547	1,397	\$80.1B
3	 Harvard University	1,352	1,222	\$57.0B
4	 University of Pennsylvania	1,197	1,099	\$52.9B
5	 Massachusetts Institute of Technology (MIT)	1,175	1,049	\$53.6B
6	 Cornell University	933	882	\$35.1B
7	 Tel Aviv University	893	755	\$29.8B
8	 University of Michigan	860	792	\$27.0B
9	 University of Texas	842	773	\$21.7B
10	 University of Illinois	739	687	\$24.1B

Source: [Top 100 colleges ranked by startup founders - PitchBook News](https://pitchbook.com/news/articles/pitchbook-university-rankings)
<https://pitchbook.com/news/articles/pitchbook-university-rankings>

A few examples of university-based entrepreneurship programs are presented in Table H2.

Table H2. Selected Global Institutions and their Startup/ Entrepreneurship Program

Name of the University	Country	Program	Description
Stanford University	United States	Stanford Technology Ventures Program (STVP)	-Provides range of courses, resources, and initiatives to foster innovation and entrepreneurial thinking among students
Massachusetts Institute of Technology (MIT)	United States	MIT Sloan School of Management - Entrepreneurship Center	-Provides: resources, networking opportunities, and educational programs to nurture innovation
Harvard University	United States	Harvard Innovation Labs	-Serves as a resource hub for entrepreneurs -Provides a collaborative environment, opportunities to work on innovative projects -Supports in areas such as technology, life sciences, and social enterprise.
University of Cambridge	United Kingdom	Cambridge Judge Business School - Entrepreneurship Centre	-Supports to pursue entrepreneurial ventures -Provides mentorship, networking events, and programs to help individuals transform innovative ideas into successful startups
Tsinghua University	China	x-lab (Tsinghua University Science Park)	-Provides resources, mentorship, and incubation support
National University of Singapore (NUS)	Singapore	NUS Enterprise	-Provides incubation, mentorship, and funding support for startups
University of Sydney	Australia	Sydney School of Entrepreneurship (SSE)	-Provides programs and resources
Indian Institute of Technology Bombay (IIT Bombay)	India	Society for Innovation and Entrepreneurship (SINE)	-Provides incubation support, mentorship, and resources
Hong Kong University of Science and Technology (HKUST)	Hong Kong	HKUST Entrepreneurship Center	-Provides mentorship, networking opportunities, and funding support
Seoul	South Korea	SNU Center for	Provides programs, skills and knowledge

Name of the University	Country	Program	Description
National University		Entrepreneurship	
National Chengchi University	Taiwan	Center for Innovation and Entrepreneurship	Provides resources, mentorship, and networking opportunities
National University of Sciences and Technology (NUST)	Pakistan	NUST Technology Incubation Center (TIC)	Provides incubation, infrastructure, mentorship, and funding
ETH Zurich	Switzerland	ETH Zurich Entrepreneurship Lab	Provides courses, workshops, and networking events
LSE - London School of Economics and Political Science	United Kingdom	LSE Generate	Provides support in launching ventures and developing skills along with mentorship and networking
Technical University of Munich (TUM)	Germany	UnternehmerTUM	Provides accelerator programs, co-working spaces, and access to a network of mentors and investors.
KTH Royal Institute of Technology	Sweden	KTH Innovation	Provides incubation, funding, and mentorship to facilitate the startup journey
University of Helsinki	Finland	Helsinki Innovation Services (HIS)	Provides support through mentorship, technology transfer, and startup creation.
Politecnico di Milano	Italy	PoliHub	Provides mentorship, networking opportunities, and access to resources for technological innovation.
INSEAD	France/Singapore	eLab	Provides knowledge, skills to develop, and launch their entrepreneurial ventures
University Putra Malaysia	Malaysia	UPM Innovation	Provides incubation, funding, IP protection, commercialization and mentorship to facilitate the startup journey

Source: Authors' Compilation

University of California Berkley, the institution topping the list of ranking in terms of highest number of founders and companies as well as raising USD 59 Billion till 2024 is an example,

how the innovation, R&D and entrepreneurship culture can be nurtured. Its Sutardja Center for Entrepreneurship & Technology (SCET) is one of the centers of entrepreneurship development dominates Silicon Valley in terms of producing founders of tech startups [See Box H1]. The key informant debriefing of Professor Chis Burry [<https://www.linkedin.com/in/chrisburry/>], Global Ambassador, UC Berkeley SCET reveals very critical insights on building on university-based innovation and startup ecosystem.

The Sutardja Center for Entrepreneurship & Technology (SCET) at UC Berkeley has been instrumental in building a robust innovation and entrepreneurship ecosystem for startups since its inception in 2005. Here's how SCET achieves this:

Berkeley Method of Entrepreneurship: SCET is known for developing the Berkeley Method, which is an internationally recognized approach to teaching technology entrepreneurship. This method emphasizes experiential learning, critical thinking, and observational skills.

Programs and Courses: SCET offers a variety of programs and courses for students at different levels, including undergraduates, graduates, and professionals. These programs cover topics like innovation, entrepreneurship, and technology leadership.

SkyDeck: SCET houses SkyDeck, a startup accelerator that provides funding, mentorship, and resources to help startups grow and succeed.

Global Partnerships: SCET collaborates with global partners to expand its reach and impact. This includes partnerships with universities, companies, and organizations around the world.

Collider Cup: SCET hosts the Collider Cup, an annual competition where students present their startup ideas to industry leaders and investors.

Professional Programs: SCET offers professional programs for industry leaders to help them develop the skills needed to lead innovative companies.

The success of SCET provides valuable lessons for Bangladesh in building the startup ecosystem within universities:

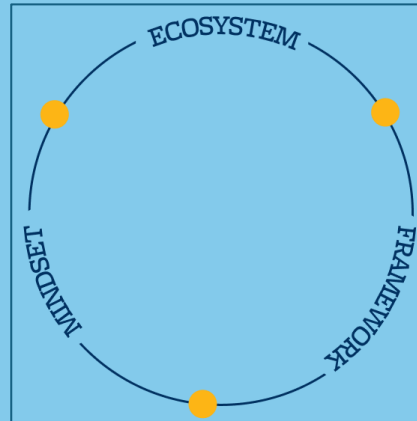
- a. **Focus on Experiential Learning:** Emphasizing hands-on learning and real-world projects can help students develop practical skills and entrepreneurial mindset.
- b. **Build Strong Ecosystems:** Creating a supportive ecosystem with access to funding, mentorship, and resources is crucial for nurturing startups.
- c. **Collaborate Globally:** Forming partnerships with international organizations and institutions can help share knowledge and resources, fostering innovation on a global scale.
- d. **Encourage Diversity and Inclusion:** Ensuring that programs are accessible to a diverse range of participants can lead to more innovative and inclusive solutions.

- e. **Regular Competitions and Showcases:** Hosting competitions and showcases can provide students with opportunities to present their ideas and receive feedback from industry experts.

By implementing these strategies, other countries can create a thriving innovation and entrepreneurship ecosystem similar to SCET's.

Box H1. University of California Berkley (UCB): Nurturing innovative mindset

According to UCB, innovative mindset is the greatest asset of an entrepreneur. When UCB identifies students of its various entrepreneurship program, first it offers a self-assessment tool titled 'Berkeley Innovation Index' (BII). It is both an open research concept, and a global collaboration project born out of interdisciplinary research by UC Berkeley faculty. In cooperation with industry professionals, BII has been developed to offer simple yet powerful ways to measure something never before measurable – an individual's innovative mindset level, and their power to innovate.



The study conducted a key informant interview with Professor Chris Burry [<https://www.linkedin.com/in/chrisburry/>], Global Ambassador, UC Berkeley Sutardja Center for Entrepreneurship & Technology (SCET). Professor Burry shared his insights, which is very helpful for designing a university-based entrepreneurship ecosystem in Bangladesh, linked with innovation.

Since 2005, SCET helped tens of thousands of students learn innovation and entrepreneurship skills and developed the foundation of Berkeley's entrepreneurship ecosystem, with SkyDeck, the Fung Institute, the Engineering Leadership Professional Program, Global Venture Lab, and an extensive network of Silicon Valley and Global partners. SCET is known for developing the Berkeley Method, an internationally recognized approach to teaching technology entrepreneurship to undergraduates, innovation to Ph.D. students, and technology firm leadership to professionals and executives.

At UCB, it is believed that champion matters, when you would like to build an R&D program linked to entrepreneurship. For Bangladesh the advice of Professor Chris Burry mentions that you need to find the right person, who can champion the cause of building entrepreneurship ecosystem within a university. 'It is not about a PhD, an innovation and entrepreneurship center within a university require Professors of skills, not Professor of knowledge'.

Source: KII

I. Bangladesh's University-based Innovation and Entrepreneurship Ecosystem Model

The secondary literature and KII reveals that a student at a university in Bangladesh very much focuses on earning a degree and after graduation looks for a job at home or abroad. Some graduates go abroad for higher studies [see Figure I1].

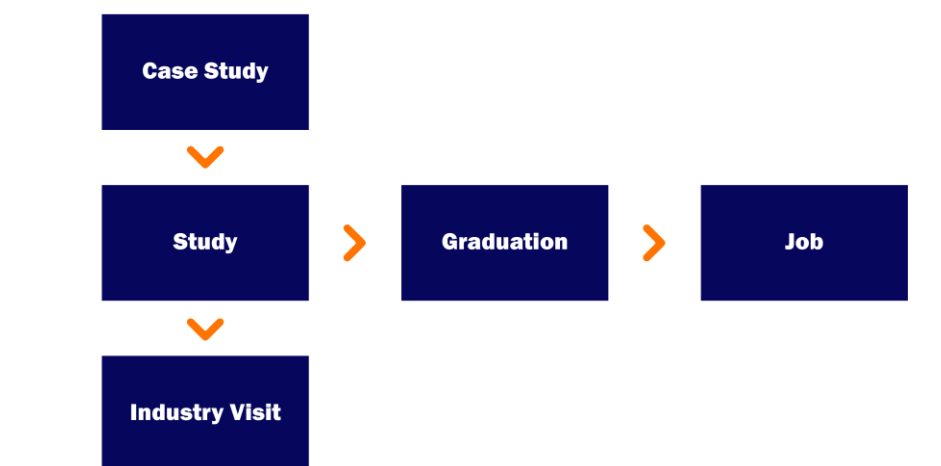


Figure I1. Current Education System in Bangladesh: Job Oriented

I1. Three Route of Innovation and Entrepreneurship Journey for a University and Students

An innovation driven entrepreneurship ecosystem development model is proposed at high level in Figure I2.

Stream 1: Regular Entrepreneurship: This stream includes various courses and programs related to innovation and entrepreneurship in-built in the academic program of a university. This stream may promote regular entrepreneurship, where the graduates replicate a proven business model with acquired knowledge and skills from entrepreneurship education, where market demand is served by existing entrepreneurship. would lead students towards venture building with already established business model. Innovation is not key, rather the objective of this route is to facilitate students to start a venture in the market segments, where there is still room for new entrants. For example, starting a venture in food sales, or fashion design. Given the lack of innovation culture in the universities and preparedness of the students, this route would be most traction.

Stream 2: Innovation-based Entrepreneurship: Innovation-based entrepreneurship is the second route, where students have idea, which is 'new' in the local context, replicating ideas tested and implemented elsewhere, The innovation in this route does not have potential for intellectual property rights other than trade mark. This stream combines innovation (R&D) and entrepreneurship. A group of students, alumni and faculty members will

be allowed to identify a problem to solve and start research and development work, which will be funded by the university, either through innovation hub or through other funding mechanism. The idea and innovation may not be patentable; however, it should have potential for commercialization. In this case, the group themselves may form a venture and pursue the idea to the level of growth. IN that process there might be change in composition of founding membership. As the university is funding the initiative, it may have stake in the business, based on valuation of the company. There may be various combinations of funding and return on investment model.

Stream 3. R&D-based invention/innovation and entrepreneurship, which has potential for IP and its commercialization. The innovators may choose for establishing venture with the IP or just happy with commercialization of IP to other venture builders. In the immediate terms, only a few universities and students may choose this route. Based on the investment in building facilities for R&D (e.g., R&D lab), this route is designed to be mainstreamed over a period of at least 10 years.

Stream 3 should be the ultimate goal of a university, however, to be realistic, the goal might be confined within stream 1 and 2. Stream 1 and 2 is important from the job creation perspective. However, for a breakthrough as a university and as a country, in the sphere of technology with core invention of innovation, which have potential for patenting, should be targeted for at least a reasonable number of universities.



Figure I2. Proposed Model of University-based Entrepreneurship Ecosystem

Stream 3 requires significant investment, both by universities and government and there should be a business model for this stream.

In this stream, there are two scenarios for an innovation team:

- Scenario 1: IP Focused:** Engage in R&D and develop a new process, product or service or design, which will be patented following due process. There should be proper marketing and sales process of these patents. Each member of the innovation team, no

matter s/he is a student, alumnus of faculty members, and university itself, will have stake in the value of commercialization of the patents. In this scenario, the innovation team may not be interested in forming a venture for developing product or service using the patented innovation.

- b. **Scenario 2:** This is a scenario, where the innovation team may want to go ahead with the development of product or service based on the patented innovation. They may also use more patents for making the product of more value and value proposition for the target markets. Here, the innovation would benefit both from having royalty of patent commercialization by others and dividend from the potential profit of the company.

12. University-based Innovation and Entrepreneurship Ecosystem Components

First of all, a university should have a separate entity for systematic nurturing of innovation and entrepreneurship connecting all relevant existing entities and facilities. There are six components, identified, which will play a role in building the ecosystem surrounding that entity [see Figure I3]. It may have its own name and may vary university to university; however, the focus is on innovation and entrepreneurship. Here, the title of the entity is proposed as ‘Innovation and Entrepreneurship Hub’.



Figure I3: University-based Innovation and Entrepreneurship Ecosystem Model: Key Components

- a. **Separate Entity:** The university should establish a separate entity to coordinate entrepreneurship education, innovation and R&D activities and facilitate the process of registration of intellectual property rights, where applicable and connect the innovation team to entrepreneurship opportunities, in all three streams mentioned above. This separate entity can be named ‘Innovation and Entrepreneurship Hub [IEH]’.

Key components of innovation hubs would include:

- i. **Physical Facilities:** Co-working spaces, labs, meeting rooms, and technology infrastructure to support ideation, prototyping, and product development.
- ii. **Mentorship and Coaching:** Guidance and support from experienced mentors and coaches to help navigate the entrepreneurial journey and develop viable ideas into successful ventures.
- iii. **Capacity Development Curriculum:** Tailored educational programs covering areas like IP management, entrepreneurship, and industry-academia collaboration to equip participants with the necessary skills and knowledge. Some of the components of the curriculum may be
- iv. **Resource Mobilization:** Assistance in securing funding, connecting with investors, and leveraging industry partnerships to support the growth and sustainability of startups.
- v. **IP Management and Commercialization:** Support in identifying, registering, and commercializing intellectual property to benefit both innovators and institutions.
- vi. **Networking and Collaboration:** Opportunities to connect with industry leaders, investors, mentors, and other stakeholders to expand networks, access resources, and foster collaboration.
- vii. **Innovation Toolkit:** Development of resources, guidelines, and tools in both digital and paper formats to aid in the development of innovative products, processes, and services.

b. Value Propositions for Stakeholders

B1. For University

The University would set up an innovation and entrepreneurship hub to foster a culture of innovation, entrepreneurship, and intellectual property management among students, alumni, and faculty members. This initiative would aim to facilitate collaboration for new product and service development, support the transformation of viable ideas into enterprises, aid in the identification and registration of intellectual property, and assist in the creation of new business ventures. By establishing an innovation hub, universities can provide students with the knowledge, skills, and resources needed to engage in entrepreneurial activities, create intellectual property, and pursue careers in entrepreneurship. Additionally, the innovation hub serves as a platform to nurture a sustainable innovation culture, develop a pipeline of ventures, and attract funding and support for innovative projects. Through strategic partnerships with industry, government, and civil society, the university innovation hub can enhance its reach, impact, and sustainability, contributing to the growth of the entrepreneurship ecosystem within universities.

The value propositions for the university to invest in IEH:

- i. **Reputation:** The reputation can attract key stakeholders and support policy advocacy, collaboration, and visibility.

- ii. **Ranking:** The university's ranking, both locally and internationally, can further enhance the credibility and attractiveness of the IEH, more of the university. A higher ranking can signal excellence in education and research, drawing more attention and interest from students, investors, and partners.
- iii. **Attraction for Students:** The establishment of an innovation hub within the university can significantly enhance its appeal to students. The opportunity to engage in innovative projects, entrepreneurship activities, and access to resources can attract motivated and ambitious students seeking practical experience and opportunities for growth.
- iv. **Interdisciplinary Contributions:** The interdisciplinary nature of the program can foster collaboration among students from various academic backgrounds. This diversity can lead to innovative solutions, unique perspectives, and a rich learning environment that nurtures creativity and critical thinking skills.
- v. **Revenue Generation:** The IEH can create multiple streams of new revenue, both form core activities of the IEH and also from various funding agencies and corporate sector. The direct revenue stream from the activities of the innovation hub is: through successful commercialization of patents and equity in ventures, and industry-academia collaboration. This revenue can not only sustain the hub but also fund further innovation initiatives, scholarships, and research projects.

By capitalizing on its reputation, ranking, ability to attract students, interdisciplinary contributions, and revenue generation potential, the university's innovation hub can become a thriving ecosystem that fosters innovation, entrepreneurship, and impactful collaborations within and beyond the academic community

B2. Value Proposition For Students

The IEH can open a whole new door of opportunities for the most of universities for the students. The major benefits of the IEH to the students are:

Hands-On Experience: Students gain real-world experience by working on actual projects and startups, which can be incredibly valuable when entering the job market.

Skill Development: The programs at IEH and as a whole in the university in-built on other departments, help students develop a wide range of skills, including critical thinking, problem-solving, leadership, and communication. They also gain specific entrepreneurial skills like business planning, marketing, and fundraising.

Networking Opportunities: Students would have the chance to connect with industry professionals, mentors, investors, and fellow entrepreneurs, which can open doors to future career opportunities and collaborations.

Access to Resources: Universities often provide access to resources such as incubators, accelerators, funding, and state-of-the-art facilities, which can significantly enhance the development and success of student startups.

Interdisciplinary Learning: Innovation and startup programs often encourage collaboration across different fields of study, allowing students to learn from diverse perspectives and apply their knowledge in new and creative ways.

Recognition and Credibility: Being part of a reputable program can lend credibility to students' ventures and make it easier to attract investors and partners.

Personal Growth: Students often experience significant personal growth, gaining confidence, resilience, and the ability to navigate complex challenges.

Employment Opportunities: Graduates of these programs are often highly sought after by employers who value entrepreneurial thinking and the ability to innovate within organizations. The founders from the IEH would also contribute in creating job opportunities in the market, contributing to resolving job crisis in the market.

By participating in the programs in the IEH and around it, students not only enhance their academic experience but also position themselves for long-term success in the ever-evolving world of innovation and entrepreneurship.

B3. Value Proposition for Industry

Bangladeshi industry has limited connection with universities and there is significant untapped potential, untapping would benefit both industry and academia, as mentioned in the literature review.

The multitude of benefits of industry by engaging the IEH may unfold. Some of them are:

Cost-effective R&D for Product Enhancement: For smaller companies, who are innovative, may cost-effectively access to expertise and facilities at IEH for new product development or product enhancement.

Access to Potential Need-based Human Capital: Through partnership and collaboration industry we can get ready-to-deploy workforce, thus, increase productivity and profitability of businesses. The partnership may make a specific business popular among students as a choice of place to work.

Scope for diversification of business: Many businesses like to diversify business. The collaboration with IEH would allow them to try new ideas and ventures by supporting innovative teams with industry knowledge and finance. A portfolio approach is win-win for both industry and IEH, as benefit from one successful venture may recover more than investment made in multiple ventures.

Business Process Reengineering: Often businesses want to improve efficiency through business process reengineering. The collaboration with IEH may be a low-cost option for them.

- c. **Facilities:** The Innovation and Entrepreneurship Hub would provide facilities, which would allow students and innovation teams to pursue innovation and entrepreneurship. Creating a thriving innovation and entrepreneurship hub in a university involves incorporating several essential facilities:

Co-Working Spaces: Co-working space is one of the key elements of facilities for an IEH. It should be flexible, open spaces where students and startup teams can collaborate, brainstorm, and work on their projects together.

Prototyping and Maker Labs: The labs equipped with tools like 3D printers, CNC machines, and other fabrication equipment would create real environment for creation. These labs allow students to create prototypes and experiment with their ideas. Each university may have existing lab facilities. Those labs should also be connected with the IEH, so that they can be used for innovation and R&D.

Meeting and Conference Rooms: Multitude of activities with large groups require spaces for team meetings, client presentations, and networking events.

High-Speed Internet and IT Support: There should be high speed Internet and IT facilities for ensuring reliable and technical support for all digital needs.

Cafeteria and Relaxation Areas: Spaces for students to take breaks, have informal discussions, and recharge are essential for success of ideation and venture building.

Library and Research Facilities: The IEH should have facilities, where students have access to academic resources, journals, and databases to support research and innovation.

By incorporating these facilities, a university can create a dynamic and supportive environment that fosters innovation and entrepreneurship among its students.

- d. **Funding and Mechanism:** There is a plethora of funding sources for modern day IEH. Some of them are presented below:

Grants and Scholarships: Many universities offer grants and scholarships specifically for student entrepreneurs. These can provide seed funding to get projects off the ground. For offering grants and scholarships, a university can dedicate its own resource as well resources through partnership and exchange programs.

Incubator and Accelerator Programs: The incubation and acceleration programs are the cornerstone of innovation and entrepreneurship ecosystem in an IEH. These programs offer funding, mentorship, and resources to help startups grow. These programs can also connect startups with potential investors.

Competitions and Pitch Events: Participating in startup competitions and pitch events can provide funding opportunities. Many competitions offer cash prizes and exposure to investors.

Government Programs: Governments often have programs to support startups, including grants, loans, and tax incentives. These programs can be a valuable source of funding for university-based startups. For example, University Innovation Hub Program commissioned by Bangladesh Hi-tech Park in 10 universities paved way to build a comprehensive innovation and entrepreneurship ecosystem. Innovation Design and Entrepreneurship Academy [iDEA <https://idea.gov.bd/>] provides pre-seed funding up to BDT 1 million and Startup Bangladesh Limited [[Startup Bangladesh Limited - a Venture Capital Company https://www.startupbangladesh.vc/](https://www.startupbangladesh.vc/)] offer equity fund up to BDT 50 million. The IEHS can foster partnership with these programs proactively and ensure funding for the innovation teams and ventures within universities. The University Grants Commission of Bangladesh has launched an ambitious program titled Higher Education Acceleration and Transformation (HEAT) project targets universities for establishment of technology transfer office [TTO] and funding core R&D. The IEH can target this funding for the growth of the ecosystem.

Venture Capital and Angel Investors: Venture capital firms and angel investors are always on the lookout for promising startups. Universities can help connect startups with these investors through networking events and introductions. The IEH can proactively reach out to VCs and angel investors and organize joint programs for match-making for funding. This match-making can also be a source of revenue for the universities. Bangladesh Angels Network [BAN] and Bangladesh Women Investors Network [BWIN] are two prominent angel fundings sources.

Crowdfunding: One of the options for university-based startups can be crowd-funding mediated by the IEH. Platforms like Kickstarter and Indiegogo allow startups to raise funds from the public. This can be a great way to validate an idea and gain early supporters.

University Funds: Some universities have their own funds to support student startups. These funds can provide seed money, equipment, and other resources. IEH can pool the fund from various sources.

Corporate Sponsorships: Partnering with corporations can provide funding and resources. Corporations often sponsor university programs and competitions, providing financial support and mentorship.

By exploring these various funding options, university startups can find the support they need to grow and succeed.

- e. **Partnership:** The IEH needs to focus on partnership. Partnership is the key for success of an IEH and the partnership may not be limited to Bangladesh only, it is possible to build international partnership as well. The benefits of partnership are presented below:

Access to Expertise: Industry experts can share their knowledge and experience in innovation, entrepreneurship, and commercialization, enhancing the skills and capabilities of the innovation teams and faculty members involved in the program.

Resources and Facilities: Industry partners can provide access to their facilities, equipment, and resources, which are essential for the development and testing of innovative products and services.

Networking Opportunities: Industry connections can facilitate networking opportunities for innovation teams, allowing them to connect with potential investors, partners, and customers, which is critical for the growth and commercialization of their ventures.

Mentorship and Coaching: Industry experts can serve as mentors and coaches, guiding innovation teams through the process of developing and commercializing their ideas, and providing valuable insights and feedback.

Funding and Investment: Industry partners can also provide funding and investment opportunities for innovation teams, helping them to scale their ventures and achieve long-term success.

Ecosystem Integration: Industry involvement helps integrate the innovation hub into the broader startup ecosystem, enhancing its visibility, credibility, and potential for impact.

Policy Advocacy: Industry partners can leverage their influence to advocate for policies and programs that support innovation and entrepreneurship, creating a nurturing environment for the innovation hub and its ventures.

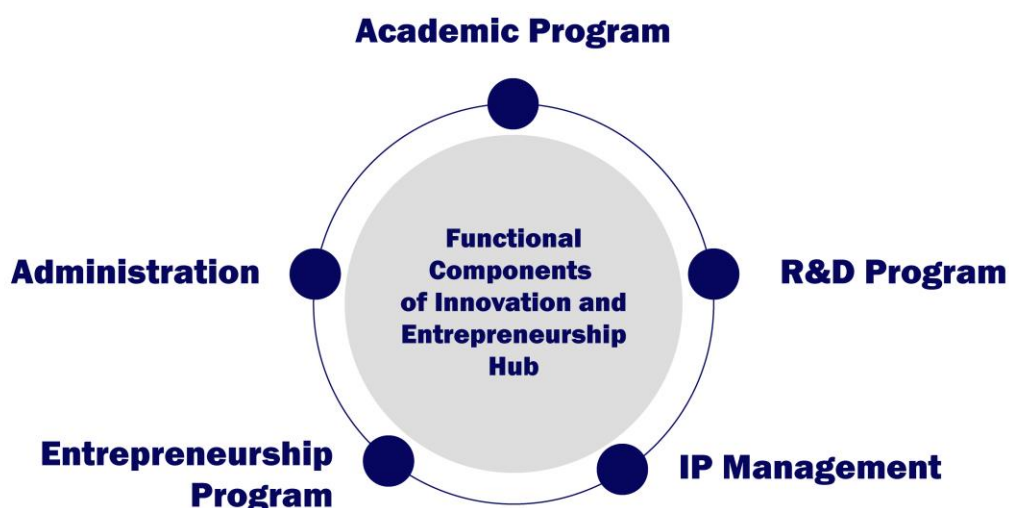
f. Curriculum, Content and Services: Ideally, the curriculum of IEH should have minimum five components [see Figure I4]:

- a. Entrepreneurship Education
- b. Incubation and Acceleration Program
- c. Intellectual Property Management
- d. Coach and Mentor Pool Development
- e. Services to Innovation Teams.

Entrepreneurship Education: Entrepreneurship related courses may be part of existing business administration curriculum. There may be independent courses, student of any discipline may choose courses of their interest. There may be a limit of academic credits for those courses.

Possible courses are presented in Box I1. The courses presented provide a well-rounded education in entrepreneurship, equipping students with the knowledge and skills needed to start and grow successful ventures.

Figure I4. Innovation and Entrepreneurship Curriculum, Content and Services



Box I1. Possible Courses for Entrepreneurship Education

1. Introduction to Entrepreneurship: Basics of starting and running a business, including idea generation, market research, and business planning.
2. Business Model Development for Enterprises: Creating and refining business models, value propositions, and understanding customer segments.
3. Financial Management for Entrepreneurs: Basics of accounting, budgeting, financial planning, financial modelling and funding for startups.
4. Marketing and Sales: Strategies for promoting products and services, understanding target markets, and building customer relationships.
5. Legal Aspects of Entrepreneurship: Legal considerations for startups, including intellectual property, contracts, and regulatory compliance.
6. Innovation and Creativity: Techniques for fostering creativity, developing innovative ideas, and problem-solving.
7. Leadership and Team Management: Building and leading effective teams, managing conflicts, and developing leadership skills.
8. Pitching and Presentation Skills: Crafting and delivering compelling pitches to investors,

customers, and partners.

9. Entrepreneurial Mindset and Resilience: Developing the mindset needed to navigate challenges, embrace failure, and persist in the face of adversity.

10. Technology and Digital Entrepreneurship: Leveraging technology for business growth, digital marketing strategies, and understanding the digital economy.

11. Social Entrepreneurship: Creating and managing ventures that aim to solve social and environmental problems.

12. Global Entrepreneurship: Exploring international markets, cross-cultural communication, and strategies for scaling businesses globally.

13. Operations and Supply Chain Management: Managing production, logistics, and supply chains for efficient business operations.

14. Venture Capital and Fundraising: Understanding the investment landscape, how to attract investors, and strategies for fundraising.

15. Corporate Entrepreneurship (Intrapreneurship): Encouraging innovation within established companies and developing entrepreneurial initiatives in a corporate setting.

16. Policy Landscape for Entrepreneurship: Understanding national and international policies, which facilitate or hinder growth of entrepreneurship.

Source: Authors' own research based on courses offered in institutions at home and abroad.

Incubator and Accelerator Programs: The IEH Providing support to early-stage startups through mentorship, funding, and resources to help them grow and scale.

The incubation program includes grooming of teams with ideas, which starts with 'problem-solution fit', where customer discovery is a major component. Generally, the incubation ends with 'product-market fit' exercise, where a prototype is tested with real customers and receives positive response from them. At this stage basic business model canvas is also prepared.

A generic outline of an incubation program is presented in Box I 2. By following the structured approach presented below, an incubation program can effectively nurture startups, helping them transition from early-stage ideas to successful, scalable businesses.

Box I2. A generic outline of an Incubation Program

An incubation program for startups at a university typically follows a well-defined structure to provide comprehensive support to budding entrepreneurs. Here's a suggested structure:

1. Application and Selection Process

- a. Call for Applications: Announce the program and invite applications from interested startups.
- b. Screening and Evaluation: Review applications based on criteria such as innovation, market potential, and team capability.
- c. Interviews and Pitches: Shortlisted applicants present their ideas to a panel for final selection.

2. Onboarding

- a. Orientation: Introduce selected startups to the program's resources, mentors, and expectations.
- b. Goal Setting: Assist startups in setting clear, achievable goals and milestones.

3. Workspace and Resources

- a. Co-Working Spaces: Provide access to collaborative workspaces and meeting rooms.
- b. Technical Resources: Offer tools, software, and equipment necessary for product development.

4. Mentorship and Training

Mentor Matching: Pair startups with experienced mentors from relevant industries.

Workshops and Seminars: Conduct regular sessions on topics such as business planning, marketing, finance, and legal issues.

Guest Speakers: Invite successful entrepreneurs and industry experts to share their experiences and insights.

5. Funding and Investment

Seed Funding: Provide initial funding to help startups develop their ideas.

-Investor Connections: Organize networking events and pitch sessions with potential investors.

Grant Opportunities: Help startups identify and apply for relevant grants and funding opportunities.

6. Development and Testing

Prototyping Labs: Offer facilities for product prototyping and testing.

Beta Testing: Assist startups in conducting beta tests with real users to gather feedback.

7. Networking and Collaboration

Industry Partnerships: Facilitate collaborations with established companies and industry leaders.

Peer Networking: Encourage interaction and collaboration among startups within the program.

8. Marketing and Outreach

Branding and Positioning: Provide guidance on branding, positioning, and market entry strategies.

Media Exposure: Offer opportunities for startups to gain media coverage and visibility.

9. Progress Monitoring and Support

Regular Check-Ins: Schedule periodic reviews to assess progress and provide feedback.

Continuous Support: Offer ongoing support and resources to address challenges and facilitate growth.

10. Demo Day and Graduation

Demo Day: Organize a culminating event where startups pitch their ideas to a wider audience, including investors, industry leaders, and media.

Graduation: Celebrate the achievements of the startups and provide them with a network of alumni support.

Source: Authors own presentation, based on designs of incubation programs of some Bangladeshi institutions and University of California Berkley

The structure of the accelerator program generally differs from the structure of an incubation program. An accelerator program for startups is typically more intense and time-bound than an incubation program [see Box I 3].

Box I3. Differences from Incubation Program

- a. **Duration:** Accelerator programs are typically shorter (3-6 months) compared to incubation programs which can last up to a year or more.
- b. **Focus:** Accelerators are more focused on rapid growth and scaling, while incubators provide long-term support for early-stage development.
- c. **Cohorts:** Accelerators usually operate in cohorts, fostering a competitive and collaborative environment, whereas incubators may offer more individualized support. However, need-based individual nurturing is also found effective.

Source: Authors own presentation, based on designs of incubation programs of some Bangladeshi institutions and University of California Berkley

Box I4 presents a generic structure of an accelerator program. A startup accelerator program can provide the intense, focused support needed to help high-potential startups achieve rapid growth and success.

Box I4. A Generic Structure of an Accelerator Program

1. Application and Selection Process

- a. **Call for Applications:** Announce the program and invite applications from high-potential startups.
- b. **Rigorous Selection:** Evaluate applications based on criteria such as innovation, market potential, and scalability. Conduct multiple rounds of interviews and pitches.

2. Cohort-Based Model: Select a batch of startups to go through the program together. This fosters a sense of community and encourages peer learning.

3. Intensive Bootcamp: Kickoff Bootcamp: Start with an intensive bootcamp covering essential topics such as business model refinement, product-market fit, and go-to-market strategy.

4. Structured Program

- a. **Mentorship and Coaching:** Pair startups with experienced mentors who provide guidance on a regular basis.
- b. **Workshops and Masterclasses:** Conduct specialized workshops and masterclasses on topics like scaling operations, customer acquisition, and fundraising.
- c. **Office Hours:** Provide opportunities for startups to have one-on-one sessions with industry experts, investors, and successful entrepreneurs.

5. Access to Resources

- a. **Workspace:** Provide dedicated workspace and facilities for the duration of the program.
- b. **Funding:** Offer initial seed funding and connect startups with potential investors.
- c. **Technical and Legal Support:** Provide access to technical resources, legal advice, and other support services.

6. Milestones and Progress Tracking

- a. **Goal Setting:** Help startups set clear goals and milestones.
- b. **Progress Reviews:** Conduct regular check-ins and progress reviews to ensure startups are on track and address any challenges.

7. Networking and Exposure

- a. **Investor Days:** Organize events where startups can pitch their ideas to a curated audience of investors.
- b. **Demo Day:** Culminate the program with a Demo Day, where startups present their progress and future plans to investors, industry leaders, and media.
- c. **Media and PR:** Provide exposure through media coverage and public relations efforts.

8. Post-Program Support

- a. **Alumni Network:** Maintain an active network of alumni who can provide ongoing support, advice, and collaboration opportunities.
- b. **Follow-On Funding:** Assist startups in securing follow-on funding and scaling their

operations.

Source: Authors own presentation, based on designs of incubation programs of some Bangladeshi institutions and University of California Berkley

Intellectual Property Management: By implementing these steps, universities can effectively manage IP in collaboration with startups, fostering innovation while protecting valuable assets. Managing intellectual property (IP) in a university setting, especially when collaborating with startups, involves several key steps and considerations:

1. IP Identification and Documentation

- a. **Identify IP Assets:** Determine what IP assets exist, such as patents, trademarks, copyrights, and trade secrets.
- b. **Document IP:** Maintain thorough records of all IP, including invention disclosures, lab notebooks, and development timelines.

2. IP Protection

- a. **Patent Filing:** File for patents to protect inventions and innovations. Universities often have technology transfer offices (TTOs) that assist with this process.
- b. **Trademark Registration:** Register trademarks for logos, names, and brands associated with the startup.
- c. **Copyrights:** Ensure that any creative works, such as software code, are properly copyrighted.

3. IP Commercialization

- a. **Licensing:** License IP to startups, allowing them to use the technology while providing the university with royalties or equity.
- b. **Spin-offs:** Encourage the creation of spin-off companies to commercialize university-developed IP.

4. IP Management and Strategy

- a. **IP Strategy:** Develop a comprehensive IP strategy that aligns with the university's and startup's goals.
- b. **IP Audits:** Conduct regular IP audits to assess the value and status of IP assets.

5. Collaboration and Agreements

- a. **Collaboration Agreements:** Establish clear agreements between the university and startups regarding IP ownership, usage rights, and revenue sharing.
- b. **Non-Disclosure Agreements (NDAs):** Use NDAs to protect sensitive information during discussions and collaborations.

6. Education and Training

- a. **IP Workshops:** Provide workshops and training sessions for students, faculty, and startup founders on IP management and protection.

- b. **Mentorship:** Offer mentorship programs where experienced IP professionals guide startups through the IP process.

7. Legal Support

- a. **Legal Counsel:** Provide access to legal experts who can offer advice on IP matters and help navigate complex IP issues.
- b. **Dispute Resolution:** Establish mechanisms for resolving IP disputes between the university and startups.

8. Monitoring and Enforcement

- a. **IP Monitoring:** Continuously monitor the use of IP to ensure compliance with agreements and prevent unauthorized use.
- b. **Enforcement:** Act against any infringement of IP rights, including legal action if necessary.

Coach and Mentor Pool Development: Building a strong pool of coaches and mentors is critical for the success of an incubation or accelerator program at a university. A structured approach to develop such a pool may include the following steps:

1. Identify and Target Potential Coaches and Mentors

- a. **Alumni Network:** Reach out to successful alumni who have experience in entrepreneurship and industry.
- b. **Industry Experts:** Connect with professionals who have a proven track record in business, technology, and innovation.
- c. **Academic Staff:** Engage faculty members with expertise in relevant fields who can provide technical and strategic guidance.
- d. **Local Entrepreneurs:** Involve local entrepreneurs who can share their real-world experience and insights.

2. Establish Criteria and Roles

- a. **Selection Criteria:** Define clear criteria for selecting coaches and mentors, such as experience level, industry expertise, and willingness to commit time.
- b. **Role Definition:** Clearly outline the roles and responsibilities of coaches and mentors, including time commitment, areas of focus, and expected outcomes.

3. Recruitment and Onboarding

- a. **Outreach:** Use various channels to reach potential mentors, such as LinkedIn, industry events, and alumni networks.
- b. **Incentives:** Offer incentives for mentors, such as recognition, networking opportunities, and access to university resources.
- c. **Onboarding Program:** Provide an onboarding program that includes an introduction to the university's incubation and accelerator programs, goals, and expectations.

4. Training and Development

- a. **Mentor Training Workshops:** Conduct workshops to train mentors on effective mentoring techniques, communication skills, and conflict resolution.

- b. **Continuous Learning:** Offer ongoing professional development opportunities for mentors to keep them updated on the latest trends and best practices in entrepreneurship.

5. Matching and Integration

- a. **Mentor-Startup Matching:** Use a structured process to match mentors with startups based on their expertise and the startup's needs.
- b. **Integration Activities:** Organize activities such as networking events, mentorship meetups, and collaborative workshops to facilitate mentor-startup interactions.

6. Support and Resources

- a. **Mentor Toolkit:** Provide mentors with a toolkit that includes resources such as mentoring guidelines, templates, and access to university facilities.
- b. **Dedicated Support Staff:** Assign dedicated staff to support mentors and address any issues that arise during the mentoring process.

7. Feedback and Evaluation

- a. **Regular Feedback:** Collect feedback from both mentors and startups to assess the effectiveness of the mentoring relationships.
- b. **Evaluation Metrics:** Develop metrics to evaluate mentor performance and the impact of mentoring on startup success.
- c. **Adjustments:** Use feedback and evaluation results to make necessary adjustments to the mentoring program.

8. Recognition and Retention

- a. **Recognition Programs:** Acknowledge the contributions of mentors through awards, public recognition, and certificates of appreciation.
- b. **Retention Strategies:** Implement strategies to retain mentors, such as creating a sense of community, offering continuous engagement, and providing opportunities for personal and professional growth.

Services to Innovation Teams: In the process of converting an idea into business, university students need access to various services, which may be provided within university by the university management or by inviting services providers into campus. Major services are:

- a. **Legal and Financial Advice:** Providing access to legal and financial advisors who can help with business formation, intellectual property issues, and financial planning.
- b. **Match-making:** Regular events to connect students with industry professionals, alumni, and other entrepreneurs.
- c. **Demand-based Mentorship:** Pairing students with experienced mentors from various industries to guide them through their entrepreneurial journey.

Due Diligence: For the advanced level startups due diligence process is crucial for securing investment. Box I5 presents a list of services related to due diligence process. By providing these services and following these steps, startups can effectively navigate the due diligence process and increase their chances of securing investment.

Box I5. Due Diligence Process for Advance Level Startups

1. Preparation and Documentation

- a. **Financial Records:** Support for ensuring all financial records are up-to-date and organized, including income statements, balance sheets, and cash flow statements.
- b. **Legal Documents:** Support for preparing all legal documents, such as incorporation papers, contracts, and intellectual property registrations.
- c. **Business Plan:** Support for preparing a comprehensive business plan that outlines the startup's vision, strategy, and market analysis.

2. Transparency and Communication

- a. **Full Disclosure:** Investors require a startup to be transparent about all aspects of the business, including any risks or challenges.
- b. **Regular Updates:** Keep investors informed with regular updates on the startup's progress and any significant developments.

3. Professional Assistance

- a. **Accountants and Auditors:** Services from professional accountants and auditors to review and verify financial information.
- b. **Legal Counsel:** Services from legal experts to ensure all legal aspects are in order and to address any potential issues.
- c. **Advisors:** Advisory services from experts with experience in due diligence to guide the process and provide insights.

4. Due Diligence Checklist

- a. **Financial Due Diligence:** Review of financial statements, tax returns, and projections.
- b. **Legal Due Diligence:** Examination of legal structure, contracts, and compliance with regulations.
- c. **Operational Due Diligence:** Assessment of the startup's operations, including supply chain, production, and distribution.
- d. **Market Due Diligence:** Analysis of market size, competition, and growth potential.

5. Investor Relations

- a. **Investor Meetings:** Schedule meetings with potential investors to present the startup and answer their questions.
- b. **Q&A Sessions:** Prepare for detailed Q&A sessions where investors can ask in-depth questions about the business.

6. Addressing Concerns

Risk Mitigation: Support for identification of potential risks and develop strategies to mitigate them.

Problem Solving: Advice to address any concerns or issues raised by investors during the due diligence process.

7. Post-Due Diligence Follow-Up

- a. **Feedback Implementation:** Support to implement any feedback or suggestions provided by investors to improve the business.
- b. **Continued Communication:** Facilitation to maintain open lines of communication with investors to build trust and rapport.

Support required at various stages of a startup, from ideation to growth

Supporting a startup through its lifecycle from ideation to Series B involves providing a range of services tailored to each stage of development. Here's a breakdown of the services required at each stage:

1. Ideation

- a. **Idea Generation Workshops:** Facilitate brainstorming sessions and workshops to help founders generate and refine their ideas.
- b. **Market Research:** Provide access to market research tools and databases to validate the market potential of the idea.
- c. **Mentorship:** Connect founders with mentors who can provide guidance on refining their business concepts.

2. Prototype Development

- a. **Prototyping Labs:** Offer facilities and equipment for developing prototypes.
- b. **Technical Support:** Provide technical assistance and access to experts for product development.
- c. **Design Thinking Workshops:** Conduct workshops on design thinking to help founders create user-centric prototypes.

3. Minimum Viable Product (MVP)

- a. **Development Resources:** Provide resources for developing an MVP, including software, hardware, and development tools.
- b. **Testing Facilities:** Offer testing facilities to validate the MVP with real users.
- c. **Feedback Mechanisms:** Establish feedback loops to gather user feedback and iterate on the MVP.

4. Seed Funding

- a. **Seed Funding Programs:** Offer seed funding opportunities through grants, competitions, or university funds.
- b. **Investor Connections:** Facilitate introductions to angel investors and early-stage venture capitalists.
- c. **Pitch Training:** Provide training on how to create compelling pitches for potential investors.

5. Product-Market Fit

- a. **Market Analysis:** Assist in conducting in-depth market analysis to ensure the product meets market needs.

- b. **Customer Development:** Guide startups through customer development processes to refine their product offerings.
- c. **Growth Hacking Workshops:** Conduct workshops on growth hacking techniques to acquire and retain customers.

6. Go-to-Market Strategy [Accelerator]

- a. **Marketing Support:** Provide marketing support, including branding, digital marketing, and PR.
- b. **Sales Training:** Offer training on sales strategies and techniques to effectively reach the target market.
- c. **Launch Events:** Organize launch events to introduce the product to the market.

7. Series A Funding [Accelerator]

- a. **Investor Relations:** Assist in building relationships with venture capitalists and preparing for Series A funding rounds.
- b. **Financial Planning:** Provide financial planning and forecasting services to prepare for investor presentations.
- c. **Legal Support:** Offer legal support for drafting term sheets and other investment-related documents.

8. Scaling Operations [Accelerator]

- a. **HR Services:** Provide human resources support for hiring and managing a growing team.
- b. **Operational Efficiency:** Offer consulting on operational efficiency and scaling strategies.
- c. **Technology Enablement:** Assist in upgrading technology infrastructure to support growth.

9. Series B Funding [Accelerator]

- a. **Advanced Investor Relations:** Continue to build and maintain relationships with investors for Series B funding rounds.
- b. **Strategic Planning:** Provide strategic planning services to guide the startup's long-term growth.
- c. **Exit Strategy Planning:** Begin planning for potential exit strategies, such as acquisition or IPO.

Actors of University-based Innovation and Entrepreneurship Ecosystem

For an idea to have journey towards a successful venture requires a set of ecosystem actors [see Figure I5].

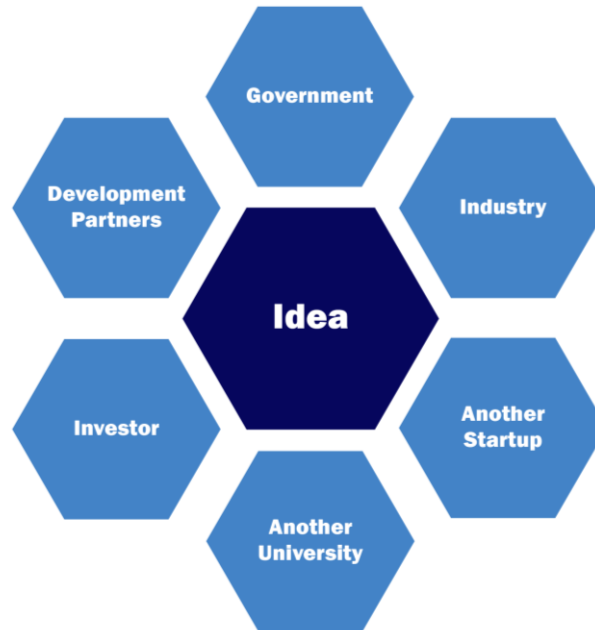
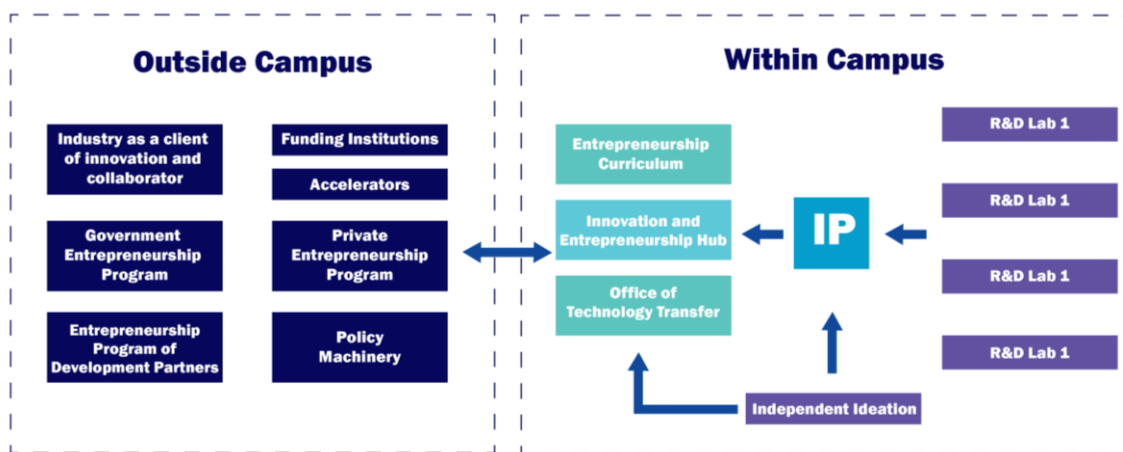


Figure I5. Key Actors of University-based Innovation and Entrepreneurship Ecosystem

Overall Model of University-based Innovation and Entrepreneurship Ecosystem



J. Model of Industry Academia Collaboration

The term IUC refers to the partnership and interaction between academic institutions (universities) and industries to foster innovation, knowledge exchange, and practical application

of research findings. As part of key component 'Partnership' of 'University-based Innovation and Entrepreneurship Ecosystem Model' the IUC sub-model is elaborated in this section.

J1 Stimulus for IUC

There has been an increased stimulus for IUC for several reasons:

- a. **Bridging the gap between academia and industry:** IUCs aim to connect universities and industries to foster innovation, knowledge exchange, and practical application of research findings. This collaboration helps bridge the gap between theoretical knowledge and industry needs.
- b. **Enhancing employability of graduates:** When universities collaborate with industries, they can revamp their curriculum to increase the employability of their graduates by aligning it with industry requirements. This benefits both students and companies.
- c. **Providing authentic data sources:** Being linked to industries provides universities with practical problems and authentic data sources to apply their knowledge and conduct research.
- d. **Promoting innovation and startups:** A collaborative approach between universities and industries increases the chances of new startups and innovations exponentially. It connects the advancement of knowledge with the advancement of practice.
- e. **Cutting short recruitment process:** Industries can cut short their recruitment process by hiring students they have already been working with through IUCs.
- f. **Improving problem-solving:** When universities and industries work together adhering to the same standards, problems are faced and resolved more effectively.
- g. **Encouraging entrepreneurship:** IUCs promote an unconventional yet innovative culture to help channel resources, leading to a sustainable long-term relationship between industry and academia.
- h. **Mutual Benefits and Long-Term Relationships:** Establishing IUCs based on mutual benefits helps build long-term relationships between academia and industry, emphasizing the importance of collaboration for technological development and new ideas.

The increased stimulus for IUCs stems from the mutual benefits they provide in terms of bridging gaps, enhancing employability, promoting innovation, improving problem-solving, and encouraging entrepreneurship.

J2 Challenges for Implementing IUC for Entrepreneurial Pipeline Development in Bangladesh

For most developed countries, the entrepreneurial pipeline is developed through the concerted effort of industry and academia. The first obvious challenge for Bangladesh is the lack of coherence and connection between academia and industry.

An entrepreneurial venture goes through several stages in its life cycle. These include – funding, mentorship and guidance, networking, IP support, infrastructure, marketing, PR support, industry-specific expertise, and talent acquisition. A detailed analysis of the startup ecosystem of Bangladesh reveals that there are several gaps in the existing lifecycle support of a startup.

The KII conducted with several industry leaders has revealed that there isn't a singular support organization that covers all the bases from funding to talent acquisition. The existing incubators all expertise in a specific field like business development, marketing, or funding. iDEA with its academy is creating a concerted effort to bring all the necessary support under one roof. Similar ventures like iDEA can expedite the process of lifecycle support of budding entrepreneurial ventures.

However, the most pressing issue against the lack of entrepreneurial ventures is funding (Pramanik, 2016). Bangladesh does not have sufficient numbers of angel investors and venture capital to support the increasing demand for funds. Investors also often try to play “safe” by investing in low-risk, low-return startups. This tendency is creating a dualistic challenge. The first one is the concentration of funds in a limited scope of fintech, EdTech, ride-sharing, and logistics startups.

Box J2 Recognition of Barriers of effective collaboration between academia and industry:

- a. **Disconnect between Academic and Industrial Researchers:** There is a significant gap between the theoretical knowledge of academic researchers and the practical requirements of industrial researchers, leading to a lack of understanding and application of research findings in industry.
- b. **Industry's Reluctance to Implement New Ideas:** The industry often resists adopting new ideas and technologies, which can hinder the transfer of knowledge from academia to industry.
- c. **Academia's Reluctance to Adopt New Teaching Ideas:** Similarly, academia can be slow to adopt new teaching methods and incorporate industry-relevant skills into their curriculum, limiting the employability of graduates.
- d. **Trust Deficit:** The long-term trust between academia and industry partners is often low, which can lead to a lack of cooperation and collaboration.
- e. **Lack of Organizational and Institutional Structure:** The absence of a structured approach to research and development can lead to inefficient allocation of resources and a failure to bridge the gap between academia and industry.
- f. **Mismatch of Dimensions of Work:** The industry and academia operate in different dimensions, focusing on market-oriented research for profits versus impact-based research for publishing and presenting new findings.
- g. **Inadequate Understanding of Industry Needs:** The industry may not always know what it wants or needs, and there may be a lack of understanding of the research process, which can hinder effective collaboration.
- h. **Limited Access to Resources:** The availability of resources, including funding and infrastructure, can be a significant barrier to collaboration between academia and industry.
- i. **Different Timeframes:** The industry operates on a fast-paced schedule, while academia is often bound by semester schedules, which can lead to difficulties in coordinating collaborative efforts.
- j. **Limited International Exchanges:** The collaboration should not be limited to intra-country exchanges but should also involve international exchanges between students and employees to foster global connections and knowledge sharing.

Source: FGDs and KIIs

Secondly, the scarcity of funds in any other type of startup (Chowdhury, 2017). In a developed economy, a failed entrepreneurial venture is not the end of things. Often serial entrepreneurs can experiment with different ideas, some of which may not succeed. Compared to a developing country like Bangladesh, the risk factor involved with entrepreneurship in a developed country is much less. In many cases, an entrepreneur in Bangladesh gets a single chance to make their venture work. The lack of room for error makes startups an even more risky prospect for fresh graduates.

The FGD conducted for this study identified the lack of curricular support and family pressure for “secured earning” as the main antagonizing factor against entrepreneurship. The volatile nature of the economy, lack of proper infrastructure, and even in many cases, lack of job security in the service sector are some of the key reasons why graduates are not interested in entrepreneurship like their international peers. The expedited brain drain combined with age-old curricula greatly hampers the academic output for industry use.

The issue with the curricula is not limited to the graduate level only. Many respondents feel that the existing system starting from the primary level fails to instill critical thinking and problem-solving abilities in a student. Though there are some initiatives at the root level, graduate studies need a massive overhaul to be on par with global leaders. The subpar output from the academia is creating a negative impression for the industries. In many cases there is a distrust from the industry to accept or adopt the ideas put forth by the academia (Hanieh et al., 2015).

In the last decade, primary and secondary education in Bangladesh has gone through several reforms to move away from book-based knowledge to a more practical and sustainable curriculum to be on par with the global demand. But the reform was not aggregated. In practice, the students aren't the only stakeholders in the system. The policymakers, educators, and textbook writers all play a significant role in the new knowledge adoption and dissemination to the student. But the lack of adequate skill on the part of the educators and the lack in textbooks is a constraint against the move to a sustainable education system. As a result, students are unable to reap the benefits of modernized education and are stuck somewhere between the age-old and the new system.

Though there are reformative changes at the primary and secondary levels, graduate-level studies, especially the public universities have critical reformation issues (Sarker, 2022). The existing education structure at the graduate level creates graduates with little to no practical knowledge of the industry. Without a change in the existing processes, it will not be possible to create a new generation of skilled manpower willing to move away from the service-oriented structure and take up entrepreneurial challenges.

The existing status quo regarding the industry-academia bonding does not help to create a strong collaborative environment. The industry leader respondents for this report feel that academia should reach out to the industry to strengthen the entrepreneurial pipeline in the economy. It's a win-win scenario considering the industry has the necessary expertise and the academia can blend the existing knowledge and the industry expertise to create skilled entrepreneurial-minded individuals.

Another key challenge is the lack of quality control in the universities of Bangladesh. The stagnating curricula combined with a lack of monitoring are creating unskilled graduates for a metronomic workforce. The commercialization of higher education has diverted institutions from the actual goal of education. There are two things that academia should focus on – research and development of new knowledge based on industry needs and dissemination the new knowledge for a skilled generation. In essence, academia needs to champion the industry and create a workforce that can be on par with the rising demand.

These drawbacks highlight the challenges that need to be addressed to strengthen the bridge between academia and industry, ensuring a more effective and sustainable collaboration that benefits both sectors.

J3 Eliminating IUC Barriers: A Proposal

As mentioned, the goal of industry-academia collaboration is to create new knowledge and solve existing problems facing the industry. The industry would approach academia with a problem and fund research for a potential solution for the problem. Throughout the life cycle of the process, the industry and academia would closely collaborate in every step to hypothesize, experiment, draw results, and eventually apply the solution to the problem (Ahmed et al., 2022).

However, from the perspective of Bangladesh, most of the steps of IUC actually does not take place. Industry generally does not approach the academia for a problem and neither does the academia has the sufficient means to solve critical problems. The latter issue can be attributed to the lack of strong R&D-oriented universities. Rather than creating overtly multidisciplinary higher education institutions, the key focus should be put on a few strong research universities working on the most pressing industry needs.

Even in a limited scope, some universities are promoting IUC through industry collaborations. In 2022, tech giant Huawei Collaborated with BUET for Huawei-BUET ICT Academy. The goal of the education program was to develop an industry and tech-fit skilled workforce for a better ICT-oriented ecosystem. BRAC University partnered with BSRM for leading research funds to create innovation and knowledge in the engineering sector. There have been similar collaborations between Dhaka University's Department of Molecular Biology and Janata Jute Mills for jute retting methodology development. Samsung Innovation Lab also collaborated with the AML lab of BUET from 2013 to 2019 to facilitate their logistical needs (Haque, 2022).

However, these collaborations deviate away from the main idea of IUC and tend to delve into CSR. In its truest sense, these collaborations aren't benefiting the industry with new knowledge. Neither Huawei nor Samsung has directly benefitted from the IUC as there were no potential problems to be solved through the collaboration. In essence, the investment by both local and international industry leaders in academia is still in the CSR or "well wishes for the alma mater" stage. It is not on par with the global standards of IUC.

In contrast to the existing IUC of Bangladesh, the existing models from the leading universities of the world can be a key example. Oxford University Innovation is a technology transfer office of the university that explicitly focuses on the commercialization of the university's research and inventions by connecting academics with industry partners, providing legal and commercial expertise, and supporting the formation of spin-out companies. Tsinghua University X-lab focuses on supporting technology-driven startups by providing resources, mentorship, and access to funding. X-lab partners with industry leaders and investors to facilitate market connections and commercialization opportunities for its startups. There are similar IUC ventures through Berkeley SkyDeck, MIT Media Lab, ETH Entrepreneur Club, Columbia Technology Ventures under Columbia University, and Stanford University Technology Venture Program to name a few.

Each of these ventures aims to commercialize the knowledge of research to the industry. At the same time, it also creates a contact point between the students and the industry for entrepreneurial and industry training and insight. These technology transfer offices are working both ways by providing and receiving knowledge, much like how IUC is intended to be (Guimón 2013). Among these ventures, Sutardja Center for Entrepreneurship and Technology of UC Berkeley stands out as a premier institution. The center has pioneered the way for Berkeley SkyDeck, Fung Institute, Engineering Leadership Professional Program, and the Global Venture Lab. It has also paved the way for developing the Berkeley Method of Entrepreneurship. The center was able to create a comprehensive entrepreneurship and leadership platform through IUC to nurture the entrepreneurial mindset among the young students at the university.

The pattern of collaboration shows that industry leaders aim to collaborate with universities with a proven track record or high level of R&D facilities. This is where the need for specialized universities or transforming the existing universities into research universities comes into play. The Advanced Intelligent Multidisciplinary Systems Lab of United International University is a leading example of local universities aiming for cutting-edge global IUC. The lab has already collaborated with several leading universities of the world including the University of Oxford and Toronto to develop a collaboration framework for tech-based industry solutions. On the business education aspects, IBA is leading the charge with industry-sourced guest faculties and creating industry visits and positioning programs for the students to get a real-world understanding of the processes (Haque, 2022). However, on an aggregate basis, academia in Bangladesh needs a large-scale reform to initiate a collaborative environment to attract true IUC in the likeness of the existing successful models.

Box J3. Possible Components of IUC

1. Research Grants and Funding
2. Technology Transfer Offices
3. Industry Internships and Work Placements
4. Joint Research Centers
5. Curriculum Development
6. Industrial Training Programs
7. Industry Advisory Boards
8. Intellectual Property (IP) Policies
9. Incubators and Innovation Hubs
10. Joint Conferences and Seminars

Source: FGDs and KIIs

While it's true that academia should take a major step in overhauling the existing system and making way for industry access, the industry too should focus on real IUC instead of CSR-based collaboration initiatives [see Table J1]. Creating resourceful individuals alone isn't enough, the collaborative environment should make way for potential entrepreneurs to experiment and gain new insights, without having to worry about fallbacks.

J4 Phases of IUC

J4 1. Formation

The formation process of Industry-University Collaboration (IUC) is a multi-step process that involves several stages. According to Mitsuhashi's model for business-to-business alliance formation, the IUC formation process can be broken down into five stages:

- a. **Purpose and Partner Selection:** The first step in forming a IUC is to establish the partnership's purpose and identify a suitable partner. Criteria for partner selection are crucial, and it is recommended to evaluate prospective partners thoroughly to ensure alignment with the specific goals of collaboration.
- b. **Partner Evaluation:** Partner evaluation is essential for the success of an IUC. It is advised to conduct a thorough evaluation of prospective partners to ensure that the collaboration is tailored to the specific IUC and that benefits can be maximized through partner selection.
- c. **Formal Agreements and Commitment:** Establishing formal agreements and ensuring commitment from all partners is vital for the success and sustainability of the IUC. Legal documents, including intellectual property agreements, should specify all relationships and agreements among partners to maintain clarity and accountability throughout the collaboration.
- d. **Operational Phase:** Once the IUC is formed, it enters an operational phase characterized by continuous learning and evolution. This phase involves a process of constant adaptation and improvement, where factors that facilitate or inhibit the relationship come into play.
- e. **Activities during IUC:** Various activities take place between the organizations involved in the IUC to achieve the collaboration's goals. These activities include meetings, networking, communication, training, personnel mobility, employment, and other relevant activities that support collaboration.
- f. **Factors Facilitating or Inhibiting IUC:** Several factors can either facilitate or inhibit the operation of IUCs. Understanding these factors is crucial for the collaboration's success and for mitigating potential challenges that may arise during the partnership.

By following a systematic approach and addressing these key aspects, organizations can establish successful and sustainable Industry-University Collaborations.

J4 2. Activities

Industry-University Collaboration (IUC) activities involve a range of interactions and processes that aim to achieve the collaboration's goals. Based on the information provided in the sources, the activities during IUC can be summarized into the following six sub-headings:

- a. **Meetings & Networking:** This includes formal meetings, conferences, workshops, seminars, symposia, forums, expositions, trade shows, fairs, exhibitions, informal social gatherings, and networking activities. These activities involve contacting, being contacted, and maintaining relationships and links between universities and industry partners.

- b. **Communication:** Communication activities encompass various forms of communication such as voice, mail, email, conference calls (formal or informal), publications or co-publications of research papers, reports, newsletters, booklets, bulletins, and pamphlets.
- c. **Training:** Training activities involve tailored educational programs for industrial personnel, internships in companies for students, students' involvement in industrial projects, joint supervision of master's degree dissertations and PhD theses by academic and industry personnel, industrial fellowships for students and faculty, and industry involvement in curriculum development.
- d. **Personnel Mobility:** This category includes the exchange of personnel to work at each other's research facilities, lectures by industry members at universities and vice versa.
- e. **Employment:** Employment-related activities involve the employment of university researchers in the business sector, employment of graduates related to the project, and representation on industry boards or university committees.
- f. **Other Activities:** This category encompasses additional activities that support the collaboration between universities and industry partners to achieve the goals of the IUC.

These activities are essential components of IUC and play a crucial role in fostering collaboration, knowledge exchange, and innovation between universities and industry partners.

J4 3. Risk Factors

The factors that may facilitate or impede Industry-University Collaborations (IUCs) are diverse and play a crucial role in the success or failure of these collaborations. Based on the information provided in the sources, the factors that can either facilitate or inhibit IUCs are summarized under seven categories or sub-headings:

- a. **Capacity and Resources:** The availability of resources, both financial and human, can significantly impact the success of IUCs. Adequate capacity and resources are essential for effective collaboration between universities and industry partners.
- b. **Legal Issues:** Clear legal frameworks, institutional policies, and well-defined contractual mechanisms are crucial for establishing and maintaining IUCs. These factors help in setting boundaries, ensuring accountability, and managing potential conflicts.
- c. **Management and Organizational Issues:** Effective management practices and organizational structures are vital for the smooth operation of IUCs. Issues related to leadership, decision-making processes, and organizational culture can either facilitate or hinder collaboration.
- d. **Issues Relating to Technology:** Technological factors, including access to cutting-edge technologies, research facilities, and expertise, play a significant role in IUCs. Technology-related issues can impact the level of innovation, competitiveness, and success of collaboration.
- e. **Political Issues:** Political factors, such as government policies, funding mechanisms, and regulatory environments, can influence the formation and operation of IUCs. Political support and alignment with policy objectives are essential for the sustainability of these collaborations.
- f. **Social Issues:** Social factors, including relationships, trust, and cultural differences, can affect the dynamics of IUCs. Building strong social connections, fostering trust, and addressing cultural barriers are critical for successful collaboration.

- g. Other Issues: Various other factors, not falling into the above categories, can also impact IUCs. These factors may include geographical proximity, communication challenges, ethical considerations, and external market conditions.

Understanding and effectively managing these factors are essential for maximizing the benefits and mitigating the drawbacks of Industry-University Collaborations. By addressing these facilitators and inhibitors, organizations can enhance the success and impact of their collaborative efforts.

Table J1. Gaps and Possible Solutions for Effective IUC

Identified Gap		Identified Solution	
Supply Side Graduates	Demand Side Professional/ Entrepreneur/ Industry	Solution	Industry-Academia Collaboration Mode
Excess supply of graduates	Limited number of suitable jobs	Optimum number of graduates	Job Placement Centers at Universities
		Career counseling	
Theory-based learning	Application-based knowledge	On-the-job learning experience	Internship
			Industry visits
Lack of updated and relevant contents in the curriculum	Knowledge on current and contextual industry practices	Review and revision of curriculum	Involvement of industry in curriculum preparation
No opportunities for participating in R&D	R&D experience	Research laboratory support	Industry-funded research
			Tax exemption on R&D
Lack of incubation support	Limited efforts to support incubation	Incubation support	Industry-funded Incubation programs
			Commercialization of university-based technologies for financial gain
Not familiar with innovation or entrepreneurial culture	Entrepreneurial mindset among the jobholders	Introduction of entrepreneurship curriculum	Revamping Higher Education Curricula
		Case-based learning	

Identified Gap		Identified Solution	
Supply Side Graduates	Demand Side Professional/ Entrepreneur/ Industry	Solution	Industry-Academia Collaboration Mode
		Entrepreneurial skill-based assignments	
Inadequate reflection of career prospects in the curriculum	Professionals with a clear understanding of career paths	Career-focused programs	Industry Connect Programs (Career Centers, Mentorships)
Localized Knowledge	Contextual knowledge and experience	Creating conducive ecosystem	Assessment of current capabilities and requirements in tune with new technologies and capabilities that can improve educational access, experiences and outcomes
Entrepreneurial skill development of specific group of students	Lack of entrepreneurial mindset in non-business background professionals	Entrepreneurship seminars	Industry Talks
Brain drain	Less competitive package and job status drop	A national innovation system	Using 'triple helix model' involving the interactions of the state, industries and universities
Interests in MNC instead of local SMEs	Industries do not self-promote themselves to make themselves lucrative to fresh graduates.	Promoting recruitment programs and company activities on social media	Recruitment Campaigns
			Promotion in University Career Groups

K. Conclusion

Bangladesh is currently riding its high tide of demographic dividend and economic growth. But the population advantage and economic expansion is underlined by a low skilled metronomic workforce and an export dependent growth factor. A majority of the workforce is employed in the informal sector with little to no upward social mobility. As a result, the economic growth also paved the way for economic disparity.

The demographic dividend of Bangladesh will hold until about 2045. The export-oriented workforce is also vulnerable to a lack of job protection and job support which became grossly evident during the Covid 19 pandemic. To sustain the growth trajectory, there must be a paradigm shift. And the shift may come in the form of developing entrepreneurial mindset among the young workforce. However, there are several challenges that need to be addressed to create an environment conducive to entrepreneurship. One significant challenge is the limited integration of entrepreneurship education into academic curricula. By incorporating entrepreneurship-focused courses and programs, academic institutions can instill an entrepreneurial mindset and equip students with the necessary knowledge and skills to identify opportunities, take risks, and navigate the complexities of starting and managing a business. Moreover, partnerships between industry and academia are instrumental in bridging the gap between theoretical knowledge and practical application.

Collaborations can provide aspiring entrepreneurs with exposure to real-world industry challenges, access to industry expertise, and opportunities for mentorship and networking. Engaging industry professionals as guest speakers, mentors, and advisors can offer valuable insights, guidance, and practical advice that enhance the entrepreneurial journey. Access to funding and investment is another critical aspect that requires attention. Many aspiring entrepreneurs face challenges in securing capital to transform their innovative ideas into viable businesses.

Industry-academia collaborations can help address this issue by establishing venture funds, angel investor networks, and corporate incubators that provide funding opportunities and support to early-stage startups. These initiatives can fuel entrepreneurship, encourage risk-taking, and facilitate the growth of innovative ventures. Support infrastructure is equally essential for nurturing entrepreneurship. The availability of incubation centers, co-working spaces, and entrepreneurship support organizations can provide aspiring entrepreneurs with the necessary physical and intellectual resources to develop their ideas and establish successful enterprises. Collaborative efforts between industry and academia can help establish and strengthen these support structures, ensuring that entrepreneurs have access to mentoring, networking opportunities, and specialized resources tailored to their needs. The proposed model of Innovation and Entrepreneurship Hub, which includes industry-university collaboration as a core component may change the current scenario within a decade, given that there is systematic efforts, coordination and appropriate resource allocation.

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Annex A. List of Key Informants

#	Name	Designation	Area of expertise
1	Barrister Anita Ghazi Rahman	Partner, Legal Circle, Bangladesh	Legal and regulatory framework of business operation
2	Professor Asif Uddin Ahmed	Director, University of Liberal Arts	Startup Ecosystem Builder
3	Mr. Bijon Islam	Managing Director, Light Castle Partners	Startup Ecosystem Analyst
4	Professor Chris burry	Co-CEO, US market Access Center and Global Ambassador, UC Berkeley Sutardja Center for Entrepreneurship and Technology, USA	University-based startup ecosystem builder and practitioner
5	Professor Samsilah Roslan, PhD	President at Innovation and Technology Managers Association (ITMA) Director, Putra Science Park, University Putra Malaysia, Malaysia	Practitioner of University-based Startup Ecosystem Building
6	Mr. Siddhartha Goswami	Manager, iDEA Project, ICT Division, Bangladesh	Startup Ecosystem Builder
7	Mr. Zakir Jafaar	Founder and Fund Manager, Origgin, Malaysia	Super-Coach and Funding Ecosystem Actor

Annex B. Checklist for Key Informant Interview

SL	Research Focus	Sub Theme	Question	Following Question
I	Introductory			
	1	General	Name	
	2		Organization	
	3		Category	
II	Role of KIs			
	1.1	General	How are you/ the organization is working for the entrepreneurship ecosystem building?	What are the programs/ activities that is happening currently for the potential entrepreneurs?
	1.2			While working with them, how do you define/ measure their gap?
	2		Based on what, do you provide fund/ incubation programs for the start-ups?	Does your industry play the role of an angel investor?
	3		How do you monitor/ guide the startups?	
	4		Could you suggest any model of your industry that should be followed by the entrepreneurs to stand up their businesses?	
III	Gap in Academia			
	1.1	General	Are the theoretical concepts and models taught at the universities relevant for their capacity building as a potential entrepreneur?	How can academia help a student to apply the theory-based knowledge in a practical context?
	1.2			What initiatives have you taken to build up a connection bridge between the theoretical and practical knowledge on behalf of the authorities of the university?
	2		Is there any application-based programme for building the pipeline of the entrepreneurship at your university?	Kindly brief us about the programs.

SL	Research Focus	Sub Theme	Question	Following Question
	3.1		Do you think that the students of the Faculty of Business Administration tend more to become successful entrepreneurs?	What are the reasons do you think behind the students of the Faculty of Business Administration getting more interested in entrepreneurship?
	3.2			How the students inclusively from all departments can be attracted to the entrepreneurship pipeline?
IV	Connectivity			
	1	Recruitment and Placement	How to make an entrepreneur more aware of the market competition prospect particular to their specific discipline of interest?	How can academia play a role in supporting that?
	2	Networking	What is the best way for a student/fresh graduate to establish his professional network for him to be more prepared in the entrepreneurship pipeline?	How can academia/industry play a role in supporting that network building?
V	Skill Development			
	1	Entrepreneurial Skills	What skills do students need to have to become a successful entrepreneur?	How can academia/industry support a student in that aspect?
	2		How can an aspiring entrepreneur have access to funding/finance to build his enterprise/startup?	what role can the academia-industry collaboration play in bridging the aspiring entrepreneurs with the industry for financing? are the current initiatives enough to support aspirants from the whole country?
	3	Technical Skills	Do you think the entrepreneurs in the pipeline are technically sound?	What initiatives can the concerning authorities take to increase their technical efficiency?
	4		What soft skills do you	What roles can both the

SL	Research Focus	Sub Theme	Question	Following Question
			think that an entrepreneur should possess?	academia and industry play to improve the soft skills of the entrepreneurs?
	5	Business design, strategy, and operations	Are the students aware of the current business design, strategy and operations in the industry?	
	6		Are the current business design, strategy, and operations fresh graduate/entrepreneur friendly?	What changes in the current business design, strategy, and operations need to occur for it to be more favorable for fresh graduates in the entrepreneur pipeline?
	7	Intellectual Property Rights	As the process of availing intellectual property rights is currently difficult in our country, how can this process be made easier for a new entrepreneur?	How can the information gap regarding intellectual property rights be reduced?
	8	Legal and compliance issues	What changes should there be in the legal framework for it to be more favorable and cost effective for entrepreneurs?	
VI	Knowledge, implementation, facilitation			
	1	Research Implementation	How to develop an effective industry-academia collaboration in terms of research practices?	
	2.1	Research Funding	Are the research funding provided by the industries adequate to support academic research to foster innovation?	How can research funding help build a better entrepreneurship pipeline?
	2.2			What needs to be done to facilitate research funding from the industry to academia to foster a better industry-academia collaboration?
	3	Incubation Program	How can incubation programs develop a better entrepreneurship pipeline?	
VII	Barriers			

SL	Research Focus	Sub Theme	Question	Following Question
	1	Gender gap	Is there any prevalent gender gap in the current entrepreneurship pipeline? Do women face additional difficulties compared to men in their journey to become an entrepreneur?	
	2	Brain Drain	What are the core reasons of brain drain in our country and how is it affecting the entrepreneurship pipeline in Bangladesh?	
	3	Legislative and Bureaucratic Factors	What are the legal and bureaucratic factors you think need to be addressed?	
	4	Regulation & Market Constraints	What are the market constraints need to be addressed?	
VIII	Developing country context			
	1	Industry-Academia practice in the context of developing countries	Is the industry-academia collaboration practice different in Bangladesh compared to the developed nations?	
	2		Would it be effective to introduce theoretical frameworks and business models in the context of Bangladesh and other developing nations for the entrepreneurship pipeline building of Bangladesh?	
IX	Recommendation			
	1	General	What are the general barriers in the current entrepreneurship pipeline?	
	2		What role do you think the government can play in promoting and supporting industry-academia collaboration for the entrepreneurship pipeline building of Bangladesh?	

SL	Research Focus	Sub Theme	Question	Following Question
	3		How do you think industry-academia collaboration can help in strengthening the entrepreneurship pipeline building in Bangladesh?	
	4		How effective is the current industry-academia pipeline?	

Annex C. Summary of Key Informant Interview

Barrister Anita Ghazi Rahman

Rolling out a business requires various specialized teams, including founders, marketing, product development, and IT teams. However, university students typically do not study all these areas comprehensively. Each person has their expertise, and universities should consider incorporating relevant courses into their curriculum to bridge this gap. Rather than calling it a deficiency, it should be recognized as a present-day necessity.

You have been connected with many ventures and startups, so, how do you monitor these startups or how you are connected with them?

We primarily provide legal advice and mentorship to startups. Additionally, I am involved with various organizations such as Bangladesh Changes Network and Bangladesh Women Investors Network, through which we connect with startups and support their legal needs.

Do the new enterprises pose the sound knowledge about intellectual property rights or how can the industry or academia make sure the entrepreneurs are aware of intellectual property rights? Also, how do industry or academia and work collaboratively as you're mainly focused on the legal side with them?

Entrepreneurs today are much more aware of intellectual property rights compared to a few years ago. Initially, many were unaware of its importance, but participation in accelerator and incubator programs, business competitions, and training initiatives has helped improve understanding. However, IP rights are not necessary for all businesses—entrepreneurs typically consider them after establishing market presence, usually one or two years into operations. The government also runs training programs to enhance awareness.

So how can our academia play a role in teaching the students about intellectual property rights or how can they aware them about legal rights?

University education primarily provides theoretical knowledge, while business requires practical experience. Entrepreneurs need diverse teams with varied expertise to succeed. IP rights are a practical concern that arises once a business has stabilized and identified its market potential. Universities should design curricula that introduce students to these real-world aspects, ensuring that they understand when and how to protect their intellectual property.

So, from your perspective, what are the common legal issues new entrepreneurs face?

Over the past 9-10 years, common legal issues for startups have evolved. Initially, entrepreneurs were hesitant to convert their businesses into formal companies. Frequent questions included whether they could bring family members into the company. Now, the focus has shifted to setting up companies abroad and understanding capital structures.

Do you think the current existing legal framework is friendly for a new startup? and if not, what changes should there be in the legal framework for it to be more entrepreneurship friendly?

Startup Bangladesh is working on policies to make the legal framework more favorable for entrepreneurs. Some progress has been made, such as reducing incorporation costs for small companies. However, more measures are needed, including government fee waivers for startups, tax relief, and simplifying licensing processes. The high cost of winding up companies is another significant barrier; reducing this expense would support failed startups in closing their operations efficiently.

From a legal perspective what would you advise the new entrepreneurs who are just starting their startups?

The key legal advice for startups includes:

1. Incorporating the company early.
 2. Clearly defining roles and responsibilities among co-founders.
 3. Understanding funding options to ensure long-term growth.
- Additionally, entrepreneurs should differentiate between a startup and a small business, as their growth trajectories and goals differ significantly.

What skills should students need in general to be a successful entrepreneur?

Students should gain work experience before launching their own businesses. Those who start immediately after graduation often lack discipline and real-world knowledge. Working in established companies helps them understand industry operations beyond textbook theories. Additionally, developing soft skills, mastering business pitching, and engaging in practical learning experiences are crucial. Collaboration between academia and industry to integrate these aspects into university curricula would be highly beneficial.

We can see very often that many startups or entrepreneurs don't continue their business after some years due to market competition and many other issues, what would be your suggestion to them to stick the ground?

Startups must understand market competition, secure at least a year's investment before launching, and distinguish between being a startup and a small business. The goal of a startup is typically to scale and eventually go public, which requires long-term planning. Entrepreneurs should identify their unique selling proposition (USP), develop a clear business projection plan, and ensure financial stability for at least a year.

Can you suggest some ideas how the startups can get funding or through what they can get funding at the beginning?

Funding typically follows a structured path:

1. Bootstrapping – Using personal capital and funds from friends and family.
 2. Angel Rounds – Attracting investors who believe in the high-risk venture.
 3. Incubation Programs – Participating in initiatives such as IDEA, BYLC, Founder Institute, and NSU SN, which provide seed funding.
 4. Institutional Funding – Seeking investments from organizations like Startup Bangladesh, IDLC, BD Venture, and SBK.
- Entrepreneurs need to research these funding options before launching their businesses.

Fortunately, the startup ecosystem is collaborative, with experienced founders willing to share knowledge and support newcomers.

What are your suggestions on strengthening academia-industry collaboration?

Universities should actively support students in securing internships in local companies. Practical experience before graduation would significantly enhance their readiness for entrepreneurship. Industry leaders, such as Chaldal's Wasim Bhai, could also contribute by teaching business-related courses. A blended approach—combining academic knowledge with insights from industry professionals—would bridge the gap between theoretical learning and real-world business challenges.

Professor Asif Uddin Ahmed

There are different models for entrepreneurs such as design thinking, lean startup models and these are theories that are associated with entrepreneurship. Are these theories of concepts and models taught at universities and are they helping to develop the capacity of students as entrepreneurs?

The models such as design thinking and lean startup models are not taught in universities. In general, universities are not helping; in fact, we are doing more harm to the ecosystem. Startups have become a buzzword and have moved away from their entrepreneurial roots. The problem is that the concepts are not clear, and those involved in startups are often unclear about them. Despite universities being able to clarify these concepts, they don't feel the urge to do so. There is a distinct difference between business, entrepreneurship, and startups, and none of them is bad. Businesses are about model replication. Startups are often confused with entrepreneurship, as if it's something that can be replicated. But the core idea behind startups is to solve a problem. A startup must begin by solving a problem.

For example, design thinking is more related to entrepreneurship than startups. The concepts are not clearly defined, and there must be distinct differences between these three areas. There needs to be clear communication and understanding. You can have a good business by replicating an existing successful model and improving it with your own managerial capacity. Entrepreneurship involves a bit of innovation tailored to the existing business. However, startups focus on solving problems, and this requires a problem-solving mindset. This mindset is crucial at the start of a startup. But despite having many startups and funds allocated for them, the education system isn't geared towards developing problem-solving skills. From early childhood, we are not taught to identify problems, let alone solve them. In class, we give students problems based on reading books, expecting them to come up with solutions. Skills like design thinking are not being taught, and the academic system is not capable of developing entrepreneurs.

How academic institutions can improve this situation, considering the three distinct areas—entrepreneurship, startups, and business?

First and foremost, it's not solely the academic role to solve this issue. There needs to be a larger social, economic, and political change that creates entrepreneurs. Academics in the ecosystem need to understand why entrepreneurship is important for Bangladesh. An entrepreneurial culture can't be developed in a four-year education system—it's part of an 18-year journey. I conducted a survey of 500 students in grades seven, eight, and nine, and only three said they

wanted to become entrepreneurs. They were hesitant to express it because they felt their teachers would undermine them. To create entrepreneurs, we need people with an entrepreneurial mindset—a willingness to solve problems. This is a skill everyone needs. However, skills like money management, how to deal with taxes, etc., are not being taught. Bangladesh has the lowest tax revenue collection rate in South Asia because children are not even taught basic tax calculations.

Our education system is not geared towards problem-solving or developing an entrepreneurial mindset. When students enter universities with this mindset, we cannot expect universities to create entrepreneurs in just four years by offering a single entrepreneurship course. Students think entrepreneurship is a shortcut to becoming a celebrity, but it's the toughest and riskiest way to achieve celebrity status, and this isn't communicated well. Courses make it seem like anyone can be an entrepreneur, but this isn't true. Our education system must target students who are interested in entrepreneurship and have the right mindset, then allocate resources to help them.

Universities don't have proper innovation hubs. In Bangladesh, there are only about 12-14 intellectual property registries. My first exposure to entrepreneurship was when I studied at MIT, where industries sought to invest in the research there. The university provided everything students with entrepreneurial mindsets needed, from dorms to labs and equipment, including carpentry tools and chemistry labs.

I don't want service innovation—what we have now is simply an adaptation of foreign innovations. We need product innovation. Furthermore, we need more boot camps and training. Entrepreneurship cannot be taught in a short MBA program. Many people think they can solve everything by connecting their work with SDGs. But you don't need to connect everything with SDGs. As an education system, we lack problem-solving, analytical skills, and diversity.

My suggestion is to focus on developing the entrepreneurial mindset from grades six to eight and let students reach grade 11 or 12. When they enter universities, there must be a proper system in place, including a separate office and funding for research. We must encourage collaboration. Not everyone needs to study physics. This can be achieved in the short term, but the long-term system must change. We need to be clear about the differences between entrepreneurship, business, and startups and stop glorifying entrepreneurship without considering accountability. Many people are jumping from one brand to another, without understanding customer expansion. This happens because no one understands the fundamentals. If you spend just one or two hours a day, you can become a master in this field. But the system must change in the long run.

In terms of entrepreneurship, there is a tendency for business students to have more access to these opportunities, but can academia promote a more collaborative and inclusive environment for students from other disciplines to explore entrepreneurial ideas?

Students entering entrepreneurship are supposed to manage businesses. But we don't teach that in business departments. On the other hand, students from other disciplines may have better analytical abilities and problem-identification skills. One of the biggest risks of entrepreneurship is failure, which can lead to demotivation. Universities need to handpick students for entrepreneurship and guide them gradually. We need to incubate and train them.

We need to identify real winners who can serve as successful examples to develop a common interest.

What kind of soft or hard skills do you think they need to possess?

They need employability skills, including the ability to convincingly speak to anyone in any language, the ability to write, and the ability to analyze multiple points and correlate them. Over time, problem-solving becomes crucial. Additionally, ethical standards, empathy, self-awareness, and the ability to work in a team are important. In the early stages, the focus should be on communication, writing, and analysis. As a judge of entrepreneurs, I don't assess the business itself—I assess the person. Your business might fail, but you cannot fail as a person. If you fail as a person, I will not invest in your business. I don't invest in business plans; I invest in the person. Technical skills like AI can be outsourced, but communication, writing, and analysis are critical life skills that can't be taught easily. Math is also an important life skill.

Universities must update their syllabus to make it application-based. As educators, we need to grow our learning abilities. The theoretical approach to studying doesn't add value. A few universities need to collaborate to achieve this objective. Teaching and learning must change. In the long term, the system needs to be overhauled, but there are short-term steps we can take. Strategy without vision won't work, and vision without strategy won't work. Both must be done properly.

What are the barriers regarding this collaboration? And how much is happening?

Collaboration is almost nonexistent, which is a problem for both parties. Bangladesh has the lowest education budget in terms of GDP in South-East Asia. The purpose of education isn't to develop skills but to develop learning abilities. Skills are static, but learning abilities are dynamic. Private sector companies are now blaming universities for not providing skilled workers. As businesses grow, they need to hire locally or abroad. Hiring from abroad is expensive. The issue is how much have we contributed in the past 50 years toward creating the next generation? How many labs do we have, and how much have we invested in this?

The barrier lies in vision and will. The government has overemphasized entrepreneurship, which is a problem. They should focus on creating an environment for entrepreneurship rather than directly creating entrepreneurs. The barrier is that no one is playing the necessary role. There is no product innovation. We need to identify sectors where innovation is not occurring. Teachers need to focus less on profitability and more on societal relevance.

The government needs to support universities and encourage them to work in youth development. They should offer more flexibility in adjusting the curriculum. The barrier between public and private sectors also needs to be reduced. We must work constantly on the ecosystem's infrastructure and foster partnerships between the public and private sectors, as the government has control over this. The youth population now views money as the key indicator of success, but the problem lies in how they use that money. Financial knowledge needs to be improved across various sectors.

How do we address the issue of fewer female participants in entrepreneurship and startups compared to men?

In Bangladesh, most science teachers in higher classes are male, and we need more female role models. Society needs to change and create a safe space for women. We need to provide successful examples and allow girls to make informed choices regarding their subjects. As academic teachers, we must facilitate this process. Positive discrimination is necessary, and the earlier we start, the better. Creating role models is crucial.

Regarding brain drain, why are talented individuals leaving, and how can we retain them?

We are losing talent to mediocrity within society, not just to foreign countries. People leave for various reasons, including better opportunities. If we don't handpick talented individuals, we cannot efficiently create successful examples, and we fail to utilize their mindsets. The entrepreneurial culture in Bangladesh is different from the foreign model. It's advanced and far ahead, but we cannot simply import these models; we must bring partnerships instead.

Mr. Bijon Islam

Please explain in brief the activities that are currently happening in LightCastle. LightCastle is working in this field through investment such as accelerator 3.0 curriculum, advance learning center, finance and different activities. Please share more details.

LightCastle is actively working in this field through various initiatives, including the Accelerator 3.0 curriculum, an advanced learning center, financial support, and other activities. We focus on supporting SMEs and enterprises by creating an enabling environment for business growth. Our efforts include improving access to capital, enhancing market access, and building business management capacity.

For example, we explore blended finance, where patient capital can attract further investment from ecosystem players, ultimately catalyzing more funding opportunities for SMEs. Additionally, our capacity-building programs train businesses in best practices, ensuring they can apply these learnings effectively. When successful, these models and practices often get adopted across industries.

Most of our work revolves around three key pillars: access to markets, access to capital, and business management capacity-building.

Can you explain in brief how you guide the entrepreneurs and the businesses while highlighting the processes to monitor them?

Our approach is structured and standardized. We have developed various curricula and networks to support businesses.

For access to capital, we connect entrepreneurs with venture capital associations, financial institutions, and banks for traditional funding options. Additionally, we engage in portfolio management by periodically monitoring high-potential companies.

We provide selected companies with software to track their business data, which allows us to assess their progress. This intensive portfolio management applies mainly to businesses where we have direct investment or strategic interest. For others, our engagement is more general, focused on anecdotal feedback and capacity-building programs.

Our capacity-building initiatives are based on carefully designed curricula that leverage industry networks. These programs equip entrepreneurs with essential skills and best practices, helping them manage and scale their businesses effectively.

You have been working with the entrepreneurship pipeline for a long time. Can you suggest any general barriers that you see in this entrepreneurship, pipeline and relation to start coming along?

Bangladesh faces several challenges in fostering a thriving entrepreneurial ecosystem. The country ranks poorly in global ease-of-doing-business indices, reflecting systemic obstacles. Compared to regional peers like India, Vietnam, and Sri Lanka, Bangladesh has significant bureaucratic inefficiencies.

Key barriers include:

1. Business Environment – Corruption, lack of transparency, and an uneven playing field hinder fair competition. Powerful entities often secure large sums of capital, while small enterprises struggle to access funding.
2. Access to Capital & Markets – High interest rates and limited market access make it difficult for small businesses to survive and scale.
3. Shortage of High-Quality Talent – The education system has not evolved to meet industry demands. Earlier generations had stronger foundational skills, while today's graduates often lack critical thinking, problem-solving abilities, and communication skills.
4. Weak Law Enforcement – Unethical businesses exploit loopholes, taking large sums from banks without accountability. This lack of legal repercussions discourages ethical entrepreneurship.

Addressing these systemic issues is essential to creating a sustainable entrepreneurial ecosystem.

There is currently a gap in education, that is failing to produce talented individuals. What are the current skill gaps that exist between them the current entrepreneurs?

The skill gap extends beyond entrepreneurs—it affects the entire workforce. Bangladesh needs to determine its economic direction and develop the necessary talent accordingly.

- Industrialization Needs Engineering Talent – But Bangladesh lacks skilled engineers.
- Business Growth Requires Strong Management Skills – However, competent management professionals are in short supply.
- Communication & Problem-Solving Deficiencies – Many graduates struggle with basic communication, especially in English, which limits their ability to engage with international businesses.
- Lack of Critical Thinking & Interpersonal Skills – The education system prioritizes rote memorization over practical problem-solving and teamwork.

These deficiencies result in a workforce that is large but lacks the productivity and innovation needed to compete globally. Many mid-to-top-level management roles in Bangladesh are filled by foreign professionals, highlighting the urgent need for skill development.

Additionally, brain drain exacerbates the issue—talented individuals prefer to leave for better opportunities abroad due to poor working conditions, corruption, and lack of career growth prospects in Bangladesh.

How can the skill gap be reduced by academia and industry collaboration? As you have spoken about brain drain, why do you think the talented individuals are leaving Bangladesh and going to foreign land? What are the opportunities that we are lacking here?

Academia plays a crucial role in shaping future talent, but it currently lacks strong industry linkages. Key areas of improvement include:

1. Industry Collaboration – Universities should actively engage with industries to align curricula with market needs.
2. Quality Faculty Development – Many of the best educators pursue careers abroad. Universities must invest in attracting and retaining skilled faculty members.
3. Research & Development (R&D) – Instead of mass-licensing private universities with low academic standards, Bangladesh should focus on building a few high-quality institutions that prioritize original research.
4. Practical Learning Over Theory – Education should emphasize real-world applications, critical thinking, and analytical skills rather than just theoretical knowledge.

By fostering stronger academia-industry partnerships, Bangladesh can develop a workforce equipped with the skills necessary to drive entrepreneurship and business success.

What can academia play a role in to support the qualities and skills of entrepreneurs? Please suggest some of the ideas.

Academia can play a significant role, but the current structure does not support strong industry linkages. While academia educates students, industries often find that graduates lack the necessary skills. Universities should actively collaborate with industries to bridge this gap, but this rarely happens.

Many of the best teachers are abroad, pursuing PhDs in places like the US. Stronger industry linkages and collaboration are necessary. Tactical R&D should be prioritized over simply obtaining degrees. Nepotism needs to be reduced, and faculty should be evaluated based on indicators like original research output.

Additionally, universities should work closely with relevant offices to track their research contributions. Instead of granting licenses to 90–95% of private universities, the focus should be on developing a few strong institutions with specialized fields. The lack of control over university licensing weakens faculty quality and increases poor faculty-to-student ratios.

Investment in faculty development is essential to ensure that educators remain in the country, engage in research, and collaborate with industries. Faculty should be involved in product commercialization, creating a direct link between academia and the market.

In the networking part, how can academia and industry collaborate in funding? What initiatives can support aspiring entrepreneurs, such as university programs and competitions?

Universities should not aim to produce entrepreneurs as their primary goal. Instead, they should focus on developing essential skills such as problem-solving, critical thinking, analytical ability, and interpersonal communication. Business competitions can help nurture these skills.

More importantly, universities should support a strong talent pipeline for industries, allowing businesses to play a role in supporting entrepreneurs. A full entrepreneurial cycle needs to be established—where founders create businesses, succeed, and later return as investors. This cycle is largely absent in Bangladesh, where most large businesses are family-run rather than entrepreneur-driven.

Strong industry-academia collaboration can lead to meaningful R&D and better commercialization of products. Historically, many successful companies originated from university environments—Facebook was created for Harvard, and Google was born from a Stanford PhD research project. Universities should focus on R&D, ensuring that high-quality research can be commercialized in partnership with industry.

By building strong communication, critical thinking, and interpersonal skills alongside research-driven innovation, universities can contribute meaningfully to entrepreneurial success.

Many entrepreneurs struggle to enter the market and build networks due to gaps in business knowledge and strategy. What challenges do they face, and how can they improve their business design for long-term success?

Globally, 90% of businesses fail within five years. Failure is a natural part of entrepreneurship, but a well-structured business environment can improve survival rates. Entrepreneurs need access to capital and a level playing field.

While Bangladesh has a few highly skilled entrepreneurs, the overall quality of entrepreneurial talent remains low. Problem-solving ability is crucial, but many struggle with fundamental business tasks, such as identifying customers or market strategies. This is due to a rote-learning approach in universities, where students memorize information instead of engaging in practical problem-solving.

For example, instead of building a website, students are often given multiple-choice exams on website development. This lack of hands-on learning creates entrepreneurs who are ill-prepared for real-world challenges.

Improving the business environment and enhancing talent quality is crucial. Even if entrepreneurs fail, they should be equipped to learn from their failures and eventually build successful ventures.

The gap you mentioned is quite realistic. What do you suggest for these entrepreneurs?

Entrepreneurs should actively network, improve their skills, and gain a deep understanding of the market. Gaining real-life experience is invaluable—working in the industry for a few years before launching a business can provide critical insights.

Before founding LightCastle Partners, you worked at Citibank as a management associate and senior analyst. Based on your experience, what advice would you give to mid-career professionals looking to transition into entrepreneurship? What are the biggest challenges, and how can they be mitigated?

Most entrepreneurs globally start their ventures mid-career. While some, like Bill Gates and Mark Zuckerberg, dropped out of Harvard to build businesses, their cases are exceptional. For most people, gaining industry experience first is beneficial—it provides knowledge, reduces risks, and allows for financial savings.

Entrepreneurs should not jump into business randomly. Instead, they should save enough to sustain themselves for a couple of years, ensure their families are financially stable, and build a

strong professional network. Having a well-tested business idea before making a full-time commitment is crucial.

Many aspiring entrepreneurs leave jobs simply because they dislike taking orders or have faced workplace challenges. However, entrepreneurship should be driven by opportunity, not dissatisfaction. The right reasons to start a business include identifying a market gap, having the necessary skills, and developing a solid execution plan.

If LightCastle were to collaborate with academia to build the entrepreneurial ecosystem, how would you design such industry-academia collaboration?

Industry-academia collaboration is challenging due to structural issues within universities. However, universities should focus on R&D and commercialization of ideas. The primary role of academia is to build talent and conduct high-quality research.

Historically, successful companies have emerged from university research—Google, artificial intelligence advancements, and many other innovations originated from academic work. Universities should be research hubs, fostering an environment where talented students can develop ideas and bring them to market.

A research-driven academic culture would naturally produce entrepreneurs and industry innovations.

You mentioned that universities are difficult to work with. Could you elaborate on the challenges?

Universities tend to be bureaucratic compared to the private sector, which is more agile and driven by market demands. Many universities operate under trusts, with numerous faculty members following different agendas.

There is often a lack of clear guidance, structure, and proper incentives to foster industry collaboration. Private sector organizations, in contrast, have streamlined decision-making processes, making them easier to work with.

Professor Chris Burry

What key elements are necessary to create an entrepreneur?

To create an entrepreneur, several elements must be addressed. One critical aspect is instilling and strengthening an entrepreneurial mindset. Entrepreneurs think, behave, and see the world differently, so it's essential to foster this mindset in aspiring entrepreneurs. In places like Silicon Valley, this mindset often develops organically due to being surrounded by like-minded individuals. However, in environments lacking this mindset, it must be intentionally cultivated. Along with the mindset, entrepreneurs need the right skills to activate it. It's important that potential entrepreneurs also develop the belief that they can succeed. A person may have the right mindset and skills but, without belief, they will pass by opportunities instead of seizing them. Therefore, an effective approach to entrepreneurship education should address mindset, skillset, and belief simultaneously.

How does the Berkeley Method of Entrepreneurship differ from traditional education?

The Berkeley method of entrepreneurship is focused on instilling mindset and belief. This pedagogy is less concerned with developing specific technical skills, such as creating a value proposition or conducting beta testing. Instead, it emphasizes helping individuals make the mental commitment to pursue an opportunity. The Berkeley Innovation Index, developed over the past decade, is a self-assessment tool designed to help individuals assess their entrepreneurial mindset. This tool enables people to identify areas of self-improvement, such as collaboration or trust, empowering founders to refine themselves.

How should Entrepreneurship be taught?

One of the challenges universities faces is that traditional teaching methods often do not work in entrepreneurship education. The analogy often used to describe this challenge is learning to be a surgeon. While foundational knowledge is necessary—such as understanding the human body—surgery itself is learned by doing, under the supervision of an experienced mentor. Similarly, entrepreneurs learn best through real-world application under the guidance of experts, not by passively absorbing theoretical knowledge. This concept has existed for centuries in apprenticeships, where a master teaches and guides the apprentice in practical tasks. In entrepreneurship education, this method is essential, as it emphasizes learning by doing rather than just theoretical instruction.

What is the role of Professors of Practice vs. Traditional Academics in entrepreneurship education?

A major challenge in entrepreneurship education within universities is the divide between professors with academic qualifications and those with real-world experience. Traditional professors, often with PhDs, focus on theoretical knowledge, while "professors of practice" bring practical experience and skill-based expertise to the table. At the Center for Entrepreneurship at Berkeley, for example, most instructors do not have PhDs but are recognized for their real-world experience as entrepreneurs. This distinction highlights the importance of practical expertise in teaching entrepreneurship. Universities need to protect professors of practice from traditional academia, which may not fully appreciate the value of hands-on entrepreneurial experience.

What does protecting the professors mean?

Universities often struggle to allocate resources fairly between traditional academic departments and entrepreneurship centers. Professors of practice, who bring real-world expertise, often face challenges in securing resources and support for their programs. Senior leadership within the university must recognize the value of entrepreneurship education and provide sufficient backing. For example, when funding was donated for the entrepreneurship center at Berkeley, it was done with the understanding that the funds would be used exclusively for the center, avoiding potential misallocation to other departments. Without this kind of protection, entrepreneurship centers may be underfunded and undervalued.

What is the Dojo Model and how does it apply to entrepreneurship education?

A highly effective approach to teaching entrepreneurship is modeled after the Dojo, a traditional Japanese setting for learning martial arts, particularly karate. The Dojo emphasizes both mindset and skill development. Students learn from a sensei (teacher) who imparts the right mindset and teaches skills through repetitive practice. Just as in the Dojo, entrepreneurs develop "muscle memory" by repeatedly practicing entrepreneurial tasks under the guidance of experienced mentors. This hands-on approach is far more effective than theoretical instruction and aligns with the philosophy that entrepreneurship is learned through practice rather than simply by studying theory.

How can Experiential Learning and Gamification enhance entrepreneurship education?

A core component of the Berkeley method is experiential learning, where students engage in activities that simulate real-world entrepreneurial challenges. These activities often involve "games" that allow students to apply their skills and mindset in practical situations. One example is the paperclip challenge, where teams start with a simple item (like a paperclip or a shampoo bottle) and engage in a series of trades over several hours. Through this exercise, students learn about rejection, value exchange, and how to structure deals. The goal is not to accumulate the most valuable item but to understand how entrepreneurs create value and how others perceive that value.

What role do alumni play in building networks for entrepreneurship students?

Alumni play a critical role in building networks for students. Keeping alumni engaged through events, talks, and online groups helps current students learn from the experiences of those who have gone through the same entrepreneurial education. In Silicon Valley, the culture of "paying it forward" is a key element. Alumni who benefited from support earlier in their careers now give back by offering mentorship and networking opportunities. This collaborative environment enables students to build strong networks that will support them throughout their entrepreneurial journey.

What are the current challenges in the core challenges in the Bangladeshi entrepreneurship ecosystem that are prevalent?

If I had to point to one major issue, it's the mindset. It's not that people aren't talented, driven, and intelligent. Every time I visit, I'm impressed by the drive and capabilities of the people I

meet. But many of them are lost when it comes to mindset and foundational skills. There are good people doing the right work, but we need a concerted effort to teach the right mindset.

Another important point is that you need heroes—people who have been successful and can serve as role models for others. The belief that “if they did it, I can do it too” is powerful. For instance, Estonia, with a population of just 1.5 million, has the highest per capita rate of entrepreneurship in the world, even more than Silicon Valley. Skype played a huge role in this transformation. Before Skype, Estonians saw themselves as a tiny country on the edge of Europe with a strange language, no market, and no investors. But once Skype succeeded, all those excuses disappeared. The early Skype employees became the next generation of startup founders and investors in Estonia, contributing to companies worth billions, such as Bolt, a major competitor to Uber.

In Bangladesh, the brightest students tend to pursue careers in banks rather than entrepreneurship. One reason for this is the lack of entrepreneurial role models. If there were successful entrepreneurs worth billions, the conversation with parents about pursuing entrepreneurship would be different. This could encourage the best and brightest to start their own companies rather than working in traditional jobs.

Can you explain what fundamental skills it's important to have in our generation or our countries that are lacking?

It might sound strange, but the most important skill for a successful startup founder is storytelling. Many founders come from technical backgrounds and are great fact tellers, but it's stories that are remembered and persuade people. Facts are forgettable, but stories are powerful. Steve Jobs, for example, was a master storyteller, and that was his superpower.

Another crucial skill is improvisation. Early-stage startup founders often don't have everything they need—whether it's a complete team, market knowledge, or sufficient resources. They have to constantly improvise, which contrasts with what engineers are typically trained for. Engineers are taught precision, especially when designing something like a bridge, but building a company is a different challenge. Improvisation is as much a mindset as it is a skill.

Design thinking is also essential. It helps entrepreneurs understand their customers' needs and develop solutions based on real insights. Very few universities teach design thinking effectively, but it's a key tool for problem-solving in startups. The process itself often teaches valuable lessons, even if the idea is ultimately discarded. Failing fast and accepting failure as a learning opportunity is also a mindset that must be nurtured.

Failing is often viewed negatively in many cultures, including Bangladesh. However, in places like Silicon Valley, failure is seen as a learning opportunity. I once had a conversation with the CEO of a major tech company who told me that he doesn't trust anyone who hasn't failed at least three or four times. In fact, investors often prefer entrepreneurs who have experienced failure because they've learned valuable lessons. In Bangladesh, however, failure can lead to exclusion from the entrepreneurial community. This needs to change.

What steps need to be undertaken to emulate the SCET strategies, methods in Bangladesh to develop a better entrepreneurship ecosystem?

One key step is identifying a champion within a university—someone at the president's level, not below. Without strong leadership, it's like "pushing a rope uphill."

My belief is that programs should be run outside of universities initially. For example, we ran a program in Georgia last summer, jointly delivered by US Mac, Berkeley, and SCET faculty, for 100 university students. The program focused primarily on mindset, and it transformed the participants' perspective.

It's important to recognize that the Bangladesh government is unlikely to fund such initiatives at the scale required. To put it in perspective, the program in Georgia cost \$400,000 for one week, while a typical multi-year program in Bangladesh might cost \$2.5 million. The difference in scale needs to be acknowledged.

We recently ran a similar program in Moldova with US aid, where we spent \$1 million over one year to set up an entrepreneurship program at one university. The return on investment was clear, and this is the kind of approach that will yield results.

Ultimately, it's critical to understand the value of these initiatives and not focus on short-term numbers. Long-term, deep investments in programs like these are essential for building a sustainable entrepreneurial ecosystem in Bangladesh.

Mr. Siddhartha Goshwami

Could you please elaborate on iDEA's role in developing the entrepreneurship ecosystem in Bangladesh? How do the mentoring, academic programs, networking, legal, and IT support work?

iDEA was established with the goal of building Bangladesh's entrepreneurship ecosystem. Initially, it focused on attracting investments and supporting growth-stage startups. However, with the formation of Startup Bangladesh to cater specifically to growth-stage startups, iDEA shifted its focus.

iDEA operates with two primary objectives:

1. To establish itself as a company, which has since been restructured.
2. To position itself as an academy.

iDEA supports early-stage startups through three key objectives:

- Supporting innovative ideas.
- Supporting prototypes.
- Providing individual support.

iDEA does not take equity from startups when providing grants. Instead, it considers these grants an investment in its own objectives:

- Promoting a technology-based innovation system.
- Fostering an entrepreneurial culture in Bangladesh.
- Connecting local startups with foreign investors.
- Creating employment opportunities.

To sum up, iDEA's mission is to develop an innovation-centric economy and foster sustainable growth. The government's initiative aims to create a national entrepreneurship support ecosystem as part of the vision to develop a Digital Bangladesh. This will enable:

- Action to innovate.
- Development of technical skills.
- Realization of the Digital Bangladesh vision.

To date, iDEA has funded 313 startups across 18 verticals, including EdTech, FinTech, Agritech, logistics and transportation, infrastructure, biotech and medicine, green tech, food processing, manufacturing, travel and tourism, media and entertainment, e-commerce, and Farmtech.

The support provided by iDEA includes:

- Grants (10 lakh pre-seed funding).
- Training.
- Lab support for device-based startups.
- Co-working space.
- Networking opportunities.

Startups are selected based on criteria such as:

- Innovative ideas.
- Prototype-level solutions.
- Ability to solve problems faster, better, and cheaper.
- Repeatable and scalable business models.
- ICT as a core component of the product or service.
- Potential for exponential growth.

Notable initiatives by iDEA include:

- Funding around 400 out of over 1200 startups in Bangladesh (according to LightCastle BD).
- Student-to-Startup program.
- National Hackathon.
- IDEATHon (2019), providing 5 crore BDT funding for five startups and offering opportunities for international collaboration with South Korean startups.
- BIG (Bangabandhu Innovation Grant, 2021), which awarded 100,000 USD to one startup without requiring equity and provided 36 startups with 10 lakh BDT each.
- The Startup Compass campaign at universities.

Some of the funded startups include:

- ShopUp
- Truck Lagbe
- Moner Bondhu
- iFarmer
- MadeEasy
- Romoni
- HelloTask
- Shohopathi

iDEA has funded a total of 313 startups to date.

Startups apply to iDEA, and the selection committee evaluates their eligibility. iDEA aims to fund 400 startups in the current financial year, and so far, startups funded by iDEA have raised approximately 10,477 million BDT. Additionally, iDEA collaborates regularly with institutions such as UC Berkeley, UT Arlington, Microsoft, and UNDP.

How does the selection committee work? Are there any failures or bottlenecks with funded startups?

Many supported startups do not survive. When iDEA's initiative was launched by the government in 2016-17, the startup ecosystem in Bangladesh was still underdeveloped. Startup ideas in 2017 were not as lucrative as those in 2023. Today, the selection committee looks for traction, a customer base, and uniqueness in ideas.

The selection committee is appointed by the Prime Minister and is chaired by Dr. Rubana Huq, with Mr. Habibullah N. Karim serving as Co-Chair. Dr. Ananya Raihan is also a member of the committee, which includes a mix of industry experts and academics.

Startups go through a prescreening process, where initial applications are reviewed. If a proposal is not up to standard, feedback is provided to the startup. Once an application passes prescreening, it is forwarded to the selection committee. The committee evaluates applications in three panels, each consisting of academics and industry experts. These panels meet with the chair and co-chair to finalize decisions.

Funding is disbursed in 2-3 steps, with progress monitored at each stage. Sector-specific consultants, such as Siddhartha Goshwami for EdTech startups, set milestones for each startup. If a startup fails to meet a milestone, no additional funds are provided.

Startups must also submit financial reports to iDEA for monitoring purposes. The Performance Monitoring Committee (PMC) rigorously vets startups, even contacting their customer base for further assessment.

What are the current gaps in industry collaboration in building the entrepreneurship pipeline?

In foreign countries, industries often provide scholarships to facilitate research in their sectors, but such initiatives are lacking in Bangladesh. Additionally, academic courses are not always aligned with industry needs. For example, when the telecom sector was booming, there was a high demand for Electrical and Electronic Engineering (EEE) graduates, but no market analysis was done to match supply with demand.

Another issue is that institutions like Daffodil University have opened specialized departments, such as real estate, without assessing actual market demand. Academics often assume there will be job market growth, but these decisions should be made in collaboration with industries to ensure alignment with future job market needs.

Recommendations:

- Assess industry needs and develop curricula accordingly. Many curricula have not been updated in 10-20 years.
- Public universities face strong regulatory hurdles when trying to change curricula, requiring permissions from deans, vice chancellors, and other authorities. This process is slow and challenging.
- Private universities, in contrast, have fewer bureaucratic obstacles and can adapt more quickly to market needs because their goal is to ensure graduates are well-established in the job market.
- Public universities in Bangladesh often lack a research culture and healthy academic practices.
- Industry-sponsored scholarships and funding opportunities are virtually nonexistent in Bangladesh.

What can iDEA do to better motivate startups?

Mentoring is even more important than funding, and iDEA should allocate more resources to it. Incubation is also vital. Currently, mentoring is provided on a need-basis, but startups require thorough guidance and structured incubation to succeed.

There are only 5-10 consultants at iDEA, so more human resources are needed. Regular training programs and activation initiatives should be implemented. There is a gap between iDEA's 10 lakh investment and Startup Bangladesh's 1-5 crore funding, with many startups struggling in the middle stage. This gap needs to be addressed.

KIIs Sorted by Themes
Theme 1: How Can Academia Better Bridge Gaps with Entrepreneurs?
Barrister Anita Ghazi Rahman: Universities should incorporate practical courses into their curriculum to bridge the gap between theoretical knowledge and real-world business needs. Students need to understand intellectual property (IP) rights and when to protect them. Academia should also collaborate with industry leaders to provide internships and practical learning experiences.
Professor Asif Uddin Ahmed: Universities are not effectively teaching entrepreneurial skills like design thinking or problem-solving. The education system should focus on developing an entrepreneurial mindset from an early age, rather than expecting universities to create entrepreneurs in four years. Universities need to establish innovation hubs and provide resources for research and collaboration.
Mr. Bijon Islam: Academia should align curricula with industry needs and focus on practical learning over theoretical knowledge. Universities must invest in quality faculty development and research & development (R&D) to bridge the skill gap. Collaboration between academia and industry is essential to prepare students for entrepreneurship.
Professor Chris Burry: Traditional teaching methods are ineffective for entrepreneurship education. Universities should adopt experiential learning models, such as the Berkeley Method, which emphasizes mindset, skillset, and belief. Professors of practice (with real-world experience) should be prioritized over traditional academics to teach entrepreneurship.
Mr. Siddhartha Goshwami: Academic courses are often outdated and not aligned with industry needs. Public universities face bureaucratic hurdles in updating curricula, while private universities adapt more quickly. Industry-sponsored scholarships and research collaborations are lacking in Bangladesh, which hinders the development of an entrepreneurial pipeline.
Theme 2: Importance of Practical Experience and Mentorship
Barrister Anita Ghazi Rahman: Students should gain work experience before launching their own businesses. Working in established companies helps them understand industry operations and develop soft skills like business pitching and teamwork. Collaboration between academia and industry is crucial for integrating practical learning into university curricula.
Professor Asif Uddin Ahmed: Entrepreneurship cannot be taught in a short MBA program. Students need hands-on experience and mentorship to develop problem-solving skills. Universities should handpick students with entrepreneurial potential and guide them gradually through incubation and training programs.
Mr. Bijon Islam: Entrepreneurs need real-world experience and mentorship to succeed. Universities should focus on developing critical thinking, problem-solving, and communication skills through business competitions and industry collaborations. Mentorship

is key to helping startups navigate challenges.

Professor Chris Burry: Entrepreneurship is best learned through real-world application under the guidance of experienced mentors. The Dojo model, which emphasizes repetitive practice and mindset development, is highly effective. Alumni networks also play a critical role in providing mentorship and networking opportunities for students.

Mr. Siddhartha Goshwami: Mentoring is more important than funding for startups. iDEA provides mentoring on a need-basis, but structured incubation and regular training programs are needed to better support startups. More human resources are required to provide thorough guidance to entrepreneurs.

Theme 3: Challenges in the Entrepreneurial Ecosystem

Barrister Anita Ghazi Rahman: The legal framework for startups needs improvement, including reducing incorporation costs, providing tax relief, and simplifying licensing processes. High costs for winding up companies also pose a barrier for failed startups.

Professor Asif Uddin Ahmed: The education system is not geared toward problem-solving or developing an entrepreneurial mindset. Many students view entrepreneurship as a shortcut to celebrity status, but it requires long-term planning and risk-taking. The government should focus on creating an environment for entrepreneurship rather than directly creating entrepreneurs.

Mr. Bijon Islam: Bangladesh ranks poorly in global ease-of-doing-business indices due to corruption, lack of transparency, and bureaucratic inefficiencies. Access to capital and markets is a major challenge for small businesses. The education system has not evolved to meet industry demands, resulting in a talent shortage.

Professor Chris Burry: The biggest challenge in Bangladesh's entrepreneurial ecosystem is the mindset. Many talented individuals lack foundational skills and belief in their ability to succeed. Successful role models and heroes are needed to inspire the next generation of entrepreneurs.

Mr. Siddhartha Goshwami: Many startups fail due to a lack of market traction, customer base, and unique ideas. The selection committee at iDEA evaluates startups rigorously, but more resources are needed to support startups in the middle stage of growth. Industry collaboration and updated curricula are essential to address these gaps.

Theme 4: Funding and Support for Startups

Barrister Anita Ghazi Rahman: Funding typically follows a structured path: bootstrapping, angel rounds, incubation programs, and institutional funding. Entrepreneurs need to research these options before launching their businesses. The startup ecosystem is collaborative, with experienced founders willing to share knowledge and support newcomers.

Professor Asif Uddin Ahmed: Funding alone is not enough to create successful entrepreneurs. The education system must focus on developing problem-solving skills and an entrepreneurial mindset. Universities should provide resources for research and innovation to support startups.

Mr. Bijon Islam: Access to capital is a major barrier for startups in Bangladesh. High interest rates and limited market access make it difficult for small businesses to survive and scale. Blended finance models and capacity-building programs can help attract investment and improve business management.

Professor Chris Burry: Funding should be accompanied by mindset development and mentorship. Programs like the Berkeley Method focus on instilling belief and entrepreneurial thinking, which are critical for long-term success. Alumni networks and experiential learning can also enhance funding opportunities for startups.

Mr. Siddhartha Goshwami: iDEA provides pre-seed funding, training, and networking opportunities for startups. However, many startups fail due to a lack of traction and customer base. More resources are needed to support startups in the middle stage of growth, and mentoring should be prioritized over funding.

Theme 5: Role of Government and Policy in Entrepreneurship

Barrister Anita Ghazi Rahman: Startup Bangladesh is working on policies to make the legal framework more favorable for entrepreneurs. Progress has been made in reducing incorporation costs, but more measures are needed, such as tax relief and simplified licensing processes.

Professor Asif Uddin Ahmed: The government should focus on creating an environment for entrepreneurship rather than directly creating entrepreneurs. Policies should encourage collaboration between academia and industry, and provide resources for research and innovation.

Mr. Bijon Islam: The government needs to address systemic issues like corruption, lack of transparency, and bureaucratic inefficiencies to create a sustainable entrepreneurial ecosystem. Investment in education and skill development is essential to prepare the workforce for entrepreneurship.

Professor Chris Burry: Strong leadership at the university level is needed to drive entrepreneurship programs. The government should invest in long-term initiatives to develop an entrepreneurial mindset and provide resources for experiential learning and mentorship.

Mr. Siddhartha Goshwami: The government's initiative to create a national entrepreneurship support ecosystem is a step in the right direction. However, more collaboration between academia and industry is needed to align curricula with market needs and provide industry-sponsored scholarships.

Selected Quotes from KIIs

"Entrepreneurs need three things: mindset, skills, and belief. Even if someone has the right skills and sees an opportunity, they won't succeed if they don't believe in themselves."

Professor Chris Burry

"Universities must protect professors of practice, whose real-world entrepreneurial expertise is invaluable, from the traditional academic system that often undervalues practical experience in favor of theoretical knowledge."

Professor Chris Burry

"Mentoring is even more important than funding, and iDEA should allocate more resources to it. Incubation is also vital. Currently, mentoring is provided on a need-basis, but startups require thorough guidance and structured incubation to succeed."

Mr. Siddhartha Goshwami

"More collaboration between academia and industry is needed to align curricula with market needs and provide industry-sponsored scholarships."

Mr. Siddhartha Goshwami

"The government should focus on creating an environment for entrepreneurship rather than directly creating entrepreneurs. Policies should encourage collaboration between academia and industry, and provide resources for research and innovation."

Professor Asif Uddin Ahmed

"Our education system is failing to produce skilled individuals. Critical thinking, problem-solving, and interpersonal skills are missing, leaving us with a workforce that struggles to contribute effectively."

Mr. Bijon Islam

" Universities must invest in quality faculty development and research & development (R&D) to bridge the skill gap. Collaboration between academia and industry is essential to prepare students for entrepreneurship."

Mr. Bijon Islam

" IP rights are a practical concern that arises once a business has stabilized and identified its market potential. Universities should design curricula that introduce students to these real-world aspects, ensuring that they understand when and how to protect their intellectual property.

Additionally, developing soft skills, mastering business pitching, and engaging in practical learning experiences are crucial."

Barrister Anita Ghazi Rahman

Annex D. iSocial Research Ethics Guideline

Background

The process of conducting research involves not only searching for data and preparing a report on the gathered insights, but also maintaining the ethical grounds in the collection, storage, transmission, retrieval and usage of data, and the publication of report. This creates the need of having a standard ethical guideline regarding the research process. In this context, DataSense publishes this guideline for its researchers and team members which will facilitate them in coming up with insightful outputs while ensuring the ethical soundness of those outputs.

A. Report writing

Based on the type and focus of the research, reports can be structured into different types. Though the contents will vary among these types, there are some core instructions to be followed while writing the reports.

- a. The structure of the report needs to be designed in a way that it is simplified and understandable for the readers.
- b. A research report should not contain grammatical errors, as these errors may result into misinterpretation of the research findings.
- c. If relevant, a report should mention the source of data/table/figure presented.
- d. The report should acknowledge the contribution of the relevant parties.

B. Collection of data

The data collection procedure needs to ensure that the data is being sourced through proper channels and the authenticity of the data can be proved. The data collection procedure needs to ensure that the data is being sourced through proper channels and the authenticity of the data can be proved.

1. Informed consent

- a. The participants/respondents need to know about the purpose and use of the data he/she is providing. In order to communicate this information to the participants, the message needs to be in a language which is understood by the participants.
- b. Informed consent/assent/permission needs to be taken from the participants/respondents, before collecting or using their data. This may be collected in writing or voice recording form.
- c. The procedure of collecting informed consent needs to be mentioned in the certificate of manuscript and in the 'Methods'/'Methodology' section of the report.

2. Treatment of human participant

- a. While collecting data, a participant should not be harmed physically, emotionally or psychologically.
- b. A *protocol* on the treatment of human subjects should be prepared and maintained. It is essential that the protocol is reviewed by an appropriate committee.

- c. A participant should never be coerced or inappropriately induced to participate in the research.
 - d. Participation in the research should not be unduly influenced based on the researcher's status, power or authority.
 - e. The debriefing procedure for the participants should not be unduly delayed or unjustified.
3. Treatment of non-human animal subjects
- a. The non-human animal subjects of the research should be treated humanely and be kept in a healthy condition. A *protocol* on the treatment of non-human animal subjects should be prepared and maintained. It is essential that the protocol is reviewed by an appropriate animal care committee.
 - b. The condition in which the subjects are being kept need to be mentioned in the certificate of manuscript and in the 'Methods'/'Methodology' section of the report.

C. Literature review and referencing

While reviewing the literatures, it is essential to note whether any past literature has later been corrected and gather insights from the updated version of the literatures. If such a literature is cited in the report, it is also important for the researcher to mention the version of the report that is being cited.

D. Management of information

The information of participant/client/organization need to stored and managed in such a way that the confidentiality is being maintained as it has been told to the respective parties.

- a. The data collected from the participants should be dealt with caution, so that the confidential and personally identifiable information are not disclosed to any unauthorized person. For this reason, adequate measures need to be taken in order to prevent unauthorized access to the participants' data. A *protocol* of authorization of access to data needs to be developed and maintained.
- b. Participants' data should not be disclosed unless consent has been documented. In other words, data of the participants are not to be disclosed to the public or any other entity, unless it has been mentioned during the collection of consent.
- c. In cases where participants are also authors/investigators for the research, they should be provided with the authority of deciding the level of information they want to disseminate.
- d. Sometimes, there could be situations where the observations are important and relevant for the research. In such situations, the following measures can be taken:
 - i. Altering specific characteristics of the information.
 - ii. Limiting description of specific characteristics of the information or presenting composite description.
 - iii. Muddling the details of the information by adding extraneous material to it.
 - iv. Deidentifying the information by not altering the relevant parts.

E. Lawfulness and transparency

The research and the report need to be transparent in presenting the activities, influences, consistency with the legal requirements, etc. This not only adds to the reliability of the report, but also adds value to the acceptability of the report.

1. Conflict of interest

- a. Research participants should be protected against any potential harm or exploitation arising from personal, scientific, professional, or legal conflict of interest.
- b. The objectivity of the research should also be protected against any sort of conflict of interest.
- c. In case of a potential conflict of interest or a circumstantial influence, the potentiality or the circumstances need to be mentioned in the 'Author Note' section of the report.
- d. The possibility of financial conflict of interest should be strictly looked into as this carries a higher chance of impairing the objectivity of the research.

2. Research results and report

- a. The research results should have a strong methodological reasoning, where selective omission of observations in order to modify the results, without a valid reasoning, is unacceptable.
- b. In case of errors that significantly influence the meaning of the published results/report, it should be immediately communicated to the relevant authorities in order to correct or retract the report.

F. Data retention

Retention of data collected, curated and analyzed for the purpose of research should maintain a consistent *protocol*. It is generally advised that the data should be stored for at least 5 years, after the completion or publication of a report. Considering the nature of DataSense, this timeline may be extended to a period more than 10 years. However, the retention procedure should filter the data based on the adequacy and the relevance of the data.

G. Data security

The security of the retained data should be strictly maintained. The measures that needs to be taken to ensure data security are:

- a. Protection of data against cyber-attack.
- b. Preventive steps to be taken against data theft.
- c. Structured provisioning of data storage and sharing

H. Data sharing

The core focus of sharing data should be on ensuring the confidentiality of the research participants. In order to ensure this provision, the following measures should be in place:

- a. Informed consent needs to be collected from the participants, before collecting data from them. They should be aware of the use of the collected data and the list of entities that may have access to those data.
- b. Data may be shared with a qualified requester, if the accuracy of the report has been questioned.

- c. In any instances of data sharing, DataSense should enter into a written agreement with the parties with which the data is being shared, where the parties assure not to disclose the data they have gained access to.
 - i. It is advised to hide or remove the identifiable information from the dataset, before sharing it with an entity other than the researcher.
 - ii. An important aspect of sharing data is the relevant costs of sharing. The provisions of cost sharing should be determined before sharing the data with another entity.

I. Authorship

The provision on authorship covers multiple aspects.

1. The following types of people involved in the research process can and should be recognized as authors of the report, where they have agreed to serve as an author (written verification) and have reviewed the manuscript:
 - a. Writer of the report.
 - b. Formulator of research problem or research hypotheses.
 - c. Structurer of the experimental design of the study.
 - d. One who organizes and conducts the analysis process.
 - e. Interpreter of the results and findings of the research.
 - f. Other type of contributors may be added, based on their contribution to the research

Contributors, who are not recognized as authors, should get acknowledged for their contributions in the 'Author Note' section of the report.

2. The order of authorship needs to be determined based on the contribution of the authors and on the mutual agreement among them. In case of equal contribution from each of the authors, the distribution of contribution should be mentioned in the 'Author Note' section.
3. It is essential to present the copyright notice in/with the report. In most of the cases, the creative commons licensing is being used.
4. A less discussed matter regarding the parties involved with the research process is accountability. The accountability of each involved party needs to be determined and documented by adopting auditable steps and strategies.

J. Plagiarism

Plagiarizing works of others and of the researcher him/herself is considered to an unethical act. This not only shows the absence of morality, but also devalues the work of the researcher. For this reason, plagiarism should be strictly prohibited.

K. Accuracy of report

The accuracy of the report can be ensured through reviews.

1. Before being published, a report has to go through a thorough review. In case of being reviewed by institutional reviewers, the process should be reported in the 'Method'/'Methodology' section of the report.

2. In addition to the initial review, a report should go through regular reviewing, based on the importance and the relevance of the report.

L. Further publication

The responsibility of a researcher may extend to multiple publications. In such cases, there are some *protocols* that need to be followed.

1. Further publication is in sole discretion of DataSense. Without prior permission any publication is prohibited. Based on the institutional strategy, the publication roadmap for each research will be decided.
2. A researcher should not opt for piecemeal publications, instead of publishing all the results of the research in one report.
3. Multiple publication is acceptable when new insights have been dug out through extending the work of a published report. In such cases, the latter publications should always ensure copyright permission from the previous authors and the previous works should be cited in the report.
4. One may publish the same or similar report in a different journal, if the former report is not widely available or has been circulated within a limited group of people.
5. One should not re-publish a translated work or a report which contains substantially same content as the previous report. This is an act of redundancy and wastes the valuable space of academic works.

M. Pandemics and natural disasters

Procedures during a pandemic or a disaster should be considered as special cases.

1. Safety *protocols* need to be followed as instructed by the public health authority.
2. Data collection procedure during pandemics, like COVID-19, needs to be dealt with caution, by considering the safety of the respondents and the data collectors. The precautions taken during data collection procedure should be mentioned in the 'Methods' section of the report.
3. If the researcher excludes a certain group of research participants, as a result of the crisis, it should be mentioned and justified in the report.
4. The working environment of the researcher should ensure coherence with the *safety protocols*.
5. The researcher should maintain the *health protocols* during external communications and should ensure that the other parties are also maintaining those.
6. It is advisable to mention it in the report if the research work has been conducted during a pandemic or a natural disaster.
7. In case of natural disaster, the researcher should consider the living condition and the emotional state of the respondent/participants.

This guideline is developed to facilitate a researcher in abiding by the ethical policies related to the process of research. This document is to be constantly reviewed and updated, based on the need of research and the market norms regarding this matter.

Annex E. Task Allocation and Responsibilities for Report Development

Activities	Description	Responsible Entity
Result 1: Research conduction and analysis		
1.1 Identification of respondents		
1.1.1 Desk Research on the research topic and relevant areas	<i>Understanding the role of industry-academia collaboration in developing entrepreneurial skills and resources in preparing the students for their journey towards being entrepreneurs</i>	Research Team
1.1.2 Identification of students for FGDs	<i>Identifying the prospective students who can be a part of the FGDs and keeping the balance of disciplines and gender in mind, while determining the participants.</i>	Research Team
1.1.3 Identification of respondents for KIIs	<i>Drafting a list of individuals (academics, industry leaders and experts) who can be interviewed for the research</i>	Research Team
1.1.4 Identification of participants for expert group consultation (EGC) session	<i>Identifying students, entrepreneurs, industry leaders and representatives, industry experts, and representatives of trade associations who can be invited for a consultation session</i>	Research Team
1.1.5 Communication with the KII and FGD Participants	<i>Establishing connection with the respondents, booking their time, and finalizing the list of respondents</i>	Research Team
1.1.6 Communication with different individuals for expert group consultation session	<i>Connecting with the prospective participants in order to know about their availability and invite them</i>	Research Team
1.2 Data Collection Instruments Development		
1.2.1 Develop KII questionnaire and FGD checklist	<i>Designing the data collection instruments (KII, FGD) based on the research objectives and questions, and running and pilot test of those</i>	Research Team
1.2.2 Designing the EGC session	<i>Developing the plan for the EGC session and the respective materials for it</i>	Research Team
1.3 Data Collection		
1.3.1 Conduction of desk research to look for relevant information	<i>Conducting secondary research on the mentioned topic and reviewing relevant literature</i>	Research Team
1.3.2 FGD conduction	<i>Arranging and conducting FGDs in each target area by communicating with the target participants of the</i>	Research Team

	<i>FGDs.</i>	
1.3.3 KII conduction	<i>Identifying, communicating with, and conducting KII</i>	Research Team
1.3.4. Arranging EGC session	<i>Organizing the expert group consultation session with the aim of extracting valuable insights through it and to facilitate a dialogue among the actors to move towards strengthening the entrepreneurship pipeline development</i>	Research Team
1.4 Data Management		
1.4.1 Data Quality Assurance	<i>Maintaining a protocol for uploading and storing data. Setting a threshold on the number of daily deliverables so that the collected outputs can be controlled efficiently, and the data collection process can be paused, if needed</i>	Research Team
1.4.2 Data Cleaning	<i>Regularly managing and curating the data</i>	Research Team
1.4.3 Data Analysis	<i>Analyzing the clean data and understanding the pattern in the collected responses</i>	Research Team
Result 2: Research progress communication		
2.1 Research Progress Reporting		
2.1.1 Preparing an interim report	<i>Developing a report on the finding and the progress of the research</i>	Research Team

Activities	Description	Responsible Entity
2.1.2 Drafting the research report	<i>Accumulating the research findings into one document</i>	Research Team
2.1.3 Reviewing the draft research report	<i>Looking into the draft report and identifying areas which require improvements and updates</i>	iDEA and Research Team
2.1.4 Developing the final research report	<i>Preparing the final version of the research report by considering the revisions and feedbacks from the iDEA team and the peers</i>	Research Team
2.2 Research Progress Communication		
2.2.1 Organizing an interim seminar and EGC session	<i>Organizing the expert group consultation session with the aim of extracting valuable insights through it, facilitating a dialogue among the actors to move towards strengthening the entrepreneurship pipeline</i>	iDEA and Research Team

	<i>development, and presenting the interim report of the research</i>	
2.2.2 Organizing a draft report presentation seminar	<i>Presenting the first draft of the research report through a seminar with representatives from iDEA research team</i>	iDEA
2.2.3 Collecting feedbacks from iDEA Research Team and Peers	<i>Collecting the feedbacks and incorporating those in the report</i>	Research Team
2.2.4 Submitting the final report	<i>Sharing the final report with iDEA Research team, and providing declaration letters with the final report</i>	Research Team
Result 3: Publication of research report		
3.1 Identifying journals where the report can be published		Research Team
3.2 Preparing the report for publication	<i>Preparing the report for the eyes of general public, which includes working on the graphical presentation of the report</i>	Research Team
3.3 Organizing a public dissemination event for the report	<i>Disseminating the report publicly and arranging for online and offline contents for the dissemination event</i>	iDEA