Government of the People's Republic of Bangladesh
National Institute of Youth Development
Savar, Dhaka-1341
Ministry of Youth and Sports

FINAL
REPORT

Industry-Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR

INDUSTRY 4.0

Bangladesh Institute of Social Research (BISR) Trust

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Abbreviation

4IR	Fourth Industrial Revolution
AIF	Asian Infrastructure Fund
AIL	Academe Industry Linkage
BAETE	Bangladesh Association of Engineers and Technology
BBS	Bangladesh Bureau of Statistics
BGTTC	Bangladesh-German Technical Training Centre
BIDS	Bangladesh Institute of Development Studies
BKTTC	Bangladesh-Korea Technical Training Center
BUET	Bangladesh University of Science and Technology.
BUP	Bangladesh University of Professionals
CSR	Corporate Social Responsibility
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GoB	Government of Bangladesh
ICT	Information and Communication Technology
IDI	In-Depth Interview
ILO	International Labour Organization
KII	Key Informant Interview
NACTAR	National Academy for Computer Training & Research
NGO	Non-Government Organization
NIYD	National Institute of Youth Development
SEIP	Skills for Employment Investment Program
TTC	Technology Transfer Centre
TVET	Technical and Vocational Education and Training
UCEP	Underprivileged Children's Educational Programme
UIU	United International University
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergency Fund
WB	World Bank
YPSA	Young Power in Social Action
TEB	Technical Education Board
MoST	Ministry of Sceince and Technology
MoYS	Ministry of Youth and Sports

June 21, 2025

To

Director General
National Institute of Youth Development
Savar, Dhaka.

Dear Sirs:

Please find herewith the final report on **"Industry-Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR".** This is for your kind necessary action.

Yours sincerely,

Dr. M. Khurshed Alam
Team Leader
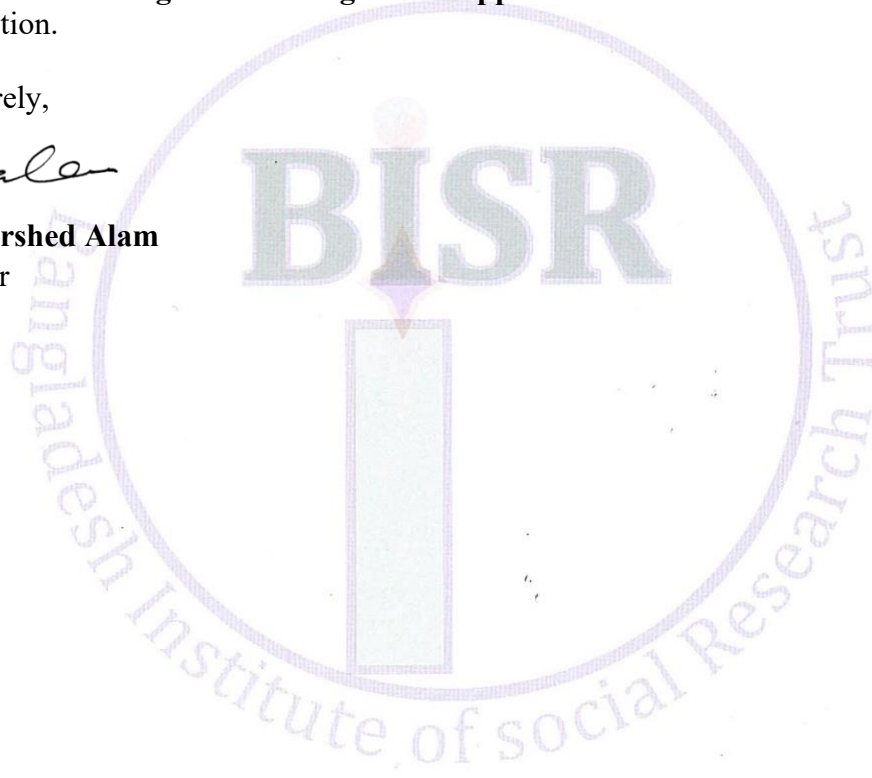
Executive Summary

The economy of Bangladesh is now one of the fastest-growing major economies in the world, ranking sixth globally and first in South Asia, with an average GDP growth rate of 6.5% over the last decade. However, the rapidly evolving technological and economic landscape—accelerated by the Fourth Industrial Revolution (4IR)—has made it challenging for the youth to acquire the necessary skills to meet the demands of the future workforce (World Bank, 2019). To address this, fostering **industry-academia collaboration** becomes crucial to equip the youth with practical skills, innovative thinking, and entrepreneurial capabilities essential for thriving in the era of quick technological advancement. To further this mission, the NIYD under the Ministry of Youth & Sports conducted a groundbreaking research project titled: **"Industry-Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR."**

The main objectives of this research include-
1. to assess the current state of youths' employment skills and identify gaps that need to be addressed through targeted training and education programs;
2. to evaluate the effectiveness of NIYD training programs, comparing them with similar initiatives by other governmental and non-governmental organizations;
3. to explore the socioeconomic impact of NIYD training programs on the country, focusing on challenges and opportunities for youth demand, collaboration, and capacity building in the 4IR context; and
4. To identify key fields of training and education for NIYD trainees, including opportunities for industry-academia collaboration to enhance practical exposure in 4IR-related areas.

The study used both quantitative and qualitative approaches to collect primary data from the field. Quantitative approach was used to collect data on the project indicators through a questionnaire survey. Moreover, under the qualitative method, Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), and In-Depth Interviews (IDIs) were conducted. Also, secondary data was collected from available sources that present an overall idea about the study before going to questionnaire preparation and primary data collection. KoBo Toolbox software was used to collect data from the field and SPSS and *Microsoft Excel software* will be used to analyze the data conducting the study. For quantitative survey data were collected 755 from NIYD and 771 from nonNIYD where total was 1526 respondents. And for Qualitative survey KII was conducted with 32 experts and industrialists and IDI was conducted with 30 target population and 7 FGDs with target population from NIYD and nonNIYD.

Quantitative Findings

Current Students

The majority of current students-both NIYD and Non-NIYD are between 21 and 30 years old (77.5%), and most come from low- to middle-income families (earning between BDT 15,000 and 25,000). While access to smartphones is nearly universal (NIYD: 97.4%, Non-NIYD: 99.5%), laptops and desktops are less common, especially among Non-NIYD. Their primary device usage is social media (over 98%), but engagement with academic activities, online

learning, and freelancing remains limited. Only 56.1% (NIYD) and 51% (Non-NIYD) use online learning platforms, and a mere 16.2% and 9.1% respectively engage in freelancing. Awareness of 4IR is relatively high (NIYD: 83%, Non-NIYD: 81.4%), but meaningful exposure is weak. Most students reported that 4IR content is missing from their curriculum (NIYD: 80.4%, Non-NIYD: 72.2%), and their teachers do not address it (NIYD: 69.6%, Non-NIYD: 86.1%). Training sessions and access to learning resources on 4IR are scarce. Notably, 50% of NIYD students reported the absence of any training opportunities on 4IR topics. The gap in institutional support is evident in both the low rate of enrollment in 4IR courses (under 5%) and the overwhelming interest (NIYD: 99.6%, Non-NIYD: 97.1%) in receiving such training if offered. Barriers cited include lack of syllabus coverage (85.3% NIYD, 76.2% Non-NIYD), poor access to training, absence of skilled trainers, and low awareness of the importance of these technologies. Motivation to learn 4IR skills stems mainly from job prospects, institutional support, and personal interest. The majority view internship opportunities and industry collaboration as the most needed supports to become "4IR-ready." Despite these gaps, students express a strong desire to up skill in areas such as communication (NIYD: 89.7%, Non-NIYD: 78.6%), language proficiency, data science, and AI. In terms of career direction, most plan to pursue private jobs, apply their knowledge in real life, or enter freelancing—though actual participation in freelancing remains low. A substantial majority believe that industry collaboration would improve learning outcomes and job placement. However, less than 17% of NIYD and only 2.3% of Non-NIYD students have ever visited an industry.

Job Holders

Among the job-holders population, both NIYD and Non-NIYD participants belong predominantly to the 21–30 age groups, with a small fraction aged over 30. Digital device ownership is again high, with all NIYD and nearly all Non-NIYD owning smartphones. However, like current students, device usage is focused on social media, with fewer using devices for online learning or freelancing (NIYD: 23.5%, Non-NIYD: 9.2%). Their awareness of 4IR technologies is encouraging (NIYD: 90.3%, Non-NIYD: 86.7%), but practical exposure remains critically low. Over 90% of participants in both groups have not enrolled in any 4IR courses. Similarly, hands-on training is nearly absent (NIYD: 97.5%, Non-NIYD: 92.9%). When asked about institutional support, only 4% (NIYD) and 10.2% (Non-NIYD) reported receiving relevant training. This indicates a significant institutional readiness gap in preparing job seekers for the demands of the 4IR job market. Internship and apprenticeship opportunities are highly demanded (NIYD: 91.2%, Non-NIYD: 73.5%). Yet, only 2.7% (NIYD) and 24.5% (Non-NIYD) participants confirmed their institutions had formal partnerships for student internships. Major barriers include outdated curriculum, lack of trained faculty, and absence of hands-on learning environments. Skill familiarity is uneven. While participants had basic awareness of topics like AI and cybersecurity, actual application or usage was limited. Many job seekers reported being only "somewhat familiar" or "occasional users" of 4IR tools. Their primary motivators for learning were career prospects and job readiness, with most preferring structured institutional courses supported by online platforms.

Job seekers

The job seeker group, primarily aged between 21 and 30, demonstrates high digital access and strong awareness of Fourth Industrial Revolution (4IR) concepts (NIYD: 93%, Non-NIYD: 77.5%). However, actual engagement in 4IR-related training is extremely low—only 2.7% of NIYD and 3.3% of Non-NIYD participants enrolled in any 4IR-focused courses, and more than

97% had no hands-on training exposure. Despite this, almost all respondents showed a willingness to attend free or subsidized training. Key skill demands include communication, language, data science, and AI. Internship and apprenticeship opportunities are highly desired (NIYD: 86%, Non-NIYD: 71.1%), but actual availability is limited, with only 4.3% of NIYD and 16% of Non-NIYD respondents reporting that their institutions had industry partnerships. The major barriers identified include outdated curricula, lack of trained faculty, absence of practical labs, and weak institutional-industry linkages. Industry-academia collaboration is widely supported—over 96% of NIYD and 81% of Non-NIYD believe it would improve employment prospects. Yet, only 7.8% of NIYD participants were aware of any such collaborations, and the majority had never visited an industry.

Qualitative Findings

The qualitative findings show that most youth training programs are too theoretical and lack practical skills. Trainers and employers noted that students often finish courses without being job-ready. A key reason is the lack of collaboration between institutions and industries, which limits access to internships and real-world experience. Many trainers are not updated on 4IR topics like AI and robotics, and institutions often use outdated curricula with poor facilities. Youth also need soft skills like communication and problem-solving, along with career guidance. Overall, stronger industry-academia collaboration is seen as essential to improve training quality and youth employability.

The findings underscore a significant gap between current skill levels of youth and the future demands of the Fourth Industrial Revolution. While digital access is high, practical, industry-relevant skill application remains low. Training provided by NIYD and similar institutions, though valuable in intent, often lacks alignment with job market expectations. The absence of structured industry-academia collaboration further widens this gap. Institutions like BUET and Rahimafrooz have shown some progress in I-A collaboration, but such practices are neither widespread nor systematic. The socio-economic impact of these programs remains limited unless a holistic, inclusive, and demand-driven training ecosystem is developed

Recommendations

Sl. No	Recommendations	Actions to be taken by
1)	There is a need for a policy from the government on industry-academia collaboration wihout which, the present process of piecemeal effort will not work much. An immediate action is needed to frame and introduce this policy.	Ministry of Youth and Sports; Ministry of Industry; and Ministry of Sceince and Technology.
2)	The issue is almost unexplored in the country, which demands a big-push to speed up the process. A special seminar may be organized with the Industrialists and Academia where two keynote speakers may be there from those two groups. Scope can be worked out as per opinions of these groups.	NIYD can be lead or MoI.

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3)	Practical, hands-on training, maintenance training, IT support service, cyber security, and language skill are to be developed.	Training institutes.
4)	Exposure to industry is very less among the trainees and students of the country. In fact, it should be made mandatory for all students to make visit to the industry of the respective fields.	Technical Education Board (TEB). All training institutes.
5)	Actual engagement in 4IR-related training is extremely low. It should be focused in the courses and hands-on training should be given.	TEB. All training institutes.
6)	Faculties in the institutes do not have training on 4IR. They are not much exposed to the 4IR. The faculties need to be given orientation on 4IR.	TEB. All training institutes.
7)	Industry and other employers are currently getting about 30% of the required skill manpower. Normally, they get 3-5 qualified persons out of 20-25 interviewed candidates. A proper quality training is essential to address the needs of the market.	Technical Education Board (TEB). All training centers.
8)	Most of the industries' do not have practice of intersnship but there is scope for the same.	Industry- Academia collaboration.
9)	NIYD gives training but many of them undertake this training not to get a job in that particular professional field. It must develop a screening method so that the right person is given the right training in the right time.	NIYD
10)	Training programs of the NIYD focusing on challenges and opportunities for youths' demand, collaboration, and capacity building in the 4IR context is not yet fully designed and achieved. As the study shows, it has not been designed in any other academic or training institute of the country except BUET to some extent. But without further delay is has to be planned and implemented. One idea may be that all the institutes' representatives may sit together and can work out a basic agreed guidelines for that.	MoST. All institutes' and industries' representatives may sit together and can work out.
11)	NIYD has received a few proposals for collaboration from some industries on skill development, not on technology development. Technology development is not the main thrust of NIYD. But the organization can look for creating that capacity in the future. Proposal for MOU is there on food technology, which is under process. But a dedicated wing/section should work on this issue so that each month it must get some responses from the industries.	A dedicated wing/section should work on this issue from each Indsutry and Academia.
12)	Target highly potential industry/industrial groups to encourage to go for I-A collaboration.	NIYD. Ministry of Industry.

Submitted by: BISR Trust

13)	There is scope for industry-academia collaboration with BUET, RUET, KUET, and MIST as Rahimafrooz does it. Maximum industries have not given any proposal nor received either for technology development. Some industries feel that there are scopes for Industry-Academia collaboration to enhance practical exposure in 4IR-related areas particularly to produce some spare parts, look for low cost machineries, energy efficiency, ICT, and artificial intelligence, etc. There is a demand for cost-effective production technology.	Industry-Academia.

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Chapter -1
Introduction

1.1 Introduction

The economy of Bangladesh is now one of the fastest-growing major economies in the world, ranking sixth globally and first in South Asia, with an average GDP growth rate of 6.5% over the last decade. This remarkable economic trajectory is accompanied by a significant demographic shift, with an increasing percentage of the population in the working-age group and a declining proportion in the dependent-age group. According to the World Bank (2021), over 64% of Bangladesh's population is currently in the working-age category, a figure expected to rise to nearly 70% by 2050. Furthermore, approximately 64% of the population is under 30 years old (Population Census, 2011), presenting a unique opportunity to harness this demographic dividend for sustained economic and social development.

However, the rapidly evolving technological and economic landscape—accelerated by the Fourth Industrial Revolution (4IR)—has made it challenging for the youth to acquire the necessary skills to meet the demands of the future workforce (World Bank, 2019). To address this, fostering **industry-academia collaboration** becomes crucial to equip the youth with practical skills, innovative thinking, and entrepreneurial capabilities essential for thriving in the era of quick technological advancement.

The government of Bangladesh has recognized the importance of human capital development, launching multiple initiatives to promote education, technical training, and skill development. The **Technical and Vocational Education and Training (TVET)** program endeavors to provide youth with the competencies needed for the 21st-century economy (Ministry of Education, 2016). Complementing this, the **Digital Bangladesh Campaign** has integrated ICT into education and skill development since 2013 (Ministry of Posts, Telecommunications and Information Technology, 2013). Other programs, such as the **Youth Entrepreneurship Development Program** (Ministry of Youth and Sports, 2022) and the **Skills for Employment Investment Program (SEIP)** (Ministry of Finance, 2017), further emphasize fostering innovation, entrepreneurship, and employability.

In parallel, the government has significantly expanded technical and vocational education infrastructure, establishing 49 government polytechnic institutes and 220 private polytechnic institutes. There is only 1 National Institute of Youth Development (NIYD) and Bangladesh has a comprehensive network of youth training institutes aimed at enhancing skills and promoting self-employment among its youth. The Department of Youth Development (DYD), under the Ministry of Youth and Sports, operates 70 youth training centers across the country, offering training in 83 different trades. These institutions aim to develop a skilled labor force to meet the growing demands of industries and service organizations. Despite these efforts, only 14% of total enrolled students are pursuing technical education (Ministry of Education, Technical Education Board, and Department of Technical Education), highlighting the need for greater emphasis on technical skill development to bridge existing gaps.

In this context, the **National Institute of Youth Development (NIYD)** has emerged as a vital platform to integrate contemporary methods into research and training programs tailored to the needs of youth in developing nations. NIYD recognizes that a nation's ability to innovate and

adopt modern technologies is directly linked to its workforce's skill level. Therefore, technical education in Bangladesh has been structured into degree-level, trade-level, and technician-level programs to address the diverse demands of the 4IR-driven economy.

To further this mission, the NIYD under the Ministry of Youth & Sports conducted a groundbreaking research project titled: **"Industry-Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR."**

This research aimed to identify the critical skills and competencies needed by the youth to meet the employment challenges of the future and explore ways to enhance their capacity. It targeted young individuals across Bangladesh to gather insights into skill gaps, emerging opportunities, and innovative solutions. The findings will enable NIYD to design and deliver programs tailored to the specific needs of youth, ensuring that they are equipped to leverage the opportunities presented by 4IR.

This initiative exemplifies the transformative potential of industry-academia collaboration, aligning education and training with the demands of the evolving global economy, and ensuring a robust, future-ready workforce for Bangladesh.

1.2 Statement of the problem

In Bangladesh, youth unemployment is a pressing issue, particularly among individuals aged 18 to 35, regardless of gender or region (urban or rural). Despite the country's economic growth, unemployment rates are disproportionately high among educated youth, highlighting disconnect between the educational system and the skills demanded by the labor market. This mismatch is indicative of systemic shortcomings in aligning education with practical employability.

Contributing factors to youth unemployment include inadequate job opportunities, low-quality education, and a lack of access to technical training and skill development programs. Additionally, barriers such as limited access to credit, corruption, insufficient transportation and communication infrastructure, and discriminatory hiring practices further restrict young people's prospects for meaningful employment.

Beyond economic and institutional challenges, social factors like early marriage, cultural prejudice, and familial restrictions exacerbate the problem, particularly for young women. Mental health issues arising from unemployment and a lack of opportunities also pose significant concerns for this demographic.

Given the transformative potential of the Fourth Industrial Revolution (4IR), these challenges become even more critical as technological advancements reshape labor markets and demand new skillsets. Addressing these systemic and social issues requires a comprehensive approach that emphasizes **industry-academia collaboration** to develop innovative educational frameworks, skill development programs, and supportive policies to prepare the youth for the evolving demands of the 4IR-driven economy.

This research project seeks to address these gaps by assessing the capacity development needs of Bangladeshi youth and exploring strategies to equip them with the skills and opportunities required to navigate the challenges and leverage the opportunities of 4IR.

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1.3 Significance of the research study

Youth constitute more than half of Bangladesh's population (UNDP, 2021), positioning them as a critical demographic for sustaining the nation's socioeconomic development. Despite notable progress in poverty reduction and access to education, the challenge of youth unemployment persists as a significant barrier to achieving inclusive growth. The youth unemployment rate, currently at 10.6%, is more than double the national average of 4.2% and accounts for a staggering 79.6% of total unemployment (ILO, 2020). This issue threatens to undermine the progress made in poverty alleviation and highlights the urgent need to provide meaningful employment opportunities for the youth to ensure continued economic and social advancement.

This study, titled **"Industry-Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR,"** is significant because it addresses this critical issue. By focusing on the rapidly evolving demands of the Fourth Industrial Revolution (4IR), the research aims to identify the skills and competencies needed to equip the youth for future job markets. The findings can be used to set the strategies for enhancing employability but also contribute to fostering a collaborative framework between industries and academia. This approach is vital for aligning educational outcomes with market demands and ensuring that Bangladesh's youth can play an active role in driving sustainable economic growth in the face of technological transformation.

1.4 Objectives of the study

The main objective of this research is, "Industry-Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR". Based on this objective we select some specific points of investigation which include-

5. to assess the current state of youths' employment skills and identify gaps that need to be addressed through targeted training and education programs;
6. to evaluate the effectiveness of NIYD training programs, comparing them with similar initiatives by other governmental and non-governmental organizations;
7. to explore the socioeconomic impact of NIYD training programs on the country, focusing on challenges and opportunities for youth demand, collaboration, and capacity building in the 4IR context; and
8. To identify key fields of training and education for NIYD trainees, including opportunities for industry-academia collaboration to enhance practical exposure in 4IR-related areas.

1.5 Scope of the study

The scope of this study are as follows-

- Present condition of youth in terms of skill related to employment
- Skill need to develop through training and education

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- Field of training and education
- Target population trainees of NIYD
- Evaluation of training programmes of NIYD in terms of effectiveness
- Comparing of training programmes of NIYD with other government and non-government organisation's training programmes
- Impact of socioeconomic condition of our country through training programmes of NIYD
- Youths' demand and collaboration with related programmes: challenges and opportunities
- Capacity building
- Live data should have been shown during the research period where the youths have been working related to 4IR.
- Industry/academia institution should have been visit with trainee/professionals related to NIYD where 4IR is practicing.

1.6 Literature review

Industry-Academia collaboration

It is a widely used concept now, which includes a kind of collaboration between industry-academia where it gives mutual benefits from partnership, create a condition to enhance partnership research between the two, helps to makes innovation, generates students' employability, resulting to augmentation of both sector. It is a win-win situation which creates three benefits such as innovation, growth and training. It has different benefits to two types of organizations:

It yields benefits to academia, which include a. access to real-world problems and resources; b. enhanced research funding and opportunities; and c. improved curriculum and teaching. Benefits to industry include: a. access to cutting-edge research and talent; b. innovation and development; and c. improved reputation and brand image.

Methods used for collaboration

There are many methods used for collaboration which include:

i. Joints research projects where both universities and business organizations has collaborated on solving the industry challenges;
ii. Internships and apprenticeships are the direct methods for students to get hands on training and acquire skills;
iii. Industry-led workshops and seminars are organized at universities to disseminate their expertise; and
iv. Co-creation of educational materials in collaboration with industry and academia as per needs of industries.

Indeed, in Bangladesh it is essential to have academia and industry collaboration to develop skill of the students who can take part in hands on training, for example, shipbuilding. There are many examples where people from academic institutions do learn wielding works but do not learn shipbuilding. Once they learn this shipbuilding works they got a very high salaried jobs at Singapore shipbuilding yards. In agriculture, we know something called high value

crops but one needs to learn it from the field, not merely from academic institutions. They can serve as manager, technical experts in those sectors. To achieve more industry- academia collaboration can be developed for availing such job in home and abroad.

Crespo and Dridi, (2007): The study analyses the intensification of university–industry relationships and its impact on university research in Quebec, Canada. The research covered twenty-eight in-depth interviews with university researchers and five interviews with technology transfer officers. The interviews revealed that researchers in scientific and technological fields conducted innovation-oriented research that benefited their graduate students as well as their institutions. However, freedom of publication was somewhat conditioned by intellectual property constraints. In order to address it majority of university researchers adopted entrepreneurship which they found useful to their academic efforts. The university–industry relationships also had latent dysfunctional effects in regard to conflicts of interest where some university researchers have created start-up companies which act both as research funding sources as well as beneficiaries of research results. Thus, intellectual property and conflict of interest issues appeared often as sources of stress and tension for researchers. However, such disputes may be resolved in a way that may satisfy both the researchers and the institutions.

Kruss and Visser (2017): To enhance collaboration for generation and transfer of knowledge and technology between universities and industry, it is necessary to work out some policies. The studies increasingly focus on identifying incentives and barriers within universities but favours individual over institutional determinants in USA, and Europe. The paper contributes to explaining the university–industry linkages within the context of academic interaction with external actors in the diverse institutions. The paper is based on an extended literature review to find the trends in an immature national system of innovation in a late developing economy namely South Africa. This analysis shows the heterogeneity of academic engagement focusing on firms collected an original dataset derived from a survey of individual academics. It claims that the incentives that drive academics and that block university–industry interaction in contexts like South Africa, are strongly related to universities' differentiated nature controlled work organizations, and they balance and priorities their roles in national development. It claims that it is necessary to putting academic-industry into a perspective.

Filippetti and Savona (2017): The article is on "University–industry linkages and academic engagements: Individual behaviours and firms' barriers". The paper covered the concept of academic engagement by exploring the heterogeneity of UI linkages along with a set of dimensions and actors involved. These are: i. incentives and behaviours of individual academic entrepreneurs; ii. firms' barriers to cooperation with public research institutions; iii. individual behaviours, incentives and organizational bottlenecks in late developing countries. The paper summarizes the individual contributions along these dimensions. Many overlooked individual characteristics are there that affect the degree of engagement of academics and scholars in cooperating with other organizations, of which gender and the non-academic background of individuals are most crucial.

Academic engagement should be enlarged to go beyond the commercialization or patenting of innovation, but embrace social and economic impact more at large. From the perspective of the firm, barriers to innovation might create an effect on the likelihood to cooperate with universities and public research institutes.

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Yusuf et al (2019) found that IR changed the life of the people which moved from hand production to mechanized production to automation of concepts of production what is now called Fourth Industrial Revolution (4IR). Indeed, 4IR leads to the process of transferring data from digital domains and offline reality via interconnected systems to change the lives. The technologies adopted under 4IR covers varying areas, such as the economy, medicine and education. Educational institutions have contributed immensely to reshaping future technologies and meanwhile, it has become imperative to bring about a change in the traditional educational approach. This can be achieved by employing the trending technologies to prepare students and educators with the right kind of knowledge and skills. A question is how the deliver education and how educational institutions can be restructured by the 4IR to prepare students for the challenges ahead.

Datta (2021) mentions that not many students understand its imapcts or even evoluation. Although this paper covers the evolution process categorically, which is useful for the students it concludes that 4IR promises and perils with a mini case on how it quietly helped the COVID-19 vaccine development can create cyberthreats and erode privacy. In the evoluation it covers the first IR (1760–1830) covering machines over men, the second IR (1870–1914) the age of energy, mass production, and communication technologies, the third IR (1940–2005) include the digital age of information automation (computing) and the fourth IR ((2010-present) which include the age of digital convergence and the MetaVerse.

Some other impoirtant works are there which include **Gleason (2018)**, **Richert et al (2016)**, **Selamat et al (2017)**, **Naudé (2017)**, **Schuster et al (2016)**, **Xu et al (2018)**, **Reich-Stiebert, Natalia and Eyssel, Friederike (2016)**.

It might be useful to mention here that the top five inventor locations are China (38,210 inventions, US (6,276 inventions), Republic of Korea (4,155 inventions), Japan (3,409) and India (1,350) Image and video data dominate GenAI patents (17,996 inventions), followed by text (13,494 inventions) and speech/music (13,480 inventions). These shows the degree that the patents are taking place around the globe.

In Bangladesh the issue is discussed to a great extent by different scholars and related organizations which include: The Institute of Chartered Accountants of Bangladesh; Conference organized by Bangladesh University of Professional (BUP) on Industry-Academia Collaboration, Bangladesh Institute of Development Studies (BIDS) carried out a research, BUET did collaborative work with several companies, etc. Out of that BIDS has done a research on Industry-academia collaboration.

Generally, industry develops products and services for profit making while universities focus more on theories and concepts. Scope of collaboration is always very high in the case of science, technology or engineering that helps the industry as well as academia. Indeed, such collaboration between the industry and academia is rising globally. But in case of Bangladesh it is yet to get a stand.

In Bangladesh employers often claim that they do not get industry-fit skilled manpower even from the leading universities of the country. A clear gap between academia and the industries has been recognized by many from both the groups.

Submitted by: BISR Trust

Bangladesh Institute of Development Studies reported (**TBS 22 August, 2022)** that the industrial sectors of the country are facing 30% skills gap. Agro-food processing and RMG sectors are facing a relatively moderate skills gap where gap is higher in the ICT, ship-building and the large-scale electronics sectors. The study found that only 3.65% of the labour force in Bangladesh receives training each year where the rate is only 1.35% in 10 specific sectors. It seems attempts are there to bridging the gap.

In 2022, tech giant Huawei and Bangladesh University of Science and Technology (BUET) jointly launched a non-profit education programme where Huawei-BUET ICT Academy is to equip young learners with industry-fit skills and develop an ICT talent ecosystem.

The academy offers many certification programmes on different subjects such as routing and switching, 5G, storage, artificial intelligence, intelligent computing, cloud computing, security, WLAN, and big data. At the end of the course, it gives three types of grade certificates like associate, professional and expert, based on their scores. The course and the certification is coordinated by Huawei Authorised Information and Network Academy.

Brac University has struck a deal with BSRM in the country, under which the company provides fund to School of Engineering of BRAC to recruit world-class faculty, conduct cutting-edge research in key impact areas and improve curriculum. The university renamed its engineering school as the BSRM School of Engineering.

The Department of Biochemistry and Molecular Biology of Dhaka University and Janata Jute Mills, have taken a joint initiative to carry out research on the method of jute retting with a view to making it suitable for cultivation twice a year to increase the production. Global electronics brand Samsung funded two labs which Samsung Innovation Lab and Applied Machine Learning Lab in BUET during the period of 2013-2019.

Under this collaboration with Samsung Research Bangladesh, the funding was used to develop research labs where full-time graduate researchers worked on some problems of mutual interest. Despite the recent funding pouring in from the businesses, the BUET feels that industry-academia collaboration is rare in Bangladesh.

BUET Professor Dr Iqbal claims "There are hardly any industry-academia collaborations in the country in the truest sense. The existing initiatives are more of CSR because in real terms such collaboration means the industry will give academia a problem, and provide funds to find a solution to that. Academics and full-time researchers will be involved in the process." He was involved in the collaborative project 'Code Review Quality Measurement,' implemented under the Samsung collaboration.

Some collaborative works are done with BUET out of good wishes for the university, or as a part of CSR. BUET also get some funding from local companies for their various conferences which are not real industry-academia collaborations. In fact, those funding are not for any direct real benefits of the companies.

Huawei didn't get any benefit from that project. This company made an attempt to introduce its new technology to the younger generation. With this aim, Huawei initiated a global project called 'Huawei ICT Academy' which makes a partnership between Huawei and other academies around the world. The same project has also made similar deals in Bangladesh with five universities including BUET.

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"Some studies show that within 6-7 years, there will be a shortage of workforce with ICT skills. Our goal is to prepare our youth to fill in that gap," said Tanvir Ahmed with an interview with The Business Standard.

Huawei claims that globally they employ 2 lakh people where 1 lakh of them are engaged in research and development. They spent more than 22% of their revenue on R&D, what they have been doing for the last 30 years. They share their knowledge and experience with the university graduates. This Huawei goes for collaborative development, indeed, collaboration with academia. It seems Huawei does it as part of CSR as they do not directly derive any benefit from this programme.

Boeing is one of the world's top manufacturers of commercial aeroplanes, develop defence, space and security systems. They have long-term research agreements with some of the world's top research universities in specific critical technology areas.

Procter and Gamble (P&G), known as the world's largest consumer goods production company, works with the University of Cincinnati (UC) as a strategic academic partner to develop various modelling and simulation capabilities for advancing product and process development.

Mostly, the world's top-ranking universities attract a lot of industry funding as the pharmaceutical industry is one of the biggest investors in academia. The IT industry is also increasingly engaging in universities, as innovations are beneficial to them.

Internships are one good example of collaboration between academia and industry. Academia and the industry are mutually co-dependent, where academia also go for sending their students for internship to the industry. Teachers also need to know from the industry about their requirement and that too to be included in the syllabus.

IBA of Dhaka University is closely linked with the industries where they harvest the benefits of it by sending their students to industries. Those organisations like to hire IBA graduates because of their trust on these interns. Through this intern process, they also learn to how to blend their practical knowledge with the acquired theoretical knowledge. Regular market visits, industry visits as well as industrialist teaching classes in IBA are really helpful in bridging the gap.

Pharmaceutical industry, IT industry, commercial aeroplanes, defence products, space and security systems are the main users of industry-academia collaboration.

In developed countries there is Technology Transfer Centre (TTC) in the universities, business organizations sign contracts with these centers for technology acquisition against money. Patent development for a new innovation is another area of such activities. Through this process, TTC earns money and supports businesses, and businesses also get benefits.

Industy-academia collaboration in Bangladesh is increasingly getting attention and considered as crucial for economic development, addressing skill gap, with universities and industries collaborating to foster innovation, research and develop skilled workforce. Here are some important aspects mentioned:

Growing Importance:

The gap between university curricula and industry is very high particularly in developing economies like Bangladesh. Industry-academia collaboration is considered as a solution to bridge this gap and improve the employability of graduates.

Mutual Benefits:

Industry: It gains access to local skilled workforce and cutting-edge research while also contributing to practical training and real-world problem-solving.

Academia: Enhances research capabilities, updates curricula, and improves the relevance of education to industry needs.

Examples of Collaboration:

Joint Research Projects: Universities and industries can collaborate on research projects to address specific industry challenges and develop innovative solutions.

Internships and Training Programs: Industry can provide internships and training programs for students, giving them practical experience and enhancing their employability.

Curriculum Development: Industry experts can contribute to the development of university curricula, ensuring that graduates are equipped with the skills and knowledge needed by the industry. At present there is a provision to included representatives from Industries, subject matter experts and external persons from outside the university but in practice it is not practice in almost all universities.

Challenges:

Funding: Securing adequate funding for collaborative research and initiatives is a big challenge.

Lack of Infrastructure: Some universities may lack the necessary infrastructure and equipment for conducting industry-relevant research.

Cultural Differences: Work cultural difference between academia and industry is there which can hinder effective collaboration.

Initiatives and Organizations:

AIF (Asian Infrastructure Fund): The AIF has provided grants to support university research and modernization of research facilities in Bangladesh as reported.

CEAT Academy-Industry Linkage (AIL) Program: This program aims to develop academic and educational cooperation with the industry through collaborative activities.

IRIIC, UIU: This institute at UIU is actively engaged in promoting industry-academia collaboration.

BAETE (Bangladesh Association of Engineers and Technologists): BAETE focuses on bridging the gap between industry and academia.

Focus Areas:

Technology: Industry-academia collaboration is particularly important in technology-driven sectors like IT, engineering, and manufacturing.

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Skills Development: Collaborations can help address the skills gap in specific industries, such as the textile industry.

Innovation: Collaboration can foster innovation and the development of new products and services.

Chapter-2
Methodology of the Study

2.1 Methodology of the study

The study used both quantitative and qualitative approaches to collect primary data from the field. Quantitative approach was used to collect data on the project indicators through a questionnaire survey. Moreover, under the qualitative method, Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), and In-Depth Interviews (IDIs) was conducted. Also, secondary data was collected from available sources that present an overall idea about the study before going to questionnaire preparation and primary data collection. KoBo Toolbox software was used to collect data from the field and SPSS and *Microsoft Excel software* will be used to analyze the data conducting the study.
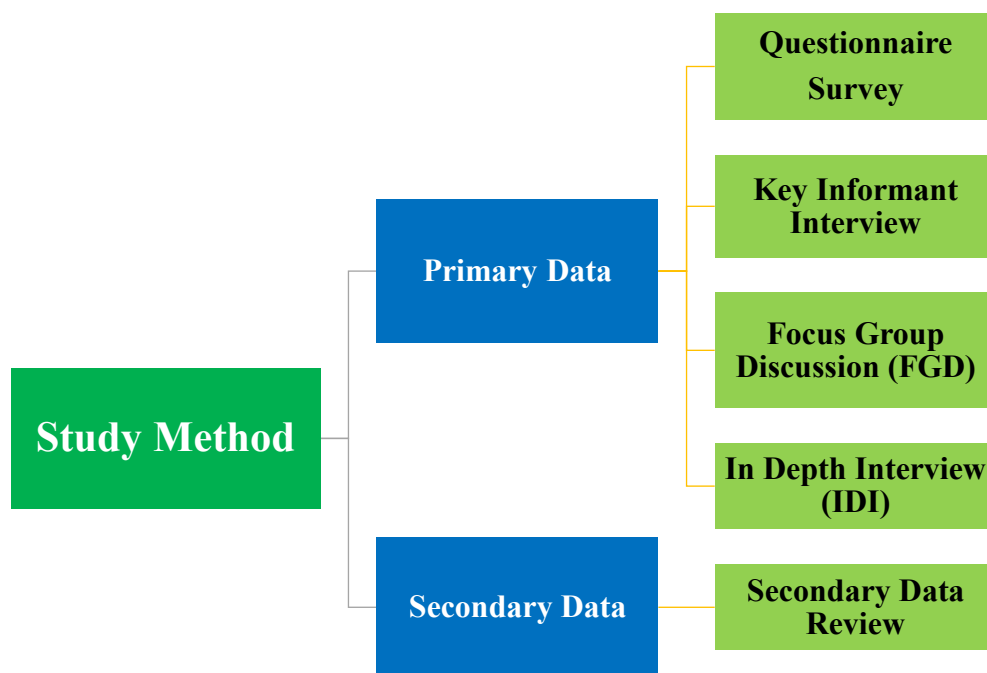
Figure 2.1: Methodology of the Study

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2.2 Objective wise Methodology

Moreover, in order to cover all the issues and make the study more analytical, the following objective wise method was followed during the study.

Table 2. 1: Issues and Methods to be followed

Objectives of the Study	Methods to be Followed	Tools
To assess the current state of youths' employment skills and identify gaps that need to be addressed through targeted training and education programs.	Secondary Data Review	Standard Checklist & Structured questionnaires
	Quantitative survey	
	In Depth Interviews (IDIs)	
	Key Informant Interviews (KIIs)	Standard checklist and Guideline
	Focus Group Discussion (FGD)	
To evaluate the effectiveness of NIYD's training programs, comparing them with similar initiatives by other governmental and non-governmental organizations.	Secondary Data Review	Standard Checklist & Structured questionnaire
	Quantitative survey	
	In Depth Interview (IDI)	
	Key Informant Interview (KII)	Standard checklist and Guideline
	Focus Group Discussion (FGD)	
To explore the socioeconomic impact of NIYD training programs on the country, focusing on challenges and opportunities for youth demand, collaboration, and capacity building in the 4IR context; and	Secondary Data Review	Standard Checklist and Questionnaire
	Quantitative survey	
	In Depth Interview (IDI)	
	Key Informant Interview (KII)	Standard checklist and Guideline
	Focus Group Discussion (FGD)	
To identify key fields of training and education for NIYD trainees, including opportunities for industry-academia collaboration to enhance practical exposure in 4IR-related areas.	Secondary Data Review & Delpi Method	Standard Checklist & Structured questionnaire
	Quantitative survey	
	In Depth Interview (IDI)	
	Key Informant Interview (KII)	Standard checklist and Guideline
	Focus Group Discussion (FGD)	

Objectives of the Study	Respondents
To assess the current state of youths' employment skills and identify gaps that need to be addressed through targeted training and education programs.	**Youth Participants**: Unemployed or underemployed Youth Employers/Industry Representative: example IT, manufacturing, logistics and services **Academic Institutions:** Teachers, administrators, and curriculum designers from technical schools, colleges, and technical institutes.
To evaluate the effectiveness of NIYD's training programs, comparing them with similar initiatives by other governmental and non-governmental organizations.	**NIYD Trainees**: Current and past participants of NIYD programs **Competitor Program Participants**: Trainees from similar programs **Program Coordinators** **Employers**: Businesses that have hired NIYD-trained individuals Policy Experts
To explore the socioeconomic impact of NIYD training programs on the country, focusing on challenges and opportunities for youth demand, collaboration, and capacity building in the 4IR context; and	**NIYD Alumni**: Graduates **Employers**: Organizations Local Government Representatives Economic Analysts and Academics
To identify key fields of training and education for NIYD trainees, including opportunities for industry-academia collaboration to enhance practical exposure in 4IR-related areas.	**Industry Experts**: Professionals in leading industries **Academic Stakeholders** **Government Policymakers**: Representatives from labor, education, and youth ministries Youth Leaders and Activists

2.3 Study area

This study was conducted with some selected government and non-government training institutes in Bangladesh with different youths and youth organizations. These include some government organizations like NIYD, NACTAR, Bangladesh-Korea Technical Training Center (BKTTC), Bangladesh-German Technical Training Center (BGTTC), Mohila Technical Training Center (MTTC) and from the private organizations UCEF from Dhaka and IPSA from Chottogram.

2.4 Data Collection

Secondary Data Collection

For this study, secondary data was collected from existing sources, such as project documents, government documents, research reports, journals, newspaper articles, etc.
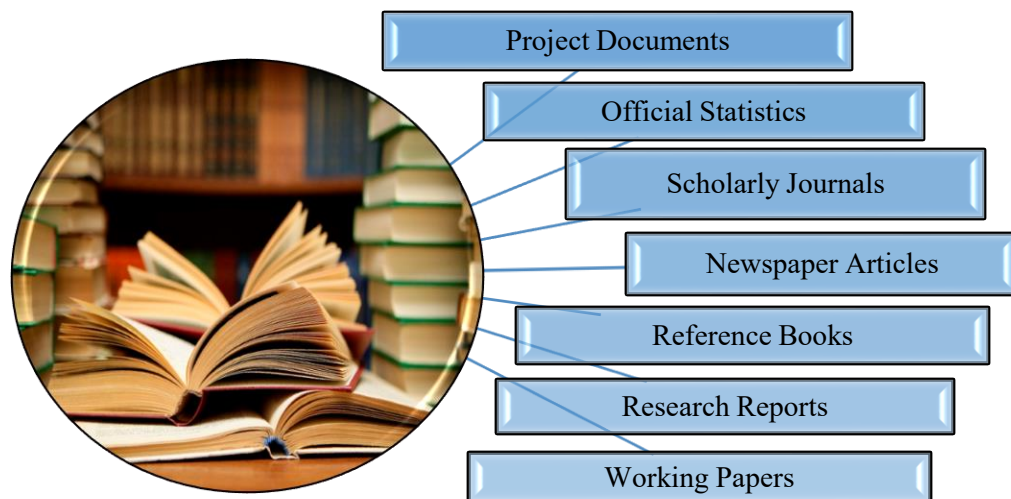
Figure 2.2: Sources of secondary data

Primary Data Collection

Questionnaire Survey, In Depth Interview (IDI), Key Informant Interviews (KII), and Focus Group Discussion (FGD) was conducted to collecting primary data for the study.

Questionnaire Survey

In order to assess the present status of value of the project indicators, a questionnaire survey was conducted to get the actual scenario. A well-structured survey questionnaire was used for conducting the interviews with the participants using Kobo toolbox.

Sampling Method

Random Sampling Method was used to select the samples to conduct the study.

Sample Selection

According to Bangladesh Bureau of Statistics (BBS) - 2021, the current population of youth in Bangladesh is around 70 million. From general sampling method the minimum required sample size is determined by the usual sample size determination formula for estimating proportion, which is used by Bangladesh Bureau of Statistics (BBS)-2011:

$$n_0 = \frac{z_{\alpha/2}^2 \, \rho \, (1 - \rho)}{d^2} \times deff$$

Where, p is a proportion of the required characteristics in the population, $z^2_{\alpha/2}$, the value of the standard normal variate allowing (1-α) % confidence interval, d is the allowing margin of error, N is the population size and n is the sample size.

The conventional value α= 0.05 has been considered which has given $Z_{\alpha/2}$= 1.96 and deff was taken as 1.5 - 2.5 for most socioeconomic surveys in Bangladesh. As the study incorporated cluster sampling, we consider the highest design effect (deff), 2.5. Theoretically, when p is unknown, p=0.5 gives the safest sample size since p (1-p) takes the highest value for p=0.5. The allowable margin of error is d =0.05 was used.

A standard sample size of 384 is typically sufficient to study a particular problem, but a larger sample size often yields more robust and reliable information. By applying a design effect factor of 2, the sample size increases to approximately 768, which we rounded to 750 for simplicity. For this study, we planned to collect data from two distinct groups: 750 samples from students (both current and those who have completed relevant courses) and 750 samples from industry professionals, experts, teachers, policymakers, government representatives, NGOs, and other relevant subject matter specialists. Thus, the total sample size for this study was 1,500 (750 + 750). But from NIYD we have collected total 755 and nonNIYD we have collected 771, in total 1526 samples.

Sample Distribution

In order to do that study the samples was collected from different sources which is as follows:

Table 2.2: Distribution of Samples

Institution	Type of sample	Targeted Number of Sample	Actual Number of Sample
NIYD	Current trainees	375	271
NIYD	Trained students looking for job or job seeker	188	258
NIYD	Trained and in job	188	226
Other similar government and non-government institutions	Current Students	375	388
Other similar government and non-government institutions	Trained students looking for job or job seeker	188	187
Other similar government and non-government institutions	Trained and in job	188	196
Total		1500	1526

In-depth Interview

In-depth interviewing is a qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation and capture more in-depth information where 30 IDIs were carried out using a standard checklist.

Key informant interview

The purpose of key informant interviews is to collect information from a wide range of people who have first-hand knowledge about the issue. They can provide insight on the nature of

problems and give recommendations for solutions. For the present study, we conducted 32 KIIs from the study area.

Focus Group Discussion

A total of 7 Focus Group Discussions (FGDs) was conducted in 6 institutions with stakeholders. Each FGD was comprised of 10-12 participants following the research standard and guidelines developed by the study team.

Table 2. 3: Research Methods and Relevant Techniques of Data Collection at a glance

Type of Inquiry	Techniques	Tools Used for Data Collection	Sample	Respondent or Participants
Quantitative Investigation	Survey	Structured Questionnaire	1526	Among Youths (755) (aged between 18 and 35) Others Institutions (771)
Qualitative Investigation	IDI	Checklist	30	Youth skill development experts, Youth education experts and so on.
	KII	Checklist and Guideline	32	University teachers from BUET, BUTEX, JU, BAU, Industrialist, Youth Officials, Trainers of NIYD, BKTTC, MTCC, NACTAR, YPSA, IWM, Academicians.
	FGD		7	Different Youth Organizations

2.5 Data Collection, Processing and Report Preparation

The filled-up questionnaires was checked to minimize the data processing error. Quantitative data was analyzed by using the customized MS Excel/ SPSS software.

For the present study, qualitative data was analyzed in light of the research objectives by following content analysis, narrative analysis and discourse analysis. However, since the studied issue is a technical one and to some extent sensitive, no verbatim was used in the report so that no KII and FGD participants were identified.

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The flow chart below shows the detailed methodology of the study at a glance:

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                    ┌─────────────────────────────┐
                    │      Conceptualization       │
                    └─────────────────────────────┘
                    ┌─────────────────────────────┐
                    │   Secondary Data Collection  │
                    └─────────────────────────────┘
                    ┌─────────────────────────────┐
                    │   Selection of the Study Area│
                    └─────────────────────────────┘
                    ┌─────────────────────────────┐
                    │    Development of Data       │
                    │      Collection Tools        │
                    └─────────────────────────────┘
                    ┌─────────────────────────────┐                    ┌──────────────────────────┐
                    │    Field Data Collection     │───────────────────│     Data Collection       │
                    └─────────────────────────────┘                    └──────────────────────────┘
                                                                        ┌──────────────────────────┐
                                                                        │ ➢ Questionnaire Survey    │
                                                                        │ ➢ In-Depth Interview      │
                                                                        │ ➢ Key Informant Interview │
                                                                        │ ➢ Focus Group Discussion  │
                                                                        └──────────────────────────┘
                    ┌─────────────────────────────┐
                    │  Monitoring, Supervision &   │
                    │      Quality Control         │
                    └─────────────────────────────┘
                    ┌─────────────────────────────┐
                    │   Data Consolidation and     │
                    │         Analysis             │
                    └─────────────────────────────┘
                  ┌────────────────────────────────────┐
                  │ Data Interpretation and Report Writing│
                  └────────────────────────────────────┘
                  ┌────────────────────────────────────┐
                  │    Result Dissemination Seminar    │
                  └────────────────────────────────────┘
                  ┌────────────────────────────────────┐
                  │  Incorporating Comments & Feedback  │
                  └────────────────────────────────────┘
                    ┌─────────────────────────────┐
                    │       **Final Report**       │
                    └─────────────────────────────┘
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Figure 2.3: Detailed Methodology of the Study at a Glance

2.6 Data Control and Quality

Quality Control Interventions for Data Collection: Data quality of a survey depends on:

- Quality of data collection instruments: instrument validity and reliability are ensured by effective design and thorough pretests of the instruments;
- On quality of checklists and guidelines: language, sequences, recording which is further ensured through pretests of checklists and guidelines;
- Training of Investigators both in class and field practices
- Supervision and monitoring of data collection.

2.7 Data Collection

Data was collected following scientific sampling adequately representing all the areas and beneficiaries; intensive supervision was undertaken during data collection jointly by BISR professionals to ensure quality of data.

2.8 Data Editing

The information collected during fieldwork was scrutinized 100% of each interviewer's interview schedule to check the quality of the raw data. It is basically a process of examination to detect errors, omissions of any and to correct these wherever possible and the respondents may be re-interviewed at the field level, if needed. The Editor was involved to edit data at field level.

2.9 Data Entry

Data was stored automatically in main server and data was supervised of Data Analyst. Before data entry a data entry program was developed by the expert.

2.10 Data Cleaning

Data cleaning is an important procedure through which the data was inspected, and erroneous in data was corrected. Data cleaning was done during the stage of data entry.

2.11 Data Analysis

The data would be analyzed focusing on the objectives of the study. For the study, quantitative data was analyzed by using SPSS in light of the study objectives. Qualitative data was analyzed in light of the study objectives by following relevant interpretation techniques. After data analysis, a report is prepared presenting the results.

Submitted by: BISR Trust

Chapter-3
Quantitative Findings of the Study

3.1 Current students from NIYD and Non-NIYD

Data presented in Table 3.1 shows the demographic data of current students of NIYD and Non-NIYD participants. The majority of participants, with 77.5% of NIYD and 58.2% of Non-NIYD belong to the 21–30 age group. The Non-NIYD group has a notably higher proportion of younger participants (26.5%) compared to the NIYD group (10.7%). In terms of gender, male respondents are higher, 71.6% of NIYD and 66.4% of Non-NIYD, while females account for 28.4% and 33.5%, respectively. In terms of family income, a significant percentage (43.2%) of NIYD participants fall within the BDT 15,001–25,000, followed by 32.8% earning less than BDT 15,000. About half, 48.2% of Non-NIYD participants reported income in the BDT 15,001–25,000, while 21.4% earn less than BDT 15,000. Android phones are the most commonly owned devices across both groups, about 97.4% in NIYD and 99.5% in Non-NIYD. Nearly all participants reported using the devices for social media, with 99.3% of NIYD and 98.4% of Non-NIYD respondents. Other common purposes include browsing websites (71.2% NIYD, 65.6% Non-NIYD), watching movies/TV shows (68.6% and 58.9%), and academic work (67.2% and 53.6%). Online learning platforms are accessed by 56.1% of NIYD and 51.0% of Non-NIYD users. A smaller segment reported using devices for freelancing—16.2% in NIYD and 9.1% in Non-NIYD. Access to good internet was higher among NIYD participants (52.0%) compared to 37.1% of Non-NIYD participants. A significant proportion in both groups reported average internet service, with 46.1% in NIYD and 55.9% in Non-NIYD participants.

Table-3. 1: Demographic information

Parameter	categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Age in years	≤20	29	10.7	103	26.5
	21-30	210	77.5	226	58.2
	Over 30	32	11.8	59	15.2
Gender	Female	77	28.4	130	33.5
	Male	194	71.6	258	66.4
Family income	Less than 15000	89	32.8	83	21.4
	150001-25000	117	43.2	187	48.2
	Over 25001	65	24.0	118	30.4
Possessing own device	Android Phone	263	97.4	380	99.5
	Laptop	88	32.6	97	25.4

Parameter	categories	NIYD		Non-NIYD	
		Frequency	**Percentage**	**Frequency**	**Percentage**
	Desktop	25	9.3	57	14.9
	Tablet	9	3.3	5	1.3
Purpose of using these devices	Social Media (Facebook, YouTube, tactic, Instagram, others)	269	99.3	378	98.4
	Browsing Websites	193	71.2	252	65.6
	Watching Movies/TV Shows	186	68.6	226	58.9
	Gaming	74	27.3	75	19.5
	Academic Work	182	67.2	206	53.6
	Online Learning (Coursera, Bohubrihi, Udemy, Code Academy and others)	152	56.1	196	51.0
	Freelancing	44	16.2	35	9.1
Access to good internet services	Yes	141	52.0	144	37.1
	No	5	1.8	27	7.0
	Average (Not bad)	125	46.1	217	55.9

The reseachers have not collected any data on income effects as it is not an impact study rather collected family income, which has been reported here. It was discussed earlier during inception report and decided not to collect any impact data. Academic background of the students varies from graduation to post-graduation level as demands vary from institutions to instiutions.

Figure 3.1 shows the awareness level of participants regarding the Fourth Industrial Revolution (4IR). A significant majority of participants, with 83.0% of NIYD and 81.4% of Non-NIYD respondents indicating awareness of the term itself. This reflects a generally high level of awareness across both NIYD and Non-NIYD participants. A smaller proportion, about 17.0% of NIYD and 18.6% of Non-NIYD participants reported not being aware of 4IR.

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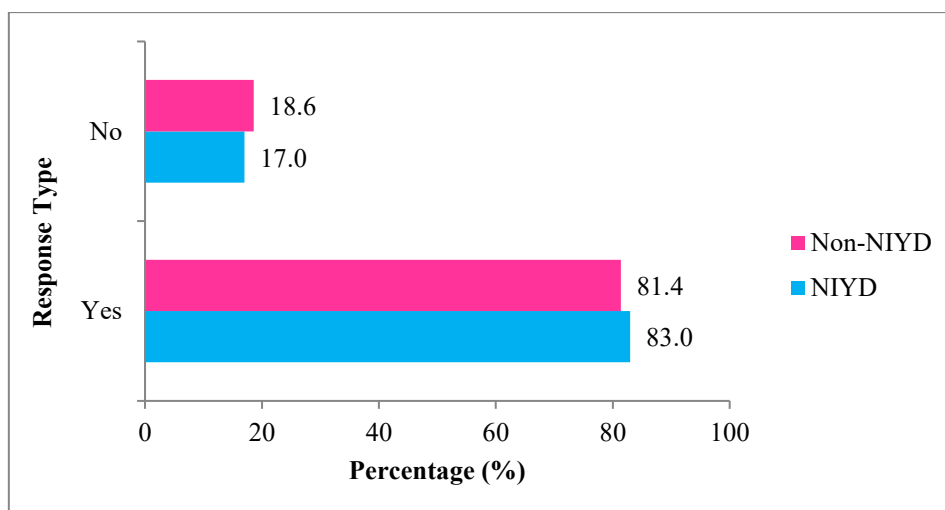
Figure-3. 1: Knowledge and Preparation for 4IR

Data presented in Table 3.2 shows participants' perceptions of gaps in their exposure to the topic of the Fourth Industrial Revolution (4IR). The majority (80.4%) of NIYD participants reported that 4IR is not included in their curriculum, while 86.1% of Non-NIYD participants reported that teachers did not discuss the topic. Half (50.0%) of the NIYD participants reported the lack of training sessions, compared to only 19.4% of Non-NIYD respondents. Limited access to relevant content, such as internet resources or books, was reported by 26.1% of NIYD and 18.1% of Non-NIYD participants. Furthermore, 32.6% of NIYD participants indicated that they were not aware of 4IR's importance, compared to 13.9% among the Non-NIYD participants.

Table-3. 2: Gap in their exposure to the topic

Response	NIYD		Non-NIYD	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Not included in curriculum	37	80.4	52	72.2
Teachers did not discuss it	32	69.6	62	86.1
No training sessions available	23	50.0	14	19.4
Lack of access to relevant content (internet/books)	12	26.1	13	18.1
Not aware of its importance	15	32.6	10	13.9

Figure 3.2 shows how participants learned about the Fourth Industrial Revolution (4IR). A majority of participants, with 96.0% of NIYD and 84.5% of Non-NIYD participants identified social media platforms such as YouTube and Facebook as their primary source. Friends and peers were the second most common source, reported by 57.3% of NIYD and 61.4% of Non-NIYD respondents. Academic courses played a significant role for Non-NIYD participants (49.4%) compared to the NIYD group (27.1%). Online courses were identified as a source by 25.8% of NIYD participants and 16.1% of Non-NIYD participants. Seminars and webinars were the least reported as a source by 12.4% of NIYD and 17.7% of Non-NIYD participants. For NIYD participants, the least common source was seminars and webinars (12.4%), while for Non-NIYD participants, the least identified source was online courses (16.1%).
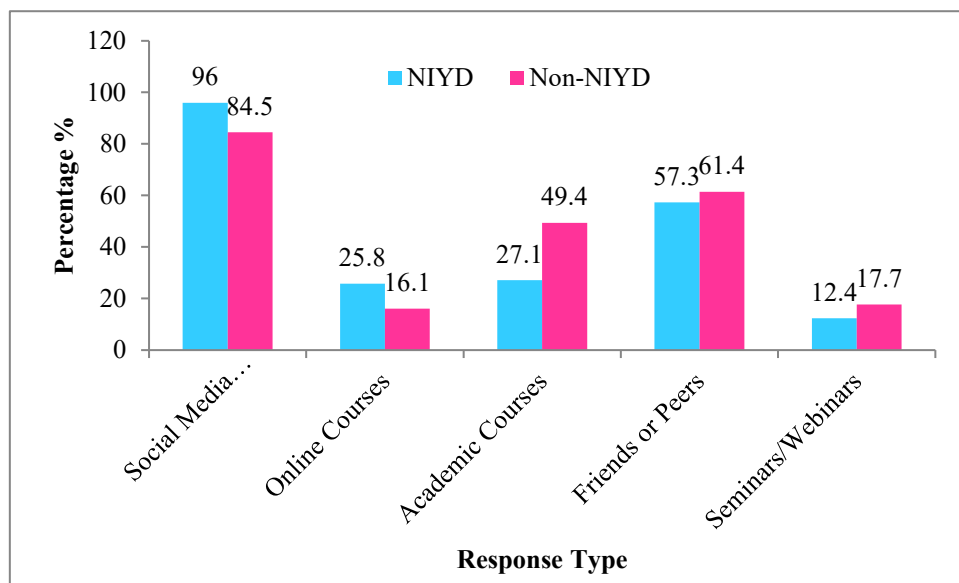
Figure-3. 2: Learned about it

Figure 3.3 shows participants' opinions on the potential impact of Fourth Industrial Revolution (4IR) on their career prospects. About 49.4% of NIYD participants strongly agreed, and 47.5% agreed that 4IR technologies would affect their careers. Similarly, 41.0% of Non-NIYD participants strongly agreed, while 43.6% agreed. A neutral opinion was more common among Non-NIYD participants (15.2%) compared to NIYD (1.8%). Very few participants disagreed with the statement. Among NIYD participants, 0.4% disagreed, and 0.7% strongly disagreed. For Non-NIYD participants, no one disagreed, and only 0.3% strongly disagreed.
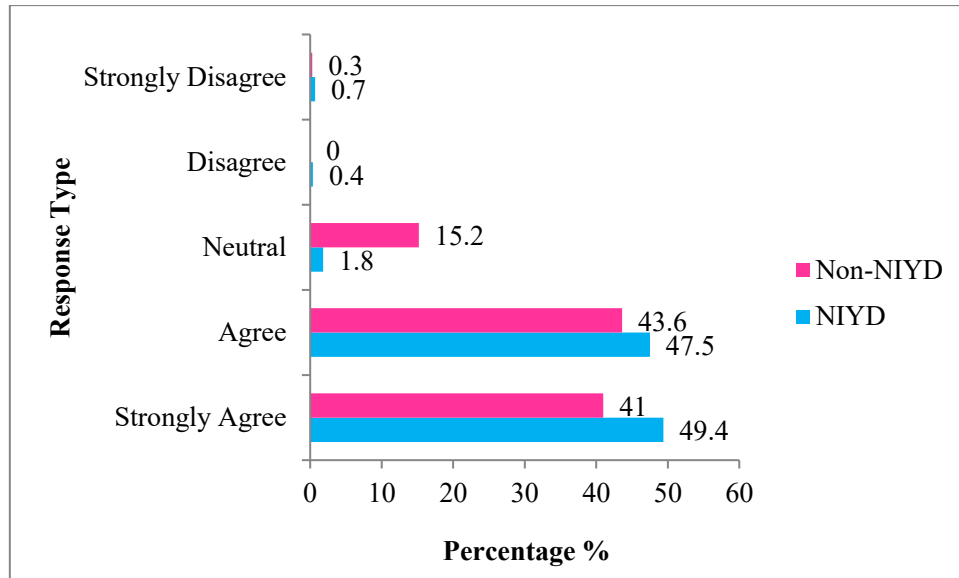
Figure-3. 3: 4IR technologies (e.g., AI, robotics, data science) affect career prospects

Figure 3.4 shows participants' interest in learning about Fourth Industrial Revolution (4IR) technologies. A strong majority (97.8%) of NIYD participants reported their interest, compared to 70.9% of Non-NIYD participants. Among NIYD participants, only 0.7% were not interested, compared to 3.9% of Non-NIYD participants. A small proportion (1.5%) of NIYD participants were undecided. In contrast, a larger proportion of Non-NIYD participants were undecided (25.3%).
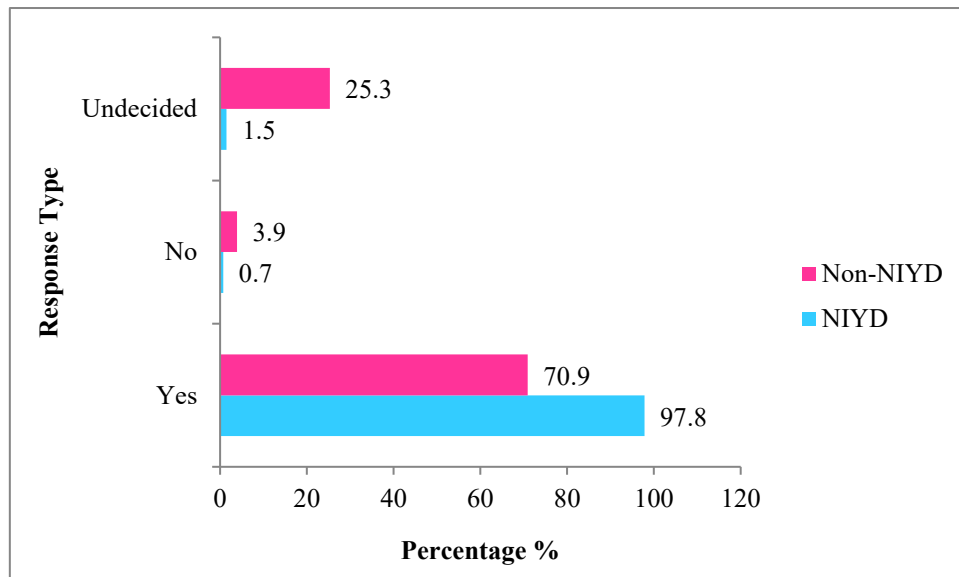
Figure-3. 4: Interested in learning about 4IR technologies

Data presented in Table 3.3 shows participants' responses to questions regarding their enrollment in 4IR-related courses, practical training, and interest in future training opportunities. For Q18, the majority (97%) of NIYD and 92.7% of Non-NIYD participants had not enrolled in any 4IR-related courses. For Q19, a strong majority (97.2%) of NIYD and 86.9% of Non-NIYD participants had not received any practical training in 4IR, while only 2.1% of NIYD and 13.1% of Non-NIYD participants reported having received such training. In response to Q20, 99.6% of NIYD participants showed interest in free or subsidized training, slightly higher than 97.1% of Non-NIYD participants.

Table-3. 3: Courses related to 4IR

Parameter	Response	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Have you ever enrolled in any course (online/offline) related to 4IR?	Yes	7	3	20	7.3
	No	230	97	255	92.7
Have you received any hands-on or practical training in 4IR?	Yes	5	2.1	36	13.1
	No	232	97.9	239	86.9
Would you attend free or subsidized training if offered?	Yes	236	99.6	1	97.1
	No	267	0.4	8	2.9

Figure 3.8 shows the main barriers participants face in learning 4IR technologies. A significant 85.3% of NIYD participants and 76.2% of Non-NIYD participants reported the most common barrier was the lack of a relevant syllabus. The second most reported barrier was the lack of relevant training programs, reported by 75.9% of NIYD and 69.9% of Non-NIYD participants. The lack of trainers was reported by 51.7% of NIYD participants and 50.6% of Non-NIYD participants. A small number of participants, 12.5% of NIYD participants and 16.4% of Non-NIYD participants reported they were unsure or unaware of the reasons.

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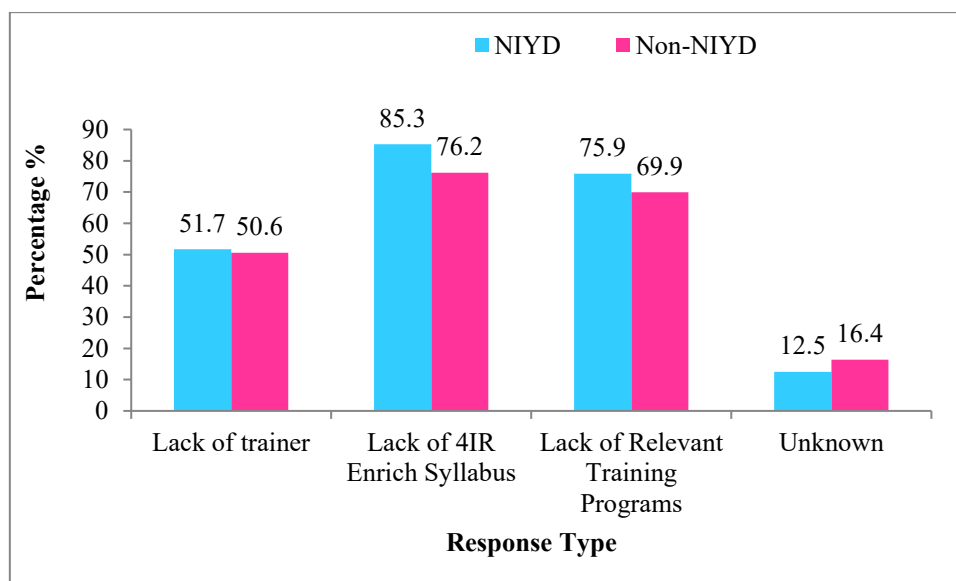
Figure-3. 5: Learning barriers of 4IR technology

Data presented in Table 3.4 presents the factors that most motivate participants to learn about 4IR technologies. The most common motivation is the prospect of a good job opportunity, reported by 82.3% of NIYD and 87.3% of NON-NIYD participants. Institutional support is the second most significant motivator, reported by 79.3% of NIYD and 73.8% of Non-NIYD participants. Personal interest in technology is a notable factor for 73.0% of NIYD and 62.2% of Non-NIYD participants. In comparison, 55.3% of NIYD participants and 41.1% of Non-NIYD participants reported financial incentives as a key motivator. A smaller portion of participants, 21.1% of NIYD and 25.5% of Non-NIYD, reported peer influence as a motivating factor.

Table-3. 4: Motivate to learn about 4IR

Response	NIYD		Non-NIYD	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Good Job opportunity	195	82.3	240	87.3
Personal Interest in technology	173	73.0	171	62.2
Peer Influence	50	21.1	70	25.5
Institutional Support	188	79.3	203	73.8
Financial Incentives	131	55.3	113	41.1

Data presented in Table 3.5A shows the participants' opinions about their institution's efforts and support related to 4IR technologies. Only 13.7% of NIYD participants and 16.0% of Non-NIYD participants reported receiving 4IR-related training from their institutions. A significant majority (71.2%) of NIYD and 50.5% Non-NIYD participants reported their institutions had

not provided such training. A majority of NIYD participants (75.6%) expressed interest in institutional collaboration with industries or startups for practical exposure, compared to 45.9% of Non-NIYD participants. On the other hand, 40.2% of Non-NIYD participants were unsure about such collaboration, compared to 18.1% in the NIYD group. More than half (54.6%) of NIYD respondents and nearly one-third of Non-NIYD respondents (32.7%) expressed that their institutions failed to provide sufficient exposure to 4IR. Among those who responded "No," the most frequently reported gap was the lack of trained faculty, reported by 73.6% of NIYD and 74.0% of Non-NIYD participants. Lack of digital infrastructure was reported by 87.4% of NIYD and 52.1% of NIYD participants. While a strong majority of (84.5%) of NIYD participants reported that 4IR should be part of academic programs, only 52.1% of Non-NIYD respondents agreed. However, 46.1% of the Non-NIYD group reported they would support such inclusion only if it had practical applications, significantly more than 14.4% of NIYD respondents.

Table-3. 5A: Institutional Capacity related to 4IR and Collaboration

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Has your institution provided any training/workshop related to 4IR technologies?	Yes	37	13.7	62	16.0
	No	193	71.2	196	50.5
	Not sure	41	15.1	130	33.5
Would you like your institution to collaborate with industries/startups to provide practical exposure in 4IR-related skills?	Yes	205	75.6	178	45.9
	No	17	6.3	54	13.9
	Not sure	49	18.1	156	40.2
What type of support would you like from your institution to be 4IR-ready? (Tick top 3)	Practical workshops with industry experts	170	62.7	239	61.6
	Internship/Apprenticeship opportunities	230	84.9	283	72.9
	Career counselling for tech jobs	136	50.2	157	40.5
	Certification programs on 4IR skills	210	77.5	251	64.7
	Access to computer labs/internet	157	57.9	173	9.5
	Peer learning groups	41	15.1	37	9.5
	Mentorship and guidance	88	32.5	70	18.0
Do you feel that your academic	Yes	45	16.6	73	18.8
	No	148	54.6	127	32.7

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
institution provides enough exposure to 4IR technologies?	Not sure	78	28.8	199	48.5
If **No**, what is lacking in your academic environment?	Outdated curriculum	100	67.6	76	59.8
	Lack of trained faculty	109	73.6	94	74.0
	No practical/lab work	77	52.0	72	56.7
	No collaboration with industry	90	60.8	91	71.7
	Lack of digital infrastructure	85	87.4	57	44.9
	Others				
Do you think 4IR should be integrated into your academic syllabus?	Yes	229	84.5	202	52.1
	No	3	1.1	7	1.8
	Maybe – If made practical	39	14.4	179	46.1

Data presented in Table 3.5B shows participants' perspectives on improving institutional capacity and collaboration to enhance student skills in Fourth Industrial Revolution (4IR) technologies. A majority (89.7%) of NIIYD and 74.7% of Non-NIYD participants reported adding 4IR subjects in regular curriculum is the most effective way to improve students' capacity. Internship opportunities in tech companies were the second most effective way, especially among (72.7%) NIYD participants compared to 55.2% of Non-NIYD. Arranging regular workshops by industry experts was selected by 69.0% of NIYD and 64.4% of Non-NIYD participants, while encouraging self-learning through online platforms was reported by 66.8% and 52.1%, respectively. A majority (67.5%) of NIYD participants selected government-funded training programs as an effective way compared to Non-NIYD participants (39.9%). Only 23.6% of NIYD and 26.8% of Non-NIYD participants had received career guidance from industry partners. Interest in mentorship and career guidance was high among both groups, 98.5% of NIYD and 90.2% of Non-NIYD participants. Only 13.7% of NIYD participants attended in seminars or workshops conducted by professionals compared to 23.7% of Non-NIYD participants. Additionally, institutional collaborations with companies for projects or internships were reported by only 15.5% of NIYD participants, whereas 47.7% of Non-NIYD participants. A majority (98.5%) of NIYD and 86.9% of Non-NIYD participants were not interested in industry-led practical sessions at their institutions. 92.2% of NIYD and 77.8% of Non-NIYD participants reported, 83.3% of NIYD, 81.4% of Non-NIYD reported they want support from their institutions for career readiness.

Table-3. 5B: Institutional Capacity related to 4IR and Collaboration

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
What are the most effective ways to improve students' capacity in 4IR areas?	Add 4IR subjects in regular curriculum	243	89.7	290	74.7
	Arrange regular workshops by industry experts	187	69.0	250	64.4
	Encourage self-learning via online platforms	181	66.8	202	52.1
	Provide access to online labs/simulators	126	46.5	174	44.8
	Internship opportunities in tech companies	197	72.7	214	55.2
	Government-funded training programs	183	67.5	155	39.9
	Peer-led learning groups or clubs	67	24.7	93	24.0
Have you received any career guidance on 4IR-related fields from industry partners?	Yes	64	23.6	104	26.8
	No	207	76.4	284	73.2
Would you be interested in receiving mentorship or career guidance in 4IR-related careers?	Yes	267	98.5	350	90.2
	No	4	1.5	38	9.8
Have you ever attended a seminar/workshop conducted by industry professionals?	Yes	37	13.7	92	23.7
	No	234	86.7	296	76.3
Has your institution ever partnered with a company for student	Yes	42	15.5	185	47.7
	No	229	84.5	203	52.3

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
projects/internships?					
Would you be interested in industry-led practical sessions at your institution?	Yes	267	98.5	337	86.9
	No	4	1.5	51	13.1
What kind of support do you want from your institution for career readiness?	Internships	249	92.2	302	77.8
	Career counseling	194	71.9	208	53.6
	Skill development labs	190	70.4	254	65.5
	Networking with industry	225	83.3	316	81.4
	Others				

Data presented in **table- 3.6** show that from NIYD some 18.2% students are familiar with data science, 13.7% with internet of things and 29.5% sometimes, 31.7% cyber security & Encryption, 34.6% cloud computing, 36.6% augmented and virtual reality. Likewise, 49.8% students are familiar with non-Humanoids and robotics, 41.0% 3D Printing, 41.7% sometimes, 5.2% Microsoft office (Word, Excel and Power point), 13.3% students are sometimes email, 5.2% video conferencing tools, (Zoom, Google Meet, Telergram, etc), 19.5% using search engines effectively (SEO), 24.7% creating strong passwords, 39.9% identifying scams or viruses, 35.4% fact-checking online content, 33.2% solving device tech issues, 28.8% using video tutorials for help and 28.8% copyright. Among them sometimes students are familiar with these technical methods which ranges from 12.2% - 48.3%. It means, among the respondents a small portion is familiar with all these technology, but the majority is not.

Table-3. 6: Familiar with the courses related to 4IR (NIYD participants)

Subject	Degree of familiarity				
	Very familiar (Expert)	**Familiar** (Regular User)	(Uses sometimes)	**Somewhat** familiar (Knows but does not uses)	**Completely unfamiliar**
Data science	9 (3.3)	40(14.8)	94 (34.7)	92 (33.9)	34 (12.5)
Internet of Things	8 (3.0)	29 (10.7)	80 (29.5)	100 (36.9)	53 (19.6)
Cybersecurity & Encryption	31 (11.4)	55 (20.3)	104 (38.4)	71 (26.2)	10 (3.7)
Artificial Intelligence	34 (12.5)	60 (22.1)	88 (32.5)	75 (27.7)	14 (5.2)

Cloud Computing	46 (17.0)	70 (25.8)	112 (41.3)	23 (8.5)	19 (7.0)
Augmented & Virtual Realit	33 (12.2)	66 (24.4)	93 (34.3)	68 (25.1)	8(3.0)
Non Humanoids and robotics	55 (20.3)	80 (29.5)	95 (35.1)	31 (11.4)	9(3.3)
3D Printing	40 (14.8)	71 (26.2)	113 (41.7)	31 (11.4)	16 (5.9)
Microsoft Office (Word, Excel, PowerPoint)	3 (1.1)	11 (4.1)	48 (17.7)	124 (45.8)	85 (31.4)
Email	-	3 (1.1)	33 (12.2)	105 (38.7)	129 (47.6)
Video Conferencing Tools (Zoom, Google Meet, Telegram etc.)	4 (1.5)	10 (3.7)	57 (21.0)	119 (43.9)	81 (29.9)
Using Search Engines effectively (SEO)	21 (7.7)	32 (11.8)	115 (42.4)	57 (21.0)	46 (17.0)
Creating strong passwords	33 (12.2)	34 (12.5)	74 (27.3)	81 (29.9)	47 (17.3)
Identifying scams or viruses	46 (17.0)	62 (22.9)	100 (36.9)	40 (14.8)	23 (8.5)
Fact-checking online content	39 (14.4)	57 (21.0)	109 (40.2)	53 (19.6)	13 (4.8)
Solving device tech issues	39 (14.4)	51 (18.8)	131 (48.3)	30 (11.1)	20 (7.4)
Using video tutorials for help	39 (14.4)	39 (14.4)	111 (41.0)	53 (19.6)	29 (10.7)
Copyright	26 (9.6)	52 (19.2)	66 (24.4)	98 (36.2)	29 (10.7)

Similarly, collected data from the Non-NIYD groups shows that 54.4% students are familiar with data science, 37.6% with internet of things, 57.7% cyber security & encryption, 72.4% cloud computing, 65.5% augmented and virtual reality. Likewise, 71.6% familiar with non-humanoids and robotics, 69.9% 3D Printing, 14.2% Microsoft office (Word, Excel and Power Point), 9.5% sometimes email, 13.9% video conferencing tools, (Zoom, Google Meet, Telegram, etc), 39.7% using search engines effectively (SEO), 48.5% creating strong passwords, 59.8% identifying scams or viruses, 51.3% fact-checking online content, 54.1% solving device tech issues, 52.8% using video tutorials for help and 53.4% copyright. Among them sometimes familiar with these technical methods which ranges from 4.6% - 47.93%.

Table-3. 7: Familiar with the courses related to 4IR (Non-NIYD participants)

Subject	Degree of familiarity				
	Very familiar (Expert)	**Familier** (Regular User)	(Uses sometimes)	**Somewhat familier** (Knows but does not uses)	**Completely unfamiliar**
Data science	64 (16.5)	147 (37.9)	136 (35.1)	34 (8.8)	7 (1.8)
Internet of Things	33 (8.5)	113 (29.1)	133 (34.3)	94 (24.2)	15 (3.9)
Cybersecurity & Encryption	89 (22.9)	135 (34.8)	117 (30.2)	42 (10.8)	5 (1.3)
Artificial Intelligence	101 (26.0)	126 (32.5)	119 (30.7)	38 (9.8)	4 (1.0)
Cloud Computing	95 (24.5)	186 (47.9)	90 (23.2)	14 (3.6)	3 (0.8)
Augmented & Virtual Realit	107 (27.6)	147 (37.9)	79 (20.4)	53 (13.7)	2 (0.5)
Non Humanoids and robotics	120 (30.9)	158 (40.7)	93 (24.0)	17 (4.4)	
3D Printing	91 (23.5)	180 (46.4)	81 (20.9)	32 (8.2)	4 (1.0)
Microsoft Office (Word, Excel, PowerPoint)	22 (5.7)	33 (8.5)	110 (28.4)	168 (43.3)	55 (14.2)
Email	18 (4.6)	19 (4.9)	88 (22.7)	156 (40.2)	107 (27.6)
Video Conferencing Tools (Zoom, Google Meet, Telegram etc.)	19 (4.9)	35 (9.0)	149 (38.4)	129 (33.2)	56 (14.4)
Using Search Engines effectively (SEO)	88 (22.7)	66 (17.0)	113 (29.1)	62 (16.0)	59 (15.2)
Creating strong passwords	78 (20.1)	110 (28.4)	84 (21.6)	88 (22.7)	28 (7.2)
Identifying scams or viruses	87 (22.4)	145 (37.4)	101 (26.0)	48 (12.4)	7 (1.8)
Fact-checking online content	75 (19.3)	124 (32.0)	161 (41.5)	23 (5.9)	5 (1.3)

Solving device tech issues	84 (21.6)	126 (32.5)	149 (38.4)	24 (6.2)	5 (1.3)
Using video tutorials for help	84 (21.6)	121 (31.2)	146 (37.6)	32 (8.2)	5 (1.3)
Copyright	46 (11.9)	161 (41.5)	111 (28.6)	60 (15.5)	10 (2.6)

Date presented in Table-3.8 shows that the only a small number of them (5.2%) from NIYD and 3.4% from Non-NIYD involved in free lanching/ tech-based work. However, another small number do it partially where from NIYD it was 3.3% and Non-NIYD it was 4.1%. Among them, 75.0% from NIYD and 30.0% from Non-NIYD do video editing. Similarly, a small number of them (66.70%) from NIYD and 20.0% from Non-NIYD involved in graphic design. Likewise, a small number of them (50.0%) from NIYD and 90.0% from Non-NIYD involved in content creation.

Table-3. 8: Relation with Freelancing/Tech-Based Work

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	**Percentage**	**Frequency**	**Percentage**
Q38: Are you involved in freelancing or tech-based jobs?	Yes	14	5.2	13	3.4
	No	248	91.5	359	92.5
	Partially	9	3.3	16	4.1
Q39: what type of work?	Video Editing	9	75.0	3	30
	Graphic Design	8	66.7	2	20
	Content Creation	6	50.0	9	90

Data presented in **Table-3.9A** show the purpose of getting the training from these organizations. It reveals that 93.4% students from NIYD and 88.9% from Non-NIYD want to get skilled. Among them, 74.5% from NIYD and 62.4% from Non-NIYD took the training for getting the job. Some 67.5% from NIYD and 77.1% from Non-NIYD also took part in the training as an extracurricular activities. Again 41.0% students from NIYD and 42.0% from Non-NIYD took part in it for academic purposes.

Data also shows the effectiveness of the training where 43.2% students from NIYD and 43.0% from Non-NIYD claimed it as effective, and the rest mentioned it as somewhat effective. Only 1.8% from NIYD and 1.3% from Non-NIYD reported that as not effective. Respondents also reported that 27.5% from NIYD and 26.0% from Non-NIYD did it for freelanching.

Table-3. 9A: Purpose for being admitted in this institution and effectiveness of this training in the job market

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	**Percentage**	**Frequency**	**Percentage**
What was your purpose for getting admitted in	To be skilled	253	93.4	345	88.9
	To get a job	202	74.5	242	62.4
	As extracurricular activity	183	67.5	299	77.1

this institution?	For academic purpose	111	41.0	163	42.0
	Others				
How much do you think the effectiveness of this training in the job market?	Effective	117	43.2	167	43.0
	Somewhat effective	149	55	216	55.7
	Not effective	5	1.8	5	1.3
What do you want to do after passing?	Freelancing	74	27.5	101	26
	Private job	153	56.9	256	66
	Apply in real life	166	61.7	275	70.9
	apply in academic education	81	30.1	167	43
	Business	128	47.6	101	26
	Others				

Data presented in **Table-3.9B** show that 27.5% students from NIYD and 26.0% from Non-NIYD are interested to go for freelancing, where 56.9% from NIYD and 66.0% from Non-NIYD want to go for private job. Some students also want to apply in their real life where 61.7% from NIYD and 70.9% from NIYD. A group also wants to apply it in their academic life where 30.1% from NIYD and 43.0% from Non-NIYD were there. Some 47.6% students from NIYD and 26.0% Non-NIYD students want to do business.

Data also reveal that 74.9% students from NIYD and 65.2% from Non-NIYD want to get skill on data science, where 53.5% from NIYD and 41.7% from Non-NIYD want to get skill on problem solving/ negotiation, 58.3% from NIYD and 66.0% from Non-NIYD want to get skill on AI, 89.7% from NIYD and 78.6% from Non-NIYD want to get skill on communication skills, and where 70.5% from NIYD and 68.6% from Non-NIYD want to get skill on language proficiency.

How can they acquire this skill was a question to them where 92.3% students from NIYD and 91.8% from Non-NIYD mentioned that they can get from any institution and 69.0% from NIYD and 61.60% from Non-NIYD from mentioned it from internet. Similarly, 60.1% from NIYD and 50.3% from Non-NIYD mentioned that they want to get it online classes.

About effectiveness of the training 95.2% from NIYD and 70.1% from Non-NIYD mentioned that it was effective. In regard to quality of that 41.3% of NIYD and 47.7% from Non-NIYD mentioned it as highly effective and 57.9% from NIYD and 51.8% from Non-NIYD mentioned it as somewhat effective. An insignificant number mentioned it as non-effective.

Table-3. 9B: Skills needed for them to get employed

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	**Percentage**	**Frequency**	**Percentage**
Which other skills are needed for you to get employed?	Data science	203	74.9	257	65.2
	Problem-solving/negotiation skills	145	53.5	158	41.7
	AI	158	58.3	250	66
	Communication skills	243	89.7	298	78.6
	Language proficiency	191	70.5	260	68.6
	Others				
How can you acquire these skills?	From any Institution	250	92.3	347	91.8
	Internet	187	69	233	61.6
	Online class	163	60.1	190	50.3
Do you have the necessary knowledge to acquire these skill?	Yes	258	95.2	272	70.1
	No	13	4.8	116	29.9
How effective do you thing this training is?	Very effective	112	41.3	185	47.7
	Somewhat effective	157	57.9	201	51.8
	Not effective	2	0.7	2	0.5

Date presented in **Table- 3.9C** shows that the institution should encourage collaboration with other industries where 73.4% students from NIYD and 62.9% from Non-NIYD reported that. In regard to challenges that might emerge while doing collaboration with other organizations 71.7% from NIYD and 58.5% students from Non-NIYD mentioned that it would take more time to complete the course, 74.0% students from NIYD and 75.5% from Non-NIYD mentioned that it would occurred difficulties in sorting curriculum, 67.2% from NIYD and 64.8% from Non-NIYD would suffer from lack of alignment with faculty members.

What might be the benefits of such industry collaboration was a question asked to the students. Some 93.0% from NIYD and 88.4% from Non-NIYD mentioned that students would learn better. Among them 87.5% from NIYD and 89.4% from Non-NIYD believed that it would help to get job.

Other capacity that should be created in their organization was an important issue. Some 91.9% of NIYD and 73.5% from nonNIYD mentioned that it would enrich the curriculum, 80.8% from NIYD and 69.5% from nonNIYD belived that it would increase manpower. Likewise,

74.2% from NIYD and 75.0% from Non-NIYD believe that it would increase computer and other appliances.

Table-3. 9C: Institutions collaboration with other industries

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	**Percentage**	**Frequency**	**Percentage**
Do you think your institution should encourage collaboration with other industries?	Yes	199	73.4	244	62.9
	No	72	26.6	144	37.1
What challenges could emerge if collaboration being done with other organization?	It will take more time to complete the course.	190	71.7	203	58.5
	Occur difficulties in sorting curriculum	196	74	262	75.5
	Lack of alignment with faculty members	178	67.2	225	64.8
	Others				
What might be the benefits of such industry collaboration?	Students will learn better	252	93.0	343	88.4
	Help to get job	237	87.5	347	89.4
	Others				
What other capacity should be created in your organization?	Enrich the curriculum	249	91.9	285	73.5
	Increase man Power	219	80.8	269	69.5
	Increase computer and other appliances	201	74.2	291	75
	Others				
Have you ever visited any industry?	Yes	44	16.2	9	2.3
	No	227	83.8	379	97.7

If yes, what did you learn from the experience?	How Industry works	33	75.0	7	77.8
	What skills are required for working in it.	37	84.1	8	88.9
	Others				

Data also show that only 16.2% from NIYD and 2.3% from Non-NIYD visited any industry. Those who visited industry from them 75.0% of NIYD and and 77.8% from Non-NIYD learned how industry works. They also leaned what kind of skill is required there.

3.2 Currently in a job from NIYD and Non-NIYD

Data (Table 3.15) shows the demographic data of current jobholders of NIYD and Non-NIYD participants. The majority (83.2%) of NIYD and (77.6%) Non-NIYD participants belong to the 21–30 age group. A notably higher proportion (17.9%) of Non-NIYD group has participants aged over 30, compared to 14.6% of NIYD participants. In terms of gender, male participants are higher - 85.8% of NIYD and 83.2% of Non-NIYD, while females account for 14.2% and 16.8%, respectively. In terms of family income, a significant percentage (60.6%) of NIYD participants fall within the income group of BDT 15,001–25,000, followed by 24.8% of participants income is over BDT 25,001. More than half (55.1%) of Non-NIYD participants reported income over BDT 25,001, while 39.8% fall within BDT 15,001–25,000. Android phones are the most commonly owned devices across both groups, 100% in NIYD and 99.0% in Non-NIYD. Laptops are owned by 57.1% of NIYD and 53.6% of Non-NIYD participants where Desktops are owned by 32.7% of NIYD and 28.6% of Non-NIYD and the tablets are reported the least owned by 2.7% of NIYD and 0.5% of Non-NIYD. Nearly all participants reported using the devices for social media, with 99.1% of NIYD and 100% of Non-NIYD participants. Other common purposes include browsing websites (83.2% NIYD, 80.1% Non-NIYD), watching movies/TV shows (53.1% and 66.8%), and academic work (46.9% and 37.2%). Online learning platforms are used by 50.9% of NIYD and 34.2% of Non-NIYD users. A total of 23.5% of NIYD participants reported using devices for freelancing compared to 9.2% in Non-NIYD. Access to good internet was the same (59.7%) among NIYD and Non-NIYD participants. A significant proportion in both groups reported average internet service, with 38.9% in NIYD and 35.2% in Non-NIYD participants.

Table-3. 10: Demographic information

Parameter	categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Age in years	≤20	5	2.2	9	4.6
	21-30	188	83.2	151	77.6
	Over 30	33	14.6	196	17.9
Gender	Female	32	14.2	33	16.8

Parameter	categories	NIYD		Non-NIYD	
		Frequency	**Percentage**	**Frequency**	**Percentage**
	Male	194	85.8	163	83.2
Family income	Less than 15000	33	14.6	10	5.1
	150001-25000	137	60.6	78	39.8
	Over 25001	56	24.8	108	55.1
Possessing own device	Android Phone	226	100	194	99.0
	Laptop	129	57.1	105	53.6
	Desktop	74	32.7	56	28.6
	Tablet	6	2.7	1	0.5
Purpose of using these devices	Social Media (Facebook, YouTube, tactic, Instagram, others)	224	99.1	196	100
	Browsing Websites	188	83.2	157	80.1
	Watching Movies/TV Shows	120	53.1	131	66.8
	Gaming	11	4.9	14	7.1
	Academic Work	106	46.9	73	37.2
	Online Learning (Coursera, Bohubrihi, Udemy, Code Academy and others)	115	50.9	67	34.2
	Freelancing	53	23.5	18	9.2
Access to good internet services	Yes	135	59.7	117	59.7
	No	3	1.3	10	5.1
	Average (Not bad)	88	38.9	69	35.2

Figure 3.6 shows the awareness level of participants regarding the Fourth Industrial Revolution (4IR). A significant majority of participants, with 90.3% of NIYD and 86.7% of Non-NIYD respondents indicating awareness of the term itself. A smaller proportion, about 9.7% of NIYD and 13.3% of Non-NIYD participants reported not being aware of 4IR.
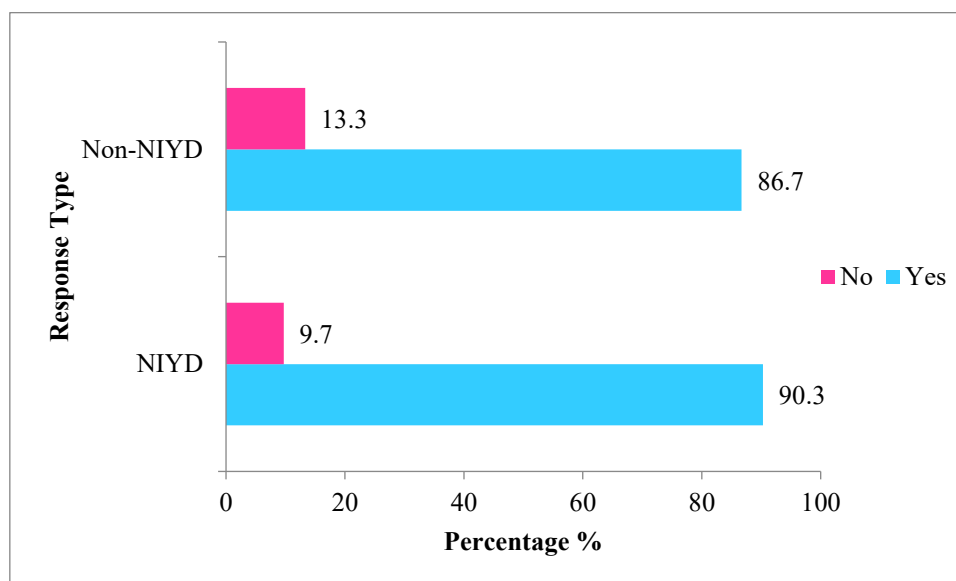
Figure-3. 6: Knowledge and Preparation for 4IR

Data presented in Table 3.11 shows participants' perception gaps in their exposure to the topic of the Fourth Industrial Revolution (4IR). The majority (90.9%) of NIYD participants reported that 4IR is not included in their curriculum, while 100% of Non-NIYD participants reported that teachers did not discuss the topic. A small proportion (18.2%) of the NIYD participants reported the lack of training sessions, compared to only 7.7% of Non-NIYD respondents. Limited access to relevant content, such as internet resources or books, was reported by 27.3% of NIYD and 11.5% of Non-NIYD participants. Furthermore, 27.3% of NIYD participants indicated that they were not aware of 4IR's importance, compared to 11.5% among the Non-NIYD participants.

Table-3. 11: Gap lies in their exposure to the topic

Response	NIYD		Non-NIYD	
	Frequency	Percentage	Frequency	Percentage
Not included in curriculum	20	90.9	23	88.5
Teachers did not discuss it	20	90.9	26	100
No training sessions available	4	18.2	2	7.7
Lack of access to relevant content (internet/books)	6	27.3	3	11.5
Not aware of its importance	6	27.3	3	11.5

Response	NIYD		Non-NIYD	
	Frequency	**Percentage**	**Frequency**	**Percentage**

Figure 3.7 shows how participants learned about the Fourth Industrial Revolution (4IR). A majority of participants, with 96.6% of NIYD and 88.2% of Non-NIYD participants identified social media platforms such as YouTube and Facebook as their primary source. Friends and peers were the second most common source, reported by 55.4% of NIYD and 58.2% of Non-NIYD respondents. Academic courses played a notable role for (31.4%) NIYD participants compared to 25.9% of Non-NIYD participants. Online courses were identified as a source by 15.7% of NIYD and 26.5% of Non-NIYD participants. Seminars and webinars were the least reported as a source by 23.5% of NIYD and 17.6% of Non-NIYD participants. The least common source was seminars and webinars for Non-NIYD (17.6%) and online courses for NIYD (15.7%).
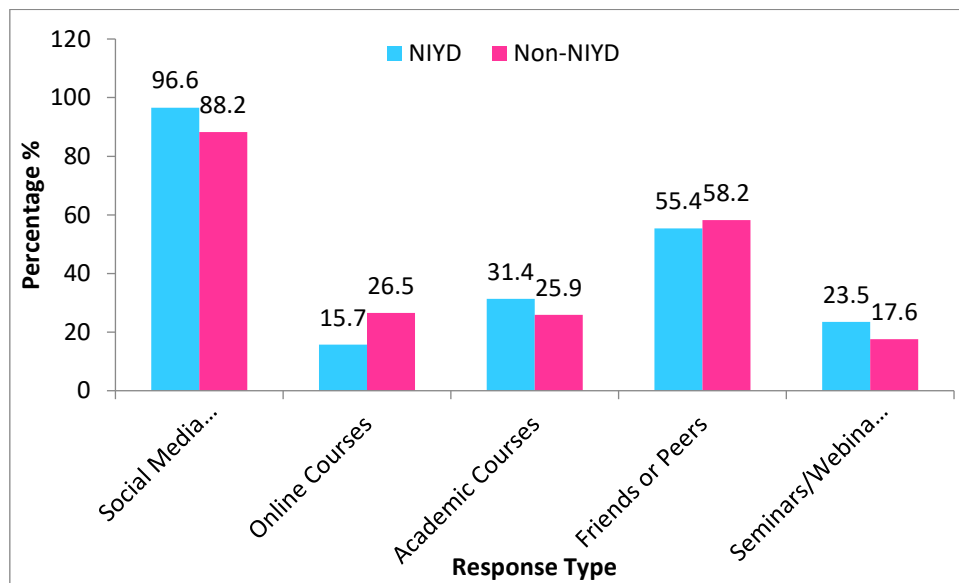
Figure-3. 7: Learn about it

Figure 3.8 shows participants' opinions on the potential impact of Fourth Industrial Revolution (4IR) on their career prospects. About 67.7% of NIYD and 46.9% of Non-NIYD participants strongly agreed that 4IR technologies would affect their careers. Similarly, about 27.0% of NIYD participants agreed compared to 39.8% of Non-NIYD. A neutral opinion was more common (13.3%) among Non-NIYD participants, while none of the NIYD participants (0%) reported this opinion. Very few participants disagreed with the statement. Among NIYD participants, none disagreed, and 5.3% strongly disagreed. For Non-NIYD participants, no one disagreed or strongly disagreed.
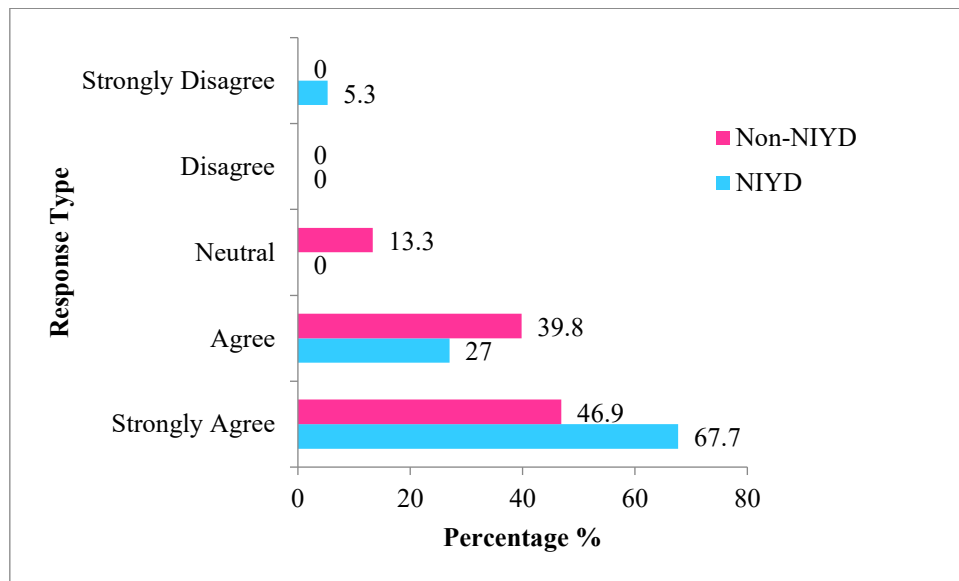
Figure-3. 8: 4IR technologies (e.g., AI, robotics, data science) affect their career prospects

Figure 3.9 shows participants' interest in learning about Fourth Industrial Revolution (4IR) technologies. A strong majority (89.4%) of NIYD participants reported their interest, compared to 64.8% of Non-NIYD participants. Among NIYD participants, only 3.1% were not interested, compared to 11.7% of Non-NIYD participants. A small proportion (7.5%) of NIYD participants were undecided. In contrast, a larger proportion of Non-NIYD participants were undecided (23.5%).
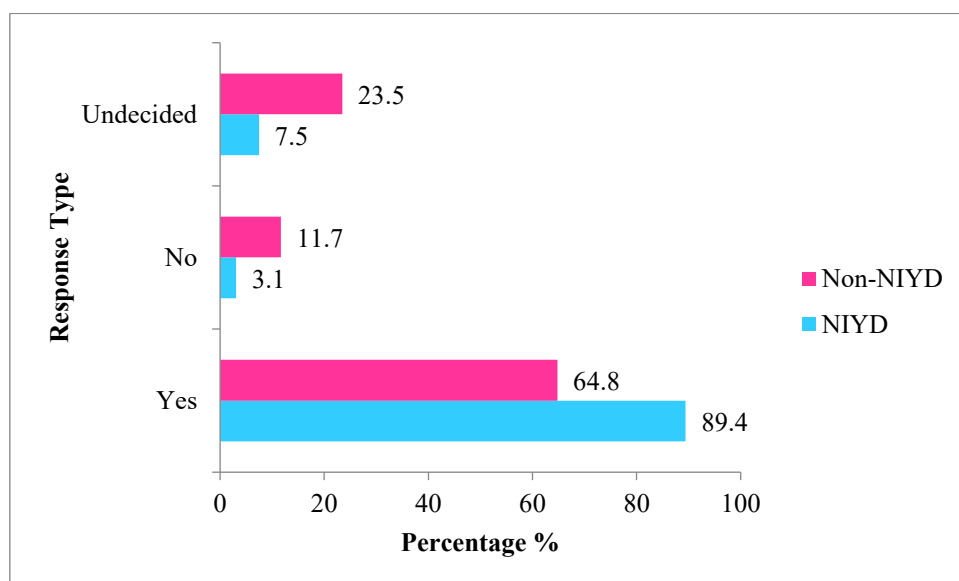
Figure-3. 9: Interested in learning about 4IR technologies

Submitted by: BISR Trust

Data (Table 3.12) shows participants' responses to questions regarding their enrolment in 4IR-related courses, practical training, and interest in future training opportunities. The majority (97.0%) of NIYD and 97.6% of Non-NIYD participants had not enrolled in any 4IR-related courses. A strong majority (97.5%) of NIYD and 92.9% of Non-NIYD participants had not received any practical training in 4IR, while only 2.5% of NIYD and 7.1% of Non-NIYD participants reported having received such training. Some 98.0% of NIYD participants showed interest in free or subsidized training, slightly higher than 97.6% of Non-NIYD participants.

Table-3. 12: Enrolment in different courses (online/offline) related to 4IR

Parameter	categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Have you ever enrolled in any course (online/offline) related to 4IR?	Yes	6	3.0	3	2.4
	No	196	97.0	124	97.6
Have you received any hands-on or practical training in 4IR?	Yes	5	2.5	9	7.1
	No	197	97.5	118	92.9
Would you attend free or subsidized training if offered?	Yes	198	98.0	124	97.6
	No	4	2.0	3	2.4

Data presented in Table 3.13 shows the main barriers participants face in learning 4IR technologies. A significant portion (84.1%) of NIYD participants and 79.4% of Non-NIYD participants reported the most common barrier was the lack of a 4IR-enriched syllabus. The second most reported barrier was the lack of guidance, reported by 72.1% of NIYD and 77.0% of Non-NIYD participants. The lack of relevant training programs was reported by 71.6% of NIYD participants and 61.1% of Non-NIYD participants. The lack of trainers was reported by 46.8% of NIYD participants and 38.1% of Non-NIYD participants. A total of 61.1% of NIYD participants, compared to 7.9% of Non-NIYD participants, reported that they were unsure or unaware of the reasons.

Table-3. 13: Learning barriers of 4IR technology

Response	NIYD		Non-NIYD	
	Frequency	Percentage	Frequency	Percentage
Lack of Guidance	145	72.1	97	77.0
Lack of Trainers	94	46.8	48	38.1

Response	NIYD		Non-NIYD	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Lack of 4IR Enrich Syllabus	169	84.1	100	79.4
Lack Relevant Training Programs,	144	71.6	77	61.1
Unknown	25	61.1	10	7.9

Figure 3.10 presents the factors that most motivate participants to learn about 4IR technologies. The most common motivation is the prospect of a good job opportunity, reported by 90.6% of NIYD and 92.9% of Non-NIYD participants. Institutional support is the second most significant motivator, reported by 77.7% of NIYD and 65.4% of Non-NIYD participants. Personal interest in technology is a notable factor for 62.9% of NIYD and 55.9% of Non-NIYD participants. In comparison, 51.5% of NIYD participants and 50.4% of Non-NIYD participants reported financial incentives as a key motivator. A smaller portion of participants, 10.9% of NIYD and 18.1% of Non-NIYD, reported peer influence as a motivating factor.
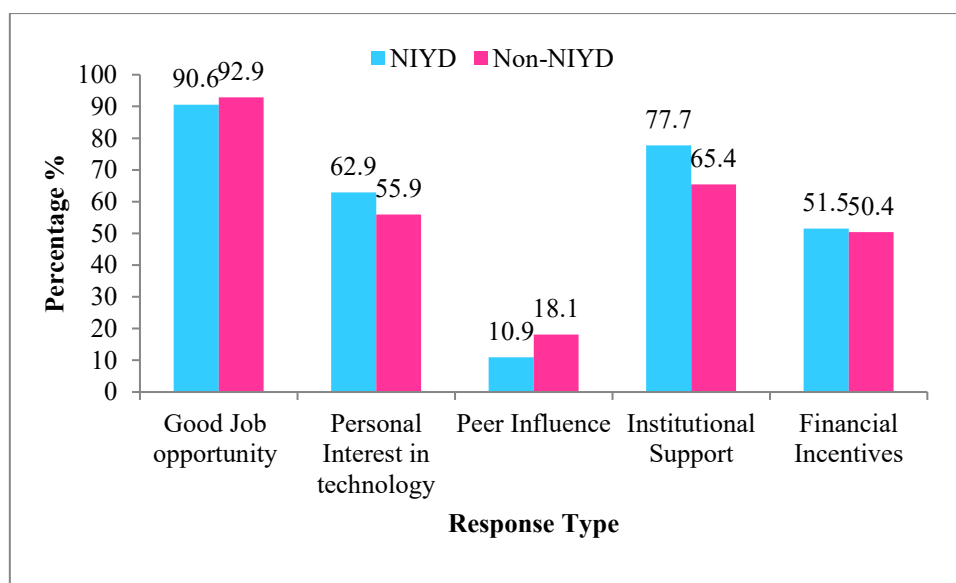
Figure-3. 10: Motivate them the most to learn 4IR

Data presented in table 3.14A shows the institutions that provided any training/workshop related to 4IR technologies. It shows that only 4.0% of NIYD mentioned that while in the case Non-NIYD it was 10.2%. Some also opined that they were not sure. They like their institution to collaborate with industries/startups to provide practical exposure in 4IR-related skills, which shows that 65.5% from NIYD and 45.4% from Non-NIYD likes it. Again some are not sure about it.

In response to the types of support they would like to get from the institution for 4IR, practical workshops with industry experts (52.7% from NIYD and 53.1% from Non-NIYD), internship/

apprenticeship opportunities as a good method (91.2% from NIYD and 73.5% from Non-NIYD), career counselling for tech jobs (40.3% from NIYD and 47.4% from Non-NIYD), certification programs on 4IR skills (70.8 from NIYD and 58.2 from Non-NIYD), access to computer labs/internet (58.8 from NIYD and 42.9 from Non-NIYD), peer learning groups (8.0 from NIYD and 10.7 from nonNIYD) and mentorship and guidance (20.8 from NIYD and 17.9 from nonNIYD).

Data also show that 6.6% from NIYD and 9.7% from Non-NIYD feel that their academic institution provides enough exposure to 4IR technologies. Some of them also mentioned that they were not sure about that. Reasons for not achieving that is the outdated curriculum, lack of trained faculty, no practical/lab work, no collaboration with industry and no networking with industry.

Table-3. 14A: Institutional Capacity related to 4IR and Collaboration

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Has your institution provided any training/workshop related to 4IR technologies?	Yes	9	4.0	20	10.2
	No	197	87.2	121	61.7
	Not sure	20	8.8	55	28.1
Would you like your institution to collaborate with industries/stratups to provide practical exposure in 4IR-related skills?	Yes	148	65.5	89	45.4
	No	5	2.2	23	11.7
	Not sure	73	32.3	84	42.9
What type of support would you like from your institution to be 4IR-ready? (Tick top 3)	Practical workshops with industry experts	119	52.7	104	53.1
	Internship/Apprenticeship opportunities	206	91.2	144	73.5
	Career counselling for tech jobs	91	40.3	93	47.4
	Certification programs on 4IR skills	160	70.8	114	58.2
	Access to computer labs/internet	133	58.8	84	42.9
	Peer learning groups	18	8.0	21	10.7
	Mentorship and guidance	47	20.8	35	17.9
Do you feel that your academic	Yes	15	6.6	9	9.7
	No	147	65.0	84	42.9

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
institution provides enough exposure to 4IR technologies?	Not sure	64	28.3	93	47.4
If **No**, what is lacking in your academic environment?	Outdated curriculum	91	61.9	44	52.4
	Lack of trained faculty	96	65.3	34	40.5
	No practical/lab work	82	55.8	25	29.8
	No collaboration with industry	119	81.0	44	52.4
	Lack of digital infrastructure	79	53.7	30	35.7
	Others				

Respondents opine that 4IR should be integrated into your academic syllabus (69.5% from NIYD and 58.7% Non-NIYD) and Maybe if made practical. Most effective ways to improve students' capacity in 4IR areas include add 4IR subjects in regular curriculum, arrange regular workshops by industry experts, encourage self-learning via online platforms, provide access to online labs/simulators, internship opportunities in tech companies, government-funded training programs and peer-led learning groups or clubs. Received any career guidance on 4IR-related fields from industry partners where 10.6% from NIYD and 26.5% from Non-NIYD mentioned it.

Some 96.5% from NIYD and 80.6% from Non-NIYD shown interest in receiving mentorship or career guidance in 4IR-related careers. Likewise, 11.5% from NIYD and 24.0% from Non-NIYD attended a seminar/workshop conducted by industry professionals. Only 2.7% from NIYD and 24.5% Non-NIYD mentioned that their institution partnered with a company for student projects/internships. Among the supports kinds of supports wanted from their institution for career readiness include internships, career counselling, skill development labs, and the networking with industry.

Table-3. 14B: 4IR integrated in the academic syllabus

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Do you think 4IR should be integrated into your academic syllabus?	Yes	157	69.5	115	58.7
	No	0	0	2	1.0
	Maybe – If made practical	69	30.5	79	40.3

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
What are the most effective ways to improve students' capacity in 4IR areas?	Add 4IR subjects in regular curriculum	188	83.2	112	57.1
	Arrange regular workshops by industry experts	157	69.5	121	61.7
	Encourage self-learning via online platforms	152	67.3	103	52.6
	Provide access to online labs/simulators	125	55.3	82	41.8
	Internship opportunities in tech companies	181	80.1	123	62.8
	Government-funded training programs	137	60.6	96	49.0
	Peer-led learning groups or clubs	64	28.3	35	17.9
Have you received any career guidance on 4IR-related fields from industry partners?	Yes	24	10.6	52	26.5
	No	202	89.4	144	73.5
Would you be interested in receiving - mentorship or career guidance in 4IR-related careers?	Yes	218	96.5	158	80.6
	No	8	3.5	38	19.4
Have you ever attended a seminar/workshop conducted by industry professionals?	Yes	26	11.5	47	24.0
	No	200	88.5	149	76.0
Has your institution ever partnered with a company for student projects/internships?	Yes	6	2.7	48	24.5
	No	188	83.2	85	43.4
Would you be interested in industry-led practical sessions at your institution?	Yes	209	92.5	162	82.7
	No	17	7.5	34	17.3
	Internships	216	95.6	136	69.4

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
What kind of support do you want from your institution for career readiness?	Career counseling	154	68.1	108	55.1
	Skill development labs	138	61.1	125	63.8
	Networking with industry	198	87.6	131	66.8

Data (Table 3.15) shows NIYD participants' familiarity with various 4IR-related subjects and digital skills. For Data Science, 34.5% reported occasional use, while 11.0% were completely unfamiliar. About 24.3% of participants were occasional users of Internet of Things, and 16.8% were completely unfamiliar. Cybersecurity & Encryption was familiar to 29.2%, with only 4.0% completely unfamiliar. Artificial Intelligence was used occasionally by 28.3%, and 8.4% were unfamiliar. About 30.1% of participants were regular users of Cloud Computing, and only 2.7% unfamiliarity. Augmented and Virtual Reality was familiar to 31.9% of participants, and unfamiliar to 4.0%. Non-Humanoids and Robotics had the highest familiarity at 35.4%, with just 0.4% unfamiliar. For 3D Printing, 34.1% were regular users, and 4.4% unfamiliar. About Microsoft Office, 41.2% were somewhat familiar, and 29.2% completely unfamiliar. For Email, 48.7% were unfamiliar, and only 0.4% were expert users. Video Conferencing Tools were somewhat familiar to 45.1%, and 21.2% unfamiliar. Using Search Engines (SEO) 51.3% had occasional users and 6.9% were unfamiliar. Creating Strong Passwords was used sometimes by 37.6%, and 12.4% were unfamiliar. Identifying Scams or Viruses had 42.0% occasional use, with 3.1% unfamiliar. Fact-checking Online Content was done sometimes by 47.3%, and 2.2% were unfamiliar. Solving Device Tech Issues was occasionally used by 49.6%, and 2.2% unfamiliar. Using Video Tutorials had 48.7% occasional users, and 4.8% unfamiliar. Lastly, Copyright was familiar to 33.6%, while 8.0% were unfamiliar.

Table-3. 15: Femilier with the mentioned subjects (NIYD participants)

Subject	Degree of familiarity				
	Very familiar (Expert)	Familier (Regular User)	(Uses sometimes)	Somewhat familiar (Knows but does not uses)	Completely unfamiliar
Data science	12 (5.3)	54 (23.9)	78 (34.5)	57 (25.2)	25(11.0)
Internet of Things	14 (6.1)	55 (24.3)	55 (24.3)	64 (28.3)	38 (16.8)
Cybersecurity & Encryption	19 (8.2)	66 (29.2)	59 (26.1)	73 (32.3)	9 (4.0)
Artificial Intelligence	16 (7.1)	73 (32.3)	64 (28.3)	54 (23.9)	19 (8.4)

Cloud Computing	50 (22.1)	68 (30.1)	52 (23.0)	50 (22.1)	6 (2.7)
Augmented & Virtual Realit	27 (11.9)	72 (31.9)	47 (20.8)	71 (31.4)	9 (4.0)
Non Humanoids and robotics	55 (24.3)	80 (35.4)	60 (26.5)	30 (13.3)	1 (0.4)
3D Printing	42 (18.6)	77 (34.1)	55 (24.3)	42 (18.6)	10 (4.4)
Microsoft Office (Word, Excel, PowerPoint)	3 (1.3)	2 (0.9)	61 (27.0)	93 (41.2)	66 (29.2)
Email	1 (0.4)	4 (1.8)	52 (23.0)	59 (26.1)	110 (48.7)
Video Conferencing Tools (Zoom, Google Meet, Telegram etc.)	1 (0.4)	6 (2.7)	69 (30.5)	102 (45.1)	48 (21.2)
Using Search Engines effectively (SEO)	16 (7.1)	14 (6.2)	116 (51.3)	65 (28.8)	15 (6.9)
Creating strong passwords	24 (10.6)	15 (6.6)	85 (37.6)	74 (32.7)	28 (12.4)
Identifying scams or viruses	30(13.3)	30 (13.3)	95 (42.0)	64 (28.3)	7 (3.1)
Fact-checking online content	31 (13.7)	36 (15.9)	107 (47.3)	47 (20.8)	5 (2.2)
Solving device tech issues	25 (11.1)	45 (19.9)	112 (49.6)	39 (17.3)	5 (2.2)
Using video tutorials for help	26 (11.5)	27 (11.9)	110 (48.7)	52 (23.0)	11 (4.8)
Copyright	11 (4.9)	76 (33.6)	53 (23.5)	68 (30.1)	18 (8.0)

Likwise, data (Table 3.16) shows Non-NIYD participants' familiarity with various 4IR-related subjects and digital skills. For Data Science, 32.1% used it occasionally, while 3.6% reported complete unfamiliarity. Some 43.9% of participants were occasional users of Internet of Things, and 5.6% were completely unfamiliar. Cybersecurity & Encryption was familiar to 29.1%, with only 3.6% unfamiliar. Among participants, 33.7% used Artificial Intelligence sometimes, and 3.6% were completely unfamiliar. Cloud Computing had 37.8% regular users, and none reported complete unfamiliarity. Augmented and Virtual Reality had 38.3% familiarity, and 2.6% unfamiliarity. Non-Humanoids and Robotics had the highest familiarity, with 40.8% being regular users and only 0.5% unfamiliar. About 45.9% were regular users of 3D Printing, with no one completely unfamiliar. For Microsoft Office, 49.5% were somewhat familiar, and 26.5% were unfamiliar. About 52.0% were somewhat familiar with Email, and 33.2% were completely unfamiliar. Video Conferencing Tools were somewhat familiar to

43.4%, and 25.5% were unfamiliar. In Using Search Engines (SEO), 26.5% used them sometimes, and 10.2% were unfamiliar. Among participants, 36.7% were occasional users of Creating Strong Passwords, and 2.6% were unfamiliar. Identifying Scams or Viruses had 40.3% familiarity, with only 0.5% unfamiliar. Fact-checking Online Content was done sometimes by 43.9%, and 1.0% were unfamiliar. For Solving Device Issues, 42.9% used this skill occasionally, and 2.6% were unfamiliar. Using Video Tutorials was done sometimes by 37.8%, and only 1.0% were unfamiliar. Lastly, Copyright was the most familiar to 37.2%, and 3.1% were unfamiliar.

Table-3. 16: Femilier with the mentioned subjects (non-NIYD participants)

Subject	Degree of familiarity				
	Very familier (Expert)	**Familier** (Regular User)	(Uses sometimes)	**Somewhat familier** (Knows but does not uses)	**Completely unfamiliar**
Data science	22 (11.2)	58 (29.6)	63 (32.1)	46 (23.5)	7 (3.6)
Internet of Things	12 (6.1)	42 (21.4)	86 (43.9)	45 (23.0)	11 (5.6)
Cybersecurity & Encryption	32(16.3)	57 (29.1)	61 (31.1)	39 (19.9)	7 (3.6)
Artificial Intelligence	23(11.7)	56 (28.6)	66 (33.7)	44 (22.4)	7 (3.6)
Cloud Computing	33 (16.8)	74 (37.8)	72 (36.7)	17(8.7)	
Augmented & Virtual Realit	28 (14.3)	75 (38.3)	60 (30.6)	28 (14.3)	5 (2.6)
Non Humanoids and robotics	58 (29.6)	80 (40.8)	53 (27.0)	4 (2.0)	1 (0.5)
3D Printing	30 (15.3)	90 (45.9)	67 (34.2)	9 (4.6)	
Microsoft Office (Word, Excel, PowerPoint)	1 (0.5)	8 (4.1)	38 (19.4)	97 (49.5)	52 (26.5)
Email	1 (0.5)	1 (0.5)	27 (13.8)	102 (52.0)	65 (33.2)
Video Conferencing Tools (Zoom, Google Meet, Telegram etc.)	1 (0.5)	13 (6.6)	47 (24.0)	85 (43.4)	50 (25.5)
Using Search Engines effectively (SEO)	25 (12.8)	42 (21.4)	52 (26.5)	57 (29.1)	20 (10.2)

Creating strong passwords	21 (10.7)	40 (20.4)	72 (36.7)	58 (29.6)	5 (2.6)
Identifying scams or viruses	25 (12.8)	79 (40.3)	76 (38.8)	15 (7.7)	1 (0-.5)
Fact-checking online content	27 (13.8)	56 (28.6)	86 (43.9)	25 (12.8)	2 (1.0)
Solving device tech issues	16 (8.2)	59 (30.1)	84 (42.9)	32 (16.3)	5 (2.6)
Using video tutorials for help	13 (6.6)	59 (30.1)	74 (37.8)	48 (24.5)	2 (1.0)
Copyright	9 (4.6)	72 (36.7)	73 (37.2)	36 (18.4)	6 (3.1)

Data presented in Table 3.17 shows the relationship of NIYD and Non-NIYD participants with freelancing or tech-based work. Among NIYD participants, 42.5% were involved in freelancing or tech-related jobs, and 11.9% were partially involved. However, 45.6% of NIYD participants were not involved. In comparison, only 18.4% of Non-NIYD participants reported involvement, while the majority, 80.1%, were not involved, and 1.5% were partially involved. For NIYD participants engaged in graphic design was the most common type (73.5%), followed by data entry (49.4%), video editing (25.3%), web design, and content creation (3.6%). Among Non-NIYD participants, graphic design (82.4%) was also the most common, followed by video editing (41.2%), data entry (23.5%), and content creation (11.8%).

Table-3. 17: Relation with Freelancing/Tech-Based Work

Parameter	Response	NIYD		Non-NIYD	
		Frequency	**Percentage**	**Frequency**	**Percentage**
Are you involved in freelancing or tech-based jobs?	Yes	96	42.5	36	18.4
	No	103	45.6	157	80.1
	Partially	27	11.9	3	1.5
If yes, what type of work?	Video Editing	21	25.3	7	41.2
	Graphic Design	61	73.5	14	82.4
	Content Creation	3	3.6	2	11.8
	Data entry	41	49.4	4	23.5
	Web Design	25			
	Other				

Data (Table 3.18) shows responses from NIYD and Non-NIYD participants regarding their views on industry experience, training impact, skill gaps, and institutional collaboration. A small proportion had worked in industry, about 8.0% of NIYD and 15.3% of Non-NIYD participants. In terms of training impact, 82.6% of NIYD and 60.4% of Non-NIYD reported improved computer skills. Acquiring skills, according to company preferences was reported by

78.9% of NIYD and 71.9% of Non-NIYD participants. Regarding institutional benefits, 77.9% of NIYD and 80.4% of Non-NIYD felt they were ahead of other candidates. A larger number (68.6%) of NIYD and Non-NIYD (73.0%) participants reported shorter wait times in getting a job, while immediate employment was less common. Only 19.0% of NIYD and 23.0% of Non-NIYD considered the training fully effective; most (65.9%) of NIYD and (71.4%) Non-NIYD described it as somewhat effective. The most frequently identified additional skills were communication skills (93.0% of NIYD, 77.3% of Non-NIYD), language proficiency (73.8% and 54.1%), AI (56.5% and 50.5%), and data science (64.0% and 42.8%). These skills were primarily gained from institutions (87.3% NIYD, 89.8% Non-NIYD). Training effectiveness was reported as very effective by 35.0% of NIYD and 38.3% of Non-NIYD participants. Institutional comparison revealed that 59.3% of NIYD observed a large difference, compared to only 23.5% of Non-NIYD. Regarding institutional activities to contemporary contexts, 50.4% of NIYD rated their institutions as good, compared to 68.9% of Non-NIYD. Most believed that collaboration would help secure jobs faster—96.5% of NIYD and 81.1% of Non-NIYD. A majority of (74.7%) NIYD and 66.8% Non-NIYD participants suggested to make the curriculum more enriched. Awareness of existing 4IR-related collaborations was low among NIYD (4.9%) but higher (19.4%) among Non-NIYD. While 62.8% of NIYD believed that there were opportunities for collaboration, 44.4% of Non-NIYD were uncertain. Reveals.

Table-3. 18: Connected with different industries

Parameter	Response	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Have you ever worked in any industry?	Yes	18	8.0	30	15.3
	No	208	92.0	166	84.7
In your opinion, how this training has helped you in getting a job?	Improved computer skills	176	82.6	116	60.4
	Learned about AI	95	44.6	72	37.5
	Acquired skills according to company Preferences	168	78.9	138	71.9
	Others				
According to you, how did you got benefited by getting admitted in this institution?	Got job quickly	72	37.9	58	29.9
	Was ahead of other candidates	148	77.9	156	80.4
	Others				
After the completion of this training to getting a job, how	Had to wait long time	64	28.3	45	23.0
	Had to wait less time	155	68.6	143	73.0

long did you had to wait?	Got the job immediately	7	3.1	8	4.1
The skill you acquired from the training, is it enough?	Effective	43	19.0	45	23.0
	Somewhat effective	149	65.9	140	71.4
	Not effective	34	15.0	11	5.6
If not enough then, what other skills do you require for getting a job?	Data science	137	64.0	83	42.8
	Problem-solving/negotiation skills	95	44.4	75	38.7
	AI	121	56.5	98	50.5
	Communication skills	199	93.0	150	77.3
	Language proficiency	158	73.8	105	54.1
	Others				
How did you acquire that skill?	From any Institution	220	87.3	176	89.8
	Internet	116	51.3	85	43.4
	Online class	103	45.6	56	28.6
How effective do you think these training is?	Effective	82	36.3	47	24.0
	Very effective	79	35.0	75	38.3
	Somewhat effective	65	28.8	74	37.8
Compared to other institutions, how different is your institution'?	Not different at all	4	1.8	21	10.7
	Somewhat different	88	38.9	129	65.8
	Large difference	134	59.3	46	23.5
How relevant are institutional activities to contemporary contexts?	Very good	103	45.6	48	24.5
	Good	114	50.4	135	68.9
	Not good	9	4.0	13	6.6
If your institution collaborated with other organization, then do you think you would have got job mare faster?	Yes	218	96.5	159	81.1
	No	8	3.5	37	18.9
If your institution collaborates with other organization	To improve skill	192	85.0	146	74.5
	To get job quickly	215	95.1	167	85.2
	To get promoted	97	42.9	71	36.2

then what possibilities would there be?	Others				
What other capacity should be created in your organization?	To make the curriculum more enriched	168	74.7	131	66.8
	To Increase Manpower	132	58.7	71	36.2
	To increase computer equipment's	132	58.7	109	55.6
	To arrange for Internship	193	85.8	130	66.3
	To collaborate with industries	181	80.4	124	63.3
	Others				
Do you know of any collaboration related to the context of 4IR?	Yes	11	4.9	38	19.4
	No	215	95.1	158	80.6
Are there adequate opportunities for such collaborations?	Yes	142	62.8	107	54.6
	No	3	1.3	2	1.0
	I don't know	81	35.8	87	44.4

3.3 Job seeker from NIYD and Non-NIYD

Data presented in Table 3.19 shows the demographic features of current job seekers of NIYD and Non-NIYD participants. The majority of participants, with 86.7% of NIYD and 91.4% of Non-NIYD belong to the 21–30 age group. A small number of participants were under 20 years old, with 5.5% in the NIYD group and 5.9% in the Non-NIYD group. However, older participants (above 30) were more common in the NIYD batches (7.8%) compared to only 2.7% in the Non-NIYD batches. In terms of gender, male respondents are higher, 68.2% of NIYD and 70.6% of Non-NIYD, while females account for 31.8% and 29.4%, respectively. In terms of family income, a majority (57.0%) of NIYD participants reported earnings within the BDT 15,001–25,000, whereas a greater proportion (62.0%) of Non-NIYD participants fell within the same income category. Notably, 33.7% of NIYD participants earned less than BDT 15,000, compared to only 10.2% of Non-NIYD participants. Moreover, a higher percentage (27.8%) of Non-NIYD respondents reported incomes exceeding BDT 25,001, while only 9.3% of NIYD participants fell into this category. The most commonly used devices are Android phones, reported by 99.6% of NIYD participants and 98.4% of Non-NIYD participants. Laptops were used by 41.2% of NIYD and 47.1% of Non-NIYD participants, while desktops were slightly more common among Non-NIYD participants (25.1%) compared to NIYD (16.0%). Tablet ownership was minimal, reported by only 1.6% in the NIYD group. Other common uses include browsing websites (73.3% NIYD, 73.8% Non-NIYD), watching movies or TV shows (64.0% NIYD and 65.2% Non-NIYD), and academic work (49.6% NIYD, 46.0% Non-NIYD). Participation in online learning was more frequent among NIYD participants

(48.1%) than among Non-NIYD participants (33.7%). while freelancing remained a relatively low-reported activity (6.2% NIYD, 8.6% Non-NIYD). A smaller portion of job seeker participants reported using devices for freelancing—6.2% in NIYD and 8.6% in Non-NIYD. Access to good internet was higher among Non-NIYD participants (52.9%) compared to 46.1% of NIYD participants. A significant proportion in both groups reported average internet service, with 46.1% in NIYD and 55.9% in Non-NIYD participants.

Table-3. 19: Demographic information

Parameter	categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Age in years	≤20	14	5.5	11	5.9
	21-30	222	86.7	171	91.4
	Over 30	20	7.8	5	2.7
Gender	Female	82	31.8	55	29.4
	Male	176	68.2	132	70.6
Family income	Less than 15000	87	33.7	19	10.2
	150001-25000	147	57.0	116	62.0
	Over 25001	24	9.3	52	27.8
Possessing own device	Android Phone	256	99.6	184	98.4
	Laptop	106	41.2	88	47.1
	Desktop	41	16.0	47	25.1
	Tablet	4	1.6		
Purpose of using these devices	Social Media (Facebook, YouTube, tactic, Instagram, others)	257	99.6	187	100
	Browsing Websites	189	73.3	138	73.8
	Watching Movies/TV Shows	165	64.0	133	65.2
	Gaming	20	7.8	17	9.1
	Academic Work	128	49.6	86	46.0
	Online Learning (Coursera, Bohubrihi, Udemy,	124	48.1	63	33.7

Parameter	categories	NIYD		Non-NIYD	
		Frequency	**Percentage**	**Frequency**	**Percentage**
	Code Academy and others)				
	Freelancing	16	6.2	16	8.6
Access to good internet services	Yes	119	46.1	99	52.9
	No	5	1.9	6	3.2
	Average (Not bad)	134	51.9	82	43.9

Figure 3.11 presents the level of awareness among participants regarding the Fourth Industrial Revolution (4IR). A significant majority (93.0%) of NIYD participants reported having heard of 4IR, compared to 77.5% of Non-NIYD participants. On the other hand, 7.0% of NIYD and 22.5% of Non-NIYD participants reported they were not familiar with the concept of 4IR.
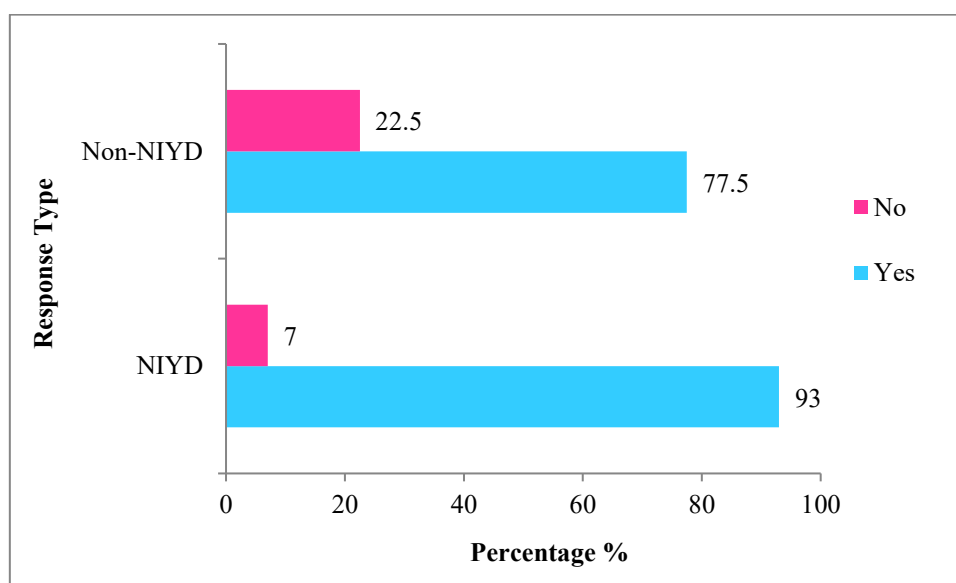
Figure-3. 11: Knowledge and Preparation for 4IR

Data pre4sented in Table 3.20 shows participants' perceptions of the gaps in their exposure to the topic. All (100%) of NIYD and 83.3% of Non-NIYD participants reported that 4IR is not included in their curriculum. The second most common cause was the topic not being discussed by teachers, reported by 94.4% of NIYD and 85.7% of Non-NIYD participants. Only 22.2% of NIYD and 14.3% of Non-NIYD participants identified the lack of training sessions as a gap. Limited access to relevant content, such as internet resources or books, was reported by 22.2% of NIYD and 16.7% of Non-NIYD participants. Additionally, 38.9% of NIYD participants

reported that they were not aware of the importance of the topic, compared to 19.0% of Non-NIYD participants.

Table-3. 20: Gap lies in their exposure to the topic

Response	NIYD		Non-NIYD	
	Frequency	Percentage	Frequency	Percentage
Not included in curriculum	18	100	35	83.3
Teachers did not discuss it	17	94.4	36	85.7
No training sessions available	4	22.2	6	14.3
Lack of access to relevant content (internet/books)	4	22.2	7	16.7
Not aware of its importance	7	38.9	8	19.0

Figure 3.12 shows how participants learned about the Fourth Industrial Revolution (4IR). Social media platforms such as YouTube and Facebook were the most common source of information, reported by 96.2% of NIYD and 89.7% of Non-NIYD participants. Friends or peers were also a significant source, reported by 64.0% of NIYD and 62.1% of Non-NIYD participants. Academic courses were identified by 36.4% of NIYD participants, compared to 21.4% in the Non-NIYD group. Online courses were reported by 11.3% of NIYD and 15.2% of Non-NIYD participants. Seminars and webinars were the least reported source for 11.7% of Non-NIYD participants, compared to 16.7% of NIYD participants.
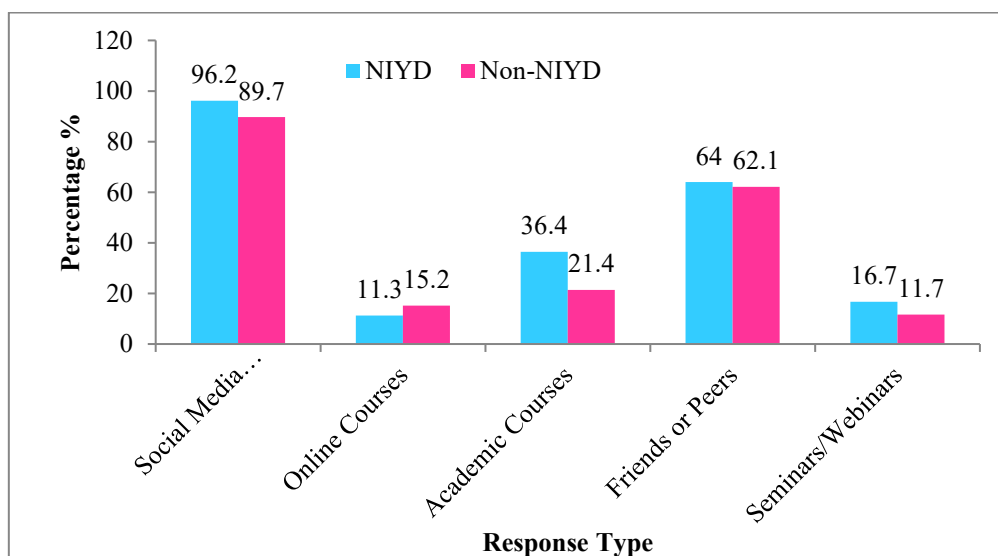
Figure-3. 12: Learn about it

Figure 3.13 shows participants' opinions on the potential impact of Fourth Industrial Revolution (4IR) on their career prospects. A significant majority (69.4%) of NIYD participants strongly agreed that 4IR technologies would impact their careers, while 25.2% agreed. In comparison, 47.1% of Non-NIYD participants strongly agreed, and 35.8% agreed. A neutral opinion was more common (16.6%) among Non-NIYD participants compared to NIYD participants (1.2%). None of the NIYD participants disagreed, whereas 0.5% of Non-NIYD participants expressed disagreement. In addition, 4.3% of NIYD participants strongly disagreed, while no one reported strongly disagreed among Non-NIYD participants.
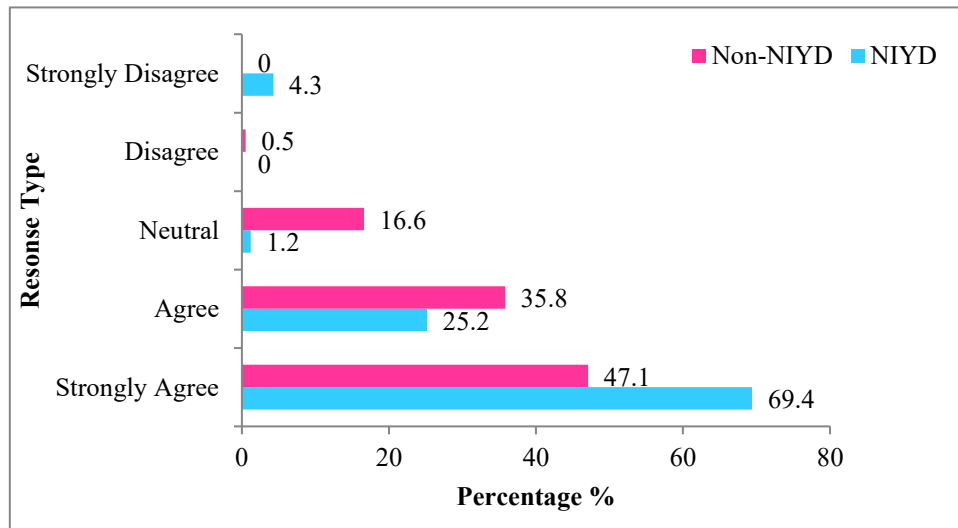
Figure-3. 13: 4IR technologies (e.g., AI, robotics, data science) affect their career prospects

Figure 3.14 shows participants' interest in learning about Fourth Industrial Revolution (4IR) technologies. A significant majority (87.2%) of NIYD participants expressed interest, compared to 64.2% of Non-NIYD participants. Only a few participants were not interested, with 4.7% from NIYD and 6.4% from Non-NIYD. In contrast, indecision was more common (29.4%) among Non-NIYD compared to just 8.1% among the NIYD participants.
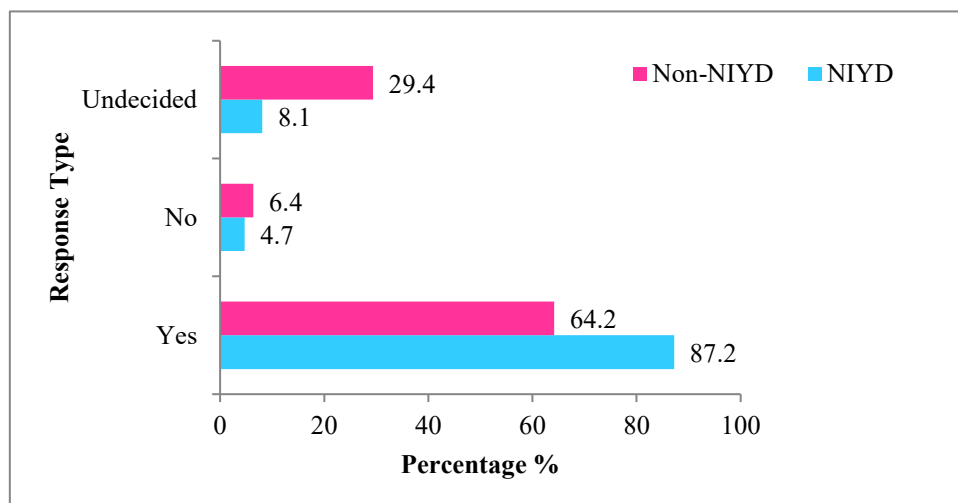
Figure-3. 14: Interested in learning about 4IR technologies

Submitted by: BISR Trust

Data (Table 3.21) shows participants' responses to questions regarding their enrollment in 4IR-related courses, practical training, and interest in future training opportunities. Majority (97.3%) of NIYD and 96.7% of Non-NIYD participants had not enrolled in any 4IR-related courses. A strong majority (97.3%) of NIYD and 96.7% of Non-NIYD participants had not received any practical training in 4IR, while only 2.7% of NIYD and 3.3% of Non-NIYD participants reported having received such training. Almost all (99.6%) of NIYD participants showed interest in free or subsidized training, compared to 97.1% of Non-NIYD participants.

Table-3. 21: Enrolled in various course (online/offline) related to 4IR

Parameter	categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Have you ever enrolled in any course (online/offline) related to 4IR?	Yes	6	2.7	4	3.3
	No	219	97.3	116	96.7
Have you received any hands-on or practical training in 4IR?	Yes	6	2.7	4	3.3
	No	219	97.3	116	96.7
Would you attend free or subsidized training if offered?	Yes	224	99.6	116	96.7
	No	1	0.4	4	1.4

Data presented in Table 3.22 shows the main barriers participants face in learning 4IR technologies. A significant portion from (84.3% of NIYD and 77.5% of Non-NIYD) participants reported the most common barrier was the lack of 4IR enrich syllabus. The second most reported barrier was the lack of relevant training programs, reported by 75.8% of NIYD, while for Non-NIYD (72.5%) participants reported the second most common barrier was lack of guidance. The lack of trainers was reported by 50.7% of NIYD participants and 38.3% of Non-NIYD participants. A small number of participants, 10.8% of NIYD participants and 10.0% of Non-NIYD participants reported they were unsure or unaware of the reasons.

Table-3. 22: Learning barriers of 4IR technology

Response	NIYD		Non-NIYD	
	Frequency	Percentage	Frequency	Percentage
Lack of Guidance	165	74.0	87	72.5
Lack of Trainers	113	50.7	46	38.3

Response	NIYD		Non-NIYD	
	Frequency	Percentage	Frequency	Percentage
Lack of 4IR Enrich Syllabus	188	84.3	93	77.5
Lack Relevant Training Programs,	169	75.8	66	55.0
Unknown	24	10.8	12	10.0

Figure 3.15 shows the factors that most motivate participants to learn about 4IR technologies. The most common motivation is the prospect of a good job opportunity, reported by 88.9% of NIYD and 91.7% of Non-NIYD participants. Institutional support is the second most significant motivator, reported by 79.1% of NIYD and 62.5% of Non-NIYD participants. Personal interest in technology is a strong motivator for 75.6% of NIYD participants, compared to 55.8% of Non-NIYD participants. Financial incentives were reported by 55.6% of NIYD and 46.7% of Non-NIYD participants. Peer influence was the least reported factor, by 10.2% of NIYD and 12.5% of Non-NIYD participants.
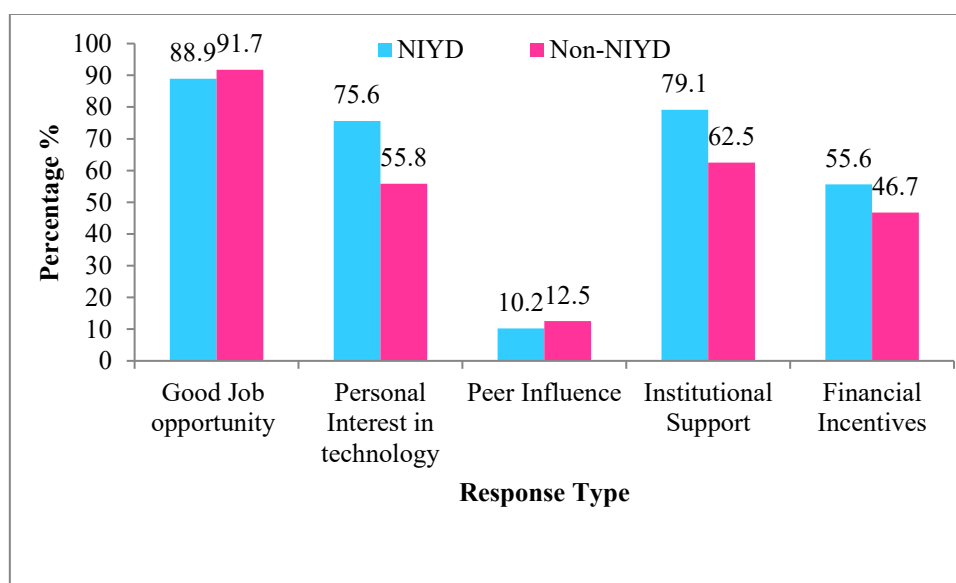
Figure-3. 15: Motivate them the most to learn 4IR

Data (Table 3.23A) shows the participants' opinions about their institution's efforts and support related to 4IR technologies. Only 4.3% of NIYD participants and 4.8% of Non-NIYD participants reported receiving 4IR-related training from their institutions. A significant majority (83.3%) of NIYD and 66.3% of Non-NIYD participants reported that their institutions had not provided such training. Additionally, 12.4% of NIYD and 28.9% of Non-NIYD participants were unsure whether their institutions offered 4IR training. Most (65.5%) of NIYD participants expressed interest in institutional collaboration with industries or startups for

practical exposure, compared to 38.5% of Non-NIYD participants. On the other hand, 44.9% of Non-NIYD participants were unsure about such collaboration, compared to 30.6% in the NIYD group. Internship or apprenticeship opportunities were the most preferred type of support among NIYD (86.0%) and Non-NIYD (71.1%) participants. Certification programs on 4IR skills were the second most preferred, reported by 80.2% of NIYD and 62.6% of Non-NIYD participants. Practical workshops with industry experts were chosen by 55.0% of NIYD and 43.3% of Non-NIYD participants. Access to computer labs and the internet was more important to NIYD participants (63.6%) than Non-NIYD participants (42.8%). A total of 66.3% of NIYD and 42.2% of Non-NIYD participants reported that their academic institutions did not provide enough exposure to 4IR. A significantly higher proportion (49.7%) of Non-NIYD participants reported being unsure whether their institutions provided sufficient exposure, in contrast to 26.4% of NIYD participants. Only a small portion of (7.4%) of NIYD and 8.0% of Non-NIYD participants felt they had received adequate exposure. Among participants who reported insufficient exposure to the topic, the most commonly identified gap was the lack of collaboration with industry, reported by 88.3% of NIYD and 40.5% of Non-NIYD participants. The lack of practical or laboratory work was a major concern for 63.7% of NIYD participants, in contrast to 25.3% of Non-NIYD participants. Lack of trained faculty was identified by 62.6% of NIYD and 49.4% of Non-NIYD participants. Outdated curriculum was reported as a barrier by 59.6% of NIYD and 59.5% of Non-NIYD participants. Furthermore, 53.2% of NIYD participants and 25.3% of Non-NIYD participants reported that lack of digital infrastructure was a key concern. A majority (72.5%) of NIYD participants reported that 4IR should be integrated into the academic syllabus, while only 59.9% of Non-NIYD participants agreed. A total of 39.6% of Non-NIYD participants reported that 4IR should be integrated into the academic syllabus if it were made practical, compared to 27.1% of NIYD respondents.

Table-3. 23A: Institutional Capacity related to 4IR and Collaboration

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Has your institution provided any training/workshop related to 4IR technologies?	Yes	11	4.3	9	4.8
	No	215	83.3	124	66.3
	Not sure	32	12.4	54	28.9
Would you like your institution to collaborate with industries/startups to provide practical exposure in 4IR-related skills?	Yes	169	65.5	72	38.5
	No	10	3.9	31	16.6
	Not sure	79	30.6	84	44.9
What type of support would	Practical workshops with industry experts	142	55	81	43.3

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
you like from your institution to be 4IR-ready? (Tick top 3)	Internship/Apprenticeship opportunities	222	86	133	71.1
	Career counselling for tech jobs	99	38.4	76	40.6
	Certification programs on 4IR skills	207	80.2	117	62.6
	Access to computer labs/internet	164	63.6	80	42.8
	Peer learning groups	26	10.1	14	7.5
	Mentorship and guidance	52	20.2	34	18.2
Do you feel that your academic institution provides enough exposure to 4IR technologies?	Yes	19	7.4	15	8.0
	No	171	66.3	79	42.2
	Not sure	68	26.4	93	49.7
If **No**, what is lacking in your academic environment?	Outdated curriculum	102	59.6	47	59.5
	Lack of trained faculty	107	62.6	39	49.4
	No practical/lab work	109	63.7	20	25.3
	No collaboration with industry	151	88.3	32	40.5
	Lack of digital infrastructure	91	53.2	20	25.3
	Others				
Do you think 4IR should be integrated into your academic syllabus?	Yes	187	72.5	112	59.9
	No	1	0.4	1	0.5
	Maybe – If made practical	70	27.1	74	39.6

Likewise, data presented in Table 3.23B shows job seeker participants' perspectives on improving institutional capacity and collaboration to enhance student skills in Fourth Industrial Revolution (4IR) technologies. A majority (87.6%) of NIYD reported adding 4IR subjects in regular curriculum is the most effective way to improve students' capacity, while 61.0% of Non-NIYD participants reported Internship opportunities as most effective way.

Internship opportunities in tech companies were the second most effective way, especially among 79.5% of NIYD compared to 61.0% of Non-NIYD participants. Arranging regular workshops by industry experts was selected by 71.3% of NIYD and 68.4% of Non-NIYD participants, while encouraging self-learning through online platforms was reported by 65.9% and 51.4%, respectively. A majority (64.3%) of NIYD participants selected government-

funded training programs as an effective way compared to Non-NIYD participants (41.7%). Only 10.9% of NIYD and 18.7% of Non-NIYD participants had received career guidance from industry partners. Interest in mentorship and career guidance was high among both groups, 96.5% of NIYD and 81.8% of Non-NIYD participants. Only 10.5% of NIYD participants attended seminars or workshops conducted by professionals compared to 19.3% of Non-NIYD participants. Additionally, institutional collaborations with companies for projects or internships were reported by only 4.3% of NIYD participants, whereas 16.0% of Non-NIYD participants. A majority (93%) of NIYD and 77% of Non-NIYD participants were interested in industry-led practical sessions at their institutions. A total of 91.9% of NIYD and 62.9% of Non-NIYD participants reported that they want support in the form of internships from their institutions for career readiness. Career counselling was chosen by 72.1% of NIYD and 48.4% of Non-NIYD, while skill development labs were reported by 69.8% and 66.7%, respectively. Networking with industry was reported by 84.9% of NIYD and 66.7% of Non-NIYD participants.

Table-3. 23B: Career Related 4IR Capacity and Collaboration

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
What are the most effective ways to improve students' capacity in 4IR areas?	Add 4IR subjects in regular curriculum	226	87.6	110	58.8
	Arrange regular workshops by industry experts	184	71.3	128	68.4
	Encourage self-learning via online platforms	170	65.9	96	51.4
	Provide access to online labs/simulators	145	56.2	76	40.6
	Internship opportunities in tech companies	205	79.5	114	61.0
	Government-funded training programs	166	64.3	78	41.7
	Peer-led learning groups or clubs	74	28.7	29	15.5
Have you received any career guidance on 4IR-related fields from industry partners?	Yes	28	10.9	35	18.7
	No	230	89.1	152	81.3
Would you be interested in receiving mentorship or career guidance in 4IR-related careers?	Yes	249	96.5	153	81.8
	No	9	3.5	34	18.2
	Yes	27	10.5	36	19.3

Parameter	Categories	NIYD		Non-NIYD	
		Frequency	Percentage	Frequency	Percentage
Have you ever attended a seminar/workshop conducted by industry professionals?	No	231	89.5	151	80.7
Has your institution ever partnered with a company for student projects/internships?	Yes	11	4.3	30	16.0
	No	201	77.9	75	40.9
Would you be interested in industry-led practical sessions at your institution?	Yes	240	93	144	77
	No	18	7	43	23
What kind of support do you want from your institution for career readiness?	Internships	237	91.9	117	62.9
	Career counseling	186	72.1	90	48.4
	Skill development labs	180	69.8	124	66.7
	Networking with industry	219	84.9	124	66.7
	Others				

Data presented in Table 3.24 shows NIYD job seeker participants' familiarity with various 4IR-related subjects and digital skills. For Data Science, 34.9% of participants were regular users, while only 5.1% were completely unfamiliar. About 29.8% of NIYD participants were occasional users with Internet of Things, and 8.9% were completely unfamiliar. In Cybersecurity & Encryption, 34.5% were regular users, while only 1.6% reported complete unfamiliarity. Artificial Intelligence had the highest at 36.8% as regular users and 1.6% reported complete unfamiliarity. About 34.5% reported they are regular users of Cloud Computing, while 1.2% were unfamiliar. A significant 41.5% of NIYD participants were familiar with Non-humanoids and Robotics, marking it as the most familiar subject, whereas just 1.2% reported complete unfamiliarity. In terms of 3D Printing, 37.2% were most familiar with the subject, and just 2.3% were completely unfamiliar. In digital skills, Email had the highest unfamiliarity at 38.0%, while only 1.2% claimed expertise. For Video Conferencing Tools, 36.4% participants used them sometimes, and 19.0% were unfamiliar. Using Search Engines (SEO) had the highest percentage (52.7%) as occasional users, and 8.2% were completely unfamiliar. Creating Strong Passwords was done sometimes by 42.2%, while 9.7% were unfamiliar. Identifying Scams/Viruses had the highest (43.4%) as occasional users and only 2.3% unfamiliar. Fact-checking Online Content was done sometimes by 47.7% participants, and 1.9% reported complete unfamiliarity. Solving Device Issues reported by 47.7% as occasional users and 4.3% unfamiliar. About 50.0% as sometimes uses Video Tutorials, with 5.4% had complete unfamiliarity. Lastly, Copyright was most familiar to 39.5%, and 4.3% were unfamiliar.

Table-3. 24: Femilier with the mentioned subjects (NIYD participants)

Subject	Degree of familiarity				
	Very familier (Expert)	**Familier** (Regular User)	(Uses sometimes)	**Somewhat familier** (Knows but does not uses)	**Completely unfamiliar**
Data science	33 (12.8)	88 (34.1)	90 (34.9)	34(13.2)	13 (5.1)
Internet of Things	23 (8.9)	74 (28.7)	77 (29.8)	61 (23.6)	23 (8.9)
Cybersecurity & Encryption	29 (11.2)	89 (34.5)	85 (32.9)	51 (19.8)	4 (1.6)
Artificial Intelligence	32 (12.4)	95 (36.8)	78 (30.2)	49 (19.0)	4 (1.6)
Cloud Computing	53 (20.5)	82 (31.8)	89 (34.5)	31(12.0)	3 (1.2)
Non Humanoids and robotics	56 (21.7)	107 (41.5)	78 (30.2)	14 (5.4)	3 (1.2)
3D Printing	48 (18.6)	96 (37.2)	62 (24.0)	46 (17.8)	6 (2.3)
Email	3 (1.2)	5 (1.9)	63 (24.4)	89 (34.5)	98 (38.0)
Video Conferencing Tools (Zoom, Google Meet, Telegram etc.)	3 (1.2)	21 (8.1)	94 (36.4)	91 (35.3)	49 (19.0)
Using Search Engines effectively (SEO)	19 (7.4)	23 (8.9)	136 (52.7)	59 (22.9)	21 (8.2)
Creating strong passwords	20 (7.8)	30 (11.6)	109 (42.2)	74 (28.7)	25 (9.7)
Identifying scams or viruses	41 (15.9)	42 (16.3)	112 (43.4)	57 (22.1)	6 (2.3)
Fact-checking online content	40 (15.5)	50 (19.4)	123 (47.7)	40 (15.5)	5(1.9)
Solving device tech issues	30 (11.6)	60 (23.3)	123 (47.7)	34 (13.2)	11 (4.3)
Using video tutorials for help	20 (7.8)	59 (22.9)	129(50.0)	36 (14.0)	15 (5.4)
Copyright	23 (8.9)	102 (39.5)	54 (20.9)	68 (26.4)	11 (4.3)

Data presented in Table 3.25 shows Non-NIYD participants' familiarity with various 4IR-related subjects and digital skills. For Data Science, 29.8% were occasional users, and 8.9% reported complete unfamiliarity. In Internet of Things, 36.4% of participants were familiar, while only 3.7% were completely unfamiliar. Cybersecurity & Encryption was familiar to 39.0%, with only 0.5% unfamiliar. In Artificial Intelligence, 36.9% were regular users, and 1.6% were completely unfamiliar. About 36.9% of participants were regular users of Cloud Computing, while only 0.5% were unfamiliar. Non-humanoids and Robotics had the highest familiarity, with 40.1% being familiar and just 1.1% unfamiliar. In 3D Printing, 52.9% were regular users, and only 3.2% were unfamiliar. About 57.2% was reported occasional users of Email, while 1.2% were expert. For Video Conferencing Tools, about 44.4% were reported somewhat familiar, and 16.6% completely unfamiliar. In Using Search Engines (SEO), 28.3% used them sometimes, and 5.3% were unfamiliar. Among participants 38.0% were familiar of Creating Strong Passwords, and 8.0% were unfamiliar. Identifying Scams or Viruses had 40.6% familiarity, while only 2.1% were unfamiliar. Fact-checking Online Content was done sometimes by 40.1% participants, and 1.6% were completely unfamiliar. For Solving Device Issues, 43.9% were occasional users, and only 2.1% reported unfamiliarity. Using Video Tutorials was done sometimes by 41.7%, and only 1.6% were unfamiliar. Lastly, Copyright was the most familiar to 42.2%, and 3.2% were unfamiliar.

Table-3. 24A: Femilier with the below mentioned subjects (Non-NIYD participants)

Subject	Degree of familiarity				
	Very familier (Expert)	**Familier** (Regular User)	(Uses sometimes)	**Somewhat familier** (Knows but does not uses)	**Completely unfamiliar**
Data science	31 (8.9)	74 (28.7)	77 (29.8)	61 (23.6)	23 (8.9)
Internet of Things	19 (10.2)	68 (36.4)	67 (35.8)	26 (13.9)	7 (3.7)
Cybersecurity & Encryption	36 (19.3)	73 (39.0)	54 (28.9)	23 (12.3)	1 (0.5)
Artificial Intelligence	28 (15.0)	69 (36.9)	60 (32.1)	27 (14.4)	3 (1.6)
Cloud Computing	42 (22.5)	69 (36.9)	63 (33.7)	12 (6.4)	1 (0.5)
Non Humanoids and robotics	70 (37.4)	75 (40.1)	38 (20.3)	2 (1.1)	2 (1.1)
3D Printing	34 (18.2)	99)52.9)	48 (25.7)	6 (3.2)	
Email		5 (1.2)	36)19.3)	107 (57.2)	39 (20.9)
Video Conferencing Tools (Zoom, Google Meet, Telegram etc.)	1 (0.5)	18 (9.6)	54 (28.9)	83 (44.4)	31 (16.6)
Using Search Engines	30 (16.0)	43 (23.0)	53 (28.3)	51 (27.3)	10 (5.3)

effectively (SEO)					
Creating strong passwords	29 (15.5)	37 (19.8)	71 (38.0)	35 (18.7)	15 (8.0)
Identifying scams or viruses	34 (18.2)	76 (40.6)	64 (34.2)	9 (4.8)	4 (2.1)
Fact-checking online content	27 (14.4)	71 (38.0)	75 (40.1)	11 (5.9)	3 (1.6)
Solving device tech issues	20 (10.7)	62 (33.2)	82 (43.9)	19 (10.2)	4 (2.1)
Using video tutorials for help	15 (8.0)	62 (33.2)	78 (41.7)	29 (15.5)	3 (1.6)
Copyright	23 (12.3)	79 (42.2)	53 (28.3)	26 (13.9)	6 (3.2)

Data presented in Table 3.26 presents the relationship of NIYD and Non-NIYD participants with freelancing or tech-based work. Among NIYD participants, only 2.7% were involved in freelancing or tech-related jobs, and only 1.6% were partially involved. However, the majority (95.7%), were not involved. In comparison, only 0.5% of Non-NIYD participants reported involvements with freelancing, while 99.5% were not involved. For NIYD, Graphic design was the most common type of work (87.5%), followed by data entry (50%), video editing (25%), web design (25%), and content creation (12.5%). The single Non-NIYD participant who participated in freelancing was involved in graphic design work.

Table-3. 25: Relation with Freelancing/Tech-Based Work

Parameter	Response	NIYD		Non-NIYD	
		Frequency	**Percentage**	**Frequency**	**Percentage**
Are you involved in freelancing or tech-based jobs?	Yes	7	2.7	1	0.5
	No	247	95.7	186	99.5
	Partially	4	1.6		
If yes, what type of work?	Video Editing	2	25	0	
	Graphic Design	7	87.5	1	100
	Content Creation	1	12.5	0	
	Data entry	4	50	0	
	Web Design	2	25	0	
	Other				

Data (Table 3.27) shows responses from NIYD and Non-NIYD participants regarding their views on institutional objectives, training effectiveness, skill gaps, and collaboration. Most (93%) NIYD participants enrolled to acquire skills or to get a job (90.7%). Over half (58.5%) of the NIYD respondents found the training somewhat effective in the job market with only 3.9% considering it ineffective. The main barrier to employment was insufficient skills,

reported by 68.2% of NIYD and 54% of Non-NIYD participants. Only 10.9% of NIYD and 9.1% of Non-NIYD respondents believed their acquired skills were enough. Most identified the need for additional skills such as language proficiency, communication, AI, and data science. These were mainly learned through institutions. While 82% of NIYD participants had the knowledge to acquire further skills, with only 26.7% of Non-NIYD participants. Regarding institutional comparison, 56.6% of NIYD participants believed their institute was better, compared to 30.5% of Non-NIYD. Collaboration with industries was supported by 75.2% of NIYD and 57.8% of Non-NIYD participants. However, challenges included extended course durations, curriculum issues, and lack of alignment with faculty. Industry collaboration was believed to improve learning and employment opportunities. Live data was shown during training for 58.5% of NIYD participants. Suggested improvements included better curriculum, more staff, equipment, and internet. Only 12% of NIYD participants had visited industries, from which they learned about required skills and industry operations. Awareness of 4IR collaborations was low among NIYD (7.8%) but high among Non-NIYD (86.6%). Many were unsure about opportunities for such collaborations.

Table-3. 26: Admission to the institution and effectiveness of the training in the job market

Parameter	Response	NIYD		Non-NIYD	
			Percentage	**Frequency**	**Percentage**
What was the main objective of your getting admitted in this institution?	To acquire skills	240	93	158	84.8
	For Getting job	234	90.7	126	67.4
	Extracurricular activity	175	67.8	108	57.8
	For academic subject	81	31.4	47	25.1
	To become an entrepreneur	66	25.6	46	24.6
	Others				
How much do you think the effectiveness of this training in the job market?	Effective	97	37.6	44	23.5
	Somewhat effective	151	58.5	135	72.2
	Not effective	10	3.9	8	4.3
What is the reason for you're not getting a job?	I don't tried	24	9.3	16	8.6
	No interested in job	2	0.8	5	2.7
	Present skill is not enough	176	68.2	101	54.0
	Other reasons	56	21.7	65	34.8
The skill you acquired from the training, is it enough?	Enough	28	10.9	17	9.1
	Somewhat enough	141	54.7	155	82.9
	Not Enough	89	34.5	15	8
	Data science	69	83.1	8	53.3

If not enough then, what other skills do you require for getting a job?	Problem-solving/negotiation skills	63	75.9	5	33.3
	AI	65	78.3	8	53.3
	Communication skills	70	84.3	8	53.3
	Language proficiency	76	91.6	10	66.7
	Others				
How did you acquire that skill?	From any Institution	81	91	14	93.3
	Internet	3	3.4	0	0
	Online class	5	5.6	1	6.7
Do you have the necessary knowledge to acquire these skill?	Yes	73	82	4	26.7
	No	2	2.2	1	6.7
	somewhat	14	15.7	10	66.7
How effective do you thing this training is?	Effective	98	38	38	20.3
	Very effective	37	14.3	32	17.1
	Somewhat effective	122	47.3	115	61.5
	Not effective	1	0.4	2	1.1
Compared to other institutions, how different is your institution'?	Not better than others	6	2.3	16	8.6
	Similar	106	41.1	114	61
	Better than others	146	56.6	57	30.5
Do you think your institution should encourage collaboration with other industries?	Yes	194	75.2	108	57.8
	No	64	24.8	79	42.2
How relevant are institutional activities to contemporary contexts?	Very relevant	101	39.1	33	17.6
	Somewhat relevant	147	57	140	74.9
	Not really relevant	10	3.9	14	7.5

If not, what are the challenges in engaging students in such collaboration?	It will take more time to complete the course.	157	65.7	85	51.5
	Occur difficulties in sorting curriculum	186	77.8	129	78.2
	Lack of alignment with faculty members	180	75.3	82	49.7
	Others				
What might be the benefits of such industry collaboration?	Students will learn better	225	87.2	128	68.4
	Help to get job	245	95	169	90.4
	Others				
Does Live date being shown in the training session?	Yes	151	58.5	83	44.4
	No	107	41.5	104	55.6
What other capacity should be created in your organization?	Enrich the curriculum	218	87.2	133	71.1
	Increase man power	169	67.6	97	51.9
	Increase computer and other appliances	182	72.8	114	61.0
	Good Internet service	161	64.4	81	43.3
	Others				
Have you ever visited any industry?	Yes	31	12.0	23	12.3
	No	227	88	164	87.7
If yes, what did you learn from the experience?	How Industry works	31	100	22	95.7
	What skills are required for working in it.	31	100	21	91.3
	Others				
	Yes	20	7.8	162	86.6

Do you know of any collaboration related to the context of 4IR?	No	238	92.2	25	13.4
Are there adequate opportunities for such collaborations?	Yes	133	51.6	84	44.9
	No	7	2.7	12	6.4
	I don't know	118	45.7	91	48.7

Chapter-4
Qualitative Findings

4.1 KII Findings

I. Quality of skills of youth and sectors to improve

They are trained but lack maintenance experience. They can adapt to the latest technology marginally. Workers are not skilled at all. They are currently facing a shortage of good quality mechanical and electrical engineers. Energy, textile machinery, and software are the sectors in which they need good quality people. IT, language skills, and skill training are much more needed. In developed countries, students are introduced to IT support services, cybersecurity, web development, digital marketing, and robotic design as part of their school curriculum. NIYD conducts pre-tests and post-tests to assess the improvement. Those who are interested learn more, but they need more practical exposure.

II. Effectiveness of NIYD training

No idea about NIYD, but workers are not skilled at all. A strong textile background is required. While many of the recruits come from Textile University, specifically from BUTEX, they still require significant on-the-job training. A six-month training requirement exists. Although these recruits may possess around 80% of the necessary knowledge, the remaining skills need to be trained through practical, hands-on training in the workplace. NIYD training is not bad. Only about 1 to 2, or at most 5 out of every 24 trainees meet the expected standards. Training could be improved by increasing supervision. The trainer-trainee ratio is important. Quality trainers are needed to create skilled manpower. Training should be based on industry-oriented requirements. Demand-oriented training is necessary. It should be discussed in the academic council when finalizing the training course. The quality of NIYD is good. So far, NIYD has conducted 49 different training programs. There is consideration of extending the training time.

III. Kinds of training required from NIYD

No idea about NIYD. Technical and managerial training is required. Quality trainers are needed, especially for migrant labor. Trainees also need communication skills. Training should match current demand. Hands-on skills are essential for young people. Technically sound manpower is needed (Textward Knitware Ltd.). Training focused on agriculture and livestock is also needed. Training is needed in small-cottage industries, plumbing, driving, mobile servicing, sewing, and fisheries. Training on computer programming, graphic design, office management, digital marketing, and handcrafting is needed.

IV. Issues or topics to be covered

Technical and managerial training are necessary. Also, training on new model vehicles, agriculture and food processing, ICT, and web design are needed. Although there is a connection between industry and academia, effective collaboration is hindered by discrimination and the influence of powerful individuals.

V. Scope of I-A in the case of Bangladesh

They use branded machinery. So, there's no clear idea about collaboration scope. But they can produce some spare parts, low-cost machinery, energy efficiency, etc. No proposals given or received from industry. Lack of industry-academia collaboration is a major barrier. Collaboration with Technical Education and NSDA is needed. A proposal for an MoU on food technology is under process. They never gave a proposal for I-A collaboration. Only some machine suppliers give proposals. They arrange seminars on the usefulness of their machinery. They have the scope of collaboration with BUET, RUET, KUET, and MIST (Rahimafrooz). No proposal was given or received for technology development. Collaboration takes place at an individual level, but there is no official collaboration.

VI. Kinds of relation of I-A with 4IR

Change in technology depends on customer demand, but the change is very slow. KOICA set up a lab at the Bangladesh-Korea Institute, but it's not part of any collaboration. No other formal proposals have been received. They do not produce any 4IR devices. It is directly related. No proposal was given or received for technology development (Rahim Afrooz).

VII. Tasks to be done to increase I-A

No clear idea. There is scope for green technology; for example, Walton offers support, but the initiative was originally promoted by GIZ. Training on this is ongoing. A clear policy and a multi-sectoral development approach are needed. More MoUs should be signed. Latest machines and technology should be used to improving the quality of training. Students need practical training alongside theoretical knowledge, starting from their academic life.

VIII. Scope of internship and its alternatives

Yes, they have internships. Yearly, they accommodate 200 interns. Internship provision is not available at Bangladesh-Korea Institute, but they offer refreshers. Scope of internship exists in areas like ICT. Food and beverage related internships are available with Radisson. Some communicate with the industry. Some industries get 20–25 interns and retain top performers (Rahim Afrooz). This is the age of social media. The government should prepare guidelines to facilitate internships. The government can provide some subsidy for that. Internship programs are available, but there is a need for further enhancement. The quality of internships is often very low. More internship opportunities should be created.

IX. Industry should go to Academia or Academia should go to Industry

No, they have neither received nor given any proposals to any organization. A policy is needed from the GoB to define roles. In that case, they can go to industry. No idea. No proposals were received or given for I-A collaboration. Industry visits and proposals for collaboration are necessary. Some MoUs exist. Consulting and software firms also engage through communication.

X. Difference between present skill and future required skill and way to improve it

Yes, there is a difference. There is a gap between current skills and future 4IR needs, but there is no new technology at present. It can be improved through I-A collaboration. Improvement

is needed as technology is changing day by day. New products are entering the market. A big gap exists with future 4IR requirements. By adopting automation, machine tech, and robotics can help reduce labor and increase production efficiency. Local demand is higher compare to 4IR demand.

XI. Making NIYD Training Effective Through I-A

No idea. A policy needs to be prepared. If the industry wants, it can be done. If industry shows interest, collaboration is possible. For ToT, training was done in Singapore. There is scope for collaboration. Better results can be achieved with the right policies and funding. I-A collaborations are taking place but they need to be formalized.

XII. Students' internships and its need

From the interns, 25% of them are retained. A job placement system exists. Students attend job fairs. In some job fairs, foreigners also participate, and they sometimes visit the BK Institute. Job placement opportunities exist. Students visit industries like Hi-Tech and Walton. Mohammadi Group accepts interns from all universities. They never develop any technology. They accept interns from any university. Some industries are interested in interns but don't always get them (Texworld Knitware Limited). The facility for internships exists within their academic system, but government policy and financial support are needed to make it effective. It's important to create a formal internship system with experienced local experts. Some students go for internships during their final year of academic study (BUET).

A list of industries has been prepared and submitted to NIYD, which are not receiving interns but interested in it.

XIII. Types of Academia & IT Sector Needs

Out of 20 students, only 2-3 are suitable for job. They follow NSDA guidelines and conduct 3rd party assessments. They can't produce as per requirement. IT support can't be produced as per industry demands. They follow the Syllabus. The syllabus changes every two years but needs annual updates. Some students in the Textile Machinery Department are using AI in their works. Only 30% of IT worker demand is met.

XIV. Kind of syllabus is required there to suit in the industry

There is no much changes demanded in the syllabus. But the main problem is the lesson hours. For example, if there is 20 lesson hours are required, the students get 4-5 hours. That is the biggest problem or gap. Skill gap has been reduced but the scope of improvement is there. The syllabus is overseen by an Academic Council of 17 experts. A new syllabus needs to be developed in collaboration with NSD, industry partners, and academic institutions. The syllabus should be designed based on industries' demands. Practical, hands-on training, maintenance training, IT support service, cyber security, and language skills are to be included in the curriculum.

XV. Kinds of strategy support for I-A collaboration

No structured plan exists. Need policy support to do it. Students and trainers both must improve. Many students are not job focused. MoUs are needed most. They have not received any proposal for I-A collaboration but are interested in doing it. Regular collaboration takes place with Samsung (BUET).

XVI. Effectiveness of I-A Collaboration

No current practice or experience with I-A. No proposal has been received so far. No experience as not practiced. No idea. Trying to do more. Technology can be developed to improve production and make it cost-effective. Currently, many recruits learn by trial and error, causing losses. Out of 5, about 3 are not work-ready.

4.2 In-depth Study Findings

1. **Understand about 4IR**
   - It's a way through which people can make their lives and earnings easier. Also, it improves and simplifies the quality of life. It is introducing a technology-based era. It has changed our lives, business, employment system, communication system, healthcare, etc. It mainly refers to AI, IoT, robotics, etc. (NACTAR)
   - It refers to technological improvement and the immense use of technology. (YPSA)
   - Bangladesh is far behind in this concept compared to other countries. It enables the ability to do business worldwide while sitting in one place. (BGTTC)
   - It's a technological revolution that changed the pattern of relationships and the work environment. Artificial intelligence is known as 4IR. The combination of technology and human life defines 4IR. Also, it is changing the mode of work environment. It leads to industrial improvement through technology. (UCEP)
   - Working has become easier than before. (BKTTC)
   - It can be used to expand business and increase productivity. (NIYD)

2. **Work quality of the present youth and topics that need to be improved**
   Work quality is not good. There are very few job opportunities. Youth are not skilled enough, though it totally depends on the type of work one wants to do. Topics need to be improved:
   a. Lack of creativity and innovative thinking
   b. Poor problem-solving capacity
   c. Insufficient technical and technological skills
   d. Limited capacity for teamwork
   e. Lack of openness to learning
   f. Low technological knowledge
   g. Poor language and leadership skills
   h. Curriculum expansion is needed
   i. Duration of training should be increased

j. Internship opportunities should be created
k. Ensure practical training

Opportunities should be created for subject-related and practical training. Youth should learn about 4IR and receive training at least equivalent to NSDA Level-3 Computer Training. Alongside academic education, 4IR-related topics must be included in the syllabus.

There is a need to introduce long-term courses. Due to the short syllabus, students are not being trained properly. If topics are taught in greater depth and internship facilities are provided, it will help them secure jobs. (NIYD)

3. **Possibility to improve skills**
    - It is possible to improve the skill. But some people lack financial condition, so government incentives are needed to help them access these trainings. (NACTAR)
    - It is possible only when the student has patience and a willingness to learn. (BGTTC)
    - All institutes across the country must be made effective and dynamic through an improved syllabus and internship opportunities, along with project-based work. (UCEP)
    - Personal interest is very important, and training must include an advanced syllabus over a six-month period. (BKTTC)
    - Improved technical skills, AI, data science, digital marketing, graphic design, and social media management must be learned. (NIYD)

4. **Effectiveness of the training at the National Youth Development Center and where to improvement**
    It is effective because it provides free training to students on relevant topics such as data science, robotics, and language skills. It offers practical training and product creation. However, a lack of financial freedom is a barrier for some students.

    Areas for improvement:
    a) It is not very effective because the course is too basic and does not help much.
    b) If job-oriented training and loan facilities are provided, it will help more students.
    c) Only relevant and up-to-date topics should be taught.
    d) Skilled teachers should be appointed.
    e) There must be partnerships with industries.
    f) Career counseling facilities should be created.
    g) Each topic should be discussed in more detail. (NIYD)

5. **Types of training provided at the National Youth Development Center**
    a) Digital marketing
    b) Data science
    c) Catering
    d) Mobile servicing and repairing

Submitted by: BISR Trust

e) Professional graphic design
f) Tourism
g) Baking
h) Computer
i) Electronics
j) Electrical and house wiring
k) Small business
l) Web design

6. **Further training needed**
   - Advanced training may be multiple on AI-related skills
   - Structured and precise training in AI (NACTAR)
   - Management, communication, and soft skills
   - Skills to directly engage with industry
   - A six-month advanced AI training program

7. **Scope for collaboration in AI in Bangladesh**
   - There is considerable scope; the government must take steps to support it. (NACTAR)
   - There is room for ICT-based collaboration, as many industries are emerging in this sector. (UCEP)
   - Collaboration can support business expansion. (UCEP)
   - Organize workshops with industry experts. (UCEP)

8. **Relevant topics to 4IR**
   All the topics and trades are somewhat related to 4IR. (NACTAR). It is related to 4 topics:
   1) Industry
   2) Innovation
   3) Infrastructure
   4) Investment

   Strong internet, cloud support, and data security are most important in this regard.

9. **Task to do to increase collaboration**
   - Use of advanced technologies for AI development
   - Introducing well-trained trainers
   - Provide advanced equipment and machinery
   - Create internship opportunities
   - Offer chances to work in different institutions (NACTER)
   - Encourage institutes to engage directly with industries and advocate for their students (NACTAR)
   - Build a strong monitoring system; teachers also need training (BGTTC)

Submitted by: BISR Trust

10. Internship opportunities and the alternatives

- Very limited opportunities are available. Not all institutions and trades offer internships.
- The government must address this and create employment opportunities for the unemployed. (NACTAR)

11. Will industry approach academia or academia approach industry?

- Both parties should approach each other based on mutual needs. (NACTAR)
- Collaboration is needed from both sides. They should communicate, understand specific needs, and provide skilled workers, which will benefit both industry and academia. (UCEP)

12. Gap between current skills and the future required skills and ways to develop through industry collaboration

- It will totally depend on demand
- The main difference is in technology and its usage. Now, people use basic computer software, but soon AI and nanotechnology will be needed. (NACTER)
- There will be major changes in communication and employment sectors.
- At present, communication is basic, but in the future, intercultural communication and virtual team management will become important.
- People will work more on online and remote projects.
- Virtual or remote internship opportunities will become necessary. (UCEP)

13. Effectiveness of Industry collaboration for NIYD training

- It will help create jobs and reduce unemployment. (NIYD)
- Better management and job training are needed.
- Industries must be included in the training system.
- Collaboration with both established and growing industries is important for improving NIYD.
- Monitoring both teachers and students can make the training more effective.
- A virtual reality-based coaching and feedback system should be developed.
- Skill gaps should be identified, and training should be designed to address them. (UCEP)
- Training programs should not be too personalized or isolated.

4.3 FGD Findings

I. Assessing Youth Employment Skills and Identifying Training Needs

The skills currently possessed by the youth are not sufficient. Training aligned with current demands is needed. (**NIYD, UCEP, NACTAR, YPSA**)

There are several limitations in the current employment situation. Firstly, the demand of the job market is not being fully met. For example, without improving our skills, we will not be

able to succeed. One such skill is proficiency in English, which would make it easier to get a job. Secondly, we need to reform our education system, because many young people still cannot use computers, programming, or software applications. Thirdly, in every trade, training should be provided on English language skills and computer literacy, which would make it easier to find employment. Everyone should support such initiatives. (**BKTTC**)

At present, production and supply in industries and factories are being conducted through advanced machinery and digital systems. Therefore, skill development in various areas is essential. In this context, institution-based skill development—especially ICT-related training—can play a vital role in driving the Fourth Industrial Revolution (4IR). Additionally, sector-specific knowledge and skills can be developed in areas such as data science, AI, robotics, food and beverages, agriculture, fish cultivation, food processing, and farming. (**UCEP, YPSA**)

II. Effectiveness of Training Provided by the NIYD

The training programs offered by NIYD are highly useful. However, they are currently insufficient, and basic training alone is not enough to progress in the professional field. In this context, the following areas need to be addressed: management systems, presentation skills, reporting, programming, technological proficiency, communication efficiency, and gaining digital knowledge, among others.(**NIYD**)

At the centers operated by the National Institute of Youth Development (NIYD), various training programs are offered for the development of youth and adolescents. Residential facilities and meals are provided to the trainees by the authorities. The accommodation, food, and training are completely free of charge. Qualified instructors are hired to conduct the training sessions. Moreover, participants are provided with a daily allowance ranging from BDT 3,000 to BDT 5,000. These training programs significantly contribute to the development of youth and adolescents. In some cases, the trainees also attend regular classes or academic programs alongside the training. Such initiatives are widely appreciated and supported by all. (**BKTTC**)

The training programs offered by NIYD are moderately useful. However, they would be more effective if the courses were aligned with current industry demands and there was collaboration with relevant industries. Additionally, having arrangements for internships would further enhance their impact. (**UCEP, NACTAR**)

III. Training Needs of the National Youth Development Program to Meet the Demands of the 4IR

To meet the demands of the Fourth Industrial Revolution (4IR), the National Institute of Youth Development (NIYD) should offer training in the following areas: Artificial Intelligence (AI), Data Science, Robotics, 4IR-related trades, Cyber Security, Advanced Computer Skills. These courses will help equip the youth with future-ready skills and ensure they are competitive in the evolving job market. (**NIYD**)

To meet the demands of the Fourth Industrial Revolution, it is essential to introduce updated and time-relevant curricula and training programs. Priority should be given to training in areas

such as: Critical thinking and problem-solving, Machine Learning, Data Science, Data Analytics, Cloud Computing, Cyber Security, Robotics, Digital Marketing, Graphics Design, Auto Cad, Web Design, 3D Modeling, Freelancing, English Language Skills. (**BKTTC, UCEP, NACTAR, YPSA**)

IV. Opportunities for Collaboration with Other Industrial Organizations

Yes, there are definitely opportunities to collaborate with other institutions. For example, partnerships can be formed with the Agriculture Department, ICT Department, various industries, defense sector, hospitals, tourism centers, garments industry, and others—provided the authorities are willing to pursue such collaborations. (NIYD, NACTAR)

There are opportunities for internships with different institutions. In addition, job fairs can be organized to help participants find suitable employment. Seminars and symposiums can also be arranged to enhance knowledge sharing and professional networking. (YPSA, UCEP)

Collaboration with reputed institutions helps enhance students' skills and makes it easier for them to secure employment. However, if an institution is not managed properly and fails to collaborate with other reputed organizations, it negatively affects the students. They miss out on valuable learning opportunities, face uncertainty about their future, and often do not complete the course within the designated time. (BKTTC)

V. Perceived Relevance of the Issue to the Fourth Industrial Revolution (4IR)

This is certainly related to the Fourth Industrial Revolution (4IR). However, it is essential to additionally include components such as data analysis, programming, cloud computing, and cyber security systems.(NIYD, UCEP, NACTAR,YPSA)

VI. Strategies to Enhance Industry-Academia Collaboration

To enhance collaboration, it is necessary to introduce advanced long-term courses focused on components of the Fourth Industrial Revolution (4IR). In addition, the following steps should be taken: Promote research projects in the education sector, Integrate AI-powered systems into academic sessions, Establish advanced research centers and engage skilled researchers, Set up lab-based practical training centers, Organize national and international level competitions, Promote automation and smart technology in the industry, Create 5G ecosystem. (NIYD, NACTAR)

To ensure effective collaboration among national and international projects and institutions, it is essential to establish a unified platform for joint activities. This can include organizing monthly or quarterly meetings and workshops where different stakeholders can share their progress, challenges, and experiences. Support should also be provided in the field of skill development, especially to institutions that are working on capacity building and training. These institutions should be empowered with appropriate training tasks and sufficient resources to enhance their capabilities. (BKTTC)

To strengthen collaboration, the following initiatives can be undertaken: Expand computer

training programs, Arrange regular company visits for trainees, Enhance skills based on specific industry needs, Facilitate internship opportunities for practical experience, Provide internship to the trainee, Manage digital class and 3D video system. (UCEP, YPSA)

VII. Availability of Internship Opportunities and Possible Alternatives

There might be opportunities for internships, but we have not accessed them yet. However, arrangements can be made as per the requirements when needed. (NIYD)

There are limited opportunities for internships, but if such opportunities were available, it would have been much easier for us to secure jobs and gain a better understanding of the industry. (UCEP, YPSA)

Since internship opportunities are very limited, gaining even a basic level of practical understanding through training becomes difficult. As alternatives, students can get involved in local NGOs, community projects, the Red Crescent, or international development organizations. In a short time frame, they can also participate in research activities, surveys, data entry, and other practical assignments conducted by such organizations.(BKTTC)

VIII. Should Academia Approach Industry or Should Industry Approach Academia?

If AI technology is integrated through training, it will lead to significant improvements in people's lives. As a result, AI will become more accessible to individuals, and in the future, people will not need to approach AI—it will be a part of their everyday lives. (UCEP)

The development of AI through research and application has the potential to significantly improve people's daily lives. The widespread adoption of AI can greatly enhance productivity and efficiency, ultimately benefiting society as a whole. The development of AI should aim to make people's daily tasks easier, ensuring that it provides practical value. It is essential to integrate AI knowledge and skills in a way that aligns with people's responsibilities and enhances their capabilities. (BKTTC)

IX. Bridging the Gap between Current and Future Skill Demands Through Industry-Academia Collaboration

Currently, the training provided follows mostly traditional methods. However, if topics related to the Fourth Industrial Revolution (4IR) are included in the syllabus, significant changes will occur. In this context, both the training methods and content need to be updated. Practical, hands-on training should be emphasized, and the focus on communication skills must be increased. Trainees need to be encouraged to take an interest in IoT (NIYD, UCEP, YPSA)

The key to progress lies in the development of critical skills, with a focus on automation, artificial intelligence (AI), and enhanced understanding. These skills are essential for staying competitive in the future job market. (BKTTC)

X. Enhancing NID Training Effectiveness Through Industry-Academia Collaboration

For effective implementation of NIYD's training programs and operations, IA collaboration, institutional management, production-oriented domestic companies, and service data institutions can be supported. Additionally, collaboration can be made in areas like automation, machinery technology, and robotics to reduce labor and increase production in various fields. (NIYD)

Chapter-5
Conclusion and Recommendations

5.1 Conclusion

The current state of youths' employment skills and gaps that need to be addressed through targeted training and education programs of the country shows a big gap where industry and other employers are getting about 30% of that required manpower. Normally, they get 3-5 qualified persons out of 20-25 interviewed candidates.

The effectiveness of NIYD training programs, comparing them with similar initiatives by other government and non-governmental organizations is almost same. NIYD gives training but many of them undertake this training not to get a job in that particular professional field rather learn it for learning sake. The same situation prevails in all the sectors where the trainees are paid. Those who want to go outside the country they try to learn more precisely and properly.

The socioeconomic impact of NIYD training programs on the country, focusing on challenges and opportunities for youth demand, collaboration, and capacity building in the 4IR context is not yet fully designed and achieved. It has to be planned and implemented at the grassroots level.

Key fields of training and education for NIYD trainees, including opportunities for industry-academia collaboration to enhance practical exposure in 4IR-related areas are ICT, artificial intelligence, production of some spare parts, look for low cost machineries, energy efficiency, etc. Most of the organizations did not receive any proposal or gave any proposal to the Industry. Lack of Industry-Academia collaboration is a big barrier as there is marginal success in this field. Collaboration with Technical Education and NSDA is required. An MOU is proposed by NIYD on food technology, which is under process of execution. Some machine suppliers give proposal to the industries and give seminars on usefulness of their machineries. Company like Rahimafrooz did collaboration with BUET, RUET, KUET and MIST. BUET have done some collaborations with some industries and organizations but not to a large scale. BUTEX feels to do it but have not yet achieved much in the regards. BUET has its own unit to channelize the collaboration with other organizations as the organization is also big which is to be handled from one unit. It has its own policy as which unit or person can do how much work. Maximum industries have not given any proposal nor received any proposal either for technology development although they feel now to do it.

5.2 Recommendations

Sl. No	Recommendations	Actions to be taken by
1)	There is a need for a policy from the government on industry-academia collaboration wihout which, the present process of piecemeal effort will not work much. An immediate action is needed to frame and introduce this policy.	Ministry of Youth and Sports; Ministry of Industry; and Ministry of Sceince and Technology.
2)	The issue is almost unexplored in the country, which demands a big-push to speed up the process. A special seminar may be organized with the Industrialists and Academia where two keynote speakers may be there from those two groups. Scope can be worked out as per opinions of these groups.	NIYD can be lead or MoI.
3)	Practical, hands-on training, maintenance training, IT support service, cyber security, and language skill are to be developed.	Training institutes.
4)	Exposure to industry is very less among the trainees and students of the country. In fact, it should be made mandatory for all students to make visit to the industry of the respective fields.	Technical Education Board (TEB). All training institutes.
5)	Actual engagement in 4IR-related training is extremely low. It should be focused in the courses and hands-on training should be given.	TEB. All training institutes.
6)	Faculties in the institutes do not have training on 4IR. They are not much exposed to the 4IR. The faculties need to be given orientation on 4IR.	TEB. All training institutes.
7)	Industry and other employers are currently getting about 30% of the required skill manpower. Normally, they get 3-5 qualified persons out of 20-25 interviewed candidates. A proper quality training is essential to address the needs of the market.	Technical Education Board (TEB). All training centers.
8)	Most of the industries' do not have practice of intersnship but there is scope for the same.	Industry- Academia collaboration.
9)	NIYD gives training but many of them undertake this training not to get a job in that particular professional field. It must develop a screening method so that the right person is given the right training in the right time.	NIYD
10)	Training programs of the NIYD focusing on challenges and opportunities for youths' demand, collaboration, and capacity building in the 4IR context is not yet fully designed	MoST. All institutes' and industries'

	and achieved. As the study shows, it has not been designed in any other academic or training institute of the country except BUET to some extent. But without further delay is has to be planned and implemented. One idea may be that all the institutes' representatives may sit together and can work out a basic agreed guidelines for that.	representatives may sit together and can work out.
11)	NIYD has received a few proposals for collaboration from some industries on skill development, not on technology development. Technology development is not the main thrust of NIYD. But the organization can look for creating that capacity in the future. Proposal for MOU is there on food technology, which is under process. But a dedicated wing/section should work on this issue so that each month it must get some responses from the industries.	A dedicated wing/section should work on this issue from each Indsutry and Academia.
12)	Target highly potential industry/industrial groups to encourage to go for I-A collaboration.	NIYD. Ministry of Industry.
13)	There is scope for industry-academia collaboration with BUET, RUET, KUET, and MIST as Rahimafrooz does it. Maximum industries have not given any proposal nor received either for technology development. Some industries feel that there are scopes for Industry-Academia collaboration to enhance practical exposure in 4IR-related areas particularly to produce some spare parts, look for low cost machineries, energy efficiency, ICT, and artificial intelligence, etc. There is a demand for cost-effective production technology.	Industry-Academia.

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Annexure

Annex -I: Survey Questionnaire for Current Students

Survey Questionnaire for Current Students

Industry Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR

Serial No. [ ][ ][ ][ ]

Enumerator's Information

Name of the Enumerator	
Date of Interview	
Start time	
End time	

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ভূমিকা

শুভেচ্ছা! আমি _____। আমি BISR-এর একজন গবেষণা সহকারী। এর স্থায়ী ঠিকানা হাসিনা ডি প্যালেসে # ৬/বি, বাড়ি # ৬/১৪, ব্লক # এ, লালমাটিয়া, ঢাকা-১২০৭। এটি বর্তমানে "চতুর্থ শিল্প বিপ্লবের জন্য প্রস্তুতি (৪.০): বাংলাদেশে পলিটেকনিক ইনস্টিটিউটের কারিগরি শিক্ষার সম্ভাবনা এবং চ্যালেঞ্জ" প্রকল্প-এর সমীক্ষা বাস্তবায়নে কাজ করছে - সামাজিক বিজ্ঞান গবেষণা কাউন্সিল, পরিকল্পনা বিভাগ, পরিকল্পনা মন্ত্রণালয়, গণপ্রজাতন্ত্রী বাংলাদেশ সরকারের সহায়তায়। আপনি এই ইন্টারভিউ সেশনে অংশগ্রহণ করতে চান কিনা তা বেছে নিতে পারেন। আমরা শুধুমাত্র আপনার সম্মতিতে অধিবেশনে এগিয়ে যাব। সাক্ষাৎকারটি একটি প্রশ্ন সিরিজ অনুসরণ করবে, যা আপনাকে জিজ্ঞাসা করা হবে। আপনার উত্তর নোট করা হবে। আমরা আশা করি আপনি অংশগ্রহণ করে এবং সৎ উত্তর প্রদান করে প্রক্রিয়াটির সফল সম্পাদনের একটি অংশ হবেন। আমরা আপনাকে আশ্বাস দিচ্ছি যে আপনার সমস্ত তথ্য কঠোরভাবে গোপনীয় বলে বিবেচিত হবে।

সাক্ষাৎকারটি সম্পূর্ণ হতে প্রায় ৩০-৪০ মিনিট সময় লাগবে। আপনি একটি নির্দিষ্ট প্রশ্নের উত্তর দিতে অস্বস্তি বোধ করলে অনুগ্রহ করে আমাদের জানান। আপনার যদি ইন্টারভিউ থেকে কোনো বিরতির প্রয়োজন হয় বা যদি অন্য কোনো উপায় থাকে যে আমরা এই সাক্ষাৎকারটিকে আরও আরামদায়ক করতে পারি, তাও নির্দ্বিধায় বলুন। আপনি যদি ইতিমধ্যে আমাদের কোনো সহকর্মীর সাথে ইন্টারভিউটি না করে থাকেন তবে আমি আপনার উপযুক্ত সময় এবং স্থানে সাক্ষাৎকার নেব।

১. গত কয়েক দিনে আমাদের প্রতিষ্ঠানের কেউ কি আপনার সাক্ষাৎকার নিয়েছেন?
ক) হাঁ, যদি হাঁ, তাহলে কখন? _____ দিন আগে (সাক্ষাৎকার বন্ধ করুন) খ) না (এগিয়ে যান)
২. আমি কি ইন্টারভিউ শুরু করতে পারি?
ক) উত্তরদাতা সম্মত হলে এগিয়ে যান খ) উত্তরদাতা একমত না হলে থামুন
৩) সাক্ষাৎকারের পরে যদি আপনার কোন প্রশ্ন থাকে বা আপনার যদি আরও ডিব্রিফের প্রয়োজন হয় তবে আপনি নিম্নলিখিত ব্যক্তির সাথে যোগাযোগ করতে পারেন:
মুনেম আহমদ চৌধুরী, গবেষক, বিআইএসআর ট্রাস্ট। সেল: ০১৮৩৬৯৩৩৯৩৯

সাক্ষাৎকার শুরু করার আগে, নিশ্চিত করুন যে আপনার কাছে প্রয়োজনীয় সমস্ত উপকরণ রয়েছে - প্রশ্নাবলী, সম্মতি ফর্ম, আইডি কার্ড, নোটবুক, কলম এবং স্থানীয় কর্তৃপক্ষের কাছ থেকে প্রয়োজনীয় অনুমতি। আপনি সঠিক ব্যক্তির সাক্ষাৎকার নিচ্ছেন তা নিশ্চিত করুন।

সুরক্ষা ব্যবস্থা:
০ ১৬ বছর বা তার বেশি বয়সীদের জন্য অবহিত সম্মতি ফর্মে স্বাক্ষর করা সরাসরি প্রাপ্ত হতে পারে, এর চেয়ে কমবয়সীদের সম্মতি তাদের পিতামাতা, অভিভাবক, যত্নশীল বা অন্যান্য উপযুক্ত প্রাপ্তবয়স্কদের মাধ্যমে প্রাপ্ত করা হবে;
০ নিশ্চিত করুন যে অংশগ্রহণকারীরা সম্পূর্ণরূপে বুঝতে পারে যে তারা কী অংশ নিতে যাচ্ছে এবং তাদের অংশগ্রহণ স্বেচ্ছাসেবী;
০ অংশগ্রহণকারী তথ্য প্রদানে অস্বস্তি বোধ করলে যে কোনো সময় অধ্যয়ন থেকে প্রত্যাহার করতে পারবেন।
০ অনুমতি ছাড়া কোন ছবি তোলা হবে না;
০ অংশগ্রহণকারীর কাছ থেকে উদ্ধৃতি ব্যবহার করার ক্ষেত্রে, অবহিত সম্মতি প্রাপ্ত করা হবে, এবং নাম প্রকাশ না করার জন্য, ডাকনাম ব্যবহার করা হবে;
০ প্রশ্ন, দৃষ্টিভঙ্গি বা মন্তব্য যা বিচারযোগ্য, সাংস্কৃতিক মূল্যবোধের প্রতি সংবেদনশীল, যেগুলি একজন অংশগ্রহণকারীকে বিপদে ফেলে বা একজন অংশগ্রহণকারীকে অপমানিত করে, অথবা যেগুলি আঘাতমূলক ঘটনা থেকে অংশগ্রহণকারীর বেদনা এবং শোককে পুনরায় সক্রিয় করে তা এড়ানো হবে;
০ অংশগ্রহণকারীকে কোথায় এবং কীভাবে সাক্ষাৎকার নেওয়া হবে সেদিকে মনোযোগ দেওয়া হবে;
০ অংশগ্রহণকারী এখনও ঠিক আছে বা আরামদায়ক কিনা তা দেখতে চেক-আপ প্রশ্ন যোগ করা হবে। সাক্ষাৎকারের দৈর্ঘ্য হবে অবহিত সম্মতির উপর ভিত্তি করে, যা অংশগ্রহণকারীর কাছে গ্রহণযোগ্য, এবং অংশগ্রহণকারীকে জিজ্ঞাসা করা হবে যে তারা ঠিক আছে এবং আরামদায়ক কিনা;
০ ইন্টারভিউয়ারের সংখ্যা সীমিত থাকবে। অংশগ্রহণকারী স্বাচ্ছন্দ্য বোধ করে তা নিশ্চিত করতে পর্যাপ্ত সময় নিন।

নৈতিক বিবেচনা:
অধ্যয়নটি নিম্নলিখিত নৈতিক নির্দেশিকা মেনে পরিচালিত হবে:
○ মূল্যায়নে এমন কিছু থাকবে না যা আইনগত বা নৈতিক কারণে উত্তরদাতাদের ক্ষতি করতে পারে।
○ কাউকে জরিপের জন্য তথ্য দিতে বাধ্য করা হবে না।
○ স্বতন্ত্র ডেটা (উদাহরণস্বরূপ, কেস স্টাডি) সর্বসম্মতভাবে রিপোর্ট করা হবে;
○ তথ্য সংগ্রহের আগে সমস্ত উত্তরদাতাদের কাছে সমীক্ষার উদ্দেশ্যগুলি পরিষ্কারভাবে ব্যাখ্যা করা হবে। দলটি যেকোন ব্যক্তির কাছ থেকে তথ্য সংগ্রহ করা থেকে বিরত থাকবে যারা তথ্য প্রদানে অস্বীকৃতি জানায় বা অনীহা দেখায়।
○ তথ্য সংগ্রহের আগে উত্তরদাতাদের মৌখিক ও লিখিত সম্মতি নেওয়া হবে এবং ছবি ব্যবহারের জন্য লিখিত সম্মতি নেওয়া হবে।
○ মূল্যায়নকারীরা উত্তরদাতাদের তাদের তথ্য এবং ডেটার উৎসের গোপনীয়তা বজায় রাখার জন্য অত্যন্ত প্রতিশ্রুতিবদ্ধ হবে। তারা তথ্য সংগ্রহে নিরপেক্ষ হতে তাদের আন্তরিক প্রচেষ্টা চালাবে।

অনুমতি ফরম
১. উপরে বর্ণিত হিসাবে, আমাকে নির্দিষ্ট এবং অতিরিক্ত উদ্দেশ্য(গুলি) সম্পর্কে অবহিত করা হয়েছে যার জন্য আমার ব্যক্তিগত ডেটা সংগ্রহ করা হবে, ব্যবহার করা হবে এবং প্রকাশ করা হবে।
২. আমি বুঝতে পারি যে আমার ব্যক্তিগত ডেটা টি অর্জনের জন্য প্রয়োজনীয় গৌণ উদ্দেশ্যে ব্যবহার এবং প্রকাশ করা হতে পারে
৩. আমি বুঝি যে আমি গবেষণাদলের সাথে যোগাযোগ করে অনুরোধের ভিত্তিতে আমার ব্যক্তিগত ডেটা অ্যাক্সেস এবং সংশোধন করতে পারি।
৪. আমি ঘোষণা করছি যে আমি যে তথ্য দিয়েছি তা আমার জানামতে সত্য এবং সঠিক।
৫. আমি এই অবহিত সম্মতি ফর্মের বিষয়বস্তু বুঝতে পারি:

(ক) উপরের ধারাগুলো পড়ার পর: হাঁ/না
(খ) উপরের ধারাগুলো অনুবাদ করা হয়েছে বা আমাকে পড়া হয়েছে: হাঁ/না

স্বাক্ষরিত (স্থানে)...

তারিখ)..

ইন্টারভিউয়ার: আমি প্রত্যয়ন করছি যে _____ তারিখে _____ তারিখে, তথ্য পাওয়ার এবং ব্যবহারের অনুমতির জন্য আমি এই ফর্মের বিষয়বস্তু ওই ব্যক্তির কাছে পৌঁছে দিয়েছি।

Types of respondents: Current student of NIYD

১. উত্তরদাতার তথ্য

Sl. no.	Question	Response
১.	উত্তরদাতার নাম	
২.	ফোন নম্বর	
৩.	প্রতিষ্ঠানের নাম	
৪.	একাডেমিক বর্ষ	
৫.	ডিপার্টমেন্ট/ ট্রেড	

২. ডেমোগ্রাফিক তথ্য

Sl. no.	Question	Response	Code
৬.	উত্তরদাতার বয়স		
৭.	লিঙ্গ পরিচয়	নারী	1
		পুরুষ	2
		তৃতীয় লিঙ্গ	3
৮.	পারিবারিক আয় (মাসিক)		
৯.	নিচের কোন ডিভাইসটি আপনার নিজের রয়েছে? (একাধিক উত্তর হতে পারে)	এন্ড্রয়েড মোবাইল	1
		ল্যাপটপ	2
		ডেস্কটপ	3
		ট্যাব	4
		অন্যান্য	
১০.	কোন উদ্দেশ্যে আপনি এই ডিভাইসটি/গুলো ব্যবহার করেন? (একাধিক উত্তর হতে পারে)	সামাজিক যোগাযোগ মাধ্যম ব্যবহারের জন্য (ফেসবুক, ইউটিউব, টিকটক, ইন্সটাগ্রাম, এবং অন্যান্য)	1
		বিভিন্ন ওয়েবসাইট দেখার জন্য	2
		মুভি, সিরিজ বা নাটক দেখার জন্য	3
		গেম খেলার জন্য	4
		প্রাতিষ্ঠানিক শিক্ষার কাজে	5
		অনলাইনে শিক্ষা অর্জনের জন্য (Coursera, Bohubrihi, Udemy, Code Academy and others)	6
		ফ্রিল্যান্সিং করার জন্য	7
		অন্যান্য	
১১.	গতি এবং ভলিউমের দিক থেকে আপনি কি ভালো ইন্টারনেট সার্ভিস ব্যবহার করেন?	হ্যাঁ	1
		না	0
		খারাপ নয় এমন (মোটামুটি)	2

৩. চতুর্থ শিল্প বিপ্লব সম্পর্কিত জ্ঞান এবং মনোভাব

Submitted by: BISR Trust

Sl. no.	Question	Response		Code
১২.	আপনি কি চতুর্থ শিল্প বিপ্লব (Fourth Industrial Revolution (4.0)) সম্পর্কে জানেন?	হ্যাঁ		1
		না		0
যদি উত্তর না হয়, তবে তাকে চতুর্থ শিল্প বিপ্লব সম্পর্কে প্রাথমিক ধারণা দিন। এরপর পরবর্তী প্রশ্নগুলো জিজ্ঞেস করা শুরু করুন।				
১৩.	চতুর্থ শিল্প বিপ্লব কি আপনার নিকট আকর্ষণীয়?	হ্যাঁ		1
		না		0
১৪.	আপনি কি চতুর্থ শিল্প বিপ্লব এর প্রযুক্তি গুলো সম্পর্কে জানতে আগ্রহী?	হ্যাঁ		1
		না		0
১৫.	আপনি কি চতুর্থ শিল্প বিপ্লব এর প্রযুক্তি গুলো সম্পর্কে ব্যবহার করতে আগ্রহী?	হ্যাঁ		1
		না		0
১৬.	আপনি কি চতুর্থ শিল্প বিপ্লব সম্পর্কিত প্রযুক্তিগত পরিবর্তনগুলির সাথে নিজেকে মানিয়ে নিতে প্রস্তুত?	হ্যাঁ		1
		না		0
১৭.	চতুর্থ শিল্প বিপ্লব সম্পর্কিত প্রযুক্তিগত পরিবর্তনগুলি পেতে আপনার আর্থিক ক্ষমতার সমস্যা রয়েছে কিনা?	হ্যাঁ		1
		না		0

১৭. নিম্নোলিখিত বিষয়গুলোর সাথে আপনি কতটা পরিচিত?

Sl. no.	Question	খুব পরিচিত (এক্সপার্ট)	পরিচিত (রেগুলার ব্যবহার করে)	মোটামুটি পরিচিত (মাঝেমাঝে ব্যবহার করে)	কিছুটা পরিচিত (জানে তবে ব্যবহার করেনি)	একেবারেই অপরিচিত
		(5)	**(4)**	**(3)**	**(2)**	**(1)**
a)	ডাটা সাইন্স					
b)	ইন্টারনেট অফ থিংস					
c)	সাইবার সিকিউরিটি এবং এনক্রিপশান					
d)	আর্টিফিশিয়াল ইন্টেলিজেন্স					
e)	ক্লাউড কম্পিউটিং					
f)	অগমেন্টেড এবং ভার্চুয়াল রিয়েলিটি					
g)	নন হিউমেনয়েড এবং রোবট					
h)	থ্রিডি প্রিন্টিং					
i)	জেনেরাটিভ এআই (e.g., Chat GPT)					

১৮. নিম্নোলিখিত বিষয়গুলোর সাথে আপনি কতটা পরিচিত/ জানেন?

Sl. no.	Question	খুব পরিচিত (এক্সপার্ট)	পরিচিত (রেগুলার ব্যবহার করে)	মোটামুটি পরিচিত (মাঝেমাঝে ব্যবহার করে)	কিছুটা পরিচিত (জানে তবে ব্যবহার করেনি)	একেবারেই অপরিচিত
		(5)	**(4)**	**(3)**	**(2)**	**(1)**
a.	মাইক্রোসফট অফিস (MS word, Excel এবং Powerpoint)					
b.	ইমেল					
c.	বার্তাপ্রেরণ বা ভিডিও কনফারেন্সিং প্ল্যাটফর্মের মতো বিভিন্ন যোগাযোগের					

Sl. no.	Question	ভালোভাবে জানেন (এক্সপার্ট)	জানেন (রেগুলার ব্যবহার করে)	মোটামুটি জানেন (মাঝেমাঝে ব্যবহার করে)	কিছুটা জানেন (জানে তবে ব্যবহার করেনি)	জানেন না
	সরঞ্জামগুলো (Zoom, Google Meet, Telegram etc.)					
		(5)	(4)	(3)	(2)	(1)
d)	কি ওয়ার্ড দিয়ে সার্চ ইঞ্জিন কার্যকর ভাবে ব্যবহার করা (SEO)					
e)	শক্তিশালী পাসওয়ার্ড তৈরি করতে জানা					
f)	স্ক্যাম বা ভাইরাস এট্যাক					
i)	অনলাইন থেকে প্রাপ্ত তথ্যগুলির বিশ্বাসযোগ্যতা বা ফ্যাক্ট চেকিং (Fact checking)					
j)	ডিভাইসে সাধারণ প্রযুক্তিগত সমস্যাগুলির সমাধান					
k)	ডিজিটাল সমস্যা সমাধানে ভিডিও টিউটোরিয়াল ব্যবহার করা					
l)	কপিরাইট					

৪. ১ফ্রিল্যান্সিং/ প্রযুক্তি নির্ভর কোন চাকুরির সাথে সম্পৃক্ততা

১৯.	আপনি কি ফ্রিল্যান্সিং/ প্রযুক্তি নির্ভর কোন চাকুরির সাথে সংযুক্ত আছেন?	হ্যাঁ	১
		না	0
২০.	করলে কাজের ধরন কোনটি?	ফ্রিল্যান্সিং	১
		প্রযুক্তি নির্ভর চাকুরি	২
		অন্যান্য	

২১	আপনার এই প্রতিষ্ঠানে ভর্তি হওয়ার উদ্দেশ্য কি?	দক্ষ হওয়া	১
		চাকরি পাওয়া	২
		অন্যান্য	৩
২২	এই ট্রেনিং পর্বর্তি চাকরির বাজার কেমন বলে আপনি মনে করেন?	ভালো	১
		মোটামুটি	২
		ভাল না	৩
২৩	আপনি পাশ করে কি করতে চান?	ফ্রিল্যান্সিং	১
		প্রাইভেট চাকরি	২
		অন্যান্য	৩
২৪	আপনার চাকরি পেতে আর কিকি বিষয়ে দক্ষতা দরকার বলে মনে করেন?	ডাটা সায়েন্স	১
		গ্রাফিক ডিজাইন	২
		এআই	৩

২৫	সেই দক্ষতা গুলো কোথায় পাওয়া যায়?	কোনো প্রতিষ্ঠান প্রদান করে	১
		ইন্টারনেট	২
		অনলাইন ক্লাস	৩
২৬	সেই দক্ষতাগুলো পাওয়ার জন্য আপনার যথেষ্ট জ্ঞান আছে কি না??	হ্যাঁ	০
		না	১
২৭	প্রশিক্ষণকে আপনি কতটা কার্যকর বলে মনে করেন?	আনেক কার্যকর	১
		মোটামুটি কার্যকর	২
		কার্যকর না	৩
২৮	আন্য কোনো প্রতিষ্ঠানের সাথে আপনার এই প্রতিষ্ঠান কোলাবোরেট করতে পারে কি না?	হ্যাঁ	০
		না	১
২৯	যদি অন্য কোনো প্রতিষ্ঠানের সাথে কোলাবোরেট করে তাহলে কি ধরনের সমস্যা আছে?	কোর্সটি শেষ হতে অধিক সময় লাগবে	১
		কারিকোলাম সাজাতে সমস্যা হবে	২
		অন্যান্য	৩
৩০	যদি অন্য কোনো প্রতিষ্ঠানের সাথে কোলাবোরেট করে তাহলে কি ধরনের সম্ভাবনা সৃস্টি হবে?	শিক্ষার্থীরা ভালো শিখবে	১
		চাকরি পেতে সাহায্য হবে	২
		অন্যান্য	৩
৩১	আপনার এ প্রতিষ্ঠানের আর কি ধরনের কেপাসিটি তৈরি করা দরকার?	কারিকোলাম আরো সমৃদ্ধ করা	১
		জনবল বাড়ানো	২
		কম্পিউটার, সরঞ্জাম বাড়ানো	৩
		অন্যান্য	৪
৩২	আপনি কখনো কোন ইন্ডাস্ট্রি ভিজিট করেছেন কি না?	হ্যাঁ	০
		না	১
৩৩	যদি হ্যাঁ হয়, আপনি ইন্ডাস্ট্রি ভিজিট করে তা থেকে কি অভিজ্ঞতা অর্জন করেছেন?	ইন্ডাস্ট্রি কিভাবে কাজ করে	১
		ইন্ডাস্ট্রিতে কাজ করতে কি দক্ষতা দরকার তা জেনেছেন	২
		অন্যান্য	৩

Annex -II: Survey Questionnaire for Course Completed Students who are looking for Job

Survey Questionnaire for Course Completed Students who are looking for Job

Industry Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR

Serial No. [ ][ ][ ][ ]

Enumerator's Information

Name of the Enumerator	
Date of Interview	
Start time	
End time	

Study Conducted By

Bangladesh Institute of Social Research (BISR) Trust

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March, 2025

Submitted by: BISR Trust

ভূমিকা

শুভেচ্ছা! আমি _____। আমি BISR-এর একজন গবেষণা সহকারী। এর স্থায়ী ঠিকানা হাসিনা ডি প্যালেসে # ৬/বি, বাড়ি # ৬/১৪, ব্লক # এ, লালমাটিয়া, ঢাকা-১২০৭। এটি বর্তমানে "চতুর্থ শিল্প বিপ্লবের জন্য প্রস্তুতি (৪.০): বাংলাদেশে পলিটেকনিক ইনস্টিটিউটের কারিগরি শিক্ষার সম্ভাবনা এবং চ্যালেঞ্জ" প্রকল্প-এর সমীক্ষা বাস্তবায়নে কাজ করছে - সামাজিক বিজ্ঞান গবেষণা কাউন্সিল, পরিকল্পনা বিভাগ, পরিকল্পনা মন্ত্রণালয়, গণপ্রজাতন্ত্রী বাংলাদেশ সরকারের সহায়তায়। আপনি এই ইন্টারভিউ সেশনে অংশগ্রহণ করতে চান কিনা তা বেছে নিতে পারেন। আমরা শুধুমাত্র আপনার সম্মতিতে অধিবেশনে এগিয়ে যাব। সাক্ষাৎকারটি একটি প্রশ্ন সিরিজ অনুসরণ করবে, যা আপনাকে জিজ্ঞাসা করা হবে। আপনার উত্তর নোট করা হবে। আমরা আশা করি আপনি অংশগ্রহণ করে এবং সৎ উত্তর প্রদান করে প্রক্রিয়াটির সফল সম্পাদনের একটি অংশ হবেন। আমরা আপনাকে আশ্বাস দিচ্ছি যে আপনার সমস্ত তথ্য কঠোরভাবে গোপনীয় বলে বিবেচিত হবে।

সাক্ষাৎকারটি সম্পূর্ণ হতে প্রায় ৩০-৪০ মিনিট সময় লাগবে। আপনি একটি নির্দিষ্ট প্রশ্নের উত্তর দিতে অস্বস্তি বোধ করলে অনুগ্রহ করে আমাদের জানান। আপনার যদি ইন্টারভিউ থেকে কোনো বিরতির প্রয়োজন হয় বা যদি অন্য কোনো উপায় থাকে যে আমরা এই সাক্ষাৎকারটিকে আরও আরামদায়ক করতে পারি, তাও নির্দ্বিধায় বলুন। আপনি যদি ইতিমধ্যে আমাদের কোনো সহকর্মীর সাথে ইন্টারভিউটি না করে থাকেন তবে আমি আপনার উপযুক্ত সময় এবং স্থানে সাক্ষাৎকার নেব।

১. গত কয়েক দিনে আমাদের প্রতিষ্ঠানের কেউ কি আপনার সাক্ষাৎকার নিয়েছেন?
ক) হ্যাঁ, যদি হ্যাঁ, তাহলে কখন? _____ দিন আগে (সাক্ষাৎকার বন্ধ করুন) খ) না (এগিয়ে যান)
২. আমি কি ইন্টারভিউ শুরু করতে পারি?
ক) উত্তরদাতা সম্মত হলে এগিয়ে যান খ) উত্তরদাতা একমত না হলে থামুন
৩) সাক্ষাৎকারের পরে যদি আপনার কোন প্রশ্ন থাকে বা আপনার যদি আরও ডিব্রিফের প্রয়োজন হয় তবে আপনি নিম্নলিখিত ব্যক্তির সাথে যোগাযোগ করতে পারেন:
মুনেম আহমদ চৌধুরী, গবেষক, বিআইএসআর ট্রাস্ট। সেল: ০১৮৩৬৯৩৩৯৩৯

সাক্ষাৎকার শুরু করার আগে, নিশ্চিত করুন যে আপনার কাছে প্রয়োজনীয় সমস্ত উপকরণ রয়েছে - প্রশ্নাবলী, সম্মতি ফর্ম, আইডি কার্ড, নোটবুক, কলম এবং স্থানীয় কর্তৃপক্ষের কাছ থেকে প্রয়োজনীয় অনুমতি। আপনি সঠিক ব্যক্তির সাক্ষাৎকার নিচ্ছেন তা নিশ্চিত করুন।

সুরক্ষা ব্যবস্থা:

০ ১৬ বছর বা তার বেশি বয়সীদের জন্য অবহিত সম্মতি ফর্মে স্বাক্ষর করা সরাসরি প্রাপ্ত হতে পারে, এর চেয়ে কমবয়সীদের সম্মতি তাদের পিতামাতা, অভিভাবক, যত্নশীল বা অন্যান্য উপযুক্ত প্রাপ্তবয়স্কদের মাধ্যমে প্রাপ্ত করা হবে;

০ নিশ্চিত করুন যে অংশগ্রহণকারীরা সম্পূর্ণরূপে বুঝতে পারে যে তারা কী অংশ নিতে যাচ্ছে এবং তাদের অংশগ্রহণ স্বেচ্ছাসেবী;

০ অংশগ্রহণকারী তথ্য প্রদানে অস্বস্তি বোধ করলে যে কোনো সময় অধ্যয়ন থেকে প্রত্যাহার করতে পারবেন।

০ অনুমতি ছাড়া কোন ছবি তোলা হবে না;

০ অংশগ্রহণকারীর কাছ থেকে উদ্ধৃতি ব্যবহার করার ক্ষেত্রে, অবহিত সম্মতি প্রাপ্ত করা হবে, এবং নাম প্রকাশ না করার জন্য, ডাকনাম ব্যবহার করা হবে;

০ প্রশ্ন, দৃষ্টিভঙ্গি বা মন্তব্য যা বিচারযোগ্য, সাংস্কৃতিক মূল্যবোধের প্রতি সংবেদনশীল, যেগুলি একজন অংশগ্রহণকারীকে বিপদে ফেলে বা একজন অংশগ্রহণকারীকে অপমানিত করে, অথবা যেগুলি আঘাতমূলক ঘটনা থেকে অংশগ্রহণকারীর বেদনা এবং শোককে পুনরায় সক্রিয় করে তা এড়ানো হবে;

০ অংশগ্রহণকারীকে কোথায় এবং কীভাবে সাক্ষাৎকার নেওয়া হবে সেদিকে মনোযোগ দেওয়া হবে;

০ অংশগ্রহণকারী এখনও ঠিক আছে বা আরামদায়ক কিনা তা দেখতে চেক-আপ প্রশ্ন যোগ করা হবে। সাক্ষাৎকারের দৈর্ঘ্য হবে অবহিত সম্মতির উপর ভিত্তি করে, যা অংশগ্রহণকারীর কাছে গ্রহণযোগ্য, এবং অংশগ্রহণকারীকে জিজ্ঞাসা করা হবে যে তারা ঠিক আছে এবং আরামদায়ক কিনা;

০ ইন্টারভিউয়ারের সংখ্যা সীমিত থাকবে। অংশগ্রহণকারী স্বাচ্ছন্দ্য বোধ করে তা নিশ্চিত করতে পর্যাপ্ত সময় নিন।

নৈতিক বিবেচনা:

অধ্যয়নটি নিম্নলিখিত নৈতিক নির্দেশিকা মেনে পরিচালিত হবে:

০ মূল্যায়নে এমন কিছু থাকবে না যা আইনগত বা নৈতিক কারণে উত্তরদাতাদের ক্ষতি করতে পারে।

০ কাউকে জরিপের জন্য তথ্য দিতে বাধ্য করা হবে না।

০ স্বতন্ত্র ডেটা (উদাহরণস্বরূপ, কেস স্টাডি) সর্বসম্মতভাবে রিপোর্ট করা হবে;

০ তথ্য সংগ্রহের আগে সমস্ত উত্তরদাতাদের কাছে সমীক্ষার উদ্দেশ্যগুলি পরিষ্কারভাবে ব্যাখ্যা করা হবে। দলটি যেকোন ব্যক্তির কাছ থেকে তথ্য সংগ্রহ করা থেকে বিরত থাকবে যারা তথ্য প্রদানে অস্বীকৃতি জানায় বা অনীহা দেখায়।

০ তথ্য সংগ্রহের আগে উত্তরদাতাদের মৌখিক ও লিখিত সম্মতি নেওয়া হবে এবং ছবি ব্যবহারের জন্য লিখিত সম্মতি নেওয়া হবে।

০ মূল্যায়নকারীরা উত্তরদাতাদের তাদের তথ্য এবং ডেটার উৎসের গোপনীয়তা বজায় রাখার জন্য অত্যন্ত প্রতিশ্রুতিবদ্ধ হবে। তারা তথ্য সংগ্রহে নিরপেক্ষ হতে তাদের আন্তরিক প্রচেষ্টা চালাবে।

অনুমতি ফরম

১. উপরে বর্ণিত হিসাবে, আমাকে নির্দিষ্ট এবং অতিরিক্ত উদ্দেশ্য(গুলি) সম্পর্কে অবহিত করা হয়েছে যার জন্য আমার ব্যক্তিগত ডেটা সংগ্রহ করা হবে, ব্যবহার করা হবে এবং প্রকাশ করা হবে

২. আমি বুঝতে পারি যে আমার ব্যক্তিগত ডেটা টি অর্জনের জন্য প্রয়োজনীয় গৌণ উদ্দেশ্যে ব্যবহার এবং প্রকাশ করা হতে পারে

৩. আমি বুঝি যে আমি গবেষকদলের সাথে যোগাযোগ করে অনুরোধের ভিত্তিতে আমার ব্যক্তিগত ডেটা অ্যাক্সেস এবং সংশোধন করতে পারি।

৪. আমি ঘোষণা করছি যে আমি যে তথ্য দিয়েছি তা আমার জানামতে সত্য এবং সঠিক।

৫. আমি এই অবহিত সম্মতি ফর্মের বিষয়বস্তু বুঝতে পারি:

(ক) উপরের ধারাগুলো পড়ার পর: হ্যাঁ/না
(খ) উপরের ধারাগুলো অনুবাদ করা হয়েছে বা আমাকে পড়া হয়েছে: হ্যাঁ/না

স্বাক্ষরিত (স্থানে)..

তারিখ)...

ইন্টারভিউয়ার: আমি প্রত্যয়ন করছি যে _____ তারিখে _____ তারিখে, তথ্য পাওয়ার এবং ব্যবহারের অনুমতির জন্য আমি এই ফর্মের বিষয়বস্তু ওই ব্যক্তির কাছে পৌঁছে দিয়েছি।

Types of respondents: Students of NIYD who Completed the Course looking for Job

৫. উত্তরদাতার তথ্য

Sl. no.	Question	Response
২১.	উত্তরদাতার নাম	
২২.	ফোন নম্বর	
২৩.	প্রতিষ্ঠানের নাম	
২৪.	একাডেমিক বর্ষ	
২৫.	ডিপার্টমেন্ট/ ট্রেড	

৬. ডেমোগ্রাফিক তথ্য

Sl. no.	Question	Response	Code
২৬.	উত্তরদাতার বয়স		
২৭.	লিঙ্গ পরিচয়	নারী	1
		পুরুষ	2
		তৃতীয় লিঙ্গ	3
২৮.	পারিবারিক আয় (মাসিক)		
২৯.	নিচের কোন ডিভাইসটি আপনার নিজের রয়েছে? (একাধিক উত্তর হতে পারে)	এন্ড্রয়েড মোবাইল	1
		ল্যাপটপ	2
		ডেস্কটপ	3
		ট্যাব	4
		অন্যান্য	
৩০.	কোন উদ্দেশ্যে আপনি এই ডিভাইসটি/গুলো ব্যবহার করেন? (একাধিক উত্তর হতে পারে)	সামাজিক যোগাযোগ মাধ্যম ব্যবহারের জন্য (ফেসবুক, ইউটিউব, টিকটক, ইন্সটাগ্রাম, এবং অন্যান্য)	1
		বিভিন্ন ওয়েবসাইট দেখার জন্য	2
		মুভি, সিরিজ বা নাটক দেখার জন্য	3
		গেম খেলার জন্য	4
		প্রাতিষ্ঠানিক শিক্ষার কাজে	5
		অনলাইনে শিক্ষা অর্জনের জন্য (Coursera, Bohubrihi, Udemy, Code Academy and others)	6
		ফ্রিল্যান্সিং করার জন্য	7
		অন্যান্য	
৩১.	গতি এবং ভলিউমের দিক থেকে আপনি কি ভালো ইন্টারনেট সার্ভিস ব্যাবহার করেন?	হ্যাঁ	1
		না	0
		খারাপ নয় এমন (মোটামুটি)	2

৭. চতুর্থ শিল্প বিপ্লব সম্পর্কিত জ্ঞান এবং মনোভাব

Sl. no.	Question	Response		Code
৩২.	আপনি কি চতুর্থ শিল্প বিপ্লব (Fourth Industrial Revolution (4.0)) সম্পর্কে জানেন?	হ্যাঁ		1
		না		0
যদি উত্তর না হয়, তবে তাকে চতুর্থ শিল্প বিপ্লব সম্পর্কে প্রাথমিক ধারণা দিন। এরপর পরবর্তী প্রশ্নগুলো জিজ্ঞেস করা শুরু করুন।				
৩৩.	চতুর্থ শিল্প বিপ্লব কি আপনার নিকট আকর্ষণীয়?	হ্যাঁ		1
		না		0
৩৪.	আপনি কি চতুর্থ শিল্প বিপ্লব এর প্রযুক্তি গুলো সম্পর্কে জানতে আগ্রহী?	হ্যাঁ		1
		না		0
৩৫.	আপনি কি চতুর্থ শিল্প বিপ্লব এর প্রযুক্তি গুলো সম্পর্কে ব্যবহার করতে আগ্রহী?	হ্যাঁ		1
		না		0
৩৬.	আপনি কি চতুর্থ শিল্প বিপ্লব সম্পর্কিত প্রযুক্তিগত পরিবর্তনগুলির সাথে নিজেকে মানিয়ে নিতে প্রস্তুত?	হ্যাঁ		1
		না		0
১৭.	চতুর্থ শিল্প বিপ্লব সম্পর্কিত প্রযুক্তিগত পরিবর্তনগুলি পেতে আপনার আর্থিক ক্ষমতার সমস্যা রয়েছে কিনা?	হ্যাঁ		1
		না		0

৩৭. নিম্নোলিখিত বিষয়গুলোর সাথে আপনি কতটা পরিচিত?

Sl. no.	Question	খুব পরিচিত (এক্সপার্ট)	পরিচিত (রেগুলার ব্যবহার করে)	মোটামুটি পরিচিত (মাঝেমাঝে ব্যবহার করে)	কিছুটা পরিচিত (জানে তবে ব্যবহার করেনি)	একেবারেই অপরিচিত
		(5)	**(4)**	**(3)**	**(2)**	**(1)**
m)	ডাটা সাইন্স					
n)	ইন্টারনেট অফ থিংস					
o)	সাইবার সিকিউরিটি এবং এনক্রিপশান					
p)	আর্টিফিশিয়াল ইন্টেলিজেন্স					
q)	ক্লাউড কম্পিউটিং					
r)	অগমেন্টেড এবং ভার্চুয়াল রিয়েলিটি					
s)	নন হিউমেনয়েড এবং রোবট					
t)	থ্রিডি প্রিন্টিং					
u)	জেনেরাটিভ এআই (e.g., Chat GPT)					

৩৮. নিম্নোলিখিত বিষয়গুলোর সাথে আপনি কতটা পরিচিত/ জানেন?

Sl. no.	Question	খুব পরিচিত (এক্সপার্ট)	পরিচিত (রেগুলার ব্যবহার করে)	মোটামুটি পরিচিত (মাঝেমাঝে ব্যবহার করে)	কিছুটা পরিচিত (জানে তবে ব্যবহার করেনি)	একেবারেই অপরিচিত
		(5)	**(4)**	**(3)**	**(2)**	**(1)**
d.	মাইক্রোসফট অফিস (MS word, Excel এবং Powerpoint)					
e.	ইমেল					

Sl. no.	Question	ভালোভাবে জানেন (এক্সপার্ট)	জানেন (রেগুলার ব্যবহার করে)	মোটামুটি জানেন (মাঝেমাঝে ব্যবহার করে)	কিছুটা জানেন (জানে তবে ব্যবহার করেনি)	জানেন না
f.	বার্তাপ্রেরণ বা ভিডিও কনফারেন্সিং প্ল্যাটফর্মের মতো বিভিন্ন যোগাযোগের সরঞ্জামগুলো (Zoom, Google Meet, Telegram etc.)					
		(5)	(4)	(3)	(2)	(1)
d)	কি ওয়ার্ড দিয়ে সার্চ ইঞ্জিন কার্যকর ভাবে ব্যবহার করা (SEO)					
e)	শক্তিশালী পাসওয়ার্ড তৈরি করতে জানা					
f)	স্ক্যাম বা ভাইরাস এট্যাক					
i)	অনলাইন থেকে প্রাপ্ত তথ্যগুলির বিশ্বাসযোগ্যতা বা ফ্যাক্ট চেকিং (Fact checking)					
v)	ডিভাইসে সাধারণ প্রযুক্তিগত সমস্যাগুলির সমাধান					
w)	ডিজিটাল সমস্যা সমাধানে ভিডিও টিউটোরিয়াল ব্যবহার করা					
x)	কপিরাইট					

৮. ফ্রিল্যান্সিং/ প্রযুক্তি নির্ভর কোন চাকুরির সাথে সম্পৃক্ততা

৩৯.	আপনি কি ফ্রিল্যান্সিং/ প্রযুক্তি নির্ভর কোন চাকুরির সাথে সংযুক্ত আছেন?	হ্যাঁ	1
		না	0
৪০.	করলে কাজের ধরন কোনটি?	ফ্রিল্যান্সিং	1
		প্রযুক্তি নির্ভর চাকুরি	2
		অন্যান্য	

২১	আপনার এই প্রতিষ্ঠানে ভর্তি হওয়ার উদ্দেশ্য কি?	কম্পিউটদক্ষ হওয়া	১
		চাকরি পাওয়া	২
		অন্যান্য	৩
২২	এই ট্রেনিং পরবর্তি চাকরির বাজার কেমন বলে আপনি মনে করেন?	ভালো	১
		মোটামুটি	২
		ভাল না	৩
২৩	আপনার চাকরি না পাওয়ার কারন কি?	চেষ্টা করেন নি।	১
		চাকরির জন্য সাগ্রহী নন।	২
		যে দক্ষতা আছে তা যথেষ্ট নয়।	৩

		অন্য কোনো কারণ।	৪
২৪	প্রশিক্ষণ থেকে আপনি যে দক্ষতা অর্জন করেছেন তা কি যথেষ্ট?	যথেষ্ট	১
		মোটামুটি যথেষ্ট	২
		যথেষ্ট না	৩
২৫	না হলে, আপনার চাকরি পেতে আর কিকি বিষয়ে দক্ষতা দরকার বলে মনে করেন?	ডাটা সায়েন্স	১
		গ্রাফিক ডিজাইন	২
		এআই	৩
২৬	সেই দক্ষতাগুলো কোথায় পাওয়া যায়?	কোনো প্রতিষ্ঠান প্রদান করে	১
		ইন্টারনেট	২
		অনলাইন ক্লাস	৩
২৭	সেই দক্ষতাগুলো পাওয়ার জন্য আপনার যথেষ্ট জ্ঞান আছে কি না?	হ্যাঁ	০
		না	১
২৮	আপনার প্রতিষ্ঠানের প্রশিক্ষণকে আপনি কতটা কার্জকর বলে মনে করেন?	ভালো	
		খুব ভালো	
		মোটামুটি ভালো	
২৯	অন্য প্রতিষ্ঠানের সাথে অন্য প্রতিষ্ঠানের তফাৎ কতটা?	মোটেও না	১
		কিছুটা	২
		অনেক তফাৎ	৩
৩০	কোনো প্রতিষ্ঠানের সাথে আপনার প্রতিষ্ঠানের কোলাবোরেট করতে পারে কি না?	হ্যাঁ	০
		না	১
৩১	সম-সাময়িক বিষয়ের ওপর প্রশিক্ষণের প্রভাব কেমন?	খুব ভালো	১
		কিছুটা ভালো	২
		তেমন কিছু নয়	৩
৩২	যদি অন্য কোনো প্রতিষ্ঠানের সাথে কোলাবোরেট করে তাহলে কি ধরনের সমস্যা আছে?	কোর্সটি শেষ হতে অধিক সময় লাগবে	১
		কারিকুলাম সাজাতে সমস্যা হবে	২
		অন্যান্য	৩
৩৩	যদি অন্য কোনো প্রতিষ্ঠানের সাথে কোলাবোরেট করে তাহলে কি ধরনের সম্ভাবনা আছে?	শিক্ষার্থীরা ভালো শিখবে	১
		চাকরি পেতে সাহায্য হবে	২
		অন্যান্য	৩
৩৪	প্রশিক্ষণের সময় লাইভ ডাটা দেখানো হয় কিনা?	হ্যাঁ	০

			না	১
৩৫	আর কি ধরনের ক্যাপাসিটি তৈরি করা দরকার?		কারিকোলাম আরো সমৃদ্ধ করা	১
			জনবল বাড়ানো	২
			কম্পিউটার, সরঞ্জাম বাড়ানো	৩
			অন্যান্য	৪
৩৬	আপনি কখনো কোন ইন্ডাস্ট্রি ভিজিট করেছেন কি না?		হ্যাঁ	০
			না	১
৩৭	আপনি কখনো কোন ইন্ডাস্ট্রি ভিজিট করে থাকলে তা থেকে কি অভিজ্ঞতা অর্জন করেছেন?		ইন্ডাস্ট্রি কিভাবে কাজ করে	১
			ইন্ডাস্ট্রিতে কাজ করতে কি দক্ষতা দরকার তা জেনেছেন	২
			অন্যান্য	৩
৩৮	আইএ এর ক্ষেত্রে কোনো কোলাবোরেশন আছে কি না সেটা জানেন কিনা?		হ্যাঁ	০
			না	১
৩৯	কালবোরেশন এর জন্য কিছু করা যায় কিনা?		হ্যাঁ	০
			না	১
			আমার জানা নেই	২

Annex -III: Survey Quesationnaire for Students who are currently in Job

Survey Questionnaire for Students who are currently in Job

Industry Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR

Serial No. [ ][ ][ ][ ]

Enumerator's Information

Name of the Enumerator	
Date of Interview	
Start time	
End time	

Study Conducted By

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March, 2025

ভূমিকা

শুভেচ্ছা! আমি _____। আমি BISR-এর একজন গবেষণা সহকারী। এর স্থায়ী ঠিকানা হাসিনা ডি প্যালেসে # ৬/বি, বাড়ি # ৬/১৪, ব্লক # এ, লালমাটিয়া, ঢাকা-১২০৭। এটি বর্তমানে "চতুর্থ শিল্প বিপ্লবের জন্য প্রস্তুতি (৪.০): বাংলাদেশে পলিটেকনিক ইনস্টিটিউটের কারিগরি শিক্ষার সম্ভাবনা এবং চ্যালেঞ্জ" প্রকল্প-এর সমীক্ষা বাস্তবায়নে কাজ করছে - সামাজিক বিজ্ঞান গবেষণা কাউন্সিল, পরিকল্পনা বিভাগ, পরিকল্পনা মন্ত্রণালয়, গণপ্রজাতন্ত্রী বাংলাদেশ সরকারের সহায়তায়। আপনি এই ইন্টারভিউ সেশনে অংশগ্রহণ করতে চান কিনা তা বেছে নিতে পারেন। আমরা শুধুমাত্র আপনার সম্মতিতে অধিবেশনে এগিয়ে যাব। সাক্ষাৎকারটি একটি প্রশ্ন সিরিজ অনুসরণ করবে, যা আপনাকে জিজ্ঞাসা করা হবে। আপনার উত্তর নোট করা হবে। আমরা আশা করি আপনি অংশগ্রহণ করে এবং সৎ উত্তর প্রদান করে প্রক্রিয়াটির সফল সম্পাদনের একটি অংশ হবেন। আমরা আপনাকে আশ্বাস দিচ্ছি যে আপনার সমস্ত তথ্য কঠোরভাবে গোপনীয় বলে বিবেচিত হবে।

সাক্ষাৎকারটি সম্পূর্ণ হতে প্রায় ৩০-৪০ মিনিট সময় লাগবে। আপনি একটি নির্দিষ্ট প্রশ্নের উত্তর দিতে অস্বস্তি বোধ করলে অনুগ্রহ করে আমাদের জানান। আপনার যদি ইন্টারভিউ থেকে কোনো বিরতির প্রয়োজন হয় বা যদি অন্য কোনো উপায় থাকে যে আমরা এই সাক্ষাৎকারটিকে আরও আরামদায়ক করতে পারি, তাও নির্দ্বিধায় বলুন। আপনি যদি ইতিমধ্যে আমাদের কোনো সহকর্মীর সাথে ইন্টারভিউটি না করে থাকেন তবে আমি আপনার উপযুক্ত সময় এবং স্থানে সাক্ষাৎকার নেব।

১. গত কয়েক দিনে আমাদের প্রতিষ্ঠানের কেউ কি আপনার সাক্ষাৎকার নিয়েছেন?
ক) হ্যাঁ, যদি হ্যাঁ, তাহলে কখন? _____ দিন আগে (সাক্ষাৎকার বন্ধ করুন) খ) না (এগিয়ে যান)
২. আমি কি ইন্টারভিউ শুরু করতে পারি?
ক) উত্তরদাতা সম্মত হলে এগিয়ে যান খ) উত্তরদাতা একমত না হলে থামুন
৩) সাক্ষাৎকারের পরে যদি আপনার কোন প্রশ্ন থাকে বা আপনার যদি আরও ডিব্রিফের প্রয়োজন হয় তবে আপনি নিম্নলিখিত ব্যক্তির সাথে যোগাযোগ করতে পারেন:
মুনেম আহমদ চৌধুরী, গবেষক, বিআইএসআর ট্রাস্ট। সেল: ০১৮৩৬৯৩৩৯৩৯

সাক্ষাৎকার শুরু করার আগে, নিশ্চিত করুন যে আপনার কাছে প্রয়োজনীয় সমস্ত উপকরণ রয়েছে - প্রশ্নাবলী, সম্মতি ফর্ম, আইডি কার্ড, নোটবুক, কলম এবং স্থানীয় কর্তৃপক্ষের কাছ থেকে প্রয়োজনীয় অনুমতি। আপনি সঠিক ব্যক্তির সাক্ষাৎকার নিচ্ছেন তা নিশ্চিত করুন।

সুরক্ষা ব্যবস্থা:
০ ১৬ বছর বা তার বেশি বয়সীদের জন্য অবহিত সম্মতি ফর্মে স্বাক্ষর করা সরাসরি প্রাপ্ত হতে পারে, এর চেয়ে কমবয়সীদের সম্মতি তাদের পিতামাতা, অভিভাবক, যত্নশীল বা অন্যান্য উপযুক্ত প্রাপ্তবয়স্কদের মাধ্যমে প্রাপ্ত করা হবে;
০ নিশ্চিত করুন যে অংশগ্রহণকারীরা সম্পূর্ণরূপে বুঝতে পারে যে তারা কী অংশ নিতে যাচ্ছে এবং তাদের অংশগ্রহণ স্বেচ্ছাসেবী;
০ অংশগ্রহণকারী তথ্য প্রদানে অস্বস্তি বোধ করলে যে কোনো সময় অধ্যয়ন থেকে প্রত্যাহার করতে পারবেন।
০ অনুমতি ছাড়া কোন ছবি তোলা হবে না;
০ অংশগ্রহণকারীর কাছ থেকে উদ্ধৃতি ব্যবহার করার ক্ষেত্রে, অবহিত সম্মতি প্রাপ্ত করা হবে, এবং নাম প্রকাশ না করার জন্য, ডাকনাম ব্যবহার করা হবে;
০ প্রশ্ন, দৃষ্টিভঙ্গি বা মন্তব্য যা বিচারযোগ্য, সাংস্কৃতিক মূল্যবোধের প্রতি সংবেদনশীল, যেগুলি একজন অংশগ্রহণকারীকে বিপদে ফেলে বা একজন অংশগ্রহণকারীকে অপমানিত করে, অথবা যেগুলি আঘাতমূলক ঘটনা থেকে অংশগ্রহণকারীর বেদনা এবং শোককে পুনরায় সক্রিয় করে তা এড়ানো হবে;
০ অংশগ্রহণকারীকে কোথায় এবং কীভাবে সাক্ষাৎকার নেওয়া হবে সেদিকে মনোযোগ দেওয়া হবে;
০ অংশগ্রহণকারী এখনও ঠিক আছে বা আরামদায়ক কিনা তা দেখতে চেক-আপ প্রশ্ন যোগ করা হবে। সাক্ষাৎকারের দৈর্ঘ্য হবে অবহিত সম্মতির উপর ভিত্তি করে, যা অংশগ্রহণকারীর কাছে গ্রহণযোগ্য, এবং অংশগ্রহণকারীকে জিজ্ঞাসা করা হবে যে তারা ঠিক আছে এবং আরামদায়ক কিনা;
০ ইন্টারভিউয়ারের সংখ্যা সীমিত থাকবে। অংশগ্রহণকারী স্বাচ্ছন্দ্য বোধ করে তা নিশ্চিত করতে পর্যাপ্ত সময় নিন।

নৈতিক বিবেচনা:
অধ্যয়নটি নিম্নলিখিত নৈতিক নির্দেশিকা মেনে পরিচালিত হবে:
০ মূল্যায়নে এমন কিছু থাকবে না যা আইনগত বা নৈতিক কারণে উত্তরদাতাদের ক্ষতি করতে পারে।
০ কাউকে জরিপের জন্য তথ্য দিতে বাধ্য করা হবে না।
০ স্বতন্ত্র ডেটা (উদাহরণস্বরূপ, কেস স্টাডি) সর্বসম্মতভাবে রিপোর্ট করা হবে;
০ তথ্য সংগ্রহের আগে সমস্ত উত্তরদাতাদের কাছে সমীক্ষার উদ্দেশ্যগুলি পরিষ্কারভাবে ব্যাখ্যা করা হবে। দলটি যেকোন ব্যক্তির কাছ থেকে তথ্য সংগ্রহ করা থেকে বিরত থাকবে যারা তথ্য প্রদানে অস্বীকৃতি জানায় বা অনীহা দেখায়।
০ তথ্য সংগ্রহের আগে উত্তরদাতাদের মৌখিক ও লিখিত সম্মতি নেওয়া হবে এবং ছবি ব্যবহারের জন্য লিখিত সম্মতি নেওয়া হবে।
০ মূল্যায়নকারীরা উত্তরদাতাদের তাদের তথ্য এবং ডেটার উৎসের গোপনীয়তা বজায় রাখার জন্য অত্যন্ত প্রতিশ্রুতিবদ্ধ হবে। তারা তথ্য সংগ্রহে নিরপেক্ষ হতে তাদের আন্তরিক প্রচেষ্টা চালাবে।

অনুমতি ফরম
১. উপরে বর্ণিত হিসাবে, আমাকে নির্দিষ্ট এবং অতিরিক্ত উদ্দেশ্য(গুলি) সম্পর্কে অবহিত করা হয়েছে যার জন্য আমার ব্যক্তিগত ডেটা সংগ্রহ করা হবে, ব্যবহার করা হবে এবং প্রকাশ করা হবে।
২. আমি বুঝতে পারি যে আমার ব্যক্তিগত ডেটা টি অর্জনের জন্য প্রয়োজনীয় গৌণ উদ্দেশ্যে ব্যবহার এবং প্রকাশ করা হতে পারে
৩. আমি বুঝি যে আমি গবেষণাদলের সাথে যোগাযোগ করে অনুরোধের ভিত্তিতে আমার ব্যক্তিগত ডেটা অ্যাক্সেস এবং সংশোধন করতে পারি।
৪. আমি ঘোষণা করছি যে আমি যে তথ্য দিয়েছি তা আমার জানামতে সত্য এবং সঠিক।
৫. আমি এই অবহিত সম্মতি ফর্মের বিষয়বস্তু বুঝতে পারি:

(ক) উপরের ধারাগুলো পড়ার পর: হ্যাঁ/না
(খ) উপরের ধারাগুলো অনুবাদ করা হয়েছে বা আমাকে পড়া হয়েছে: হ্যাঁ/না

স্বাক্ষরিত (স্থানে)..

তারিখ)..

ইন্টারভিউয়ার: আমি প্রত্যয়ন করছি যে _____ তারিখে _____ তারিখে, তথ্য পাওয়ার এবং ব্যবহারের অনুমতির জন্য আমি এই ফর্মের বিষয়বস্তু ওই ব্যক্তির কাছে পৌঁছে দিয়েছি।

Types of respondents: Current student of NIYD

৯. উত্তরদাতার তথ্য

Sl. no.	Question	Response
৪১.	উত্তরদাতার নাম	
৪২.	ফোন নম্বর	
৪৩.	প্রতিষ্ঠানের নাম	
৪৪.	একাডেমিক বর্ষ	
৪৫.	ডিপার্টমেন্ট/ ট্রেড	

১০.ডেমোগ্রাফিক তথ্য

Sl. no.	Question	Response	Code
৪৬.	উত্তরদাতার বয়স		
৪৭.	লিঙ্গ পরিচয়	নারী	1
		পুরুষ	2
		তৃতীয় লিঙ্গ	3
৪৮.	পারিবারিক আয় (মাসিক)		
৪৯.	নিচের কোন ডিভাইসটি আপনার নিজের রয়েছে? (একাধিক উত্তর হতে পারে)	এনড্রয়েড মোবাইল	1
		ল্যাপটপ	2
		ডেস্কটপ	3
		ট্যাব	4
		অন্যান্য	
৫০.	কোন উদ্দেশ্যে আপনি এই ডিভাইসটি/গুলো ব্যবহার করেন? (একাধিক উত্তর হতে পারে)	সামাজিক যোগাযোগ মাধ্যম ব্যবহারের জন্য (ফেসবুক, ইউটিউব, টিকটক, ইন্সটাগ্রাম, এবং অন্যান্য)	1
		বিভিন্ন ওয়েবসাইট দেখার জন্য	2
		মুভি, সিরিজ বা নাটক দেখার জন্য	3
		গেম খেলার জন্য	4
		প্রাতিষ্ঠানিক শিক্ষার কাজে	5
		অনলাইনে শিক্ষা অর্জনের জন্য (Coursera, Bohubrihi, Udemy, Code Academy and others)	6
		ফ্রিল্যান্সিং করার জন্য	7
		অন্যান্য	
৫১.	গতি এবং ভলিউমের দিক থেকে আপনি কি ভালো ইন্টারনেট সার্ভিস ব্যবহার করেন?	হ্যাঁ	1
		না	0
		খারাপ নয় এমন (মোটামুটি)	2

১১. চতুর্থ শিল্প বিপ্লব সম্পর্কিত জ্ঞান এবং মনোভাব

Sl. no.	Question	Response		Code
৫২.	আপনি কি চতুর্থ শিল্প বিপ্লব (Fourth Industrial Revolution (4.0)) সম্পর্কে জানেন?	হ্যাঁ		1
		না		0
যদি উত্তর না হয়, তবে তাকে চতুর্থ শিল্প বিপ্লব সম্পর্কে প্রাথমিক ধারণা দিন। এরপর পরবর্তী প্রশ্নগুলো জিজ্ঞেস করা শুরু করুন।				
৫৩.	চতুর্থ শিল্প বিপ্লব কি আপনার নিকট আকর্ষণীয়?	হ্যাঁ		1
		না		0
৫৪.	আপনি কি চতুর্থ শিল্প বিপ্লব এর প্রযুক্তি গুলো সম্পর্কে জানতে আগ্রহী?	হ্যাঁ		1
		না		0
৫৫.	আপনি কি চতুর্থ শিল্প বিপ্লব এর প্রযুক্তি গুলো সম্পর্কে ব্যবহার করতে আগ্রহী?	হ্যাঁ		1
		না		0
৫৬.	আপনি কি চতুর্থ শিল্প বিপ্লব সম্পর্কিত প্রযুক্তিগত পরিবর্তনগুলির সাথে নিজেকে মানিয়ে নিতে প্রস্তুত?	হ্যাঁ		1
		না		0
১৭.	চতুর্থ শিল্প বিপ্লব সম্পর্কিত প্রযুক্তিগত পরিবর্তনগুলি পেতে আপনার আর্থিক ক্ষমতার সমস্যা রয়েছে কিনা?	হ্যাঁ		1
		না		0

৫৭. নিম্নোলিখিত বিষয়গুলোর সাথে আপনি কতটা পরিচিত?

Sl. no.	Question	খুব পরিচিত (এক্সপার্ট)	পরিচিত (রেগুলার ব্যবহার করে)	মোটামুটি পরিচিত (মাঝেমাঝে ব্যবহার করে)	কিছুটা পরিচিত (জানে তবে ব্যবহার করেনি)	একেবারেই অপরিচিত
		(5)	**(4)**	**(3)**	**(2)**	**(1)**
y)	ডাটা সাইন্স					
z)	ইন্টারনেট অফ থিংস					
aa)	সাইবার সিকিউরিটি এবং এনক্রিপশান					
bb)	আর্টিফিশিয়াল ইন্টেলিজেন্স					
cc)	ক্লাউড কম্পিউটিং					
dd)	অগমেন্টেড এবং ভার্চুয়াল রিয়েলিটি					
ee)	নন হিউমেনয়েড এবং রোবট					
ff)	থ্রিডি প্রিন্টিং					
gg)	জেনেরাটিভ এআই (e.g., Chat GPT)					

৫৮. নিম্নোলিখিত বিষয়গুলোর সাথে আপনি কতটা পরিচিত/ জানেন?

Sl. no.	Question	খুব পরিচিত (এক্সপার্ট)	পরিচিত (রেগুলার ব্যবহার করে)	মোটামুটি পরিচিত (মাঝেমাঝে ব্যবহার করে)	কিছুটা পরিচিত (জানে তবে ব্যবহার করেনি)	একেবারেই অপরিচিত
		(5)	**(4)**	**(3)**	**(2)**	**(1)**
g.	মাইক্রোসফট অফিস (MS word, Excel এবং Powerpoint)					
h.	ইমেল					

Sl. no.	Question	ভালোভাবে জানেন (এক্সপার্ট)	জানেন (রেগুলার ব্যবহার করে)	মোটামুটি জানেন (মাঝেমাঝে ব্যবহার করে)	কিছুটা জানেন (জানে তবে ব্যবহার করেনি)	জানেন না
i.	বার্তাপ্রেরণ বা ভিডিও কনফারেন্সিং প্ল্যাটফর্মের মতো বিভিন্ন যোগাযোগের সরঞ্জামগুলো (Zoom, Google Meet, Telegram etc.)					
		(5)	**(4)**	**(3)**	**(2)**	**(1)**
d)	কি ওয়ার্ড দিয়ে সার্চ ইঞ্জিন কার্যকর ভাবে ব্যবহার করা (SEO)					
e)	শক্তিশালী পাসওয়ার্ড তৈরি করতে জানা					
f)	স্ক্যাম বা ভাইরাস এট্যাক					
i)	অনলাইন থেকে প্রাপ্ত তথ্যগুলির বিশ্বাসযোগ্যতা বা ফ্যাক্ট চেকিং (Fact checking)					
hh)	ডিভাইসে সাধারণ প্রযুক্তিগত সমস্যাগুলির সমাধান					
ii)	ডিজিটাল সমস্যা সমাধানে ভিডিও টিউটোরিয়াল ব্যবহার করা					
jj)	কপিরাইট					

১২. ফ্রিল্যান্সিং/ প্রযুক্তি নির্ভর কোন চাকুরির সাথে সম্পৃক্ততা

৫৯.	আপনি কি ফ্রিল্যান্সিং/ প্রযুক্তি নির্ভর কোন চাকুরির সাথে সংযুক্ত আছেন?	হ্যাঁ	1
		না	0
৬০.	করলে কাজের ধরন কোনটি?	ফ্রিল্যান্সিং	1
		প্রযুক্তি নির্ভর চাকুরি	2
		অন্যান্য	

২১	আপনি কখনো কোন ইন্ডাস্ট্রিতে কাজ করছেন?		
২২	ট্রেনিংটি আপনাকে চাকরি পাবার ক্ষেত্রে কিভাবে সাহায্য করেছে বলে আপনি মনে করেন?	কম্পিউটার দক্ষতা বাড়িয়েছে	১
		এআই সম্পর্কে জানিয়েছে	২
		কোম্পানির চাহিদার ভিত্তিতে দক্ষতা উন্নয়ন করেছে	৩
		অন্যান্য	৪
২৩	আপনার এই প্রতিষ্ঠানে ভর্তি হয়ে কোন কোন দিক থেকে উপকৃত হয়েছেন বলে মনে করেন?	দ্রুত চাকরি পেয়েছেন	১
		অন্য চাকরি প্রত্যাসিতদের থেকে এগিয়ে ছিলেন	২
		অন্যান্য	৩

২৪	এই ট্রেনিং পরবর্তি চাকরি পেতে আপনাকে কত সময় আপেক্ষা করতে হয়েছিল?	বেশি সময় আপেক্ষা করতে হয়েছি	১
		কম সময় আপেক্ষা করতে হয়েছি	২
		সাথে সাথে চাকরি পেয়েছেন	৩
২৫	প্রশিক্ষণ থেকে আপনি যে দক্ষতা আর্জন করেছেন তা কি যথেষ্ট?	যথেষ্ট	১
		মোটামুটি যথেষ্ট	২
		যথেষ্ট না	৩
২৬	না হলে, আপনার চাকরি পেতে আর কিকি বিষয়ে দক্ষতা অর্জন করতে হয়েছে?	ডাটা সায়েন্স	১
		গ্রাফিক ডিজাইন	২
		এআই	৩
২৭	সেই দক্ষতাগুলো কোন প্রতিষ্ঠারন থেকে আর্জন করেছেন?	কোনো প্রতিষ্ঠান প্রদান করে	১
		ইন্টারনেট	২
		অনলাইন ক্লাস	৩
২৮	প্রশিক্ষণকে আপনি কতটা কার্জকর বলে মনে করেন?	ভালো	
		খুব ভালো	
		মোটামুটি ভালো	
২৯	অন্য প্রতিষ্ঠানের সাথে আপনার প্রতিষ্ঠানের তফাৎ কতটা?	মোটেও না	১
		কিছুটা	২
		অনেক তফাৎ	৩
৩০	প্রশিক্ষণের প্রভাব সম-সাময়িক বিষয়ে কেমন?	খুব ভালো	১
		কিছুটা ভালো	২
		তেমন কিছু নয়	৩
৩১	আপনার প্রতিষ্ঠান যদি অন্য কোনো প্রতিষ্ঠানের সাথে কোলাবোরেট করতো তাহলে আপনি আরো দ্রুত চাকরি পেতেন কিনা?	হ্যাঁ	০
		না	১
৩২	আপনার প্রতিষ্ঠান যদি আন্য কোনো প্রতিষ্ঠানের সাথে কোলাবোরেট করে তাহলে কি ধরনের সম্ভাবনা আছে?	দক্ষতা উন্নয়নের ক্ষেত্রে	১
		দ্রুত চাকরি পাওয়ার	২
		পদোন্নতি পাওয়ার	৩
		অন্যান্য	৪
৩৩		কারিকোলাম আরো সমৃদ্ধ করা	১

Submitted by: BISR Trust

	আপনার প্রতিষ্ঠানের আর কি ধরনের ক্যাপাসিটি তৈরি করা দরকার?	জনবল বাড়ানো	২	
		কম্পিউটার, সরঞ্জাম বাড়ানো	৩	
		অন্যান্য	৪	
৩৪	আইএ এর ক্ষেত্রে কোনো কোলাবোরেশন আছে কি না সেটা জানেন কিনা?	হ্যা	০	
		না	১	
৩৫	কোলাবোরেশন এর জন্য কিছু করা যায় কিনা?	হ্যা	০	
		না	১	
		আমার জানা নেই	২	

Annex –IV: In-Depth Interview Checklist

In-Depth Interview Checklist

Type of Respondent: Youth skill development experts, Youth education experts and so on

Name of the respondent:	
Name of the Institute	
Department	
Age of the Respondent	
Mobile No.	
Location	

Date	
Quality Control Officer	
Name of Field Investigator	
Starting Time	
End Time	

Study Conducted By

Bangladesh Institute of Social Research (BISR) Trust

Hasina De-Palace, Apartment # 6 / B, House No. # 6/14

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March, 2025

Consent Form
1. I have been informed about the specified and additional purpose(s) for which my personal data will be collected, used, and disclosed, as described above.
2. I understand that my personal data may be used and disclosed for secondary purposes necessary to achieve the above-described specified purpose(s).
3. I understand that I may access and rectify my personal data on request by contacting the study team.
4. I declare that the information I have provided is true and correct to the best of my knowledge.
5. I understand the contents of this informed consent form after:
    a. Having read the above clauses: YES/NO
    b. The above clauses have been translated or read to me: YES/NO

Signed at (place)………………………………………

On(date)………………………………………………..
INTERVIEWER: I certify that on date _____ in place _____
I conveyed the content of this form to the person, for permission to obtain and use information.

Submitted by: BISR Trust

Questions:

১. চতুর্থ শিল্প বিপ্লব বলতে আপনি কি বুঝেন?

১.আপনার মতে বর্তমানে তরুনদের চাকুরির যে দক্ষতা আছে তার মান কেমন? এখানে আর কোন কোন বিষয়ে উন্নতি করা দরকার?

২. সে বিষয়ে দক্ষতা বৃদ্ধি করা সম্ভব কি-না?

২.আপনার মতে জাতীয় যুব উন্নয়ন কেন্দ্র প্রশিক্ষণের কার্যকারিতা কেমন? কোথায় আরো উন্নতি করা দরকার?

৩.জাতীয় যুব উন্নয়ন কেন্দ্রে কি কি ধরনের ট্রেনিং দেয়া হয়?

৪.আর কোন কোন বিষয়ে ট্রেনিং দেয়া দরকার?

৫.আপনার মতে বাংলাদেশে আই-এ কোলাবেশনের সুযোগ কতটা আছে?

৬ , ফোর আই এর সাথে এ বিষয়টির সম্পৃক্ততা কতটুকু আছে বলে মনে করেন?

৭. এ ক্ষেত্রে আই-এ বাড়ানোর জন্য আর কি কি করা যেতে পারে?

ক.

খ.

গ.

ঘ.

৮. ইন্টারনশিপের সুযোগ কতটা আছে? তার বিকল্প আর কি আছে?

৯. আই কি এ-এর কাছে যাবে নাকি এ আই কাছে যাবে?

১০. বর্তমান স্কিলের সাথে ভবিষ্যত স্কিলের চাহিদার তফাত কৌথায়? কিভাবে আই- এর সহযোগিতার মাধ্যমে তা উন্নয়ন করা সম্ভব?

১১. এনআইডি এর ট্রেনিংকে আরো কার্যকর করার জন্য আই-এ কোলাবোরেশন কিভাবে সহযোগিতা করতে পারে?

Annex –V: KII Chekclist

Key Informant Interview (KII) Checklist

Type of Respondent: Youth officials, Youth entrepreneurs, Academicians, representatives from local government institutions and non-government agencies, representatives from local and national NGOs.

Name of the respondent	
Name of the Institution	
Age of the respondent	
Mobile No.	
Location	

Date	
Quality Control Officer	
Name of Field Investigator	
Starting Time	
End Time	

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March, 2025

On (date)…………………………………………….
INTERVIEWER: I certify that on date _____ in place _____
I conveyed the content of this form to the person, for permission to obtain and use information.

১.আপনার মতে বতমানে তরুনদের চাকুরির যে দক্ষতা আছে তার মান কেমন? এখানে আর কোন কোন বিষয়ে উন্নতি করা দরকার?

২.আপনার মতে জাতীয় যুব উন্নয়ন কেন্দ্র প্রশিক্ষণের কাযকারিতা কেমন?

৩.জাতীয় যুব উন্নয়নের জন্য কি কি ট্রেনিং দরকার?

৪.তা কোন কোন বিষয়ে দরকার?

৫.আপনার মতে বাংলাদেশে আই-এ কোলাবেশনের সুযোগ কতটা আছে?

৬ , ফোর আই এর সাথে এ বিষয়টির সম্পৃক্ততা কতটুকু আছে মনে করেন?

৭. এ ক্ষেত্রে আই-এ বাড়ানোর জন্য আর কি কি করা যেতে পারে?

ক.

খ.

গ.

ঘ.

৮. ইন্টারনশিপের সুযোগ কতটা আছে? তার বিরুপ আর কি আছে?

৯. আই কি এর কাছে যাবে নাকি এ আই কাছে যাবে?

১০. বতমান স্কিলের সাথে ভবিষ্যত স্কিলের চাহিদার তফাত কৌথায়? কিভাবে আএ এ সহযোগতার মাধ্যমে তা উন্নয়ন করা সম্ভব?

১১. এনআইডি এর ট্রেনিংকে আরো কাযকর করার জন্য আই এ কোলাবোরেশন কিভাবে সহযোহিতা করতে পারে?

Annex –VI: FGD Guideline

Focus Group Discussions: Guideline

Serial No. ☐ ☐ ☐ ☐

Respondent's Information

Name	Age	Phone	Sign

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March, 2025

Introduction

Greetings! I am…………. I am an interviewer/research assistant from BISR. The organisation is housed at Hasina De Palace Appt. # 6/B, House # 6/14, Block # A, Lalmatia, Dhaka-1207. It is currently working on the implementation of a Survey for the study titled **"Industry Academia Collaboration in the Context of Quick Technological Development: Assessing Youth's Demand for Capacity Development for Facing the Challenges and Opportunities of 4IR.** We would very much like your help in this regard. We will only proceed with the session with your consent. The interview will be conducted by following a series of questions that will be read to you. Your answers will be noted.

Questions:

১.আপনাদের মতে বর্তমানে তরুনদের চাকুরির যে দক্ষতা আছে তা কি যথেষ্ট? যদি না হয় তাহলে আর কোন কোন বিষয়ে প্রশিক্ষণ দরকার?

২.আপনাদের মতে জাতীয় যুব উন্নয়ন কেন্দ্রের প্রশিক্ষণ কতটা উপযোগী?

৩. চতুর্থ শিল্প বিপ্লবের চাহিদা পুরনের জন্য জাতীয় যুব উন্নয়নের কি কি ট্রেনিং দেয়া দরকার?

৪.আপনাদের সাথে অন্য কোনো শিল্প প্রতিষ্ঠানের সাথে কোন কোলাবেশনের সুযোগ আছে কিনা? থাকলে তা কি কি?

৬ , ফোর আই আর এর সাথে এ বিষয়টির সম্পৃক্ততা কতটুকু আছে মনে করেন?

৭. এ ক্ষেত্রে ফোর আই আর -এ কোলাবোরেশন বাড়ানোর জন্য আর কি কি করা যেতে পারে?

ক.

খ.

গ.

ঘ.

৮. ইন্টারনশিপের সুযোগ কতটা আছে? তার বিকল্প আর কি আছে?

৯. ইন্ডাস্ট্রি কি একাডেমির কাছে যাবে নাকি একাডেমি ইন্ডাস্ট্রির কাছে যাবে?

১০. বর্তমান স্কিলের সাথে ভবিষ্যত স্কিলের চাহিদার তফাত কোথায়? কিভাবে ফোর আই আর এ সহযোগিতার মাধ্যমে তা উন্নয়ন করা সম্ভব?

১১. এনআইওয়াইডি এর ট্রেনিংকে আরো কার্যকর করার জন্য ইন্ডাস্ট্রি-একাডেমির কোলাবোরেশন কিভাবে সহযোহিতা করতে পারে?

Submitted by: BISR Trust

Annex –VII: FGD Attandance

FGD at NIYD (Multimedia Design)

Annex –VI: FGD
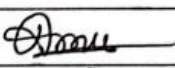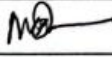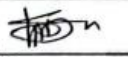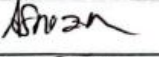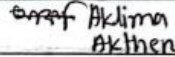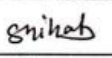
Note: Please note that in each FGD particpants would be 8-12. Two persons will be involved where one will facilitator and another will be notetaker. At the out set covey regards to them as they expect. Explain the purpose of FGD. Ensure their comfortable sitting arrangement.
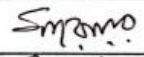
Focus Group Discussions: Guideline

Serial No. ☐☐☐☐

Respondent's Information

Name	Age	Phone	Sign
1. Rajlakshmi debnath	25	01628651575	Atoau
2. MOSTAKI M AL-HASNAt	30	01723129654	MD
Abul Hasan	35	01737198020	fasn
AFROZA AKTER	29	01637256150	Afrozn
Aklima Akther	30	01779-754409	Saraf Aklima Akther
Shahrior Ahmed Shihab	22	01678213212	snihab
Md. Saroar Jahan	30	01976501902	Smomo
Sabuj Chandra Roy	29	01780508244	Sabuj
MD. RABIUL ISLAM	28	01780610138	Rabiul
10. MD. ABDUL KARIM	28	01575014296	SAbr

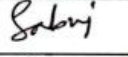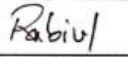FGD at NIYD (Adobe Photoshop and Illustrator)

Annex –VI: FGD

Note: Please note that in each FGD particpants would be 8-12. Two persons will be involved where one will facilitator and another will be notetaker. At the out set covey regards to them as they expect. Explain the purpose of FGD. Ensure their comfortable sitting arrangement.

Focus Group Discussions: Guideline

Serial No.

Respondent's Information

Name	Age	Phone	Sign
Md. Larke Hossain	26	01796037465	Larlu
MD. Jabedul Islam	28	01571118529	Jabedul
MST: Tahera	18	01404861516	tahera
Nasrin Akter	27	01861951384	Nasrin
Taharima	28	01795390860	Taharima
Md. HUZZAT KHAN	28	01754-105768	Huzzat
MD. Sabbir	28	01798826255	MD.Sabbir
MD. SAIFUL ISLAM	31	01833771796	
MD. Iftekhar Islam Ifat	24	01623951819	
Md. Nazmul Hosen	25	01943793417	

FGD at NIYD (Tourist Guide and Ecotourism Management)

Annex –VI: FGD

Note: Please note that in each FGD particpants would be 8-12. Two persons will be involved where one will facilitator and another will be notetaker. At the out set covey regards to them as they expect. Explain the purpose of FGD. Ensure their comfortable sitting arrangement.

Focus Group Discussions: Guideline

Serial No.

Respondent's Information

Name	Age	Phone	Sign
Md. Mahdu Biswas	28	01711582961	mur
MD. Mukredul momen	26	01727711112	Jahul.
MD, Azijul Hakim	25	01858703440	Ayul
Belal Hassain	32	01886002075	Belal
A.N.M. Toha	30	0153 01517165558	Toha
Sayed Titumin	20	01990193902	Nillu
Binita Mazunden	30	01845799197	Binita Mazunden 08-05-25
Suborana Akter	25	01917117451	সুবর্ণা
Nadira Akther	26	01919723393	Ni
Maria Akter (Daisy)	26+	01677743620	Maria 08.05.25
Mst. Amena Jannat Lizamoni	18	01616997794	আমেনা জান্নাত
Ramibul Hasan	30	01641113444	Rakibul

FGD at YPSA

Annex –VI: FGD

Note: Please note that in each FGD particpants would be 8-12. Two persons will be involved where one will facilitator and another will be notetaker. At the out set covey regards to them as they expect. Explain the purpose of FGD. Ensure their comfortable sitting arrangement.

Focus Group Discussions: Guideline

Serial No.

Respondent's Information

Name	Age	Phone	Sign
Bablu De	31	01869282762	বাবলু দে
Sanjay Nodh	33	01838670711	Sanjay Nath
Nasiru Uddin	41	01815643155	Uddin
Amjad Hossain	30	01627449485	আমজাদ
Mohhamad Ali	33	01819642319	Ali
Sapmin Aktero Nishy	25	01830185157	নিশু
Bibi Fotema Ani	18	01823291099	ফাতেমা
Razia Sultana	28	01887626857	রাজিয়া
Morseda Aktero	38	01700930066	মরসেদা

FGD at UCEP (Multimedia)

Annex –VI: FGD

Note: Please note that in each FGD particpants would be 8-12. Two persons will be involved where one will facilitator and another will be notetaker. At the out set covey regards to them as they expect. Explain the purpose of FGD. Ensure their comfortable sitting arrangement.

Focus Group Discussions: Guideline

Serial No. ☐ ☐ ☐ ☐

Respondent's Information

Name	Age	Phone	Sign
Juboer Al Mahamud	21	01755103373	Juboer
Md Rasel Hossain	23	01828626031	Rasel
Md. Saddam Hossain	29	01992850060	Saddam
MD. Mahmudul Hasan Akash	26	01707926371	Akash
Md. Faizul Arefin	23	01580323754	Arefin
Md Abdullah	21	01734863797	Abdullah
Moninul Islam Sachchib	20	01831680124	moninul Islam
MD RAFSUL HASAN	28	01575018183	Rafi
Baki Billah	25	01777079470	Bali
MD. Hridoy Ahmed	21	01923-040690	Hridoy
Selem Mia	24	0177123839 2	Selim
FAROIN	12	01939822526	F

FGD at NACTAR

Annex –VI: **FGD**

Note: Please note that in each FGD particpants would be 8-12. Two persons will be involved where one will facilitator and another will be notetaker. At the out set covey regards to them as they expect. Explain the purpose of FGD. Ensure their comfortable sitting arrangement.

Focus Group Discussions: Guideline

Serial No. ☐☐☐☐

Respondent's Information

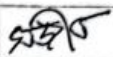| Name	Age	Phone	Sign
Md. Shojib	24	01978023174	শুভ
Sabir Hossain	27	01738219286	মোঃ সাবির
Abdul wadud	23	01309240019	আব্দুল ওয়াদুদ
Monika Akter	22	01609121374	Monika Akter
Shohanur Rahman	25	01718757626	মোঃ সোহানুর রহমান
Farhana Akter	20	01953772062	ফারহানা
Tonmoy Sorkar	24	01701521921	Tonmoy
Nijal Hossain	23	01711325728	নিজাম
Jobayer Hossain	19	01926201896	জোবায়ের হোসেন

FGD at BKTTC

Annex –VI: FGD

Note. Please note that in each FGD participants would be 8-12. Two persons will be involved where one will facilitator and another will be notetaker. At the out set covey regards to them as they expect. Explain the purpose of FGD. Ensure their comfortable sitting arrangement.

Focus Group Discussions: Guideline

Serial No. ☐☐☐☐

Respondent's Information.

Name	Age	Phone	Sign
MD: Imamul Khan	25	01790825897	Imamul
MD.PARVEZ ALI	22	01734775648	*(signature)*
Sanzida Akter Mim	22	01332654286	Sanzida
Nakib Uddin Ahmad	27	01557755727	Nakib
Rehamoni	20	01993763005	Moni
Rony Ahmed	84	01571820091	*(signature)*
Sabbir Hossen	20	01788808853	*(signature)*
Md. Rakibul Alam	28	01870148882	*(signature)*

Annex-VIII: List of IDI

Sl. No.	Name of the Respondents	Name of the Institution	Name of the Courses
1	Md. Salam		Data Entry
2	Mahmuda Akter	NIYD	Communicative Language (English)
3	Jannatul Ferdous Oishi	NIYD	High Value Vegetable and Spice Production
4	Sinthiya		Modern Agriculture
5	Md. Mujtoba Rashid		Horticulture
6	Md. Jubayer Al Mahmud		Safe Food Production and Food Preservation
7	Maleka Khatun		Safe Food Production and Food Preservation
8	Md. Alamgir Hossain		Safe Food Production and Food Preservation
9	Shomik Hasan Ashik		Safe Food Production and Food Preservation
10	Arafat Islam Alif		Catering and Hospitality Management
11	Md. Rakibul Hasan		Tour Guide
12	Md. Hridoy Ahmed		Safe Food Production and Food Preservation
13	Moksedul Hasan		Adobe Photoshop and Illustrator
14	Mohammad Ali Shamol		Web Site Design
15	Md. Ashik	BKTTC	Driving and Auto Mechanism
16	Md. Sazzad Hossen Rafi	BKTTC	Computer Operation
17	Abed Hossain	BKTTC	Japan Language

18	Belal Hossain Sazzad	BKTTC	Japanese Trade
19	Shova Akter	UCEP	Food and Beverage Service
20	Sadia Akter	UCEP	Baking
21	Mst. Ziniya Akter Jari	UCEP	Food and Beverage Service
22	Khaleda Nargis	UCEP	Food and Beverage Service
23	Abdur Rob	BGTTC	Graphic Design
24	Md. Mahdi Islam	BGTTC	English Language
25	Suronjit Kimar Nath	YPSA	Digital Marketing
26	Rubi Das	YPSA	Digital Marketing
27	Md. Kamrul Islam	YPSA	Electrical and Lighting
28	Md. Iftekharuzzaman	NACTAR	Basic Computer
29	Abu Bokkor Siddik	NACTAR	Computer Operation-L3
30	Tanjirul Islam	NACTAR	Web Page Desiging

Annex-IX: List of KII Respondents

Sl. No.	Name of the Respondents	Name of the Institution	Designation
1	Dr. Md. Bashirul Alam	NIYD	Director-General
2	Mr. Sourandra Nath Saha	NIYD	Registrar
3	Mr. Saiful Islam	Pakiza	General Manager
4	Engr. Md. Lutfor Rahman	BKTTC	
5	Mst. Memruzzahan	BKTTC	
6	Kamrul Hossain	Bangladesh Auto Industry	
7	Abdullah Al Saki	Mohammadi Group	
8	Swapan Kumar Das	Texworld Knitwear Ltd.	
9	Mainul Hasan	Rahim Afrooz	
10	Dr. Hosne Ara Begum	Dept. of Yarn Engineering, BUTEX	Professor
11	Dr. Md. Syduzzaman	Dept. of Textile Engineering Management	Professor
12	Kamrul Hasan Bappy	NIYD	Instructor, English
13	Jhumur Roy	NIYD	Assistant Director, Research
14	Sahida Easmin	NIYD	Lecturer, Agriculture
15	Emrul Ahsan Plabon	NIYD	Instructor, Food and Beverage
16	Sweety Akter	NIYD	Lecturer, English
17	Sultan Mahmud	NIYD	Lecturer, ICT
18	Al Imran Hossain	NACTAR	Teacher_Dept. Head_Computer Operation

Submitted by: BISR Trust

Sl. No.	Name of the Respondents	Name of the Institution	Designation
19	Naiyan Noor	NACTAR	Teacher, Dept. of Webpage Designing
20	Most. Najnin	YPSA	Trainer
21	Md. Abu Hanif	BKTTC	Trainer
22	Most. Afroza	BKTTC	Trainer
23	Ambiya Khatun	BKTTC	Trainer
24	Md. Ziya	BKTTC	Trainer
25	Shohifa Hosna	SFMTTC	Chief Instructor
26	Dr. Mohammad Mujibur Rahman	Jahangirnagar University	Professor, Dept. of Environmental Science
27	Dr. M. A. Faruk	Bangladesh Agricultural University (BAU)	Professor, Dept. of Environmental Science
28	Dr. Nazmul Islam	BUET	Professor, Economics
29	Dr. Mahbubur Rahman	BUET	Professor, Accidental Research Institute (ARI)
30	Dr. Mohammad Abdul Basith	BUET	Professor, Physics
31	Khaled Mahmud Shahriar	BJUET	Assistant Professor, Dept. of Computer Science and Engineering
32	Md. Abdulla Hel Kafi	IWM	Head of Research, Innovation and Development

Submitted by: BISR Trust

Annex-X: Some Photograph of Interviews

Submitted by: BISR Trust

Annex-XI: Photograph of FGDs

Submitted by: BISR Trust

Annex-XI: Photograph of KII

Submitted by: BISR Trust