

# **DATA COLLECTION SURVEY ON IT TRAINING FOR UKRAINIAN REFUGEES IN POLAND AND IT SECTOR HUMAN RESOURCE DEVELOPMENT IN UKRAINE**

## **WORK COMPLETION REPORT**

**FEBRUARY 2026**

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

**JAPAN DEVELOPMENT SERVICE CO., LTD (JDS)**

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## ABBREVIAT

| Abbreviation | English/Polish                                                       |
|--------------|----------------------------------------------------------------------|
| ACTED        | Agency for Technical Cooperation and Development                     |
| AI           | Artificial Intelligence                                              |
| ALMPs        | Active Labour Market Policies                                        |
| AMIF         | Asylum, Migration and Integration Fund                               |
| API          | Application Programming Interface                                    |
| AR           | Augmented Reality                                                    |
| AUC          | Area Under the Curve                                                 |
| AWS          | Amazon Web Services                                                  |
| B2B          | Business to Business                                                 |
| CBOS         | Centre for Public Opinion Research                                   |
| CDTO         | Chief Digital Transformation Officer                                 |
| CEFR         | Common European Framework of Reference for Languages                 |
| CEO          | Chief Executive Officer                                              |
| CERT-UA      | The Computer Emergency Response Team of Ukraine                      |
| CES          | Consumer Electronics Show                                            |
| CIC          | Centre for Integration of Foreigners / Centrum pro integraci cizinců |
| CDTO         | Chief Digital Transformation Officer                                 |
| COIL         | Collaborative Online International Learning                          |
| CRUD         | Create, Read, Update, Delete                                         |
| CSS          | Cascading Style Sheets                                               |
| CV           | Curriculum Vitae                                                     |
| DDoS         | Distributed Denial of Service attack                                 |
| DP           | Dokument                                                             |
| DX           | Digital Transformation                                               |
| ECTS         | European Credit Transfer and Accumulation System                     |
| EU           | European Union                                                       |
| FWCI         | Field Weighted Citation Impact                                       |
| FWVI         | Fields-Weighted View Impact                                          |
| GBP          | Great Britain Pound                                                  |
| GDP          | Gross Domestic Product                                               |
| GDPR         | General Data Protection Regulation                                   |
| GIZ          | The Deutsche Gesellschaft für Internationale Zusammenarbeit (German) |
| GmbH         | Gesellschaft mit beschränkter Haftung (German)                       |
| HDI          | Human Development Index                                              |
| HEI          | Higher Education Institution                                         |
| HP           | Home Page                                                            |
| HTML         | Hyper Text Markup Language                                           |
| HTTP         | Hypertext Transfer Protocol                                          |
| ICT          | Information and Communications Technology                            |
| ID           | Identification                                                       |
| IDP          | Internally Displaced Person                                          |
| IITP         | Intensive International Training Programmes                          |
| IOM          | International Organization for Migration                             |
| IoT          | Internet of Things                                                   |
| IT           | Information Technology                                               |
| JDS          | Japan Development Service Co., Ltd.                                  |
| JETRO        | Japan External Trade Organization                                    |
| JICA         | Japan International Cooperation Agency                               |
| JPY          | Japanese Yen                                                         |
| KPI          | Key Performance Indicator                                            |
| MBA          | Master of Business Administration                                    |
| ML           | Machine Learning                                                     |
| MOOC         | Massive Open Online Courses                                          |
| MOU          | Memorandum of Understanding                                          |

| Abbreviation    | English/Polish                                                   |
|-----------------|------------------------------------------------------------------|
| MR              | Mixed Reality                                                    |
| MSWiA           | Ministerstwo Spraw Wewnętrznych i Administracji (Polish)         |
| NAWA            | Polish National Agency for Academic Exchange                     |
| NBP             | Narodowy Bank Polski                                             |
| NGO             | Non-governmental Organization                                    |
| NLP             | Natural Language Processing                                      |
| PB              | Peta Bytes                                                       |
| PBL             | Project Based Learning                                           |
| PC              | Personal Computer                                                |
| PCK             | Polski Czerwony Krzyż (Polish)                                   |
| PCPM            | Polish Center for International Aid                              |
| PDF             | Portable Document Format                                         |
| PESEL           | Powszechny Elektroniczny System Ewidencji Ludności (Polish)      |
| PhD             | Doctor of Philosophy                                             |
| PJAiT           | Polish Japanese Academy of Information Technology                |
| PLN             | Polish Zloty                                                     |
| PROM            | short-term academic exchange program                             |
| PTSD            | Post-Traumatic Stress Disorder                                   |
| QR              | Quick Response                                                   |
| REST            | Representational State Transfer                                  |
| ROC             | Receiver Operating Characteristic curve                          |
| SCORM           | Sharable Content Object Reference Model                          |
| SEO             | Search Engine Optimization                                       |
| SMS             | State Migration Service                                          |
| SNS             | Social Networking Service                                        |
| SoC             | System on Chip                                                   |
| SQL             | Structured Query Language                                        |
| STAR            | Situation, Task, Action, Result                                  |
| STEM            | Science, Technology, Engineering, Mathematics                    |
| TSL             | Transport, Shipping, Logistics                                   |
| UAH             | Ukrainian Hryvni                                                 |
| UAS             | University of Applied Sciences                                   |
| USAID           | United States Agency for International Development               |
| UI              | User Interface                                                   |
| UK              | United Kingdom                                                   |
| UKR             | Ukraine                                                          |
| UNDP            | United Nations Development Programme                             |
| UNESCO          | United Nations Educational, Scientific and Cultural Organization |
| UNHCR           | The Office of the United Nations High Commissioner for Refugees  |
| UNICEF          | The United Nations Children's Fund                               |
| UNITAR          | United Nations Institute for Training and Research               |
| USD             | United States Dollar                                             |
| USF             | (Ukrainian Startup Fund                                          |
| UTF             | Ukrainian Talent Foundation                                      |
| UUKi            | Universities UK International                                    |
| UV              | Unmanned Vehicle                                                 |
| UX              | User experience                                                  |
| VAT             | Value Added Tax                                                  |
| VBA             | Visual Basic for Applications                                    |
| VR              | Virtual Reality                                                  |
| WINWIN Strategy | Ukrainian Global Innovation Strategy WINWIN                      |
| WWW             | World Wide Web                                                   |
| XR              | Cross Reality                                                    |
| ZUS             | Zakład Ubezpieczeń Społecznych                                   |
| 3D              | Three Dimensions                                                 |

## **1. Outline of the Survey**

### **1.1 Survey Background**

Prior to Russia's invasion of Ukraine in February 2022, Ukraine's IT sector continued to grow, mainly through outsourcing, with its IT industry market size at \$4.5 billion (Ukrainian Investment Agency, 2018). There are more than 150 technical higher education institutions in the country, and as of 2018, the IT industry was reported to have high potential, producing many talented IT professionals each year, including developing 16,000 people with IT-related degrees annually (2022, JETRO).

After Russia's invasion of Ukraine, the Ukrainian government has been working to protect its IT resources to continue state activities, including the use of AWS's cloud computing system for data management in ministries and universities, but it has faced difficulties in continuing to train IT personnel. As the invasion continues, universities and other institutions, especially in eastern Ukraine, have been severely damaged, and many Ukrainian engineers, including university students in IT-related fields, have fled to Poland and other neighbouring countries, making it difficult for them to receive the same education they had before the invasion. According to the United Nations High Commissioner for Refugees (UNHCR), as of March 15, 2022, immediately after the invasion, approximately 3 million Ukrainians had fled to neighbouring countries, of which Poland hosted 1.8 million refugees, or 60 percent. Although Ukrainian refugees have since been returning home, 990,000 Ukrainian refugees still remain in Poland as of January 2025.

In light of this situation, JICA conducted the “Data Collection Survey for Ukrainian IT Human Resource Development Collaborating with Polish-Japanese Academy of Information Technology” (February - December 2023) (hereinafter referred to as the “previous survey”). The previous survey first identified the situation and needs of Ukrainian refugees in Poland with a view to improving their employment and livelihood and then conducted short-term intensive pilot training to improve their IT literacy at the Polish-Japanese Academy of Information Technology (PJAIT), with which JICA has cooperated over many years. At the end of the previous survey, proposals were made for future measures (medium- and long-term support measures), which JICA will consider taking for further support of Ukrainian refugees in Poland and IT human resources development in Ukraine. The measures include (i) basic and applied training in IT skills for Ukrainian refugees in Poland, and (ii) support for distance education for students and research capacity building for faculty at Ukrainian universities, with a view to revitalizing Ukraine's IT sector. However, especially in Ukraine, there is room for collecting further information to confirm the current situation, cooperation needs, and the possibility of collaboration with Japanese companies in the higher education and IT sector.

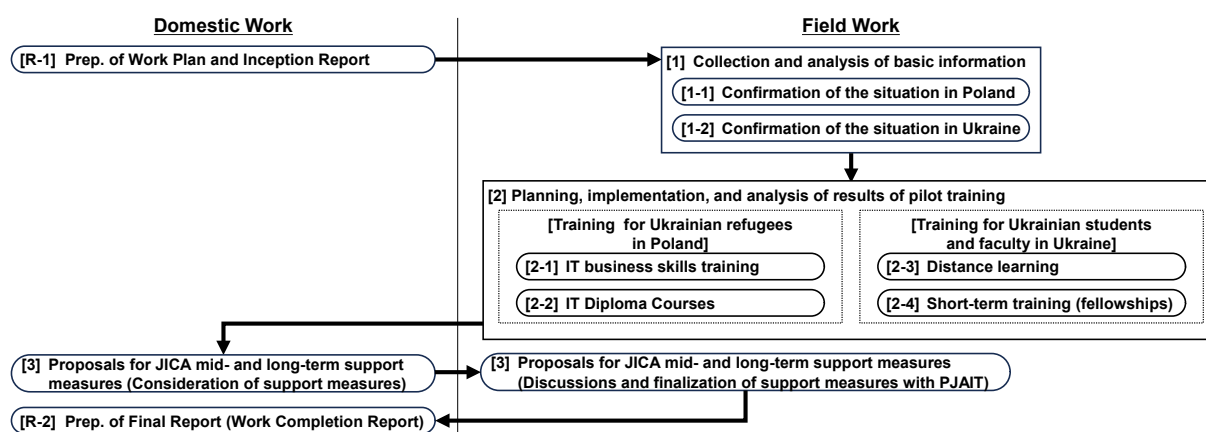
### **1.2 Survey Objectives**

With the above background in mind, this survey will refine training programs and trial them after gathering additional information on the higher education and IT sector in Ukraine. In addition, basic and

applied training on IT skills in Poland will also be tested after improving and refining training programs based on the results of the previous survey. At the end of this survey, the JICA Study Team will propose future measures for JICA to consider taking for Ukrainian refugees in Poland and for IT sector human resource development in Ukraine as medium- and long-term support measures. In formulating measures, the involvement of the Polish National Agency for Academic Exchange (NAWA) will be considered.

### 1.3 Scope of the survey and implementation period

The survey, as shown in the figure below, consists of: 1) Collection and analysis of basic information (items [1-1] and [1-2] in the figure below), 2) Planning, implementation, and analysis of results of the pilot training (items [2-1], [2-2], [2-3], and [2-4] in the figure below), 3) Proposals for JICA's medium- to long-term support measures (item [3] in the figure below), and 4) Preparation of deliverables (items [R-1] and [R-2] in the figure below).



Source: Prepared by the JICA survey team

Figure-1 Overall Flow of the Survey Work

The survey was conducted from March 31, 2025, to February 20, 2026.

### 1.4 Composition of the JICA Survey Team

The JICA survey team consists of five members. The affiliations and positions of each member are as shown in the table below.

Table-1 Composition of the JICA Survey Team

| Name                   | Company Name                              | Field of Expertise                            |
|------------------------|-------------------------------------------|-----------------------------------------------|
| Hiroyuki Kanzaki       | Japan Development Service Co., Ltd. (JDS) | Team Leader/Higher Education                  |
| Natsuko Nishio (Ozawa) | JDS                                       | Deputy Team Leader / IT Resource Coordination |
| Tsutomu Ono            | JDS                                       | IT Training I/ Distance Learning              |
| Yumi Yoshida           | ASAGAO sp.zo.o                            | IT Training II                                |
| Naoko Kato             | JDS                                       | Short-term Training (fellowship)              |

Source: Prepared the JICA survey team

## **2. Collection and Analysis of Basic Information**

### **2.1 The Environment Surrounding Ukrainian Refugees in Poland**

#### **(1) Current Situation and Challenges Facing Ukrainian Refugees**

##### **1) Basic Information**

Three years after the start of Russia's invasion of Ukraine, approximately one million Ukrainian citizens are currently residing in Poland under temporary protection, receiving support from both the Polish government and private-sector actors. The majority of this population consists of women and children. In total, 1.55 million Ukrainians hold valid residence permits in Poland, while approximately two million refugees have applied for temporary protection. The Ukrainian nation represents the largest group among foreign residents in Poland, accounting for 78% of the total foreign population.

Among the 1,001,832 Ukrainian citizens registered under temporary protection, approximately 59% are women, and among adults alone, this proportion rises to 71%. Moreover, one in two individuals within this group is a child.<sup>1</sup> Approximately 462,000 Ukrainian nationals hold a valid Temporary Residence Permit, most of which have been issued based on employment.

In addition, around 92,000 individuals possess either a Permanent Residence Permit or an EU Long-Term Residence Permit.<sup>2</sup> In 2024, 8,219 Ukrainian nationals acquired Polish citizenship, accounting for approximately 50% of the total number of citizenships granted that year and corresponding to about 0.022% of Poland's total population.

However, public attitudes toward Ukrainian refugees have begun to shift. According to a survey conducted by the Public Opinion Research Center (CBOS), approximately half of Polish respondents believe that government support for Ukrainian refugees is excessive. Furthermore, 58% of respondents expressed the view that social benefits and services, such as the "Rodzina 800+" child benefit program and free healthcare, should be limited to Ukrainians who are employed and paying taxes in Poland.<sup>3</sup>

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<sup>1</sup> Refugees from Ukraine registered in Poland, <https://shorturl.at/XKoGE>

<sup>2</sup> Central Offices, <https://www.gov.pl/web/udsc/obywatele-ukrainy-w-polsce--aktualne-dane-migracyjne2>

<sup>3</sup> Onet.pl, "The Actual Situation of Ukrainians Who Have Acquired Polish Citizenship", <https://www.onet.pl/informacje/prawdaorgpl/ilu-ukraincow-naprawde-dostalo-polskie-obywatelstwo-sprawdzamy-liczby-i-procedury/rsfmb2k,30bc1058>

Table-2 Current Status of Ukrainian Refugees

|                                  |           |
|----------------------------------|-----------|
| PESEL UKR holders                | 1,001,832 |
| Cumulative registered applicants | 2,011,104 |

Source: [https://dane.gov.pl/en/dataset/2715\\_zarejestrowane-wnioski-o-nadanie-statusu-ukry](https://dane.gov.pl/en/dataset/2715_zarejestrowane-wnioski-o-nadanie-statusu-ukry) (as of 14 October 2025)

| Age and Gender Distribution |        |      |
|-----------------------------|--------|------|
| Age Group                   | Female | Male |
| 0~4                         | 2%     | 2%   |
| 5~11                        | 8%     | 8%   |
| 12~17                       | 7%     | 8%   |
| 18~59                       | 37%    | 21%  |
| Older than 60               | 5%     | 1%   |

Source: <https://app.powerbi.com/view?r=eyJrIjoiaZWJhMWUyMzEtN2E0OC00N2ZkLTlhZDEtZDE4NmY0NTMxYjk4IiwidCI6ImU1YzZM3OTgxLTy2NjQtdmVzNC04YTBlLTU1NDNkMmFmODBiZSIsImMiOj9>

| Number of Refugees by Voivodeship |         |
|-----------------------------------|---------|
| Masovian                          | 222,857 |
| Lower Silesian                    | 119,443 |
| Silesian                          | 100,824 |
| Greater Poland                    | 89,102  |
| Lesser Poland                     | 70,300  |
| Pomeranian                        | 62,181  |
| Łódź                              | 46,963  |
| West Pomeranian                   | 37,950  |
| Lublin                            | 34,652  |
| Lubusz                            | 32,870  |
| Kuyavian-Pomeranian               | 31,011  |
| Subcarpathian                     | 31,011  |
| Opole                             | 22,106  |
| Warmian-Masurian                  | 17,069  |
| Holly Cross                       | 14,805  |
| Masovian                          | 13,485  |

Source: <https://app.powerbi.com/view?r=eyJrIjoiaZWJhMWUyMzEtN2E0OC00N2ZkLTlhZDEtZDE4NmY0NTMxYjk4IiwidCI6ImU1YzZM3OTgxLTy2NjQtdmVzNC04YTBlLTU1NDNkMmFmODBiZSIsImMiOj9>

## 2) Employment Situation

According to a joint report by Deloitte and UNHCR, Ukrainian refugees contributed approximately 2.7% to Poland's GDP in 2024. Among working-age refugees, 69% are employed in the Polish labor market, slightly lower than the 75% employment rate among working-age Polish nationals.<sup>4</sup> Employment among refugees increased from 61% in 2023, representing an 8 percentage-point rise. Despite this progress, many refugees remain employed in positions that do not fully utilize their qualifications. Among refugees holding university degrees, only one-third are employed in jobs requiring higher education. Nevertheless, data from the National Bank of Poland indicate a gradual improvement: the share of refugees working in low-skilled or elementary occupations has declined,

<sup>4</sup> Poland: Analysis of the impact of refugees from Ukraine on the economy of Poland — 2nd edition, <https://data.unhcr.org/en/documents/details/116621>

while employment in skilled and qualification-based positions has increased. Between 2023 and 2024, the proportion of migrants in elementary jobs decreased from 53% to 44%, while employment in occupations requiring vocational or intermediate skills rose from 33% to 38%. The share of migrants employed in positions utilizing higher education increased from 10% to 14%.<sup>5</sup>

A clear distinction exists between Ukrainian migrants who arrived before the 2022 invasion and those who arrived afterward. Refugees arriving after 2022 generally possess higher educational attainment, yet often face difficulties aligning their qualifications with Polish labor market demand. As a result, only 16% are employed in positions requiring higher education, while 51% work in low-skilled or elementary jobs. By contrast, Ukrainians who arrived before 2022 tend to have lower formal education, but demonstrate greater labor market adaptability and hold in-demand skills, particularly in construction and transport. Among this group, 46% are employed in skill-based occupations unrelated to higher education, while 37% work in low-skilled positions.

### 3) Support Needs

Although many Ukrainian refugees possess high qualifications and extensive professional experience, they face institutional and structural barriers to career development in Poland. According to the Deloitte–UNHCR report, certain professions still require Polish citizenship, forcing even highly qualified individuals to retrain for entirely different occupations. The report also highlights that expanding access to part-time employment could significantly alleviate unemployment among Ukrainian refugee women with children. Many refugee women struggle to balance employment with family responsibilities, limiting their participation in full-time work. A persistent challenge remains the mismatch between refugees' qualifications and labor market demand, which continues to hinder economic integration.

Among identified priority areas for support, Polish language education is considered one of the most effective tools for improving labor market outcomes. Research indicates that refugees with higher Polish-language proficiency earn significantly higher wages. Consequently, publicly funded language courses benefit not only refugees but the broader economy. Such programs should extend beyond beginner and intermediate levels to support advanced learners seeking access to highly skilled professions.

Another critical area is the liberalization of professional licensing requirements. While certain requirements have already been relaxed for Ukrainian nationals, further permanent reforms would benefit both the Polish economy and refugee integration. The report emphasizes that nationality-based restrictions, independent of actual competence or language ability, could be fully removed without compromising professional standards.

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<sup>5</sup> The National Bank of Poland, “The Living and Economic Conditions of Ukrainian Refugees in Poland in 2024”, [https://nbp.pl/wp-content/uploads/2024/11/Raport\\_Imigranci\\_z\\_Ukrainy\\_2024-PL-DS-2024-WWW.pdf](https://nbp.pl/wp-content/uploads/2024/11/Raport_Imigranci_z_Ukrainy_2024-PL-DS-2024-WWW.pdf)

Finally, Active Labor Market Policies (ALMPs) should specifically target refugees who were not economically active prior to arriving in Poland, including those engaged in domestic or caregiving roles. Tailored ALMP interventions could support transitions into formal employment, thereby fostering economic independence and social integration.

#### 4) Corporate Employment Demand

Employment patterns among migrants in Poland vary significantly according to the period of arrival. Approximately one-quarter of all migrants are employed in industrial sectors such as manufacturing. Migrants, predominantly men, who arrived prior to the Ukrainian invasion tend to work in transport, construction, and administrative occupations. In contrast, refugees arriving after 2022 are primarily employed in service sectors, including personal care, hospitality, cleaning, and elderly care. Notably, this group also exhibits a higher share of employment in highly specialized professions, such as healthcare, IT, and finance.

Wage disparities across sectors are pronounced. Migrants employed in transport, construction, and IT, which are industries with higher male participation, earn median net monthly wages exceeding PLN 5,000, at least 25% above the migrant median wage. Conversely, the lowest wages are observed in domestic services, hospitality, and agriculture, where median net monthly income ranges between PLN 3,400 and PLN 3,500.

According to the Polish Economic Institute, 31% of companies express willingness to hire Ukrainian workers, with 40% of these being medium- and large-sized enterprises. The highest demand exists in construction, manufacturing, transport and logistics (TSL), education, accounting, and services. While construction poses barriers for women, manufacturing offers comparatively greater employment opportunities. Migrants are also frequently employed in hospitality with accommodation provided, personal and household services, logistics, and food processing.<sup>6</sup>

At the same time, Poland is experiencing a notable structural transformation in its labor market. Since 2021, there has been a clear increase in job vacancies in new technology-related fields. According to the Warsaw Enterprise Institute (2022) report “The Future of Refugees from Ukraine on the Polish Labour Market”, the IT sector has been expanding particularly rapidly, and similar trends can also be seen in marketing, e-commerce, and Research and Development (R&D). Employers are increasingly seeking workers with the technical and analytical competencies required to operate in digital environments. This trend is being driven by factors such as the continued digitalization of the economy, the expansion of remote work, and the growing adoption of cloud-based tools.

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<sup>6</sup> The Polish Enterprise Institute, <https://wei.org.pl/wp-content/uploads/2022/05/Przyszlosc-uchodzcow-z-Ukrainy-na-ryнку-pracy-w-Polsce.pdf>

## (2) Polish Government Policy on Ukrainian Refugees

From 1 November 2025, new regulations regarding accommodation for refugees came into effect. Under the Act on Assistance for Ukrainian Citizens, signed by President Karol Nawrocki at the end of September, the Government will terminate the acceptance of Ukrainian refugees into collective accommodation facilities as of 31 October 2025, and will subsequently phase out the program.

Exceptions will apply to socially vulnerable groups, including:

- pension recipients (women aged 60 and above; men aged 65 and above);
- persons with moderate or severe disabilities; and
- large families.

Eligible individuals will receive a subsidy of PLN 15 per day. Other refugees will be required to cover housing costs at their own expense.

Under the new law, the legal stay of Ukrainian nationals in Poland will be extended until 4 March 2026, in line with the validity period of the corresponding decision of the EU Council.

In addition, on 26 September, President Karol Nawrocki signed another law stipulating that social benefits (so-called “800+”) will be granted only to Ukrainian refugees who are employed in Poland. According to Zbigniew Bogucki, Head of the Chancellery of the President, this represents “the last law as a special and exceptional support measure,” and he stated that “there is no longer any basis or reason to continue such support.” The “800+” program provides PLN 800 per month per child under the age of 18. Under the special act, eligibility will be limited to Ukrainian citizens who are working or studying in Poland. In other words, those who have completed upper secondary education and proceeded to university or vocational training, or households in which at least one parent is working under a formal employment contract, will remain eligible to receive the benefit. According to data from the Social Insurance Institution (ZUS), as of July 2025, a total of 276,600 foreign children were receiving “800+”, and 224,700 of these were Ukrainian children. Bogucki further stated that, due to President Nawrocki’s use of the veto power, the Government of Donald Tusk was forced to make certain “adjustments,” and that savings of approximately PLN 270 million are expected in 2026 from the “800+” program alone.

Through these new conditions, the Government of Poland aims to promote the social integration and economic self-sufficiency of Ukrainian refugees. As part of its refugee assistance policy, the Government of Poland launched the “Together to Independence” project. The project is led by the Ministry of the Interior and Administration (MSWiA) and implemented in cooperation with the Polish Red Cross (PCK) and the Polish Center for International Aid (PCPM). Funding is provided through the European Union’s Asylum, Migration and Integration Fund (AMIF) 2021–2027, with

a total budget of approximately PLN 93.5 million, 90% of which is financed by EU funds. The program implementation period runs until 31 March 2026. The initiative targets Ukrainian citizens staying in Poland under temporary protection who are currently living in collective accommodation facilities. Its main objective is to support the transition from state-supported accommodation to private housing, while promoting employment, improving Polish-language skills, and facilitating integration into local communities to encourage self-reliance. Participants receive a range of assistance, including:

- housing support (assistance with the security deposit and partial coverage of rent for up to six months);
- relocation cost support;
- vouchers for purchasing essential goods;
- career counselling and employment support;
- free Polish-language courses; and
- integration activities aimed at promoting social inclusion and self-reliance.

Eligibility requires holding a PESEL number with “UKR” status and currently residing in a collective accommodation facility. Through this project, the Government of Poland and its partner organizations aim to help Ukrainian refugees establish stable, self-reliant living conditions and gradually reduce dependence on public assistance.<sup>7</sup>

Another initiative promoted by the Ministry of Family, Labour and Social Policy using EU funds is the establishment of Foreigners’ Integration Centers (CICs). As of October 2024, 49 centers had been opened, providing the following services:

- Polish-language courses (A1/A2 level);
- information provision and consultation desks;
- psychological care for children;
- support for obtaining and legalizing residence status;
- legal support on employment and labor rights;
- adaptation and orientation courses;
- domestic violence prevention;
- human trafficking prevention;
- training for education and administrative personnel; and
- management of CIC websites and social media accounts.

This project is financed through a combination of EU funds, the Polish state budget, local government budgets, and the Asylum, Migration and Integration Fund (AMIF), and is operated with the aim of

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<sup>7</sup> Polish Government Website, <https://www.gov.pl/web/mswia/projekt-wspolnie-do-niezaleznosci>

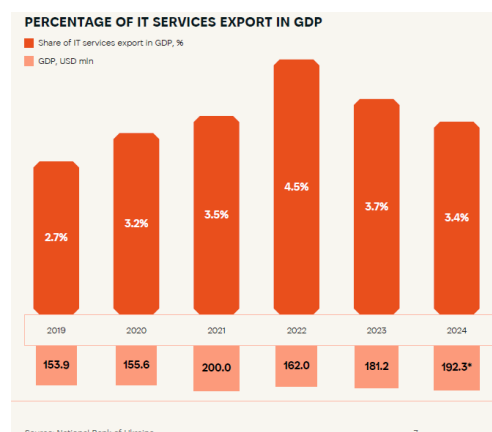
promoting the social integration of foreigners residing in Poland, including Ukrainian refugees.<sup>8</sup>

## 2.2 Initiatives of the Ukrainian Government

### (1) Promotion of the IT Industry

#### 1) Positioning of the IT Industry

The IT industry plays an extremely important role in Ukraine's economy, particularly in exports. In the early 2010s, IT industry exports accounted for 0.5–1% of Ukraine's GDP. However, from 2020 to 2021, that share reached approximately 2%, more than doubling from the early 2010s.<sup>9</sup> Following Russia's full-scale invasion in 2022, the loss of most of the metal industry and the temporary halt in agricultural exports caused this share to rise to 4.5%. However, with agricultural exports fully resuming in 2023 and 2024, IT's share of Ukraine's GDP has declined slightly, though it remains at 3.7% to 3.4% of GDP.<sup>10</sup>



Source: Digital Tiger: The Market Power of Ukrainian IT Research for 2024 (IT Ukraine Association)

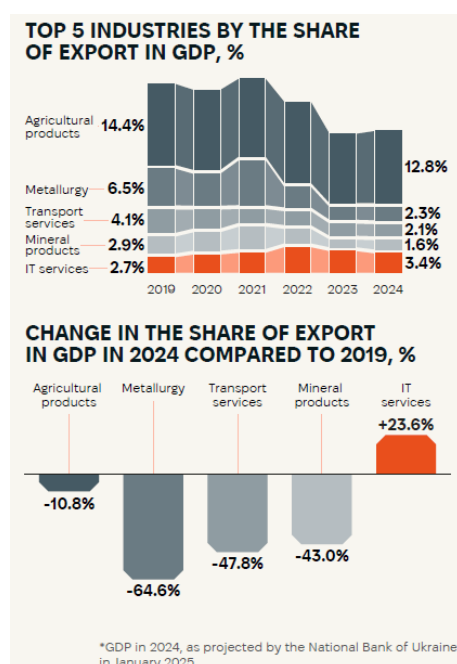
Figure-2 Share of IT Industry Exports in GDP

When compared to other industries, IT services rank among the top five industries alongside agricultural products, metals, mineral products, and transportation services. Among these five industries, IT services is the only one to have increased its share compared to 2019. Its share rose from 2.7% in 2019 to 3.4% in 2024, representing a 23.6% increase.

<sup>8</sup> Poland: New integration centres established nationwide, [https://home-affairs.ec.europa.eu/news/poland-new-integration-centres-established-nationwide-2024-10-07\\_en](https://home-affairs.ec.europa.eu/news/poland-new-integration-centres-established-nationwide-2024-10-07_en)

<sup>9</sup> <https://www.kyivgovtechcentre.org/it-sector-ua>

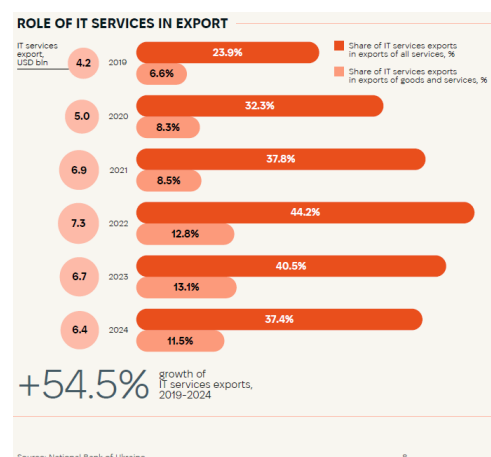
<sup>10</sup> <https://www.kyivgovtechcentre.org/it-sector-ua>



Source: Digital Tiger: The Market Power of Ukrainian IT Research for 2024 (IT Ukraine Association)

Figure-3 Changes in the Share of Exports in GDP at the Top Five Industries

Exports reached \$4.2 billion in 2019 and then hit a record high of \$7.3 billion in 2022. Although they have declined slightly since then, exports in 2024 represent a 54.5% increase compared to 2019.



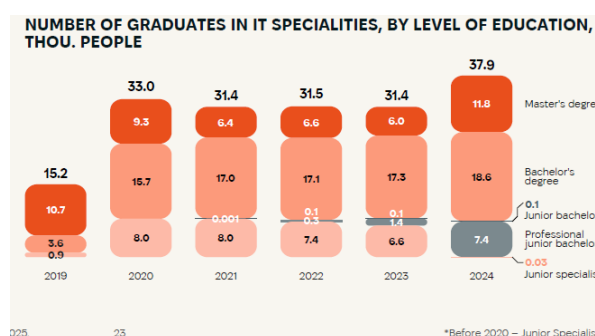
Source: Digital Tiger: The Market Power of Ukrainian IT Research for 2024 (IT Ukraine Association)

Figure-4 Trends in IT Industry Export Value (2019–2024)

## 2) The Current State of IT Companies

Ukrainian IT companies continue to grow steadily despite the war with Russia. Revenue<sup>11</sup> for Ukrainian IT companies reached \$4.2 billion in 2019, \$4.4 billion in 2020, \$6.1 billion in 2021, \$5.9 billion in 2022, \$6.0 billion in 2023, and \$6.2 billion in 2024.<sup>12</sup> The average annual growth rate in US dollars was 8.2%, equivalent to 20.4% when converted to the local currency.

As of August 2024, 2,118 IT companies are operating within Ukraine.<sup>13</sup> By business model, outsourcing is the most common at 47%, followed by product at 31%, mixed at 19%, and out-staffing at 3%.<sup>14</sup> The number of IT specialists is approximately 302,000, of whom about 238,000 work domestically and 64,000



Source: Digital Tiger: the Market Power of Ukrainian IT Research for 2024 (IT Ukraine Association)

Figure-5 Number of Graduates in IT Specialties, by Level of Education

<sup>11</sup> Digital Tiger: The Market Power of Ukrainian IT Research for 2024 (IT Ukraine Association)

<sup>12</sup> Digital Tiger: The Market Power of Ukrainian IT Research for 2024 (IT Ukraine Association)

<sup>13</sup> IT research Ukraine 2024 (Lviv IT Cluster)

<sup>14</sup> IT research Ukraine 2024 (Lviv IT Cluster)

work overseas.<sup>15</sup>

In 2024, 405 higher education institutions admitted students to IT-specialized programs, producing 37,900 graduates.<sup>16</sup> From 2019 to 2024, over a six-year period, 184,000 graduates were produced, and the number of graduates in this field increased 2.5 times over these six years.<sup>17</sup>

In Ukraine, alongside formal higher education institutions, a network of non-formal education providers, including IT schools and programs run by IT companies, has been established. These non-formal education institutions train specialists who are well-suited to meet market demand and specific business requirements. According to a survey by the IT Ukraine Association, 821,300 people completed IT-related courses at non-formal education institutions between 2019 and 2024.<sup>18</sup>

In addition to formal and non-formal educational institutions, IT clusters play a significant role in the development of Ukraine's IT industry. Currently, 26 IT clusters exist in major cities such as Kyiv, Lviv, and Kharkiv.<sup>19</sup> These clusters form an ecosystem that promotes the regional IT industry by fostering collaboration among IT companies, educational institutions, and government agencies. Specifically, they engage in activities such as training and promoting IT professionals, conducting industry analysis and research, organizing thematic events, supporting new ventures, and hosting startup competitions.<sup>20</sup>

Additionally, the IT Ukraine Association, as Ukraine's largest domestic IT industry association, protects the interests of IT companies in taxation and legal aspects of business operations, implements educational and social projects, provides legal and public relations support, facilitates networking among members and partners, and promotes Ukraine's branding as a world-leading developer and supplier of IT products and services.<sup>21</sup>

### 3) Challenges Facing Ukraine's IT Industry

Ukraine's IT industry has demonstrated resilience in the face of war, but it faces challenges including those stemming from the conflict itself and those inherent to the industry's underlying structure.

#### a) Increase in cybersecurity threats

As military conflicts spill over into cyberspace, companies face an increasing risk of frequent cyberattacks, with the threat intensified by highly integrated global IT systems and

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<sup>15</sup> IT research Ukraine 2024 (Lviv IT Cluster)

<sup>16</sup> Digital Tiger: The Market Power of Ukrainian IT Research for 2024 (IT Ukraine Association)

<sup>17</sup> Digital Tiger: The Market Power of Ukrainian IT Research for 2024 (IT Ukraine Association)

<sup>18</sup> Digital Tiger: the Market Power of Ukrainian IT Research for 2024 (IT Ukraine Association)

<sup>19</sup> <https://mezha.ua/en/articles/it-clusters-in-ukraine-how-the-community-lives-during-the-war/>

<sup>20</sup> <https://mezha.ua/en/articles/it-clusters-in-ukraine-how-the-community-lives-during-the-war/>

<sup>21</sup> <https://itukraine.org.ua/en/about-us/>

infrastructure. According to the latest data, Ukraine's Computer Emergency Response Team (CERT-UA) detected over 4,300 cyber incidents last year. This represents an increase of approximately 70% compared to the previous year.<sup>22</sup>

b) Over-reliance on outsourcing

Ukraine's IT industry shows a pronounced concentration on outsourcing, with 47% of IT companies adopting this business model. Meanwhile, 31% of companies are engaged in production, and 19% operate under a hybrid model.<sup>23</sup> Outsourcing has contributed to sector growth and international integration, but its dominance indicates limited diversification within the industry. This structure suggests potential vulnerability to fluctuations in external demand. Furthermore, if outsourcing destinations shift due to concerns over the business continuity and cybersecurity of Ukrainian IT companies caused by the war, Ukrainian IT companies would suffer significant negative impacts.

c) Limited Venture Capital and Startup Support

The underdeveloped venture infrastructure impacts IT companies' ability to secure growth funding and achieve scalability. This constraint reduces access to early-stage funding and mentorship opportunities essential for fostering innovation. Consequently, many startups face challenges transitioning from prototype models to market-ready solutions.<sup>24</sup>

d) Employee Well-being and Mental Health

The prolonged war has made mental health a critical issue for IT professionals in Ukraine.<sup>25</sup> IT companies are responding by offering psychological support as part of employee benefits packages. 56.8% of companies provide access to in-house psychologists or cover all or part of the cost of psychological counseling, an 11% increase from the previous year.<sup>26</sup>

e) Overseas Relocation of IT Specialists

The impact of the war has led to approximately 120,000 highly skilled Ukrainian IT professionals emigrating abroad, creating a significant brain drain issue.<sup>27</sup> According to the 2024 survey on IT professionals' migration intentions, many Ukrainian tech specialists wish to live and work in Ukraine, yet the risk of human capital outflow persists. The survey found that when asked, "If you had no restrictions on where to live, where would you choose to live?", 57.7% responded Ukraine. This figure represents a 1.8% increase compared to 2023.

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<sup>22</sup> Special Report: Impact of the Russia-Ukraine crisis on the Technology sector (Dun & Bradstreet, Inc. 2022)

<sup>23</sup> IT research Ukraine 2024 (Lviv IT Cluster)

<sup>24</sup> Ukraine Investment Catalogue 2025 (Ministry of Economy of Ukraine, Kyiv School of Economics)

<sup>25</sup> Wartime and Ukrainian Information Technology specialists' wellbeing: exploring the role of internal resilience resources, Iryna Kryazh& Victoria Kholmanova

<sup>26</sup> IT research Ukraine 2024, Lviv IT cluster

<sup>27</sup> Of these, approximately 62,000 to 64,000 continue to work for Ukrainian companies.

Meanwhile, 25.5% answered “abroad.”<sup>28</sup>

f) Responding to the Changing Labor Market

Another issue is that IT talent development is failing to adapt to changes in the labor market. Currently, Ukraine's labor market sees sustained demand for mid-level and senior IT professionals, while the general labor market for entry-level positions (trainees, junior roles) remains challenging due to an oversupply of candidates.<sup>29</sup> For example, among IT personnel hired in 2024, trainees accounted for 14% and junior positions for 12%, representing a limited proportion.<sup>30</sup> Furthermore, as technology evolves, demand for IT professionals proficient in emerging technologies such as AI, cybersecurity, and cloud computing continues to grow.<sup>31</sup>

4) The Ukrainian Government's IT Industry Promotion Policy

One of the key initiatives in the Ukrainian government's IT industry policy is the “Ukraine Global Innovation Strategy” (hereinafter referred to as the WINWIN Strategy), approved by the Ukrainian government in January 2025. This strategy is a comprehensive document outlining the direction, principles, goals, and objectives of national policy for promoting digital innovation through 2030. According to this strategy document, it is evident that the Ukrainian government is seeking to advance digital innovation by focusing on government policies supporting human capital development, the national innovation system, economic incentives for innovation, and priority innovation sectors.<sup>32</sup> The table below shows the strategic goals for each of these four strategic areas.

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<sup>28</sup> IT research Ukraine 2024, Lviv IT cluster

<sup>29</sup> <https://112.ua/en/it-rinok-ukraini-u-2026-pomirne-zrostanna-ta-novi-pravila-dla-pocatktivciv-134762>

<sup>30</sup> IT research Ukraine 2024, Lviv IT cluster

<sup>31</sup> <https://www.talentuch.com/post/it-market-in-ukraine-2024-issues-and-solutions>

<sup>32</sup> <https://digitalstate.gov.ua/news/tech/winwin-global-innovation-strategy-until-2030>

Table-3 Strategic Objectives in the WIN-WIN Strategy

| Strategic Areas                                           | Strategic Goals                                                                                                                                             |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Human capital development                              | 1. Transform the system of preschool and complete general secretary education into a reasonable basis for an innovative ecosystem                           |
|                                                           | 2. Create conditions for transforming vocational education institutions into an integrated part of the innovation ecosystem                                 |
|                                                           | 3. Transform higher education and research institutions into innovation development centers deeply integrated into market and business                      |
|                                                           | 4. Retain and attract human capital                                                                                                                         |
| 2. National Innovation System                             | 5. Improve coordination and cooperation at the level of innovation policy making and implementation                                                         |
|                                                           | 6. Legal regulation of the national innovation ecosystem elements                                                                                           |
|                                                           | 7. Create regulatory and infrastructural opportunities for efficient technology transfer                                                                    |
|                                                           | 8. Build capacity to create knowledge-intensive innovations                                                                                                 |
|                                                           | 9. Provide protection, commercialization and enforcement of intellectual property                                                                           |
|                                                           | 10. Introduce the Industry 4.0 technological approach to support innovation activities                                                                      |
| 3. Economic Incentives for Innovation                     | 11. Achieve cross-cutting deregulation in areas of innovation                                                                                               |
|                                                           | 12. Stimulate R&D and create a solid financial footing with limited resources                                                                               |
|                                                           | 13. Easier access to the capital market for small innovative businesses (startups)                                                                          |
| 4. Government Policy to Support Priority Innovation Areas | 14. Effective regional innovation ecosystems based on the initial competitive advantages of the regions                                                     |
|                                                           | 15. Concentration of available resources to support 14 most promising tech sectors will create the basics for the National Innovation Ecosystem of Ukraine. |

Source: Prepared by the JICA survey team based on UKRAINIAN GLOBAL INNOVATION STRATEGY 2030 (full version)

The 14 priority areas specified in Strategic Goal 15 in the table above include Defense Tech, MedTech, BioTech, GovTech, AgroTech, EdTech, Semiconductor Technology, Cybersecurity, GreenTech, Cross Reality (XR), Artificial Intelligence (AI), Unmanned Vehicles (UV), SpaceTech, and Fluid Economy.

Another major government initiative in this field is “Diia.City,” launched in 2022.<sup>33</sup> This is a pioneering legal and tax framework designed to promote Ukraine's digital economy and attract global investment in the technology sector. Diia.City offers a unique regulatory environment tailored to the needs of IT companies, startups, and venture capital firms, providing benefits such as tax reductions, simplified employment models through gig contracts, and enhanced intellectual property protection. Specifically, this includes a 5% personal income tax for IT professionals, a 1.5% low-rate military tax, and attractive corporate tax options (such as a 9% tax on withdrawn capital instead of the standard 18%). According to a 2025 report by Ukraine's Ministry of Digital Transformation, 70% of the country's entire IT industry is now based in Diia.City. The number of participating companies has reached 1,555 over three years, ranging from large corporations like monobank, Grammarly, Reface, Rakuten Viber, Visa, and Nokia to small startups.<sup>34</sup>

<sup>33</sup> <https://digitalstate.gov.ua/projects/govtech/diia-city>

<sup>34</sup> <https://ain.ua/2025/02/07/diia-city-splatili-ponad-18-mlrd-grn-podatkov/>

Additionally, the Ukrainian Startup Fund (USF) plays a crucial role in nurturing tech startups. This is a government fund that strategically supports early-stage tech startups through financial backing.<sup>35</sup> Established in 2018 under the leadership of Ukraine's Minister of Finance, it has been managed by the Ministry of Digital Transformation since 2023. Through this fund, it has provided a total of \$9 million in funding to over 450 startups by 2025. Among them are globally recognized companies such as Esper Bionics, Awesomic, Upswot, Finmap, and SLab. USF's strategic initiatives are as follows.

- Providing grant programs for pre-seed and seed-stage startups across 19 sectors (IT consulting, cybersecurity, blockchain, AI, GovTech, EdTech, GreenTech, MedTech, robotics, etc.)
- Forming international consortia (e.g., Seeds of Bravery, WIN2EDIH, Wennovate)
- Dispatch startup tech missions to global innovation events (Web Summit, CES, VivaTech, TechCrunch, etc.)
- Implement corporate innovation programs connecting startups with leading companies like Nova, Uklon, and Glovo
- Collaborate with Ukraine's Ministry of Education and Science on educational initiatives and develop startup schools
- Organize workshops, ecosystem events, and formulate innovation policies

#### 5) Challenges in IT Talent Development and the Ukrainian Government's Initiatives

The Ministry of Digital Transformation announced an IT education roadmap for Ukraine in 2021, aiming to reform IT education by 2030. Within this roadmap, challenges for each education subsector are organized as shown in the table below.

Table-4 Challenges in IT Education under the IT Education Reform Roadmap 2030

| Education Sub-Sector                                                             | Problems in IT Education                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Complete general secondary education                                             | <ul style="list-style-type: none"> <li>• Low quality of education in rural areas</li> <li>• Insufficient number of teachers who use modern approaches and methods of teaching STEM subjects</li> <li>• The career choices of 80% of school students are influenced by their parents</li> </ul>                                                  |
| Vocational, vocational education and training, professional pre-higher education | <ul style="list-style-type: none"> <li>• Low quality of pre-higher education</li> <li>• Low prestige of vocational education</li> </ul>                                                                                                                                                                                                         |
| Higher education                                                                 | <ul style="list-style-type: none"> <li>• Lack of financial autonomy of higher education institutions</li> <li>• Uncompetitive salaries for teachers and IT specialists</li> <li>• Weak management in educational institutions</li> <li>• Lack of “future-oriented specializations” (AI, Internet of things, Big Data, cybersecurity)</li> </ul> |
| Non-formal education, lifelong learning, self-education                          | <ul style="list-style-type: none"> <li>• Complex licensing system</li> <li>• Unequal tax conditions with foreign platforms</li> <li>• Restrictions on recognition of education obtained in educational institutions</li> </ul>                                                                                                                  |

Source: Prepared by the JICA survey team based on presentation on roadmap for reforming IT education

<sup>35</sup> <https://digitalstate.gov.ua/projects/tech/ukrayinsky-fond-startapiv-uks>

To address these challenges, initiatives for each education subsector have been established under three reform goals: i) Developing non-formal education, ii) Improving the competitiveness and autonomy of universities and colleges, and iii) Improving the quality of mathematics and computer science in schools, as shown in the table below.

Table-5 Reform Objectives and Actions in the IT Education Reform Roadmap 2030

| Main Reform Objectives                                                  |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Reform Objectives                                                   | Time Axis  | Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Development of informal education                                       | Short-term | <ul style="list-style-type: none"> <li>• Development of a mechanism for recognizing results of studies that can be obtained in non-formal education, within the formal system.</li> <li>• Creation of a special fund, which will cover 50% of the cost of training in non-formal education institutions for switchers - these are people who want to change their specialty and get an IT profession.</li> </ul>                                                                                                 |
| Improving the competitiveness and autonomy of universities and colleges | Mid-term   | <ul style="list-style-type: none"> <li>• Inclusion of cooperation with business in the mandatory performance indicators of university leaders</li> <li>• Involvement of practitioners and foreign teachers.</li> <li>• Development of new professional standards for modern professions in the industry together with the IT community and their addition to the state classifier</li> </ul>                                                                                                                     |
| Improving the quality of mathematics and computer science in schools    | Long term  | <ul style="list-style-type: none"> <li>• Introduction of video courses in mathematics and computer science.</li> <li>• Development of network education to provide opportunities for a child to attend a certain subject outside of school in another institution.</li> <li>• Provision of professional guidance for schoolchildren such as online meetings with bright professionals, testing, information campaigns for children to learn about real modern professions and get motivated to learn.</li> </ul> |

| Reform Action                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                 |                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Non-formal Education                                                                                                                                                                                                                               | Higher and Professional Pre-higher Education                                                                                                                                                                                                                                                                                                                     | Higher and Pre-higher Education                                                                                                                                                                                                                                             | General Secondary Education                                                                                                                                                                                                     | Computer Science                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• VAT exemption for EdTech and recognition of non-formal education outcomes by universities and colleges</li> <li>• Training of IT switchers and advanced training for computer science teachers</li> </ul> | <ul style="list-style-type: none"> <li>• Cooperation mechanisms between HEIs and IT businesses</li> <li>• Financial autonomy of HEIs</li> <li>• Inclusion of the National Student Survey in the HEI funding formula</li> <li>• Wide-ranging information campaigns about successful cases and cooperation opportunities between HEIs and IT businesses</li> </ul> | <ul style="list-style-type: none"> <li>• Public KPI of heads of educational institutions</li> <li>• New professional standards and updating the classifier</li> <li>• Involvement of practitioners and foreign teachers</li> <li>• Development of dual education</li> </ul> | <ul style="list-style-type: none"> <li>• Teacher internship and certification</li> <li>• Video course in mathematics</li> <li>• Development of network education</li> <li>• Professional guidance for schoolchildren</li> </ul> | <ul style="list-style-type: none"> <li>• Creating a new curricula and video course in computer science</li> <li>• Training in modern technologies for computer science teachers</li> </ul> |

Source: Prepared by the JICA survey team based on the presentation on the roadmap for reforming IT education

Furthermore, the WINWIN strategy, which covers a broader scope of digital innovation, also highlights the importance of human resource development. WINWIN identifies human capital development as one of its four strategic areas. This stems from the recognition that insufficient standards and quality across all education subsectors in Ukraine, the loss and outflow of human resources due to Russia's full-scale invasion, and inadequate collaboration between educational institutions and industry are hindering the development of human capital capable of actively engaging in innovative product creation and building innovation systems. Based on this understanding, WINWIN defines strategic objectives, challenges, and measures for achieving these

objectives specifically for the education subsector to advance human capital development. An overview is presented in the table below.

Table-6 Strategic Goals, Challenges, and Tasks for Advancing Human Capital Development

| Strategic Goals                                                                                                                     | Key Challenges                                                                                                                                                                                                                                                                                                                                                                                                              | Tasks to achieve the Goals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transform the system of preschool and complete general secondary education into a reasonable basis for an innovative ecosystem      | <ul style="list-style-type: none"> <li>• The basic literacy skills of schoolchildren in natural sciences and mathematics are limited.</li> <li>• Women are underrepresented due to gender stereotypes and poor teaching</li> <li>• Online learning has caused a decline in the quality of education and the competencies of students in Ukraine</li> </ul>                                                                  | <ul style="list-style-type: none"> <li>• Ensure the implementation of the New Ukrainian School concept, promote offline learning</li> <li>• Develop digital, entrepreneurial, scientific and other key competencies in students, to motivate them to do independent research</li> <li>• Encourage cooperation with enterprises by involving practitioners in teaching and skills counseling</li> <li>• Create informational and entertainment content in the media to interest students in mathematical and applied disciplines</li> <li>• Raise the prestige of teachers profession, including through financial incentives</li> <li>• Introduce gender-sensitive educational courses to overcome gender bias</li> </ul>                                                                |
| Create conditions for transforming vocational education institutions into an integrated part of the innovation ecosystem            | <ul style="list-style-type: none"> <li>• Negative stereotypes about vocational education</li> <li>• Gender stereotypes about women in vocational education institutions</li> <li>• Mismatch of specialists with market needs due to the lack of cooperation between vocational schools and higher education institutions and business representatives</li> <li>• Poor quality of the vocational education system</li> </ul> | <ul style="list-style-type: none"> <li>• Create regulatory, administrative and communication prerequisites for i) integration of vocational education institutions into sectoral innovation environments, and ii) establishing connections with businesses</li> <li>• To promote the improvement of the material and technical base of vocational education institutions by i) international technical assistance, and ii) donor and business coordination</li> <li>• Involve vocational education institutions in studying the labor market and adapting educational programs to market needs</li> <li>• Support the exchange of information between institutions on research and development</li> </ul>                                                                                |
| Transform higher education and research institutions into innovation development centers deeply integrated into market and business | <ul style="list-style-type: none"> <li>• Lack of financial autonomy</li> <li>• Regulatory barriers to HR policy</li> <li>• Limited possibilities for disposing of real estate</li> <li>• Use and tolerance of plagiarism, which creates a disrespectful attitude to IP</li> <li>• Low level of interaction with the business</li> </ul>                                                                                     | <ul style="list-style-type: none"> <li>• Create platforms for cooperation with business based on higher education institutions that will work on business relevant R&amp;D</li> <li>• Develop a system of organizational, social and financial incentives for scientists who initiate startups and spin-off companies based on R&amp;D</li> <li>• Use incentives to encourage higher education and research institutions to create innovations</li> <li>• Remove bureaucratic barriers to cooperation between higher education and research institutions and the private sector</li> <li>• Establish Dia.Business branches at higher education institutions to help with technology transfer</li> <li>• Promote gender-responsive teaching practices to eliminate gender bias</li> </ul> |
| Retain and attract human capital                                                                                                    | <ul style="list-style-type: none"> <li>• Years of low funding for science have led to an outflow of qualified personnel</li> <li>• Poor Communication with Ukrainians abroad</li> <li>• Low level of foreign talent attraction</li> </ul>                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• Conduct a study of the business and scientific environment and prepare a list of specialists required for the development of the national innovation ecosystem</li> <li>• Create a support program for Ukrainians who are ready to return to Ukraine to help them find jobs, housing, educational institutions, psychological support, etc.</li> <li>• Intensify contacts with innovators and startup founders of Ukrainian origin living abroad. Integrate them into innovation clusters, business incubators, science parks, etc.</li> </ul>                                                                                                                                                                                                  |

Source: Prepared by the JICA survey team based on UKRAINIAN GLOBAL INNOVATION STRATEGY 2030 (full version)

Based on this understanding of challenges and strategy, the Ukrainian government is advancing the development of IT talent. The table below introduces some IT education projects in Ukraine.

Table-7 Human Resource Development Project in Ukraine (Example)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Diia. Education</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1) Support Organizations: Ukrainian government-led initiatives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2) Implementation Period: May 2023–present (predecessor Diia.Digital Education launched in January 2020)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 3) Overview: This national educational platform specializes in supporting Ukraine's digital skills enhancement and reskilling/upskilling initiatives, playing a vital role in fostering digital literacy. It supports lifelong individual capacity development and serves as a platform for over 370 free educational projects. <sup>36</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>2. IT Generation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1) Support Organizations: UASID, UNDP, Sweden, Binance Charity, Lviv IT Cluster                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2) Implementation Period: 2022–2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 3) Overview: The IT Generation project launched by the Ministry of Digital Transformation in June 2022 aims to provide free IT education and job opportunities to Ukrainian citizens through a regional IT school network. <sup>37</sup> The program targets individuals aged 21 to 60 who speak English and have no academic background or experience in IT, but wish to engage in cutting-edge technology industries. <sup>38</sup> From over 200,000 applicants, 2,200 were selected: Frontend (378), QA (299), UI/UX Design (231), Python (214), Project/Product Management (182), Java (152), JavaScript (151), Digital Marketing (88), Business Analysis (46), and Blockchain (31). <sup>39</sup><br>IT schools are non-formal educational institutions that provide practical, career-oriented training in the IT field, serving as an alternative to or supplement for university IT education. |
| <b>3. CDTO Campus</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1) Support Organizations: Visa Foundation, BMZ, GIZ GmbH, Switzerland, Cisco                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 2) Implementation Period: November 2023–present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 3) Overview: The CDTO Campus is a national educational initiative aimed at training Chief Digital Transformation Officers (CDTOs) and their teams to implement innovative technology projects in public administration. It provides free specialized education in administrative technology, cybersecurity, and artificial intelligence, designed to meet the evolving needs of modern public governance. <sup>40</sup> To date, nearly 30 programs have been offered, with over 1,300 participants enrolled. <sup>41</sup>                                                                                                                                                                                                                                                                                                                                                                             |
| <b>4. Updated Informatics-IT Studio</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1) Support Organizations: EU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 2) Implementation Period: January 2023–present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3) Overview: This program aims to modernize digital education in Ukrainian schools by integrating practical IT skills into the curriculum. It targets students from grades 1 through 11 and teachers, supporting them in acquiring the digital skills required in today's labor market. <sup>42</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>5. Teacher Internship</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 1) Support Organizations: EPAM, IT Ukraine Association                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2) Implementation Period: 2017–present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 3) Overview: The Teacher Internship is a nationwide comprehensive internship program for school and university teachers, provided by experienced specialists from EPAM, a leading Ukrainian IT company, and the IT Ukraine Association. This training program supports educators in gaining a deep understanding of generative AI principles and learning how to utilize these tools for creating teaching materials, conducting lessons, and generating new ideas and solutions. <sup>43</sup>                                                                                                                                                                                                                                                                                                                                                                                                         |

<sup>36</sup> <https://osvita.diia.gov.ua/en>

<sup>37</sup> <https://it-generation.gov.ua/>

<sup>38</sup> <https://it-generation.gov.ua/>

<sup>39</sup> <https://www.undp.org/ukraine/press-releases/it-generation-project-training-ukrainians-wide-range-it-specialties-comes-end>

<sup>40</sup> <https://www.cdto-campus.com/en>

<sup>41</sup> <https://digitalstate.gov.ua/news/govtech/cdto-campus-20-dva-roky-rozvytku-y-start-hlobalnoho-masshtabuvannia>

<sup>42</sup> [https://www.eeas.europa.eu/delegations/ukraine/updated-informatics-%E2%80%93-it-studios-mdtu-and-mes-supported-eu-available-every-ukrainian-student\\_en?s=232](https://www.eeas.europa.eu/delegations/ukraine/updated-informatics-%E2%80%93-it-studios-mdtu-and-mes-supported-eu-available-every-ukrainian-student_en?s=232)

<sup>43</sup> <https://campus.epam.ua/en/training/4523>

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>6. Teachers' Smart UP</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1) Support Organizations: Stigma Software, IT Ukraine Association                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 2) Implementation Period: January 2022–present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 3) Overview: This program is a joint initiative launched by Sigma Software and the IT Ukraine Association, aimed at enhancing the quality of education for Ukrainian educators and bringing educational programs and methods up to today's global standards. Support includes updating and improving educational programs through close collaboration with teachers, as well as a five-day intensive online training course. <sup>44</sup>                                                                                                                                                             |
| <b>7. Pre-Junior Program</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1) Support Organizations: EPAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2) Implementation Period: April 2021–present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3) Overview: The Pre-Junior Program is an initiative for high school students jointly run by EPAM and the Ukrainian IT Association. During the three-month learning period, participants acquire foundational knowledge about the IT industry, discover various specializations within technical fields, delve deeply into project details, and learn who is responsible for what within a team. After studying basic comprehensive themes, students can further deepen their knowledge in one of the following technologies: front-end, .NET, or cloud computing. <sup>45</sup>                       |
| <b>8. ACTED IT Training Grant</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 1) Support Organizations: ACTED Ukraine, Embassy of Canada (Ukraine), Global Affaires Canada                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2) Implementation Period: June 2024 to June 2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3) Overview: The IT Training Grant launched by ACTED Ukraine is a humanitarian education initiative aimed at supporting vulnerable people in Ukraine—including internally displaced persons, veterans, persons with disabilities, and others affected by the war, particularly women—to acquire new digital skills, pursue reskilling, and enter the IT sector. Course durations range from 3 to 12 months, during which participants can learn programming languages, front-end and back-end development, testing, computer graphics and design, and other modern digital technologies. <sup>46</sup> |

In addition, this survey examined support from other countries in the higher education subsector (particularly in the IT field). The list of higher education projects supported by foreign institutions obtained from Ukraine's Ministry of Education and Science is shown in the table below; however, no support projects specifically focused on IT education were found.

Table-8 Support Projects by Foreign Institutions in the Higher Education Subsector

| Project title                                                      | Partner                                                         | Country              | Short description                                                                                                                                                                                                                                                                                                                                                                                                                                          | Budget     | Terms     |
|--------------------------------------------------------------------|-----------------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|
| Support for master's entrance examinations                         | OECD                                                            |                      | Support for the development of tasks for master's entrance exams, organization of their conduct                                                                                                                                                                                                                                                                                                                                                            | EUR 30000  | 2022      |
| Integrated Education and Child Protection Initiative/ Summer Camps | Be Free (YMBF), Radooga, "Child of war", Netherlands            | Ukraine, Netherlands | Ensuring access to formal and non-formal education, while providing a comprehensive approach with child protection and psychosocial support                                                                                                                                                                                                                                                                                                                | USD 2,5mln | 2022-2023 |
| Support of higher educational institutions                         | UNESCO                                                          |                      | Purchase of educational equipment                                                                                                                                                                                                                                                                                                                                                                                                                          | USD 20000  | 2023      |
| UK-Ukraine Twinning Initiative                                     | Cormack Consultancy Group, Universities UK International (UUKi) | UK                   | Assistance to Ukrainian institutions of higher education in preservation, restoration and development during the war and in the long term, forming strategic partnerships and alliances for joint work and further mutual internationalization through the formation of partnerships with universities in Great Britain. The initiative includes development of double degree programs, provisions of research and innovation grants and equipment supply. | GBP 15mln. | 2022-     |

<sup>44</sup> <https://university.sigma.software/en/courses/teachers-smart-up-summer-edition-2025/>

<sup>45</sup> <https://itukraine.org.ua/en/pre-junior-at-epam-university-40-students-completed-their-studies/>

<sup>46</sup> <https://chaszmin.com.ua/40-000-grn-grant-na-navchannya-u-sferi-it-vid-acted/>

| Project title                                                                              | Partner                                                                           | Country | Short description                                                                                                                                                                                                                                                                                                                                                      | Budget      | Terms     |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Twinning Research Support under the UK-Ukraine Twinning Initiative                         | Cormack Consultancy Group, Universities UK International (UUKi), Research England | UK      | Support of science, technology and innovation in institutions of higher education as part of Twinning partnerships                                                                                                                                                                                                                                                     | GBP 5mln.   | 2023      |
| Double Degree Project under the UK-Ukraine Twinning Initiative                             | Cormack Consultancy Group, Universities UK International (UUKi)                   | UK      | Development and launch of a double degree program                                                                                                                                                                                                                                                                                                                      | GBP 500000  | 2023-2025 |
| Cambridge English Language Moodle Project                                                  | Cambridge University Press & Assessment                                           | UK      | The project of providing access on the Cambridge MOOC platform to educational materials on learning English for students and teachers of higher education institutions in Ukraine                                                                                                                                                                                      |             | 2022-     |
| EU programs for education, training, youth and sports Erasmus+                             | EU                                                                                |         | A systematic approach to building potential in the system of education, youth and sports for the implementation of reforms. Opportunities for participants from Ukraine (educational institutions, education seekers, teaching staff and other target audience) within the EU Erasmus+ programs, which are aimed at both international and intra-European cooperation. | EUR 31,5bln | 2021-2027 |
| Promotion of the development of professional education in agricultural colleges of Ukraine | GFA Consulting Group GmbH, ADT Project Consulting GmbH                            | Germany | Improvement of methodological approaches and the content of practical training in agricultural colleges and educational centers, experimentally introduce elements of dual education                                                                                                                                                                                   | EUR 1419967 | 2021-2024 |

Source: Ministry of Education and Science of Ukraine

## (2) The Ukrainian Government's Policy for Refugees Abroad

According to official and humanitarian assistance-related information, Ukraine is currently not providing direct material or financial support to its citizens living abroad. According to the UNHCR Switzerland Office webpage on “voluntary return to Ukraine,” support for Ukrainians living abroad is provided not by the Government of Ukraine but primarily by host countries and international organizations such as UNHCR, IOM (International Organization for Migration), and the Red Cross.

Meanwhile, the Ukrainian government is negotiating with EU countries on the following three key areas to provide indirect support to its citizens residing abroad:<sup>47</sup>

- Extension of the temporary protection regime
- Strengthening of return assistance
- Integration support for those choosing not to return (including legalization of residence status through work or student visas)

<sup>47</sup> BDO, Desk Research for IT Industry and IT Human Resources in Ukraine

Additionally, the Government of Ukraine has implemented policies to support citizens who wish to return voluntarily. In cooperation with international partners, Ukraine is promoting safe return and providing access to reintegration programs, legal consultations, and post-return social support. A plan is also underway to establish “Unity Hubs” in various countries to support Ukrainians abroad and encourage return. Memoranda of understanding have already been concluded with Germany, the Czech Republic, Spain, and France, and negotiations are ongoing with Italy, Austria, and Poland.<sup>48</sup>

According to the announcement by the Cabinet of Ministers of Ukraine, returnees and internally displaced persons (IDPs) can access state support schemes for low-income households, which include monthly financial assistance based on household income and composition. In addition, information from “EnableMe Ukraine” indicates that Ukrainians returning from abroad may apply—via social welfare offices—for one-off or regular financial assistance, with priority given to vulnerable groups such as households with children, older persons, and persons with disabilities.

Overall, Ukraine’s policy focus appears to be not on providing material or financial assistance to citizens residing abroad, but on supporting reintegration after return.

At the same time, in response to the ongoing impacts of the war, Ukraine has taken important measures to ensure access to administrative services for its citizens living abroad. According to the State Migration Service (SMS), Ukrainians residing abroad can obtain or renew domestic ID cards and international passports without returning to Ukraine, via diplomatic missions or overseas branches of the state-owned enterprise DP “Dokument.” These measures were introduced under martial law and aim to enable refugees and other Ukrainians abroad to maintain valid identification documents and exercise their legal rights while overseas. Of particular importance is the fact that Ukrainian men aged 18 to 60 are now able to apply for passports without submitting the military registration certificate previously required.

In addition, DP “Dokument” branches established in countries such as Poland can process procedures such as passport renewal, re-issuance, and changes to personal information promptly. The Consulate General of Ukraine in Cracow also offers a delivery service that sends newly issued passports directly to applicants.

These initiatives demonstrate Ukraine’s approach to ensuring both the maintenance of legal identity for citizens living abroad and support for reintegration after return.

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<sup>48</sup> BDO, Desk Survey for IT Industry and IT Human Resources in Ukraine

### 3. Current State of Education and Research at Ukrainian Universities (IT Field)

#### 3.1 Overview of the Questionnaire Survey

A questionnaire survey was conducted targeting universities in Ukraine to assess i) the current state of education and research at Ukrainian universities (particularly in the IT field), and ii) interest in the pilot training planned under this survey. The table below outlines the details of the questionnaire survey.

Table-9 Summary of the Questionnaire Survey for Universities in Ukraine

| Items                 | Content                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Survey Target         | <ul style="list-style-type: none"> <li>Survey forms were distributed to university presidents, faculty leaders (e.g., deans), department heads, and faculty members in IT-related departments at 20 universities in Ukraine.</li> <li>These 20 universities were recommended by the Ukrainian Ministry of Education and Science as potential partner universities for the pilot training program during the previous survey.</li> </ul> |
| Survey Methodology    | Online (with supplementary email or phone contact)                                                                                                                                                                                                                                                                                                                                                                                      |
| Question Items        | The main survey items include matters concerning the state of education and research, as well as the level of interest in pilot training.                                                                                                                                                                                                                                                                                               |
| Survey Period         | May 13 to June 3, 2025                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Number of respondents | <ul style="list-style-type: none"> <li>Responses were received from 32 individuals at 17 universities.</li> <li>No responses were obtained from Dnipro University of Technology, National Technical University “Kharkiv Polytechnic Institute,” and Simon Kuznets Kharkiv National University of Economics, as faculty members were too busy to participate in the survey during the period.</li> </ul>                                 |
| Remarks               | <ul style="list-style-type: none"> <li>The responses do not necessarily represent the university's views and reflect the personal opinions of the respondents.</li> <li>Responses from respondents who did not consent to the handling of their personal data were excluded from the analysis.</li> </ul>                                                                                                                               |

Source: The Prepared by the JICA survey team

As shown in the table above, the questionnaire survey asked about the state of education and research, as well as interest in pilot training. The details of the survey questions are as shown in the table below.

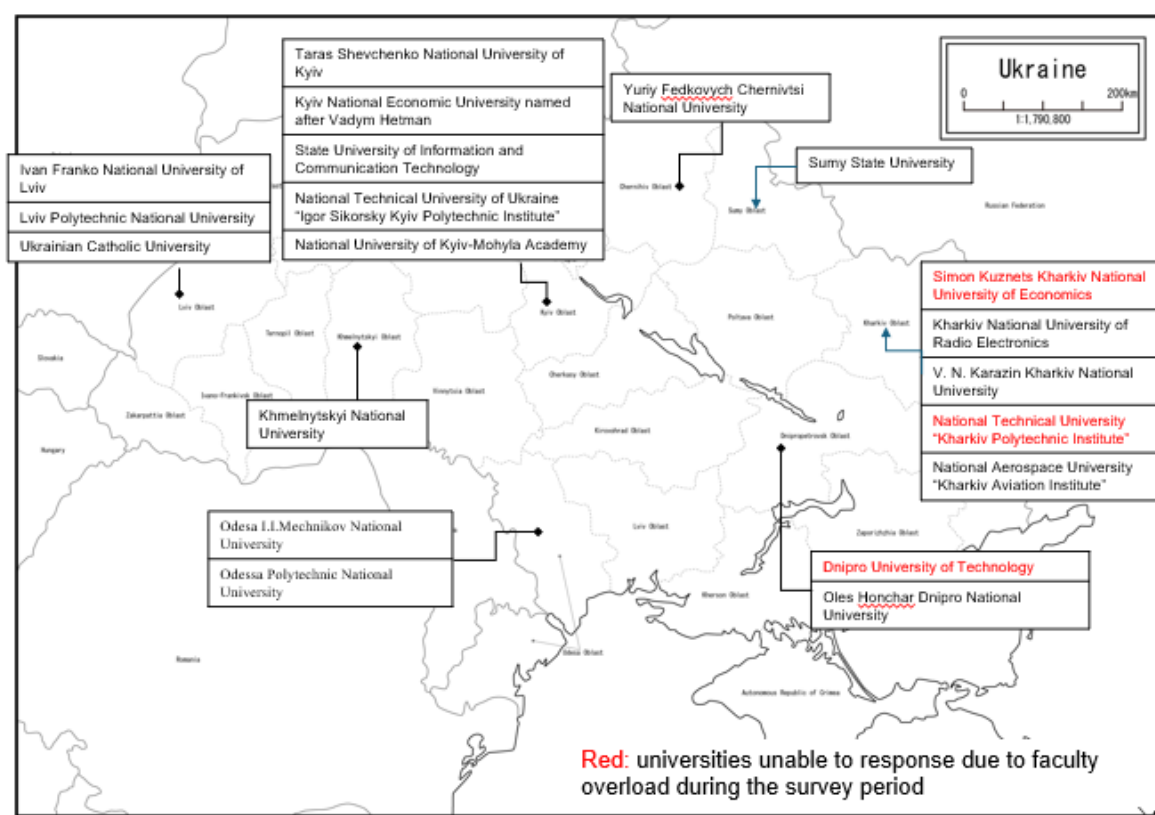
Table-10 Survey Items for Questionnaire Survey

| Major Items                                                     | Subitems                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>I. Status of Education and Research</b>                      |                                                                                                                                                                                                                                                 |
| A. Status of Educational and Research Infrastructure            | 1. Facilities and equipment, 2. Power supply, 3. Internet connectivity, 4. Impact of cyberattacks                                                                                                                                               |
| B. Continuation of Education and Research                       | 1. Education status, 2. Class format, 3. Staffing/faculty resilience, 4. Issues in education, 5. Curriculum updates, 6. Exposure to new technology, 7. Research status, 8. Research performance, 9. Open repository status, 10. Research issues |
| C. Status of Distance Learning                                  | 1. Status of implementation, 2. Online education platforms in use, 3. MOOCs in use                                                                                                                                                              |
| D. Opportunities for Teacher Training                           | 1. Training opportunities, 2. Training themes                                                                                                                                                                                                   |
| E. Status of Joint Research with Foreign Countries              | 1. Status of joint research, 2. Details of joint research                                                                                                                                                                                       |
| F. Current Status of Joint Education with Foreign Countries     | 1. Status of collaborative education, 2. Content of collaborative education                                                                                                                                                                     |
| G. Support for other Ukrainian Universities Affected by the War | 1. Support status, 2. Support type                                                                                                                                                                                                              |

| Major Items                              | Subitems                                                                                                                                                                |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>II. Interest in Pilot Training</b>    |                                                                                                                                                                         |
| A. Distance Education (Special Lectures) | 1. Interest in the special lectures, 2. Preferred lecture theme                                                                                                         |
| B. Distance Education (PBL/COIL)         | 1. Interest in distance education (PBL/COIL), 2. Topics that should be covered in distance education (PBL/COIL), 3. Feasibility of implementing extracurricular classes |
| C. Short-term Training                   | 1. Interest in short-term training by research topic, 2. Nomination of interested researchers                                                                           |
| D. Travel Abroad                         | Possibility of international travel                                                                                                                                     |

Source: The Prepared by JICA survey team

The universities surveyed are located in Kyiv (5), Kharkiv (5), Odesa (2), Sumy (1), Donipro (2), Khmelnytskyi (1), Chernihiv (1), and Lviv (3). The figure below shows their locations.



Source: T Prepared by the JICA survey team

Figure-6 Location of Surveyed Universities

### 3.2 Summary of Questionnaire Survey Results

#### (1) Status of Education and Research

##### 1) Status of Educational and Research Infrastructure

69% of respondents answered that their educational faculties are operational for 80% and more while 25% respondents answered that 50–80% are operational. Almost half of all respondents (44%) have experienced uninterrupted power supply while 50% respondents have experienced

occasional planned outages. Over half of respondents (59%) reported that their universities have already installed emergency backup systems, while 28% noted plans to do so.

69 % respondents answered that Internet connectivity is permanent and stable, with 81% using fiber-optic connection (switch to fiber-optic is a national tendency to keep connection during blackouts) and over half (60%) reporting fast or very fast speeds with excellent (53%) and good (16%) latency. Despite this, 54% respondents have experienced cyberattacks, with DDoS and phishing being the most common.

## 2) Status of Continuation of Education and Research

Despite the ongoing war, most respondents (81%) reported that they continue to operate at their original locations, delivering education through on-site (38%) or hybrid formats (34%). Faculty staffing levels remain largely stable, with only minor reductions and limited disruption due to displacement or enlistment. Basic mental health support is available at most universities, however, only 34% of respondents reported comprehensive support. The main education challenges include reduced international collaboration (63%), and insufficient practical learning due to safety concern (34%), though curricula are regularly updated to reflect global trends, and students are frequently exposed to emerging technologies.

47% of respondents reported they have increased research activities (e.g., expansion into new fields, increases in selected areas, or international cooperation, while 19% reported they have reduced research activities (e.g., reduced or suspended in some fields) or significantly decreased them (e.g., most research activities have been suspended). The same trends are observed regarding the number of research papers published. Most respondents (94%) answered that they use open-access repositories to support publication and dissemination of research outputs and 68% of respondents have their own institutional open repository. The main research challenges include insufficient budget (50%), decreased joint research and training opportunities with other countries (44%) and less exposure to latest research information (41%).

## 3) Status of Distance Learning (Online Education)

All reported they have integrated online education platforms- primarily Moodle, Google Classroom, and Microsoft Teams into their teaching. MOOCs are used selectively, with Coursera being the most popular. Digital tools like SCORM are common, but advanced technologies like xAPI and Open Badges are less widespread.

## 4) Training Opportunities for Teachers

Almost all respondents (94%) offer regular training for teachers, focusing on modern teaching methods (78%), utilization of ICT (69%) and grant proposal writing (69%).

## 5) Status of Joint Research and Education with Foreign Countries

Most respondents reported that they actively engage in joint education (84%) and joint research (72%) with foreign partners. Common formats in education include double-degree programs (72%), short-term exchanges, and shared online courses while PBL/COIL (13%) is a minor format. Key partners are USA and European countries such as Poland, Germany, UK, Czech Republic, France, Lithuania, Norway and Finland.

## 6) Assistance to Other Ukrainian Universities Damaged by the War

88% of respondents reported they are either currently assisting (41%) or planning (47%) to assist war-affected domestic universities. Kinds of support include offering online classes (63%) and campus relocation.

## (2) Interest in the Pilot Training

The questionnaire survey presented planned pilot training content for special lectures, PBL/COIL training, and short-term training, and asked respondents about their interest in each training.

### 1) Interest in Special Lectures

78% of respondents expressed that they are willing to encourage students to join special lectures. Respondents mentioned various preferred topics in IT for special lectures. The table below shows the results of categorizing these topics (sub-topics) mentioned by respondents into five larger categories and sorting by frequency of appearance. Artificial Intelligence & Data Science is the most dominant topic, followed by Emerging Tech, Hardware & Applications, and Cybersecurity & Information Security. Emerging technologies like blockchain, quantum cryptography, and AR/VR are also touched on.

Table-11 Preferred Topics for Special Lectures

| No. | Categorized topics                     | Contents                                                                                                                                                                 | Frequencies respondents mentioned |
|-----|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 1   | Artificial Intelligence & Data Science | This category includes all mentions of AI, ML, NLP, data analytics, tools, and AI-driven applications.                                                                   | 19                                |
| 2   | Emerging Tech, Hardware & Applications | This category includes hardware-specific design (e.g., SoC, robotics), XR, blockchain, bionics, embedded systems, and technical applications in verticals like IoT, etc. | 14                                |
| 3   | Cybersecurity & Information Security   | This category includes general and advanced cybersecurity, encryption, social engineering, ethical hacking, and related legal and post-quantum security methods.         | 13                                |
| 4   | Software Development and Programming   | This category includes all aspects of programming, software engineering, cloud-native development, frameworks, and methodologies.                                        | 11                                |
| 5   | Cloud, Platforms & Infrastructure      | This category focuses on cloud services, containers, orchestration, and related infrastructure tools and platforms.                                                      | 5                                 |

Source: Prepared by the JICA survey team based on the questionnaire survey results

## 2) Interest in PBL/COIL Training

78% of respondents expressed that they wish to join the pilot PBL/COIL while 53% of respondents answered that they can organize out of regular class activities for the pilot PBL/COIL. Respondents mentioned various preferred topics in IT for the PBL/COIL. The table below shows the results of categorizing these topics (sub-topics) mentioned by respondents into five larger categories and sorting by frequency of appearance. Artificial Intelligence & Data Science is the most dominant topic, followed by Cybersecurity and Information Technology, and Specialized Applications.

Table-12 Preferred Topics for Pilot PBL/COIL Training

| No. | Categorized topics                       | Contents                                                                                                                                                                                                                                                                                                                                                                        | Frequencies respondents mentioned |
|-----|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 1   | Artificial Intelligence and Data Science | This category focuses on the development and application of algorithms and statistical models to extract insights from data and create intelligent systems. It includes areas like artificial intelligence (AI), machine learning, deep learning, computer vision, and big data analytics.                                                                                      | 14                                |
| 2   | Cybersecurity and Information Technology | This category covers the protection of digital systems, networks, and data from cyber threats, as well as the foundational technologies and tools used to manage and operate IT environments. It includes both technical and organizational aspects of digital security and IT infrastructure.                                                                                  | 10                                |
| 3   | Specialized Applications                 | This category includes unique or interdisciplinary uses of technology in specific sectors or contexts. These topics highlight how digital tools and concepts are tailored to solve problems or enhance outcomes in education, health, environment, and society.                                                                                                                 | 7                                 |
| 4   | Emerging Technologies                    | This category explores new and rapidly evolving technologies that have the potential to significantly impact society and industry. These technologies are often at the forefront of innovation and may still be in early stages of adoption. Topics include blockchain, Internet of Things (IoT), cloud computing, and Intersections between AI, blockchain, and cybersecurity. | 4                                 |
| 5   | Software Development and Programming     | This category focuses on the design, writing, testing, and maintenance of software applications and systems. It involves programming languages, development methodologies, and software architecture patterns.                                                                                                                                                                  | 4                                 |

Source: Prepared by the JICA survey team based on the questionnaire survey results

## 3) Interest in short-term training

Respondents interested in participating in the short-term training program selected their preferred research topic from the four research themes proposed by PJAiT: Research Topic 1: Biomedical Signal Analysis, Research Topic 2: Multilingual & Cross-lingual Disinformation Detection, Research Topic 3: Anthropomorphism (Art - Technology Interaction), and Research Topic 4: Transdisciplinary data-driven XR-based R&D. Furthermore, some respondents listed the names

of researchers at their own universities who share an interest in the research topics they cited.

#### 4) Interest in Pilot Training (Summary)

The table below summarizes interest in pilot training at Ukrainian universities. Universities marked with ● in the pilot training column are those that have indicated a positive response to participating in the relevant training. Universities that indicated a positive response but subsequently declined further contact have been excluded from this list. In the PBL/COIL training column, ● is marked for universities that responded they wish to participate and that they can organize extracurricular classes to implement pilot PBL/COIL training. The short-term training column lists the research topics of interest.

Table-13 Interest in Pilot Training at Ukrainian Universities

| University Name                                                                     | State       | Special Lectures | PBL/COIL | Short-term Training           |
|-------------------------------------------------------------------------------------|-------------|------------------|----------|-------------------------------|
| National University of Kyiv-Mohyla Academy                                          | Kyiv        | ●                | ●        | ●<br>(Research Topic 2)       |
| Taras Shevchenko National University of Kyiv                                        | Kyiv        | ●                | ●        | ●<br>(Research Topic 4)       |
| Kyiv National Economic University Named after Vadym Hetman                          | Kyiv        | ●                |          | ●<br>(Research Topic 1, 2)    |
| National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute» | Kyiv        | ●                | ●        | ●<br>(Research Topic 1,2,4)   |
| State University of Information and Communication Technology                        | Kyiv        | ●                | ●        | ●<br>(Research Topic 1,2,3,4) |
| V.N. Karazin Kharkiv National University                                            | Kharkiv     | ●                | ●        | ●<br>(Research Topic 2,4)     |
| Kharkiv National University of Radio Electronics                                    | Kharkiv     |                  |          | ●<br>(Research Topic 1)       |
| National Aerospace University “Kharkiv Aviation Institute”                          | Kharkiv     |                  | ●        | ●<br>(Research Topic 1)       |
| Odesa I.I. Mechnikov National University                                            | Odesa       | ●                | ●        | ●<br>(Research Topic 2)       |
| Odessa Polytechnic National University                                              | Odesa       | ●                | ●        | ●<br>(Research Topic 1)       |
| Sumy State University                                                               | Sumy        | ●                | ●        | ●<br>(Research Topic 1,2,4)   |
| Oles Honchar Dnipro National University                                             | Dnipro      | ●                |          | ●<br>(Research Topic 1)       |
| Khmelnyskyi National University                                                     | Khmelnyskyi | ●                | ●        | ●<br>(Research Topic 1,2,4)   |
| Yuriy Fedkovych Chernivtsi National University                                      | Chernihv    |                  |          | ●<br>(Research Topic 1)       |
| Lviv Polytechnic National University                                                | Lviv        | ●                |          | ●<br>(Research Topic 1)       |
| Ivan Franko National University of Lviv                                             | Lviv        | ●                |          | ●<br>(Research Topic 1,4)     |
| Ukrainian Catholic University                                                       | Lviv        | ●                |          | ●<br>(Research Topic 2)       |

Source: Prepared by the JICA survey team based on the questionnaire survey results

### (3) International Travel

81% of respondents answered that travel abroad is possible with the permission of the relevant authorities and it is possible to obtain permission while 15% replied that getting permission is difficult or travel abroad itself is difficult.

### (4) Regional Disparities

In Kharikiv, Sumy, Odesa, and Kyiv, respondents reported frequent issues with electricity, infrastructure, and staffing. These cities are either located near the frontline or are frequent targets of missile and drone attacks, which explains the higher instability compared to safer regions.

## **4. Planning, Implementation, and Analysis of Pilot Training Results**

### **4.1 IT Business Skills Training**

#### (1) Formulation of the Training Implementation Plan

The tasks related to the formulation of the training implementation plan described in this section are based on the report of the previous survey, specifically “4. Proposals for the Implementation of Training and Projects in Cooperation with PJAIT (Proposal of Medium-to-Long-Term Cooperation Plan)”<sup>49</sup>.

During the first survey mission conducted in April 2025, visits were made to PJAIT, Polish government agencies, international organizations, NGOs, and Japanese companies operating in Poland to seek cooperation and confirm the implementation framework for the training. In addition, a visit was made to the PJAIT Gdańsk campus to provide an overview of the training and to discuss its implementation.

Based on the discussions and results of the visits to these relevant institutions, the JICA survey team conducted internal deliberations to finalize the training content and implementation structure. As a result, the final overall framework of the IT Business Skills Training Plan was formulated as shown in the table below.

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<sup>49</sup> Data collection survey for Ukrainian IT human resource development collaborating with Polish-Japanese Academy of Information Technology: work completion report  
[https://openjicareport.jica.go.jp/007/007\\_946.html](https://openjicareport.jica.go.jp/007/007_946.html)

Table-14 Overall Overview of the IT Business Skills Training

| Item                                                      | Content                                                                                                                                                                                                          |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Training Purpose                                          | Training primarily targeting Ukrainian refugees in Poland, aimed at employment support through the acquisition of IT skills necessary for work                                                                   |
| Training Language                                         | Polish                                                                                                                                                                                                           |
| Training Location                                         | PJAIT Warsaw Campus, Gdańsk Campus (Computer Lab)                                                                                                                                                                |
| Training Courses                                          | 1. Introduction to Data Analysis Course (Excel)<br>2. Website Development Course (WordPress)<br>3. Python Programming Course                                                                                     |
| Training Capacity                                         | Warsaw Campus: 100 students (20 per classroom times 5 courses)<br>Gdańsk Campus: 80 participants (16 per classroom times 5 courses)                                                                              |
| Lecturers                                                 | - Lecturers (PJAIT Faculty): 1 per course<br>- Assistants (Ukrainian students studying in PJAIT): 1 per course<br>* A "Training Coordinator" fluent in Ukrainian will also be assigned from the JICA survey team |
| Training Hours                                            | 9:00 AM - 12:00 PM: Self-study in the classroom (with assistant support)<br>1:00 PM to 5:00 PM: Lecture                                                                                                          |
| Training Period                                           | Excel/WordPress Course: 8 days (extended from 5 days in the 2023 training)<br>Python Course: 12 days (extended from 9 days in the 2023 training)                                                                 |
| Training Structure                                        | First Half: Fundamentals and Practical Assignments<br>Second Half: Applied Projects and Final Presentation Session                                                                                               |
| Training Content                                          | Building on the 2023 pilot training content, incorporating the latest IT technologies and improvements based on evaluation results and feedback from lecturers and participants                                  |
| Preparation (Polish Language Training)                    | Online "Business Polish Training" provided to interested participants                                                                                                                                            |
| Preparation (Pre-Study Materials)                         | Distribute pre-course study materials two weeks before the start of the course to help standardize participants' skill levels                                                                                    |
| Applicant Selection Method                                | Participants are selected based on a questionnaire submitted at the time of application, scoring IT literacy (PC usage experience, etc.) and age (priority given to younger participants)                        |
| Soft Skills Training                                      | Online Soft Skills Training will be offered to participants during the training period (optional participation).                                                                                                 |
| Employment Support                                        | A "Job Consultation Fair" will be held on the day of the completion ceremony with the cooperation of private companies and other organizations                                                                   |
| Follow-up Survey                                          | A follow-up survey will be conducted approximately three months after the training ends to assess participants' employment status                                                                                |
| Evaluation (JICA's Medium and Long-Term Support Measures) | Data collected through lecturer reports, participant questionnaires, and follow-up surveys is analyzed and evaluated to support continued implementation in subsequent years                                     |

Source: Prepared by the JICA survey team

Regarding the implementation plan for the IT Business Skills Training Course, following the discussions held at PJAIT Warsaw, a survey visit to the Gdansk campus was conducted in line with the agreed framework. Meetings and consultations were organized with the principal and training staff, during which their cooperation and participation in the training were confirmed.

It was, however, identified that the computer laboratories at the Gdansk campus are smaller than those at the Warsaw campus, accommodating up to 16 students per classroom. Although the number of available classrooms is sufficient to conduct the planned courses, this capacity constraint necessitated a revision of the participant allocation for the Gdansk campus—from the initially planned 100 participants to a total of 80 participants (16 participants × 5 courses).

The table below presents the finalized implementation plan for the IT Business Skills Training Course, prepared based on the results of the survey visit and subsequent adjustments.

Table-15 Implementation Plan of the IT Business Skills Training (Warsaw and Gdańsk)

| Training Course                              | Training Period                  | Warsaw Campus |                    | Gdańsk Campus |                    | Total |
|----------------------------------------------|----------------------------------|---------------|--------------------|---------------|--------------------|-------|
|                                              |                                  | Capacity      | Number of Sessions | Capacity      | Number of Sessions |       |
| Introduction to Data Analysis Course (Excel) | 2 weeks<br>(8 days of lectures)  | 20            | 2                  | 16            | 2                  | 72    |
| Website Development Course (WordPress)       | 2 weeks<br>(8 days of lectures)  | 20            | 2                  | 16            | 2                  | 72    |
| Python Programming Course                    | 4 weeks<br>(12 days of lectures) | 20            | 1                  | 16            | 1                  | 36    |
| Total                                        |                                  |               | 100                |               | 80                 | 180   |

Source: Prepared by the JICA survey team

The training content for each course was designed based on the 2023 pilot training program, with an extended training period. This enhancement reflects feedback from lecturers and training participants, incorporating the results of the 2023 training evaluation.

Specifically, the training duration was extended from 5 days to 8 days for the Excel and WordPress courses, and from 9 days to 12 days for the Python course. As a result, more practical and applied content was incorporated, and a final presentation session was introduced on the last day, where participants presented their final deliverables as a form of practical assignment.

The table below summarizes the training schedule and main content for each course.

Table-16 Contents of the IT Business Skills Training

| Course                                | Objectives                                                                                                                                    | Content                                                                                                                                                                                                                                                                                                                                                               | Period                                        |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Introduction to Data Analysis (Excel) | Acquire the ability to aggregate and analyze corporate operational data, and master skills for cross-tabulation and data visualization        | <ul style="list-style-type: none"> <li>• Worksheet and Workbook Management</li> <li>• Managing Data in Cells and Cell Ranges</li> <li>• Table and Table Data Management</li> <li>• Calculations Using Formulas and Functions</li> <li>• Creating graphs</li> <li>• <u>Data analysis using PivotTables</u></li> <li>• <u>Final Project and Presentation</u></li> </ul> | 2 weeks<br>(8 lectures)                       |
| Website Development (WordPress)       | Develop the ability to create professional websites and acquire practical skills such as security, SEO optimization, and multilingual support | <ul style="list-style-type: none"> <li>• Using the latest WordPress features</li> <li>• Creating professional websites utilizing themes and plugins</li> <li>• <u>Multilingual website implementation</u></li> <li>• <u>Security Measures and SEO Optimization</u></li> <li>• <u>Final Project and Presentation</u></li> </ul>                                        | 2 weeks<br>(8 lectures)                       |
| Python Programming                    | Understand the fundamentals of object-oriented programming using Python and develop the ability to pursue continuous learning                 | <ul style="list-style-type: none"> <li>• Python Programming for Beginners<br/>From basic to fundamentals of object-oriented programming</li> <li>• <u>Simple Application Development</u></li> <li>• <u>Final Project and Presentation</u></li> </ul>                                                                                                                  | 4 weeks<br>(3 lectures per week, 12 lectures) |

Note: Underlined items are additional topics compared with the content of the 2023 pilot training.

Source: Prepared by the JICA survey team

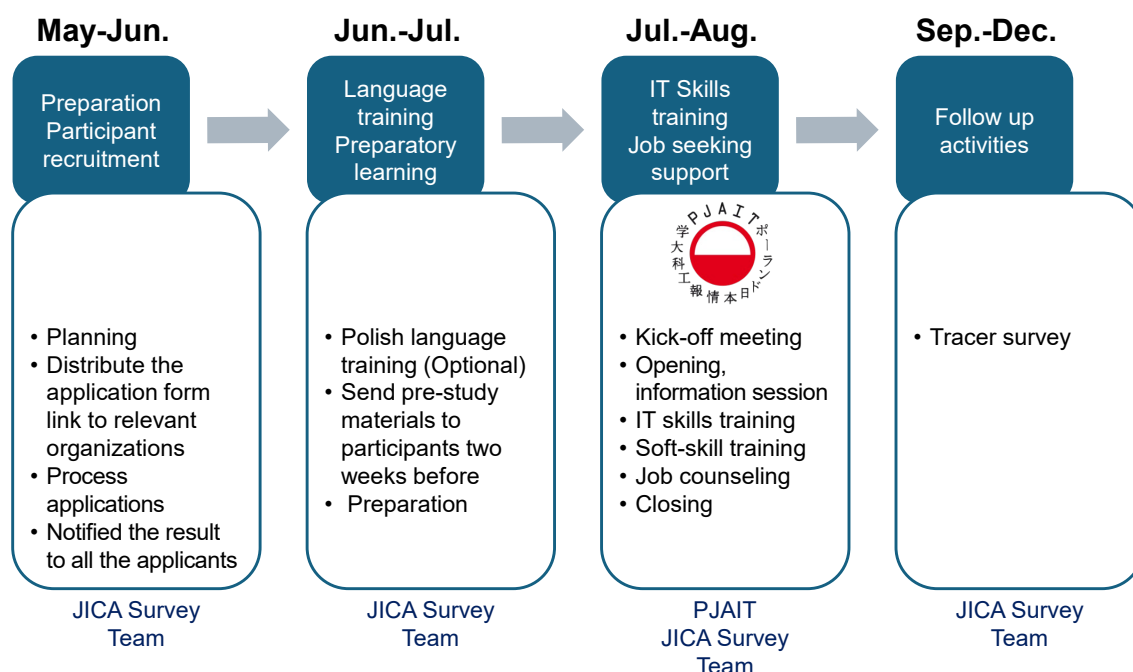
Based on the above outline, the detailed training schedule was finalized as shown in the table below. Recruitment and selection of participants were carried out accordingly, and the training was conducted as planned from July 14 to August 14, 2025. The details of the training schedule are presented in the table below.

Table-17 Schedule of the IT Business Skills Training  
PJAiT Warsaw PJAiT Gdańsk

| 2025                   | Excel                                            | Word Press | Python                 | 2025                   | Excel                                            | Word Press | Python                 |
|------------------------|--------------------------------------------------|------------|------------------------|------------------------|--------------------------------------------------|------------|------------------------|
| 8, July                | Kick-off meeting & Prep. meeting                 |            |                        | 8, July                | Kick-off meeting & Prep. meeting                 |            |                        |
| 14, July               | Opening                                          |            |                        | 21, July               | Opening                                          |            |                        |
| 14-23, Jul<br>(8 days) | 20                                               | 20         | 20                     | 21-30, Jul<br>(8 days) | 16                                               | 16         | 16                     |
| 28-6, Aug<br>(8 days)  | 20                                               | 20         | (3 days /<br>per week) | 4-13, Aug<br>(8 days)  | 16                                               | 16         | (3 days /<br>per week) |
| 14, Aug                | AM: Job counseling fair<br>PM: Closing at Warsaw |            |                        | 14, Aug                | AM: Job counseling fair<br>PM: Closing at Warsaw |            |                        |

Source: Prepared by the JICA survey team

Furthermore, the overall workflow of the training program from planning and preparation, through recruitment and selection, to implementation and follow-up activities is illustrated in the figure below.



Source: Prepared by the JICA survey team

Figure-7 Workflow of the IT Business Skills Training Implementation

Finally, the implementation structure of this training program is shown in the figure below. The training was conducted through close collaboration between the training management teams at PJAIT (Warsaw) and the Gdansk campus, together with the respective lecturers at both campuses.

This structure ensured consistency in the training content and quality across the two campuses. The lecturers for the Excel and WordPress courses at the Warsaw campus had also served in the 2023 pilot training and shared their experiences and lessons learned with other lecturers. As a result, even those newly involved in the training were able to begin teaching smoothly from the first day.

Furthermore, the Ukrainian-speaking training coordinator assigned by the JICA survey team supported participants in all courses while maintaining continuous communication with the training team. This arrangement enabled the coordinator to accurately understand participants' situations and challenges. Consequently, a smooth and integrated operational framework was established for the implementation of the training.

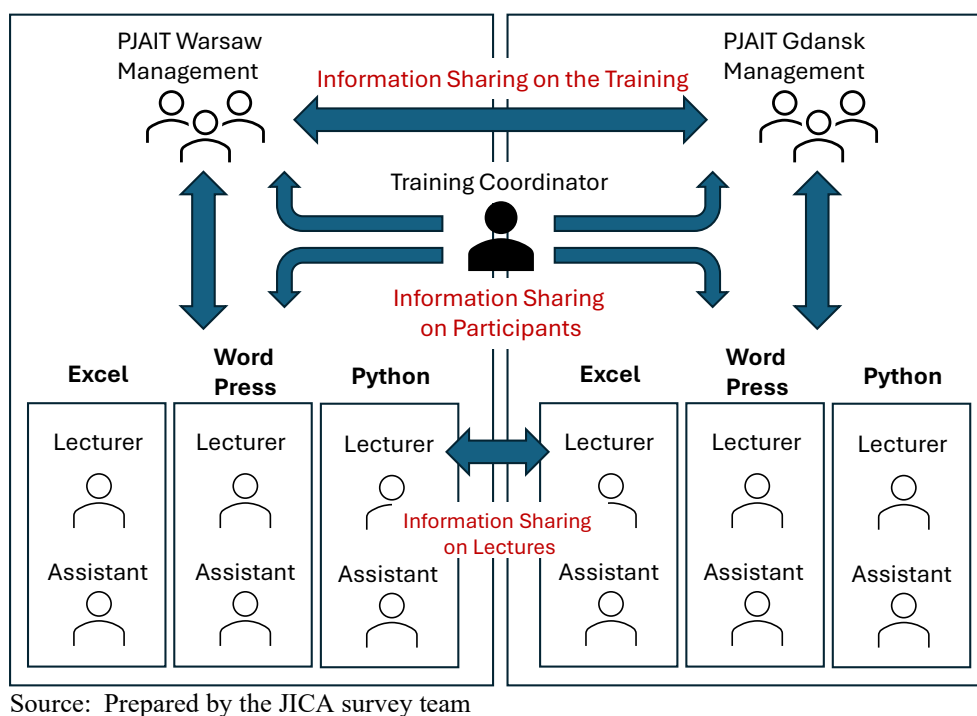


Figure-8 Implementation Structure of the IT Business Skills Training

## (2) Implementation of IT Business Skills Training

### 1) Recruitment and Selection of Training Participants

Recruitment of participants was carried out through networks of NGOs, international organizations, and Japanese companies that had collaborated in the 2023 baseline survey, as well as through newly established networks developed during this survey.

Prior to the recruitment, cooperation was requested and obtained from these partner organizations

through online meetings or on-site visits conducted during the survey mission.

Actual recruitment was carried out by distributing pamphlets containing QR codes that linked to the online application form prepared by the JICA survey team, through each cooperating organization. These organizations then promoted the opportunity via their advertising media and networks for refugees. The recruitment pamphlets distributed through the cooperating organizations are shown below.



Source: Prepared by the JICA survey team

Figure-9 Recruitment Brochures (Left: Warsaw / Right: Gdańsk)

Applications were received online through the application form from May 12 to May 30, 2025.

The recruitment results are summarized in the table below, with the number of applications exceeding twice the total training capacity.

Table-18 Recruitment Results of Participants

| Item                        | PJAiT Warsaw Campus | PJAiT Gdańsk Campus |
|-----------------------------|---------------------|---------------------|
| Capacity                    | 100                 | 80                  |
| Applicant                   | 235                 | 135                 |
| Applicant-to-capacity ratio | 2.35                | 1.69                |

Source: Prepared by the JICA survey team

The breakdown of applicants by course is presented in the following figure and table. As shown, there was variation among the courses, with some receiving more than three times the capacity while a few courses fell below capacity. Specifically, the WordPress Group 2 courses in Warsaw and Gdańsk did not reach their capacity. For these groups, in accordance with the initially

established training implementation plan, the training coordinator conducted reassignments by inviting applicants from WordPress Group 1 or other courses to transfer, thereby balancing the overall number of participants.

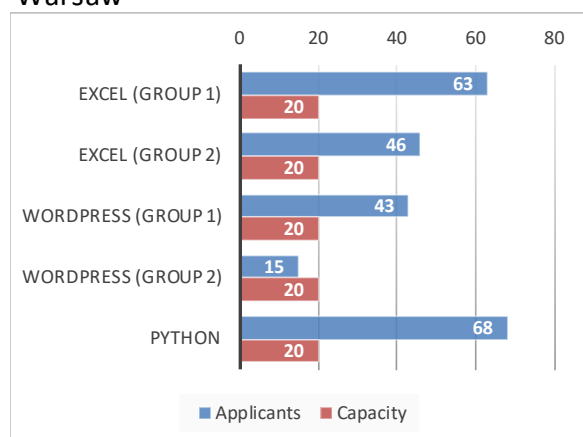
Conversely, the Python Programming course received more than three times the capacity at both the Warsaw and Gdańsk campuses. This is likely due to the increasing demand for Python, a programming language widely used in the fields of AI and data science, reflecting the growing interest in these areas in recent years. Indeed, multiple international market surveys have identified Python as the most popular programming language (ranked No. 1) <sup>50</sup>, suggesting that its strong reputation is reflected in the large number of applicants. Therefore, as described in Section 5, JICA's Medium- and Long-Term Support Measures, if this training is to continue in the next fiscal year and beyond, it will be necessary to consider strengthening the program's capacity, such as by expanding the number of participants or classrooms.

Table-19 Number of Participants and Applicants for Each Course

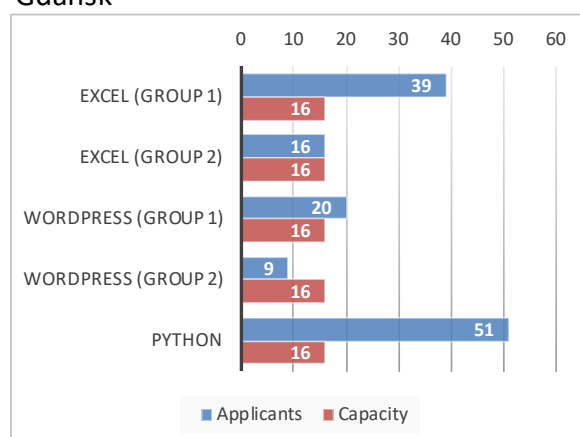
| Training Course       | PJAiT Warsaw Campus |          | PJAiT Gdańsk Campus |          |
|-----------------------|---------------------|----------|---------------------|----------|
|                       | Applicants          | Capacity | Applicants          | Capacity |
| Excel (1st Group)     | 63                  | 20       | 39                  | 16       |
| Excel (2nd Group)     | 46                  | 20       | 16                  | 16       |
| WordPress (1st Group) | 43                  | 20       | 20                  | 16       |
| WordPress (2nd Group) | 15                  | 20       | 9                   | 16       |
| Python                | 68                  | 20       | 51                  | 16       |
| Total                 | 235                 | 100      | 135                 | 80       |

Source: Prepared by the JICA survey team based on registration information

Warsaw



Gdańsk



Source: Prepared by the JICA survey team based on registration information

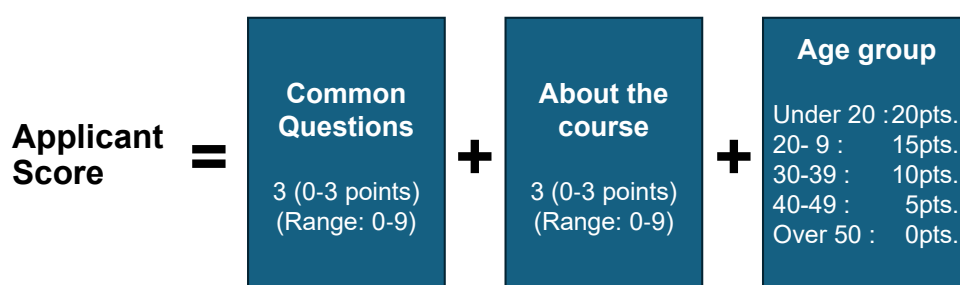
Figure-10 Number of Participants and Applicants for Each Course

<sup>50</sup> The Top Programming Languages 2025  
<https://spectrum.ieee.org/top-programming-languages-2025>

To select participants to fill the available slots from the above applicants, a selection process was conducted to identify those with high training needs and eligibility. The selection process is illustrated in the figure below. Applicants were scored based on evaluation criteria including IT literacy (e.g., PC usage), relevant experience for the desired course, age, and responses to other application questions.

Regarding age specifically, the primary purpose of this training is to support employment through IT skill acquisition. Therefore, the main target group was defined as younger individuals (generally under 40 years old) who have more employment opportunities. Based on this policy, evaluation criteria were established so that younger applicants received higher scores, which were reflected in the final evaluation. On the other hand, as PJAIT is a higher education institution, individuals under 17 years old were considered ineligible for this program. Accordingly, the training coordinator verified only the ages of applicants under 20 years old. Ultimately, based on the total calculated scores, the top candidates were selected as provisional qualifiers up to the capacity limit.

Next, the training coordinator contacted the provisional qualifiers by phone to confirm their actual intent to participate. If any applicant declined participation, the next highest-scoring candidate was promoted to qualification. Subsequently, this procedure was repeated until the capacity for all courses was filled, at which point the final participants were confirmed. Furthermore, should any withdrawals occur before the training began, the training coordinator continuously implemented the same procedure to ensure no vacancies arise.



Source: Prepared by the JICA survey team

Figure-11 Selection Method for Applicants (Scoring Formula)

The questions for each course are shown below. The red-framed sections in the questionnaire indicate course-specific questions, while the remaining items are common to all courses.

Table-20 Selection Method for Applicants (Questions by Course)

### Questions for the **Excel** Course

| No. | Question                                                                                                                                        | Score Range   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1   | Do you usually use a computer?<br>No, Yes (a few times a month), Yes (a few times a week), Yes (almost every day)                               | 0 – 3         |
| 2   | Do you usually use a computer for work or study?<br>No, Yes (a few times a month), Yes (a few times a week), Yes (almost every day)             | 0 – 3         |
| 3   | Do you have your own computer?<br>No, Yes (Laptop), Yes (Desktop), Yes, (Both Laptop and Desktop)                                               | 0 – 3         |
| 4   | Have you ever used Excel?<br>No, Yes (less than 1 year), Yes (about 1–3 years), Yes (more than 3 years)                                         | 0 – 3         |
| 5   | Have you ever created summary tables in Excel?<br>No, Yes (less than 1 year), Yes (about 1–3 years), Yes (more than 3 years)                    | 0 – 3         |
| 6   | Have you ever created charts (such as bar / pie charts) in Excel?<br>No, Yes (less than 1 year), Yes (about 1–3 years), Yes (more than 3 years) | 0 – 3         |
| 7   | Please select your age from the options below.<br>50 years old or older, 40–49, 30–39, 20–29, Under 20 years old                                | <b>0 - 20</b> |

### Questions for the **WordPress** Course

| No. | Question                                                                                                                            | Score Range   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1   | Do you usually use a computer?<br>No, Yes (a few times a month), Yes (a few times a week), Yes (almost every day)                   | 0 – 3         |
| 2   | Do you usually use a computer for work or study?<br>No, Yes (a few times a month), Yes (a few times a week), Yes (almost every day) | 0 – 3         |
| 3   | Do you have your own computer?<br>No, Yes (Laptop), Yes (Desktop), Yes, (Both Laptop and Desktop)                                   | 0 – 3         |
| 4   | Have you ever used WordPress?<br>No, Yes (less than 1 year), Yes (about 1–3 years), Yes (more than 3 years)                         | 0 – 3         |
| 5   | Have you ever written HTML/CSS?<br>No, Yes (less than 1 year), Yes (about 1–3 years), Yes (more than 3 years)                       | 0 – 3         |
| 6   | Have you ever written JavaScript?<br>No, Yes (less than 1 year), Yes (about 1–3 years), Yes (more than 3 years)                     | 0 – 3         |
| 7   | Please select your age from the options below.<br>50 years old or older, 40–49, 30–39, 20–29, Under 20 years old                    | <b>0 - 20</b> |

### Questions for the **Python** Course

| No. | Question                                                                                                                                | Score Range   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1   | Do you usually use a computer?<br>No, Yes (a few times a month), Yes (a few times a week), Yes (almost every day)                       | 0 – 3         |
| 2   | Do you usually use a computer for work or study?<br>No, Yes (a few times a month), Yes (a few times a week), Yes (almost every day)     | 0 – 3         |
| 3   | Do you have your own computer?<br>No, Yes (Laptop), Yes (Desktop), Yes, (Both Laptop and Desktop)                                       | 0 – 3         |
| 4   | Do you have experience with Python programming?<br>No, Yes (less than 1 year), Yes (about 1–3 years), Yes (more than 3 years)           | 0 – 3         |
| 5   | Do you have any programming experience other than Python?<br>No, Yes (less than 1 year), Yes (about 1–3 years), Yes (more than 3 years) | 0 – 3         |
| 6   | If yes, please tell us which programming languages<br>(Count up to 3 object-oriented languages similar to Python)                       | 0 – 3         |
| 7   | Please select your age from the options below.<br>50 years old or older, 40–49, 30–39, 20–29, Under 20 years old                        | <b>0 - 20</b> |

Source: Prepared by the JICA survey team

Based on the recruitment and selection results obtained thus far, the training coordinator prepared the final list of participants and shared it with the PJAIT training management team. Subsequently, PJAIT proceeded with detailed preparations for the implementation of the training.

## 2) Profile of Training Participants

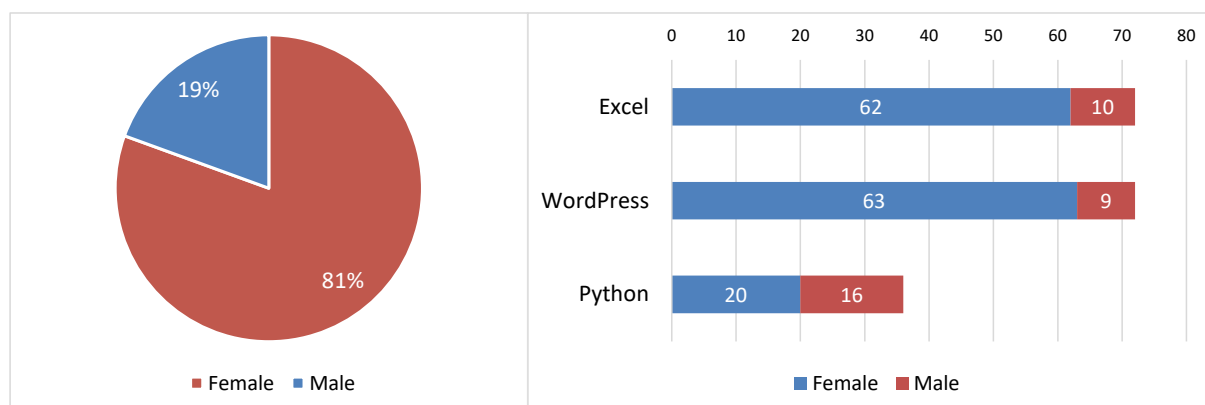
Based on the finalized participant list, profile information was collected and analyzed. As similar trends were observed at both the Warsaw and Gdańsk campuses, data from both locations were consolidated to produce aggregate results representing the overall trends among all participants. The following table and figure present a summary and the aggregated results for each item.

Table-21 Overview of Participant Profiles

| No. | Question type            | Summary                                                                                                                                                                                                                                           |
|-----|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Gender                   | Answer: Select from Female, Male, or No Answer<br>Trend: More women (same trend as the 2023 pilot training)                                                                                                                                       |
| 2   | Age Group                | Answer: Select from Under 20, 20-29, 30-39, 40-49, Over 50<br>Trend: Centered on those in their 30s (Younger compared to the 2023 pilot training)                                                                                                 |
| 3   | Educational Background   | Answer: Select from Secondary, High school, bachelor's degree, master's degree, doctoral degree<br>Trend: High proportion of highly educated individuals (same as the 2023 pilot training)                                                        |
| 4   | Current Status           | Answer: Select from Self-employed, employed (part-time), employed (full-time), Not currently working (job seeking), High school/University student, Other<br>Trend: Higher proportion of employed individuals compared to the 2023 pilot training |
| 5   | Currently Seeking a job? | Answer: Select from Yes, looking for work, No, not looking for work<br>Trend: Many participants are job seekers (same trend as the 2023 pilot training)                                                                                           |

Source: Prepared by the JICA survey team based on registration information

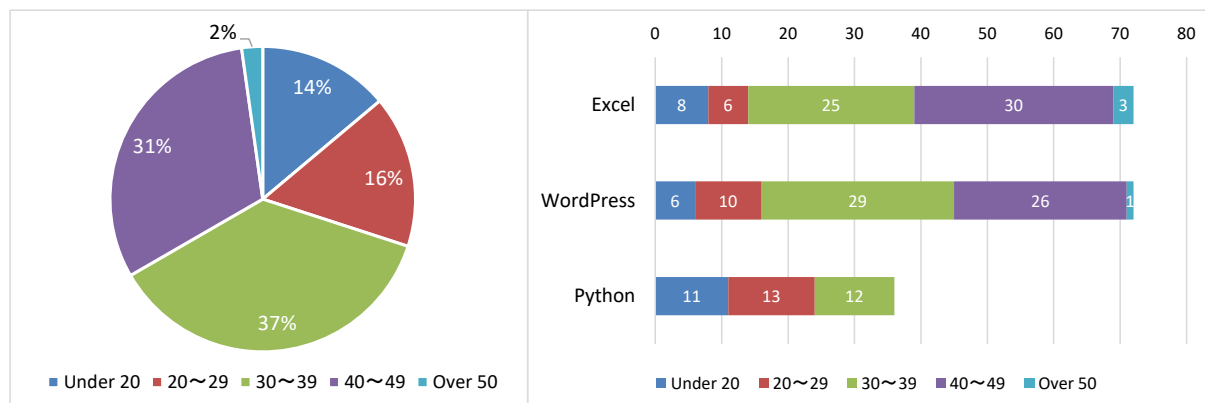
From here, the table above is examined by category. First, regarding participant gender, as shown in the figure below, women accounted for 81% and men for 19%, indicating a high proportion of female participants. This trend was also observed in the pilot training conducted in 2023 (also 81% women and 19% men), confirming it as a consistent characteristic. By course, the Python course had 20 female participants and 16 male participants, showing the highest proportion of male participants among the three courses.



Source: Prepared by the JICA survey team based on registration information

Figure-12 By Gender (Left: Overall Ratio / Right: Number by Course)

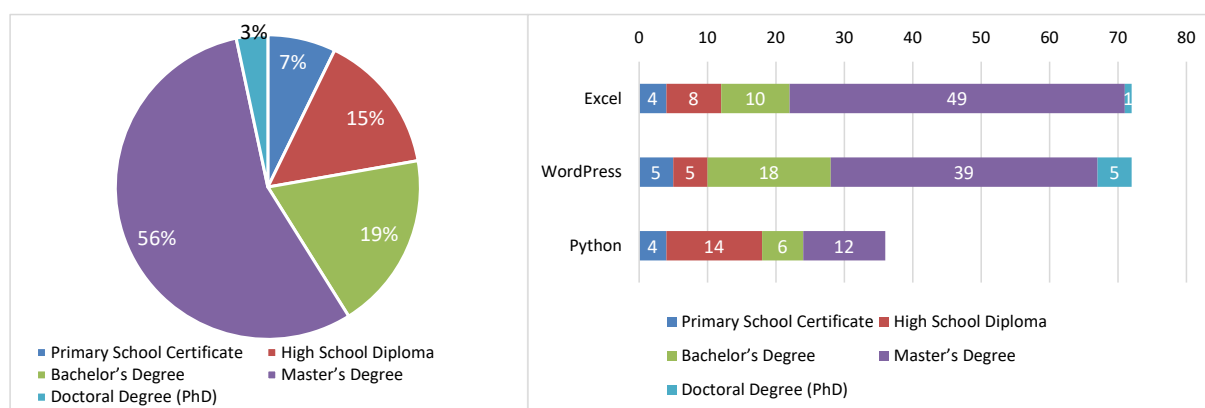
The age distribution of participants ranged widely from under 20 to over 50 years old. As shown below, the core age group was 30–39 years old, accounting for approximately 37% of the total. Compared with the 2023 pilot training, the selection criteria for this main training assigned higher scores to younger applicants, resulting in an overall shift toward a younger age distribution.



Source: Prepared by the JICA survey team based on registration information

Figure-13 By Age Group (Left: Overall Ratio / Right: Number by Course)

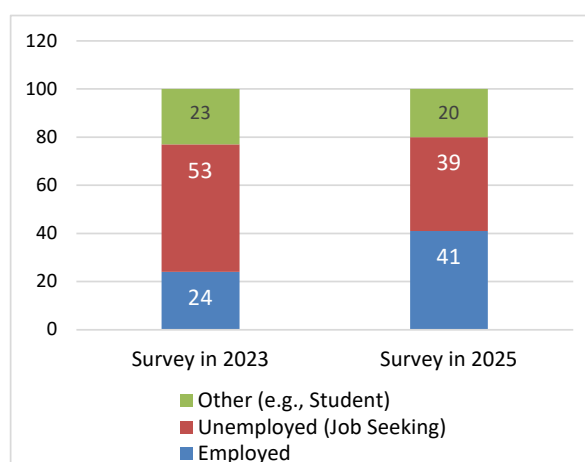
Regarding participants' educational background, a trend toward higher education levels was observed, like the 2023 pilot training. As shown below, 19% of participants held a bachelor's degree, and approximately 59% held a master's degree or higher, indicating that 78% of all participants had received higher education. On the other hand, as this session included a certain number of younger participants, those with a high school diploma or lower - including current university students - accounted for 22% of the total.



Source: Prepared by the JICA survey team based on registration information

Figure-14 By Educational Background (Left: Overall Ratio / Right: Number by Course)

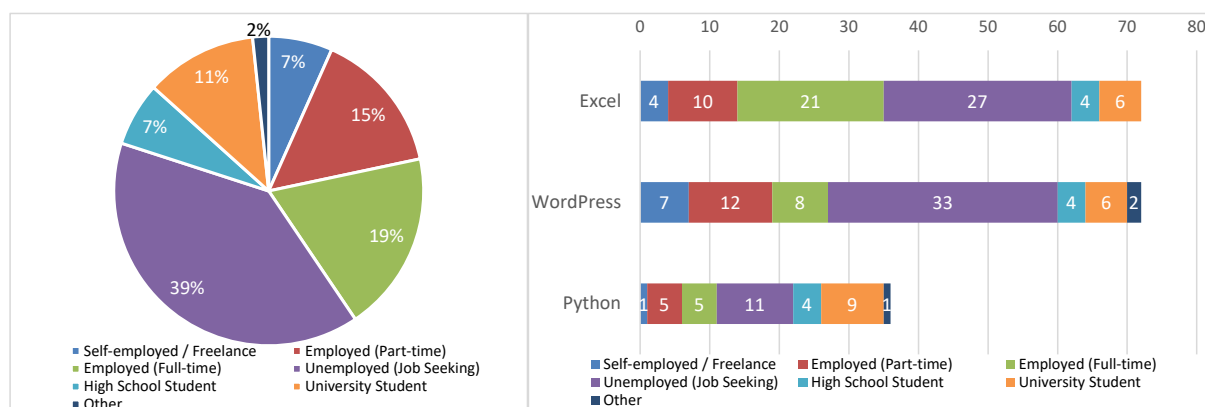
The current employment status of participants is shown below, comparing the results of the 2023 pilot training survey with those of this survey. As illustrated in the figure, the proportion of respondents indicating “Working” (including part-time, full-time, and freelance) increased from 24% to 41% compared with 2023, while the proportion indicating “Not working (job-seeking)” decreased from 53% to 39%. This trend suggests that, as the duration of stay in Poland lengthens, the need to stabilize livelihoods and secure employment opportunities is growing.



Source: Prepared by the JICA survey team based on registration information

Figure-15 Current Status  
(Comparison between 2023 and 2025 Surveys, %)

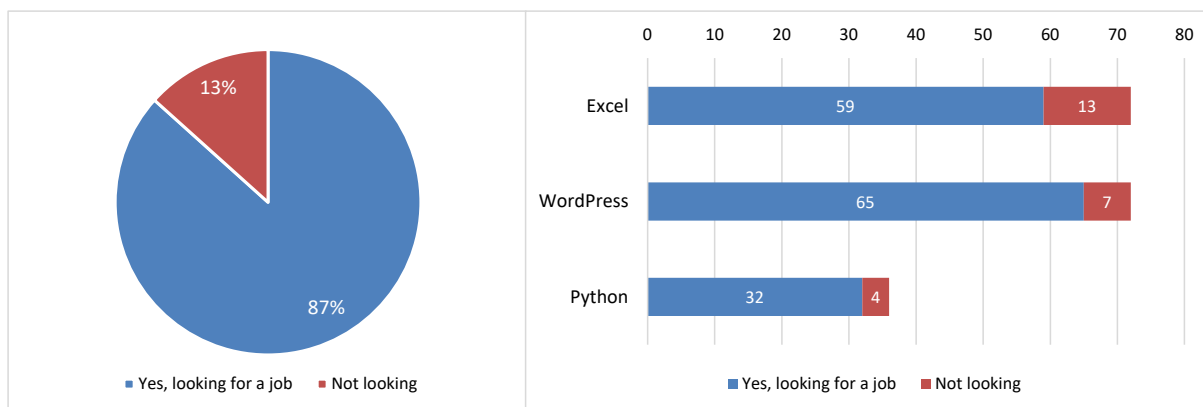
Similarly, the details of the participants’ current employment status by course are shown in the figure below.



Source: Prepared by the JICA survey team based on registration information

Figure-16 Current Status (Left: Overall Ratio / Right: Number by Course)

Finally, the results of asking whether participants wish to change jobs or seek employment with better conditions, regardless of their current employment status, are shown in the figure below. As shown in the figure, similar to the 2023 pilot training, it became clear that a large number of participants (87%) are seeking new employment opportunities.



Source: Prepared by the JICA survey team based on registration information

Figure-17 Currently Seeking Employment? (Left: Overall Ratio / Right: Number by Course)

Summarizing the participant profiles for this training program, the female ratio is notably high (approximately 80%), with the age group primarily concentrated in their 30s, yet spanning a wide range from under 20 to over 50. Furthermore, the majority have completed higher education (around 80%), with a particularly large proportion holding master's degrees, indicating a generally high level of educational attainment.

In terms of current employment status, although the number of participants engaged in part-time, freelance, or other non-regular forms of work has increased, many are still in the process of job searching, highlighting the challenge of securing stable employment.

Based on these findings, participants can be characterized as a group with strong learning motivation and a solid foundational skill set, while demonstrating a clear need to acquire practical skills that directly contribute to stable employment.

### 3) Implementation of Training

The training was conducted in computer labs at PJAiT's Warsaw and Gdańsk campuses, following the same format as the pilot training held in 2023. Each campus utilized three classrooms, and the sessions were scheduled during the university's summer break as follows:

- PJAiT Warsaw Campus: July 14, 2025 (Opening ceremony in the morning; lectures began in the afternoon) – August 6
- PJAiT Gdańsk Campus: July 21, 2025 (Opening ceremony in the morning; lectures began in the afternoon) – August 13

The computer labs were equipped with 20 training PCs at the Warsaw campus and 16 at the Gdańsk campus. All PCs operated on Windows 11 with Microsoft 365 installed. In addition, the system administrators at each campus pre-installed all other software required for the courses, ensuring full readiness prior to the start of training.

As in the 2023 pilot training, each course was jointly conducted by a PJAiT lecturer and a Ukrainian international student assistant. Before the training began, participant information was shared by the training coordinator with all lecturers and assistants, who then made course-specific preparations accordingly. At the start of the first session of each course, the training coordinator, lecturers, and assistants conducted an orientation to explain the overall training structure and key points to the participants.

During the orientation, participants also practiced accessing and using the Microsoft Teams accounts created in advance by PJAiT. Throughout the training period, Microsoft Teams was actively used for communication between lecturers and participants — including information sharing, material distribution, assignment submission, and schedule confirmation — which contributed to the smooth and efficient management of the training.

Furthermore, approximately two weeks prior to the start of each course, pre-training materials were distributed to participants to encourage preparation in advance. These materials were developed by each lecturer and designed to allow participants to study according to their individual levels and circumstances. The distributed materials were standardized in format and provided as PDF files, as illustrated below. This approach ensured that all participants began the training with a shared baseline understanding, allowing the program to proceed smoothly from the first day.

The pre-training materials included the following sections:

- Course Objectives and Overview
- Knowledge Transfer Tools: Explanation of the educational approach used in the training
- Course Details and Schedule Overview
- Explanation of Pre-Training Preparation

The schedule for the IT Business Skills Training held at PJAiT's Warsaw and Gdańsk campuses is presented in the table below. Each training course designated the morning session (9:00 AM – 12:00 PM) as an Open Lab, staffed by Ukrainian exchange students serving as assistants, to provide optional self-study opportunities. The afternoon sessions (1:00 PM – 5:00 PM) were devoted to formal lectures and practical exercises conducted by lecturers.

Table-22 Implementation Schedule (PJAIT Warsaw Campus)

| Date                   | Schedule                                                                                                                                              | Organizations / Guests                                                                                                                                                                                                   |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| July 9                 | Kick-off Meeting<br>(Warsaw Campus - Hybrid Format)                                                                                                   | Recruitment of Training Participants<br>Partner Organizations                                                                                                                                                            |
| July 14                | Opening Ceremony and Reception                                                                                                                        | Guest Address: Chargé d'Affaires ad interim Mr. Tajima                                                                                                                                                                   |
| July 14<br>~July 23    | - Excel, WordPress Group 1<br>(14th, 15th, 16th, 17th, 18th, 21st, 22nd, 23rd)<br>- Python Programming<br>(14th, 15th, 16th, 21st, 22nd, 23rd)        |                                                                                                                                                                                                                          |
| July 28th<br>~August 6 | - Excel, WordPress Group 2<br>(28th, 29th, 30th, 31st, August 1st, 4th, 5th, 6th)<br>- Python Programming<br>(28th, 29th, 30th, August 4th, 5th, 6th) |                                                                                                                                                                                                                          |
| August 14              | Job Counseling Session, Closing Ceremony<br>(Jointly held at Warsaw Campus)                                                                           | Guest Address: JICA Section Chief<br>Mr. Takahashi<br>Guest Address: Mr. Piotr Kępski,<br>Director of the Department of<br>Programmes for Institutions, NAWA<br>Participants: Cooperating<br>Organizations and Companies |

Source: Prepared by the JICA survey team

Table-23 Implementation Schedule (PJAIT Gdańsk Campus)

| Date                     | Schedule                                                                                                                                                | Organizations / Guests                                                                                                                                                                                                   |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| July 9                   | Kick-off Meeting<br>(Warsaw Campus - Hybrid Format)                                                                                                     | Recruiting Training Participants<br>Partner Organizations                                                                                                                                                                |
| July 21                  | Opening Ceremony, Reception                                                                                                                             | Guest Address: First Secretary Mr. Taniguchi                                                                                                                                                                             |
| July 21<br>~July 30      | - Excel, WordPress Group 1<br>(21st, 22nd, 23rd, 24th, 25th, 28th, 29th, and 30th)<br>- Python Programming<br>(21st, 22nd, 23rd, 28th, 29th, and 30th)  |                                                                                                                                                                                                                          |
| August 4th<br>~August 13 | - Excel, WordPress Group 2 Training<br>(4th, 5th, 6th, 7th, 8th, 11th, 12th, and 13th)<br>- Python Programming<br>(4th, 5th, 6th, 11th, 12th, and 13th) |                                                                                                                                                                                                                          |
| August 14                | Job Counseling Session, Closing Ceremony<br>(Jointly held at the Warsaw campus)                                                                         | Guest Address: JICA Section Chief<br>Mr. Takahashi<br>Guest Address: Mr. Piotr Kępski,<br>Director of the Department of<br>Programmes for Institutions, NAWA<br>Participants: Cooperating<br>Organizations and Companies |

Source: Prepared by the JICA survey team

Similar to the 2023 pilot training, a joint kick-off meeting for both the Warsaw and Gdańsk campuses was held at the PJAIT Warsaw campus on July 9, prior to the commencement of the training. The purpose of this meeting was to share the overall goals and objectives of the training among all stakeholders and to promote mutual understanding. Participants included training management staff from both campuses, all lecturers and assistants, representatives from

cooperating organizations, and the JICA survey team. During the meeting, a pre-training orientation was conducted to explain the overall objectives, course content, and administrative procedures. The orientation was delivered in a hybrid format, allowing those unable to attend in person to participate online.

The opening ceremonies were held at both the PJAIT Warsaw and PJAIT Gdańsk campuses, with representatives from the Embassy of Japan in Poland attending as guests and delivering remarks. Furthermore, on August 14, the final day of the training, a job counseling session and closing ceremony for both campuses took place at the Warsaw campus. The graduation ceremony featured congratulatory remarks from representatives of JICA Headquarters (joining online) and the Polish National Agency for Academic Exchange (NAWA).

The photos below show the opening ceremonies held at the PJAIT Warsaw and PJAIT Gdańsk campuses.



Opening Ceremony (Warsaw)



Guest Address:  
Chargé d'Affaires ad interim Mr. Tajima



Opening Ceremony (Gdańsk)



Guest Address:  
First Secretary Mr. Taniguchi

Source: PJAIT

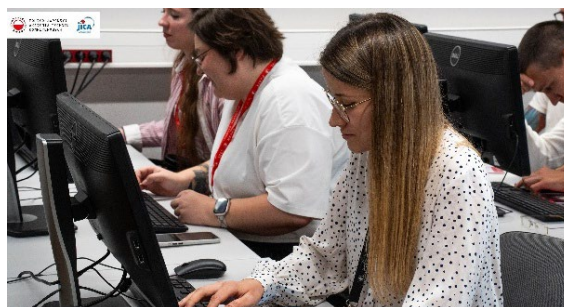
Figure-18 Opening Ceremony

Additionally, the photos below present scenes from the training sessions at both campuses and graduation ceremonies at the Warsaw campus.<sup>51</sup>

<sup>51</sup> Also available on PJAIT's YouTube channel. <https://www.youtube.com/watch?v=tnFhUs9C530>



Training Session (Warsaw Campus)



Training Session (Warsaw Campus)



Training Session (Gdańsk Campus)



Training Session (Gdańsk Campus)



Closing Ceremony



Closing Ceremony

Source: PJAIT

Figure-19 Training Sessions

The schedule and main contents of each training course are shown in the table below. The Excel and WordPress courses were conducted with nearly identical curricula at both the Warsaw and Gdańsk campuses; therefore, they are presented here in a combined format. For all training courses, the final day was designated for final presentations, during which each participant had the opportunity to present deliverables demonstrating the knowledge and skills acquired through the training.

Table-24 Course Contents (Excel)

| Schedule | Main Content                                                                   |
|----------|--------------------------------------------------------------------------------|
| Day 1    | Orientation, Basic Excel Operations, Fundamentals of Worksheets and Data Entry |
| Day 2    | Fundamentals of Formulas/Functions (SUM, AVERAGE, IF, etc.), Cell References   |
| Day 3    | Sorting, filtering, and conditional formatting                                 |
| Day 4    | Advanced Excel Functions (VLOOKUP, XLOOKUP, COUNTIF, SUMIF, etc.)              |
| Day 5    | Creating and Editing Charts, Data Visualization                                |
| Day 6    | Pivot Tables and Cross-Tabulation, Fundamentals of Data Analysis               |
| Day 7    | Practical Exercise: Analysis and Report Creation Using Business Data           |
| Day 8    | Final Presentation (Presentation of Practical Assignments)                     |

Source: The JICA survey team, based on PJAIT materials

Table-25 Course Contents (WordPress)

| Schedule | Main Content                                                        |
|----------|---------------------------------------------------------------------|
| Day 1    | Orientation, WordPress Overview, Environment Setup                  |
| Day 2    | Selecting a Template and Basic Settings, Creating Pages and Posts   |
| Day 3    | Menu and Widget Settings, Inserting Images and Videos               |
| Day 4    | Plugin Installation and Management, Security Basics                 |
| Day 5    | Design Customization, Theme Editing Basics                          |
| Day 6    | SEO (Search Engine Optimization) and Multilingual Support Basics    |
| Day 7    | Practical Exercise: Original Website Development (Individual/Group) |
| Day 8    | Final Presentation (Presentation of developed Websites)             |

Source: Prepared by the JICA survey team based on PJAIT materials

Regarding the Python Programming Course, while the lecture content covering Python fundamentals was common to both campuses, differences were observed in the focus and libraries used during the application development exercises that followed the foundational phase. The table below compares the main training contents at both campuses and highlights their respective characteristics. Specifically, the Warsaw campus emphasized application development in the field of data analysis, whereas the Gdańsk campus focused on web application development. Both areas represent typical applications of Python, and the differences reflect appropriate instructional decisions made by each campus's lecturers in consideration of participants' backgrounds and learning environments, rather than any superiority or inferiority between the two approaches.

Table-26 Course Contents (Python Programming in Warsaw)

| Schedule | Main Content                                                                       |
|----------|------------------------------------------------------------------------------------|
| Day 1    | Orientation, Python Setup, Basic Syntax (Variables, Control Structures, Functions) |
| Day 2    | File I/O, Exception Handling, Modules                                              |
| Day 3    | NumPy Basics (Arrays, Operations, Broadcasting)                                    |
| Day 4    | Pandas Basics (Series, DataFrame, Preprocessing)                                   |
| Day 5    | Visualization (Matplotlib, Plotly)                                                 |
| Day 6    | Pandas Applications (Joining, Aggregation, Time Series Processing)                 |
| Day 7    | Streamlit Introduction (UI Building, Interactive Features)                         |
| Day 8    | Streamlit Advanced (File I/O, Chart Integration, Data Visualization)               |
| Day 9    | Manim Introduction (Animation Production)                                          |
| Day 10   | Manim Advanced (Scene Composition, Custom Objects)                                 |
| Day 11   | Comprehensive Production (Data Analysis or Visualization App Development)          |
| Day 12   | Final Presentation (Review and Feedback)                                           |

Source: Prepared by the JICA survey team based on PJAIT materials

Table-27 Course Contents (Python Programming in Gdańsk)

| Schedule | Main Content                                                             |
|----------|--------------------------------------------------------------------------|
| Day 1    | Orientation, Python Basics, Development Environment Setup (venv, Poetry) |
| Day 2    | Web Fundamentals (HTTP/REST, API Overview)                               |
| Day 3    | Flask Basics (Routing, Templates)                                        |
| Day 4    | Database Fundamentals (SQLite, SQLAlchemy)                               |
| Day 5    | Flask - Database Integration (CRUD Operations, Forms)                    |
| Day 6    | UI Improvements (HTML/CSS, Error Handling)                               |
| Day 7    | API Development (Blueprint Configuration, REST Design)                   |
| Day 8    | Flask-Based Web Application Development Exercise                         |
| Day 9    | Integrated Development 1 (Requirements Definition & Design)              |
| Day 10   | Integrated Development 2 (Implementation & Testing)                      |
| Day 11   | Integrated Development 3 (Deployment Overview & Presentation Prep)       |
| Day 12   | Final Presentation (Review and Feedback)                                 |

Source: Prepared by the JICA survey team based on PJAIT materials

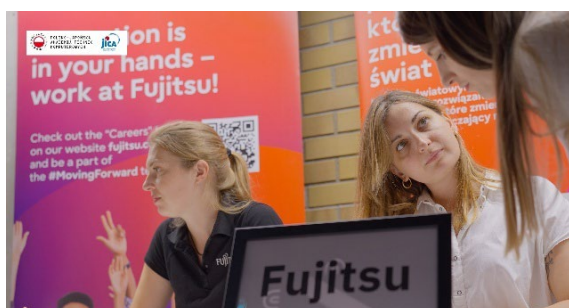
### (3) Career Consultation Fair

On the day of the IT business skills training graduation ceremony, a Job Consultation Fair was held. An overview and snapshots from the day are presented in the table and figures below. A total of seven organisations and companies participated in the fair. Approximately 130 graduates of the PJAIT Warsaw Campus and Gdansk Campus—who were scheduled to attend the graduation ceremony held later that afternoon—took part, creating a lively and well-attended event. Participants visited consultation booths of interest in turn and were provided with employment support, including access to job vacancy information and résumé reviews, making the fair a meaningful opportunity for career development.

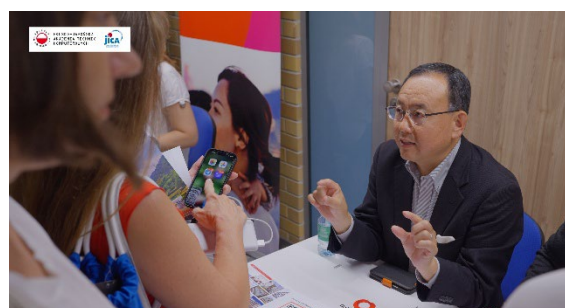
Table-28 Overview of the Job Consultation Fair

| Item                                    | Details                                                                                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date & Time                             | 14 August 2025, 11:00–13:00                                                                                                                                                   |
| Venue                                   | PJAIT, 2nd Floor (Building A)                                                                                                                                                 |
| Cooperating organisations/<br>companies | Warsaw City Labour Office; Fujitsu Poland; Caritas Poland (Warsaw); Ukrainian House; Pasona Group Inc.; Daiwa House Europe B.V., Ltd.; UNIQLO Poland (in no particular order) |
| Participants                            | Approximately 130 attendees of the IT business skills training graduation ceremony (from PJAIT Warsaw Campus and Gdańsk Campus)                                               |

Source: Prepared by the JICA survey team



Job Consultation Booth (Fujitsu Poland)



Job Consultation Booth (Daiwa House Europe B.V.)

Source: PJAIT

Figure-20 Job Consultation Fair Scene

### (4) Polish Language Training

Following the pilot programme conducted in 2023, an online Business Polish language training was implemented for interested participants of the IT business skills training, with the cooperation of Social Welfare Corporation Fukudenkai.<sup>52</sup>

A total of 110 participants took part in the training, which was conducted between June and July 2025, prior to the start of the IT business skills training for the same year. An overview of the programme is presented in the table below.

<sup>52</sup> <https://www.fukudenkai.or.jp/>

Table-29 Overview of the Polish Language (Online) Training

| Item                                           | Details                                                                                                                                                                           |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Training objective (target level)              | To acquire the Polish language skills required for the training prior to conducting IT business skills training.                                                                  |
| Training period (session length / total hours) | 17 June – 31 July 2025<br>(each session: 1 hour, total: 12 hours)                                                                                                                 |
| Training content                               | IT-related terminology (Excel, WordPress, Python); company introductions; a day at the office, recruitment processes, effective business practices                                |
| Scale of training                              | Number of classes: 20 in total (2–10 participants per class)<br>Number of instructors: 1 certified Polish language instructor<br>Participants: 110 (average attendance rate: 93%) |

Source: Prepared by the JICA survey team based on reports from Social Welfare Corporation Fukudenkai

According to reports from the cooperating instructor, participants demonstrated a high level of motivation, with many consistently completing assigned tasks. While there was some variation in participants' Polish language proficiency—requiring certain adjustments in class management—the average attendance rate remained high at 93%. In cases of absence, make-up classes were offered by allowing participants to attend sessions of other groups, indicating a strong commitment to continued learning.

The language training contributed to a partial standardisation of participants' basic Polish language comprehension, which in turn facilitated the smooth implementation of the subsequent IT business skills training. Instructors and international student teaching assistants from Polish-Japanese Academy of Information Technology for the IT business skills training also provided positive feedback regarding the improvement in participants' language proficiency.

#### (5) Soft Skills Training

When job hunting, in addition to specific technical skills and language abilities, the ability to analyze and express oneself during job interviews is also essential. Therefore, with the cooperation of UNIQLO Poland, soft skills training was provided to interested participants of the IT Business Skills Training program. The training was conducted online by Joanna Dogadalska, Manager of UNIQLO Poland. Each session covered identical content and took place on July 24, July 31, and August 7, 2025, from 10:00 AM to 12:00 PM. The training content is shown in the table below.

Table-30 Content of the Soft Skills Training

| Modules                     | Content                                                                                                                                                                                                                                             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preparing for the interview | <ul style="list-style-type: none"> <li>• Understanding the interview process: Equip participants with the knowledge to prepare confidently for different types of interviews</li> <li>• STAR technique (Situation, Task, Action, Result)</li> </ul> |
| Building Trust              | <ul style="list-style-type: none"> <li>• Learn how to build credibility and rapport with interviewers</li> <li>• Authenticity and transparency in answers</li> <li>• Demonstrating values and integrity</li> </ul>                                  |
| Unlocking Your Potential    | <ul style="list-style-type: none"> <li>• Identifying personal strengths and talents</li> <li>• Growth mindset vs fixed mindset</li> </ul>                                                                                                           |

Source: Soft Skills Training Instructor

A total of 75 participants attended the training over three days. Each session featured lively Q&A sessions. Particularly numerous questions addressed challenges associated with entering unfamiliar national labor markets, transitioning to different industries or job types, applying existing skills to unknown workplace environments, effectively navigating the hiring process, and key points for advancing to the interview stage. Instructors provided practical, clear explanations tailored to individual circumstances in response to these questions.

#### (6) Evaluation of Training

The results of this training program are summarized in the table below. A total of 180 participants registered across the Warsaw and Gdańsk campuses, of whom 150 completed the course. In comparison, during the pilot training conducted in 2023, 86 out of 100 registrants completed the program. The completion rate for this training was 83.3%, which is nearly the same as 86.0% recorded in the previous year.

According to field reports, most absences were attributed to personal reasons such as work commitments, family circumstances (including childcare responsibilities), mental health issues, or family- and acquaintance-related matters in Ukraine (such as the impact of Russian military attacks). For privacy and data protection reasons, the JICA survey team did not identify or count individual participants affected by these circumstances. However, interviews with local stakeholders indicated that many of these individuals either did not attend the training at all or were present only on the first day before discontinuing their participation.

Table-31 Number of Registered Participants and Graduates

| PJAIT  | Course             | Participants | Graduates | Rate (%)  |
|--------|--------------------|--------------|-----------|-----------|
| Warsaw | Excel Group 1      | 20           | 20        | 100       |
|        | Excel Group 2      | 20           | 17        | 85        |
|        | WordPress Group 1  | 20           | 15        | 75        |
|        | WordPress Group 2  | 20           | 17        | 85        |
|        | Python Programming | 20           | 15        | 75        |
|        | <b>Total</b>       | <b>100</b>   | <b>84</b> | <b>84</b> |
| Gdańsk | Excel Group 1      | 16           | 10        | 63        |
|        | Excel Group 2      | 16           | 16        | 100       |
|        | WordPress Group 1  | 16           | 14        | 88        |
|        | WordPress Group 2  | 16           | 11        | 69        |
|        | Python Programming | 16           | 15        | 94        |
|        | <b>Total</b>       | <b>80</b>    | <b>66</b> | <b>83</b> |

Source: Prepared by the JICA survey team based on PJAIT materials

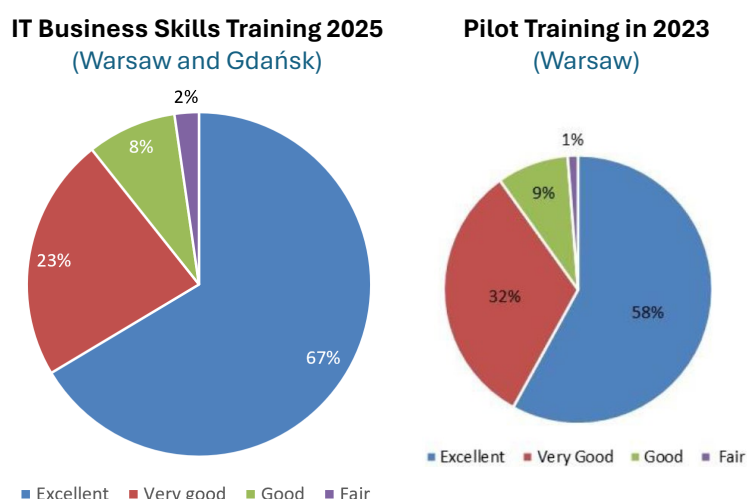
The evaluation of this training was conducted based on the results of an online questionnaire (131 respondents) administered on the final day of each course. A summary of the questionnaire results, compared with those from the 2023 pilot training, is presented in the table below.

Table-32 Overview of the Analysis of Survey Results (Comparison with the 2023 Pilot Training)

| Survey Items                                                               | Summary of Survey Results                                                                                 |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| How was the training?                                                      | Received high ratings similar to the 2023 pilot training                                                  |
| Was the training period appropriate?                                       | The percentage of "Appropriate" responses increased compared to the 2023 pilot training                   |
| Were the Polish language lectures easy to understand?                      | The percentage of responses indicating "difficult" decreased compared to the 2023 pilot training          |
| To what extent did your skills improve through the training?               | The percentage of responses indicating "Extremely improved" increased compared to the 2023 pilot training |
| How do you plan to utilize the knowledge you gained through this training? | Many responses linked the learned content to "specific actions (work, employment, learning)"              |
| What kind of courses would you like to take in the future?                 | Many expressed a desire to participate in the current courses with more practical and applied content     |
| Please share any suggestions or opinions for improving the training        | Participant satisfaction was extremely high, with positive feedback constituting many responses           |

Source: Prepared by the JICA survey team based on the questionnaire survey results

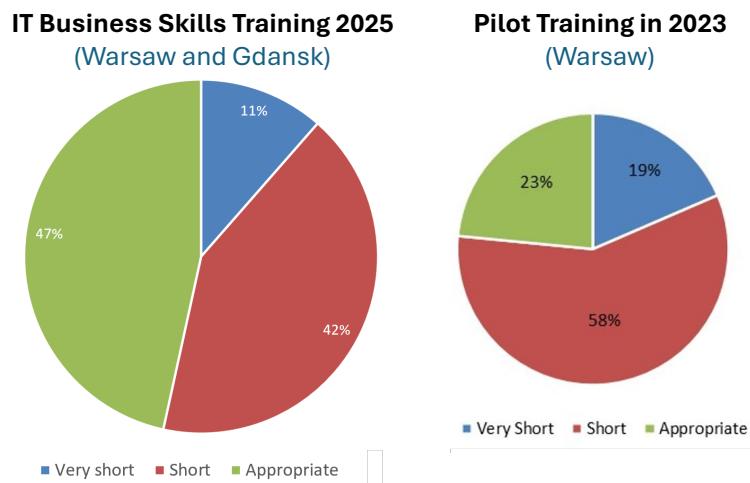
In response to the question, “*How was the training?*”, 90% of participants rated it as either “5 (Excellent)” or “4 (Very Good)” on a 5-point scale, as shown in the figure below, indicating a high level of satisfaction. This result is consistent with the 90% satisfaction rate recorded in the 2023 pilot training, demonstrating sustained high evaluations for this training program.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-21 Overall Evaluation of the Training

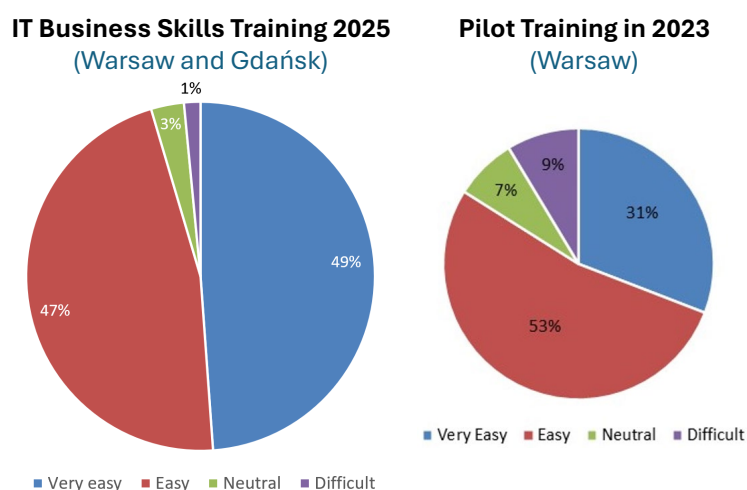
In response to the question, “*Was the training period appropriate?*”, 53% of participants answered, “Very short” or “Short,” as shown in the figure below. In contrast, 47% answered “Appropriate,” while none responded “Long” or “Very long.” Compared with the 2023 pilot training, in which 77% responded “Very short” or “Short,” this figure has decreased to 53%, indicating improved satisfaction with the training duration. Furthermore, the proportion of respondents who answered “Appropriate” nearly doubled from 23% in the 2023 pilot training to 47% this time. This improvement is likely attributable to the extension of the training period in this session—specifically, the expansion of the Excel and WordPress courses from 5 days to 8 days, and the Python course from 9 days to 12 days.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-22 Appropriateness of the Training Duration

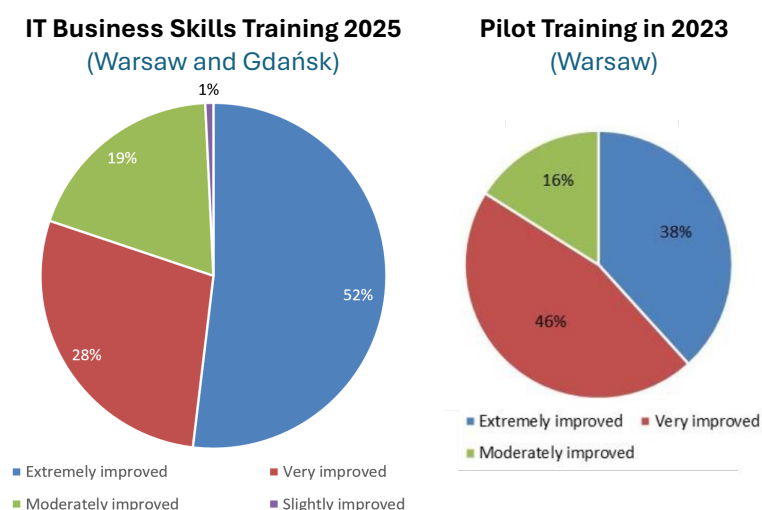
Regarding the question, “*Were the lectures in Polish easy to understand?*”, 96% of participants rated them as “5 (Very easy)” or “4 (Easy)” on a 5-point scale, as shown in the figure below, indicating an overall very high level of satisfaction. This suggests that the majority of participants were able to adequately comprehend the lectures delivered in Polish. Compared with the 2023 pilot training, the percentage of respondents who answered “2 (Difficult)” decreased significantly from 9% to 1%, demonstrating a marked improvement in language comprehension. Feedback from instructors and Ukrainian student assistants also confirmed that participants generally understood the lecture content well. PJAIT further assessed that participants’ overall proficiency in Polish had improved compared to the 2023 pilot training. One contributing factor to this improvement is the extended period of residence in Poland following the Russian invasion, during which participants naturally enhanced their language skills while adapting to local living and working environments.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-23 Comprehensibility of Lectures in Polish

In response to the question, “Compared to before the training began, how much did your skills improve?”, 80% of participants rated their improvement as “5 (Extremely improved)” or “4 (Very improved)” on a 5-point scale, as shown in the figure below, indicating a high level of satisfaction. Notably, the percentage selecting “5 (Extremely improved)” increased substantially from 38% in the 2023 pilot training to 52% in this session, suggesting that participants perceived the training’s effectiveness more strongly in their self-assessments. Furthermore, all respondents reported some degree of skill improvement, confirming the training’s effectiveness in helping participants acquire and enhance IT skills.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-24 Degree of Skill Improvement Compared with Before Training

In response to the question, “How do you plan to utilize the knowledge you gained through this training?”, participants’ responses were broadly classified into four main categories:

- (1) Application for job hunting or career change;
- (2) Practical use in their current workplaces or job duties;
- (3) Preparation for personal business ventures or future entrepreneurship; and
- (4) Further skill development through continued learning.

Overall, many participants connected the acquired knowledge with concrete and practical actions such as applying skills in their work, seeking employment opportunities, or pursuing further study, indicating that the training generated tangible and practical outcomes. Course-specific trends were as follows:

- Excel: Many participants planned to apply their skills to administrative tasks, data organization, and report creation. Responses emphasized practical applications that improve work efficiency, such as “streamlining daily operations” and “performing data analysis at work.”

- WordPress: Participants frequently mentioned using WordPress to manage personal blogs or small business websites, or to undertake freelance and self-employed projects creating websites for others. Some also expressed interest in supporting projects for non-profit organizations or schools.
- Python: Many participants aimed to leverage their skills for future career transitions into IT fields or for enhancing technical capabilities in areas such as data analysis and automation. Common aspirations included “advancing into AI/data science” and “building a foundation as a programmer.”

In response to the question, “What kind of courses would you like to take in the future?”, participants’ preferences were mainly concentrated on the current three courses Excel, WordPress, and Python and their advanced versions, confirming the continued relevance of the existing basic course structure.

A notable finding is that many respondents expressed a desire for more practical and applied content within these courses. Specific trends identified for each course are summarized below:

- Excel: Participants showed particularly strong interest in advanced skills aimed at improving work efficiency, such as macros, VBA, and process automation.
- WordPress: There was significant demand for more advanced web development skills, including web design, content creation, and JavaScript/CSS.
- Python: Many respondents indicated a desire to expand into applied domains such as AI, data analysis, and application development, highlighting a clear demand for skills beyond the foundational level.

In response to the question, “*Please share any suggestions or opinions for improving the training*” overall participant satisfaction was very high, with positive feedback predominating. However, several constructive suggestions were also provided to further enhance the effectiveness of future training. These comments can be broadly categorized into three areas: (1) training hours and duration, (2) teaching materials and instructional methods, and (3) learning support and training environment.

#### ➤ Opinions on Training Duration and Time

Many participants commented that “the time was insufficient” or “we wanted more time to learn.” This tendency was particularly strong in technical courses such as Python and WordPress, where participants requested “more hands-on practice time” and “additional follow-up sessions.” In contrast, participants in the Excel course generally felt that “the content was appropriate,” but suggested “adding an advanced-level module” in future iterations.

➤ Opinions on Teaching Materials and Methods

While the guidance provided by lecturers and assistants was highly rated overall, several participants requested improvements in the preparation phase, including “receiving materials in advance” and “having more detailed explanatory materials.”

➤ Opinions on Learning Support and Environment

Many participants expressed a desire for “opportunities to interact with participants from other courses” and “a platform for continued learning after the training.” These comments highlight strong expectations for follow-up activities and the establishment of sustainable learning communities.

Additionally, evaluation reports on the outcomes and areas for improvement of this training were submitted by each lecturer in charge of the respective courses. The contents of these reports were reviewed and organized, and a course-by-course summary is presented in the table below.

Table-33 Summary of Training Evaluations by Lecturers

| Course    | Training outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Areas for improvement                                                                                                                                                                                                                                                                                                             |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excel     | <ul style="list-style-type: none"> <li>Although skill levels varied between beginners and experienced participants, overall motivation was high.</li> <li>Ukrainian/Polish language support assistants were effective in minimizing language barriers.</li> <li>Additional assignments were introduced to accommodate advanced learners.</li> <li>Extending the course to 8 days contributed significantly to improved understanding and retention.</li> </ul>                                                                                        | <ul style="list-style-type: none"> <li>Recommend level-based class organization (Beginner / Intermediate) for future sessions.</li> <li>Strengthening pre-study materials is desirable to improve preparation before the course and promote a more uniform understanding.</li> </ul>                                              |
| WordPress | <ul style="list-style-type: none"> <li>Although differences in PC skills were observed, flexible pacing and supplementary materials enabled all participants to complete their assignments.</li> <li>Extending the course (from 5 to 8 days) was particularly effective, establishing a full learning cycle of “learning + production + presentation.”</li> <li>Participant motivation was high, with strong interest not only in WordPress, but also in related areas such as HTML, CSS, JavaScript, design theory, and video production.</li> </ul> | <ul style="list-style-type: none"> <li>Consider modularizing the course to focus on WordPress while supplementing foundational knowledge in web design and content creation.</li> <li>Providing guidance tailored to participants’ prior skill levels and introducing short pre-course online sessions is recommended.</li> </ul> |
| Python    | <ul style="list-style-type: none"> <li>Participants demonstrated very high motivation and comprehension overall.</li> <li>The practice-oriented structure enabled participants to acquire Python concepts through implementation.</li> <li>The course was easy to follow for beginners, while additional assignments were provided for advanced learners.</li> <li>The approaches of the two campuses were complementary, and both yielded strong educational outcomes.</li> </ul>                                                                    | <ul style="list-style-type: none"> <li>It is desirable to clarify course content and level more explicitly at the recruitment stage in future cycles.</li> <li>Many participants expressed interest in advancing to applied areas such as AI and machine learning; establishing an intermediate course is recommended.</li> </ul> |

Source: Prepared by the JICA survey team based on PJAIT materials

Based on the above, a summary of the overall trends observed throughout the training revealed the following common evaluations and recommendations from instructors:

- Participants demonstrated exceptionally high motivation and concentration, with clear learning outcomes observed. For example, in the Excel course, several participants with prior professional experience—such as accountants—showed particularly strong proficiency.
- Compared with the 2023 pilot training, the extended training duration significantly improved knowledge retention. (The extension of the Excel/WordPress courses from 5 to 8 days and the Python course from 9 to 12 days produced notable results.)
- The involvement of Ukrainian student assistants was highly effective, serving as a bridge in both linguistic and technical aspects.
- At the same time, Ukrainian student assistants reported that participants’ overall Polish language proficiency had improved compared with the 2023 pilot training, and many participants were able to communicate naturally with instructors in Polish.
- For future improvements, it is recommended to introduce level-based class organization and to establish advanced courses, such as “Advanced Excel,” “Practical Web Development,” and “Applied Python.”

At the end of the training evaluation, an online survey was conducted in November 2025, approximately three months after completion of the training, targeting 115 program graduates (with 70 responses received). The purpose of this survey was to assess the status and outcomes of participants’ job-search activities after completing the training. The findings were compiled and positioned as a follow-up assessment for this survey. A summary of the survey results is presented in the table below.

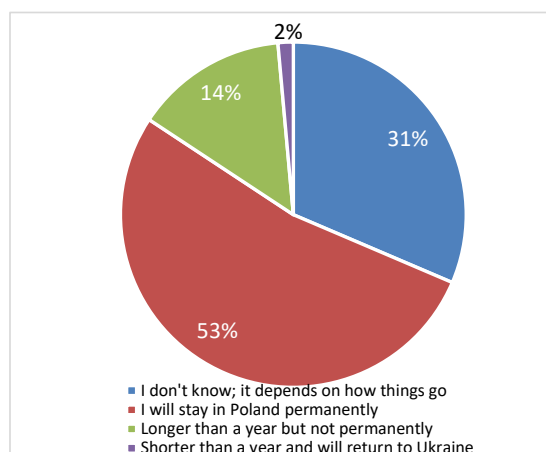
Table-34 Overview of the Follow-up Survey Results

| Item        | Content                                                   | Remarks                                                                                 |
|-------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Period      | From 18/11/2025 to 30/11/2025                             |                                                                                         |
| Method      | Online questionnaire                                      | Same content as the 2023 pilot training                                                 |
| Target      | 115 participants of the IT Business Skills Training       |                                                                                         |
| Respondents | 70 respondents (response rate: approx. 61%)               | 42 respondents from the Warsaw campus and 28 respondents from the Gdańsk campus         |
| Questions   | Attributes (gender, age, training course)                 |                                                                                         |
|             | Planned duration of stay in Poland                        | A majority plan to stay in Poland for an extended period                                |
|             | Main job-search activities after the training             | Many participants are actively engaging in job-search activities using multiple methods |
|             | Types of jobs found and the effectiveness of the training | Digital skills are effective particularly in non-IT jobs                                |
|             | Reasons for difficulty in finding a job                   | Lack of practical work experience in Poland remains a major barrier                     |
|             | Future support needed                                     | Providing opportunities for work experience in Poland is essential                      |

Source: Prepared by the JICA survey team based on the questionnaire survey results

Out of 115 graduates, 70 responded to the survey, resulting in a response rate of approximately 61%. For reference, the response rate for the similar survey conducted after the 2023 pilot training was around 47%, indicating a comparable or a higher level. The basic attributes of the respondents were also generally consistent with the results of the questionnaire conducted at the time of course completion.

First, the results of the question regarding the planned duration of stay in Poland are shown on the right. A large proportion of respondents indicated that they intend to stay in Poland for an extended period, confirming that the participants of this training constitute an appropriate target group for medium- to long-term employment support.

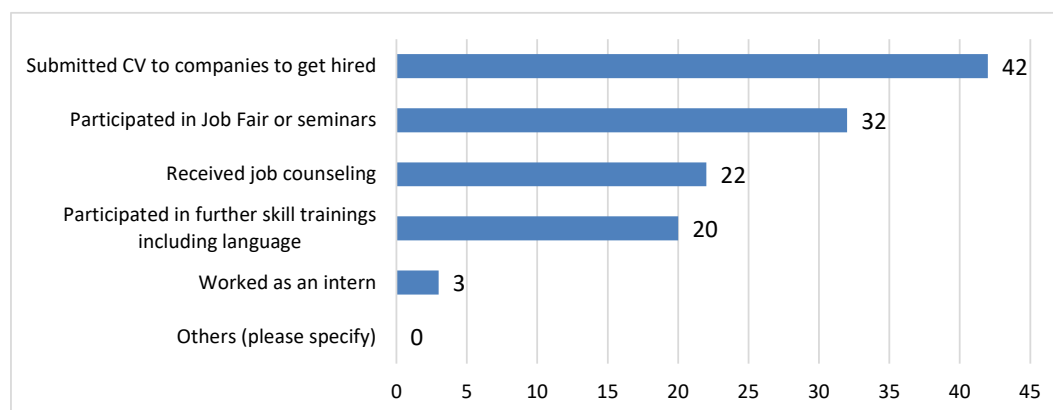


Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-25 How long do you plan to stay in Poland?

Among the 70 respondents, 53 reported that they had engaged in job-search activities after completing the training, accounting for approximately 76%. This is almost the same level as the 2023 pilot training, in which 31 out of 41 respondents (about 76%) indicated that they were actively seeking employment. These results suggest that participants in the current training, similar to those two years ago, are proactively undertaking job-search efforts.

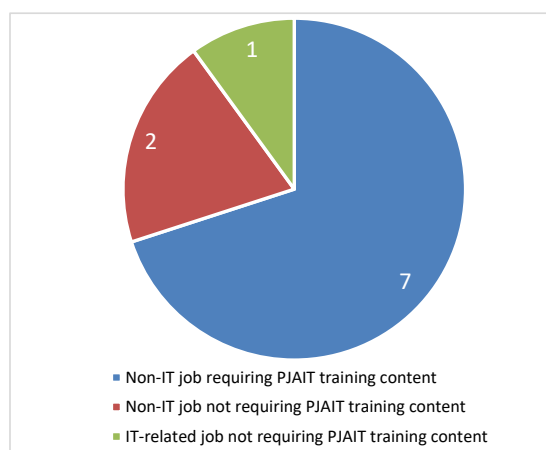
The specific job-search activities (multiple responses) are shown in the figure below. The most common activity was “Submitted CV to companies to get hired” with 42 respondents, followed by “Participated in Job Fair or seminars” (32 respondents), “Received job counseling” (22 respondents), and “Participated in further skill trainings including language” (20 respondents). These trends are similar to those observed in the 2023 pilot training conducted previously, confirming once again that training graduates actively combine multiple methods when engaging in job-search activities.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-26 Have you engaged in any job-search activities after the training?

As a result of these job-search activities, 10 out of the 53 respondents reported that they had been able to find employment. The breakdown of course is as follows: 7 participants in Excel, 1 in WordPress, and 2 in Python. The breakdown of job types is shown in the figure on the right: 7 respondents found non-IT jobs requiring the content learned in this training, 2 respondents found non-IT jobs not requiring the training content, and 1 respondent obtained an IT-related job that did not directly require the training content.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-27 What type of job have you found?  
(Number of response)

These results indicate that the training content—particularly digital skills such as Excel and WordPress—is being effectively utilized in non-IT job roles. The digital skills acquired through the training appear to be valued across a wide range of occupations and have contributed to employment in non-IT positions.

On the other hand, regarding the reasons for difficulty in finding job opportunities, the results shown in the figure indicate that the most common reason was “Lack of working experiences in Poland” (27 respondents), followed by “Lack of language proficiency in English” (25 respondents), “Lack of hard (technical) skills” (16 respondents), and “Lack of language proficiency in Polish” (16 respondents).



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-28 What are the reasons for not finding a job?

These results show that the greatest barrier to employment is not language proficiency alone but rather the lack of practical work experience in Poland. Insufficient English and Polish language skills, as well as limited technical skills, are also present to some extent, indicating that these three factors—language ability, technical proficiency, and work experience—interact and collectively constrain employment opportunities. Therefore, in addition to language training, providing opportunities to gain hands-on experience in real work environments (such as internships) and strengthening practical, job-oriented skills will be essential measures for promoting employment moving forward.

Finally, the types of support that participants felt they would need in the future are shown in the figure below. The most frequently selected item was “Providing job experience in Poland” (42 respondents), followed by “Providing technical skill training (IT/digital)” (42 respondents), “Providing language training in English” (41 respondents), and “Providing language training in Polish” (31 respondents). In addition, there was notable demand for “Providing soft skill training (communication, presentation, etc.)” (28 respondents) and “Providing job counseling” (20 respondents).



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-29 What future support do you need to find a job?

These results suggest that participants place the greatest importance on strengthening language skills and gaining practical work experience. In particular, the need for “opportunities to obtain work experience in Poland” aligns with the reasons cited in the previous question for the difficulty in finding employment, indicating that creating opportunities such as internships and workplace-based training may directly contribute to improving employment outcomes. Demand is also high for technical training and soft skills training, highlighting the importance of continuously developing practical skills to support job retention. Overall, a combination of language support, technical training, and opportunities for practical experience will be essential in designing sustained employment support in the future.

## 4.2 IT Diploma Course

### (1) Overview of Training

This IT Diploma training program is primarily designed for Ukrainians who have taken refuge in Poland following the conflict with Russia, particularly those seeking to build careers in the IT sector. The program aims to equip participants with advanced, market-relevant IT skills. It was implemented through participation in the postgraduate courses offered by PJAiT for Polish university graduates. The program overview is presented below.

Table-35 Overview of the IT Diploma Courses

|                                     |                                                                                                                                                      |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Training objective</b>           | To develop human resources who acquire advanced, highly market-relevant IT skills through this training program.                                     |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Target Courses</b>               | Existing 25 Postgraduate Courses offered by PJAiT (see next table)                                                                                   | <b>Target Participants</b>                   | Ukrainians who meet the following conditions: <ul style="list-style-type: none"> <li>• Have taken refuge in Poland following the conflict</li> <li>• Seek stable, advanced employment in the IT field or related fields</li> </ul>                                                                                                                                                                                                                                                  |
| <b>Training Period</b>              | October 2025 – September 2026 (every other Saturday and Sunday)                                                                                      | <b>Eligibility Requirements</b>              | <ul style="list-style-type: none"> <li>• Bachelor's degree or higher</li> <li>• Polish language proficiency (B2 level or equivalent)</li> <li>• Economic hardship making tuition payment difficult</li> </ul>                                                                                                                                                                                                                                                                       |
| <b>Class Hours / Delivery Style</b> | 160–210 hours / Depending on the course, classes are conducted either fully in-person or in a hybrid format combining in-person and online sessions. | <b>Number of Participants</b>                | 25 participants                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Language</b>                     | Polish                                                                                                                                               | <b>Evaluation Period / Evaluation Method</b> | October 2025 – January 2026 / Evaluation based on questionnaires and interim progress reporting from PJAiT                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Admission Fee and Tuition</b>    | Admission Fee: 1,500 PLN<br>Tuition: 9,500 – 14,000 PLN (covered by JICA)                                                                            | <b>Dropout Prevention Measures</b>           | <ul style="list-style-type: none"> <li>• During the interview stage, the following points are confirmed: <ul style="list-style-type: none"> <li>➢ Understanding of course content and IT level</li> <li>➢ Level of Polish language proficiency</li> <li>➢ Motivation and IT career plan</li> </ul> </li> <li>• During the monitoring period, continuous support will be provided through activities such as organizing business events, to maintain learning motivation.</li> </ul> |

Source: Prepared by the JICA survey team

The above summary is based on the report of the previous survey, specifically Section 4, “Proposals for the Implementation of Training and Projects in Cooperation with PJAiT (Proposal of Medium-to-Long-Term Cooperation Plan)”<sup>53</sup>.

<sup>53</sup> Data collection survey for Ukrainian IT human resource development collaborating with Polish-Japanese academy of information technology: work completion report  
[https://openjicareport.jica.go.jp/007/007\\_946.html](https://openjicareport.jica.go.jp/007/007_946.html)

The program outline was finalized following discussions with PJAiT during the first survey mission in April 2025. Subsequently, based on this outline, detailed training program design, participant recruitment, and selection were carried out.

As a result, 25 participants who completed the formal enrollment procedures began attending courses sequentially from September 2025, according to each course's schedule. Details are provided in Section (2) "Recruitment of Training Participants".

The table below lists the postgraduate courses offered by PJAiT for which recruitment was conducted in the 2025 academic year, along with the corresponding admission and tuition fees. Recruitment and selection of participants were carried out for these 25 courses.

Table-36 List of Courses Offered in FY2025 (English / Polish)

| #  | Course Title (Polish)                                              | Course Title (English)                               |
|----|--------------------------------------------------------------------|------------------------------------------------------|
| 1  | Komiks/Riso/Zin                                                    | Comics / Riso / Zine                                 |
| 2  | Technologie i Zarządzanie w Branży Motoryzacyjnej                  | Automotive Industry Technology & Management          |
| 3  | Film animowany                                                     | Animated Film                                        |
| 4  | Lider AI w Transformacji Cyfrowej                                  | AI Leadership in Digital Transformation              |
| 5  | Cyberbezpieczeństwo w praktyce                                     | Cybersecurity in Practice                            |
| 6  | UX Design                                                          | UX Design                                            |
| 7  | Psychologia gier                                                   | Psychology of Games                                  |
| 8  | Zarządzanie cyberbezpieczeństwem                                   | Cybersecurity Management                             |
| 9  | Marka Osobista w IT                                                | Personal Branding in IT                              |
| 10 | Testowanie bezpieczeństwa systemów IT                              | IT Systems Security Testing                          |
| 11 | Cyberbezpieczeństwo systemów informatycznych i telekomunikacyjnych | Cybersecurity of IT & Telecommunication Systems      |
| 12 | Python — Programowanie Sztucznej Inteligencji                      | Python - AI Programming                              |
| 13 | Big Data - inżynieria dużych zbiorów danych                        | Big Data - Large-scale Data Engineering              |
| 14 | Bioinformatyka                                                     | Bioinformatics                                       |
| 15 | Specjalista TouchDesigner                                          | TouchDesigner Specialist                             |
| 16 | Bazy danych i ich aplikacje (zaoczne)                              | Databases & Applications (Part-time)                 |
| 17 | Neurozarządzanie                                                   | Neuro-management                                     |
| 18 | Content marketing i zarządzanie produkcją multimedialną            | Content Marketing & Multimedia Production Management |
| 19 | media.ai                                                           | media.ai                                             |
| 20 | Komunikacja wizualna                                               | Visual Communication                                 |
| 21 | Kreator kontentu multimedialnego - Grafik 3D                       | Multimedia Content Creator - 3D Graphics             |
| 22 | Grafika artystyczna                                                | Artistic Graphic Design                              |
| 23 | Prawo w IT                                                         | Law in IT                                            |
| 24 | Employer branding w branży IT                                      | Employer Branding in the IT Industry                 |
| 25 | Sztuczna inteligencja w biznesie                                   | Artificial Intelligence in Business                  |

Source: Prepared by the JICA survey team based on the PJAiT website<sup>54</sup>

<sup>54</sup> <https://podyplomowe.pja.edu.pl/studia/podyplomowe/>

Table-37 List of Course Fees for FY2025 (Admission Fee and Tuition Fee)

| Course Title (English)                                       | Entrance (PLN) | Tuition (PLN) | Total (PLN) |
|--------------------------------------------------------------|----------------|---------------|-------------|
| AI Leader in Digital Transformation                          | 1,500          | 14,000        | 15,500      |
| Technology and Management in the Automotive Industry         | 1,500          | 10,500        | 12,000      |
| Animated film                                                | 1,500          | 10,500        | 12,000      |
| Comics/Riso/Zin                                              | 1,500          | 10,500        | 12,000      |
| UX Design                                                    | 1,500          | 14,000        | 15,500      |
| Cyber Security for Leaders in IT                             | 1,500          | 11,000        | 12,500      |
| Touch Designer Specialist                                    | 1,500          | 11,000        | 12,500      |
| Psychology of games                                          | 1,500          | 9,500         | 11,000      |
| Cyber security management                                    | 1,500          | 10,000        | 11,500      |
| Personal Branding in IT                                      | 1,500          | 9,800         | 11,300      |
| Cyber security of information and telecommunications systems | 1,500          | 11,000        | 12,500      |
| Security testing of IT systems                               | 1,500          | 9,500         | 11,000      |
| Python - Artificial Intelligence Programming                 | 1,500          | 10,500        | 12,000      |
| Big Data - engineering of large data sets                    | 1,500          | 11,000        | 12,500      |
| Bioinformatics                                               | 1,500          | 10,500        | 12,000      |
| Databases and their applications - part-time studies         | 1,500          | 9,500         | 11,000      |
| Content marketing and multimedia production management       | 1,500          | 9,500         | 11,000      |
| Neuro-management                                             | 1,500          | 9,500         | 11,000      |
| media.ai                                                     | 1,500          | 10,500        | 12,000      |
| Visual communication                                         | 1,500          | 10,500        | 12,000      |
| Multimedia content creator- 3d graphic designer              | 1,500          | 10,500        | 12,000      |
| Artistic graphic design                                      | 1,500          | 9,500         | 11,000      |
| Law in IT                                                    | 1,500          | 13,500        | 15,000      |
| Employer branding in the IT industry                         | 1,500          | 9,500         | 11,000      |
| Artificial intelligence in business                          | 1,500          | 9,500         | 11,000      |

Source: Prepared by the JICA survey team based on the PJAiT website<sup>55</sup>

The 25 courses listed above can be broadly classified into the following three technical categories. Participants select courses based on their specialization, level of expertise, and future career plans.

- IT Technical (e.g., Python – AI Programming, Big Data – Engineering of Large Data Sets)
- IT Media (e.g., Artistic Graphic Design, Multimedia Content Creator – 3D Graphic Designer)
- IT Management (e.g., AI Leader in Digital Transformation, Artificial Intelligence in Business)

In the IT Technical track, the targeted professional roles are IT engineers requiring practical skills such as programming, databases, and cybersecurity. In the IT Media track, the targeted roles are IT creators, where design and artistic skills (e.g., graphics and visual works) are emphasized. In the IT Management track, the targeted roles are managers and project leaders who utilize IT—including advanced technologies such as DX and AI—for business strategy and organizational decision-making. Thus, the 25 courses offered under this IT Diploma Training Program are broadly categorized into these three specialized areas, corresponding to different professional career pathways.

<sup>55</sup> <https://podyplomowe.pja.edu.pl/studia/podyplomowe/>

As an example of a course under the IT Technical category, the overview of “Python – Artificial Intelligence Programming”<sup>56</sup> shown on the PJAiT website is presented below. This course consists of multiple subjects totaling 210 hours over two semesters. The curriculum begins with the fundamentals of Linux and Python. After acquiring proficiency in commonly used Python libraries for data science, participants proceed to machine learning and deep learning applications. Finally, the course culminates in undertaking research projects in the field of AI.

Table-38 Overview of the “Python – Artificial Intelligence Programming” Course

| Semester                              | Subject                                         | Lecture Time | Exercise Time | Total |
|---------------------------------------|-------------------------------------------------|--------------|---------------|-------|
| 1st Semester<br>(October to February) | Linux fundamentals                              | 10           | 10            | 20    |
|                                       | Python fundamentals                             | 25           |               | 25    |
|                                       | Numerical computing with NumPy                  | 5            | 15            | 20    |
|                                       | Machine Learning fundamentals with Pandas       | 5            | 15            | 20    |
|                                       | Database fundamentals and SQL                   | 5            | 15            | 20    |
| 2nd Semester<br>(March to September)  | Introduction to Machine Learning (Scikit-learn) | 10           | 15            | 25    |
|                                       | Introduction to Deep Learning (Keras)           | 5            | 15            | 20    |
|                                       | Advanced Machine Learning with Scikit-learn     | 5            | 15            | 20    |
|                                       | Advanced Deep Learning with Keras               | 5            | 15            | 20    |
|                                       | Final Project Work                              | 0            | 20            | 20    |
|                                       | Total                                           | 75           | 135           | 210   |

Source: Prepared by the JICA survey team based on PJAiT materials

Table-39 Overview of the “Python – Artificial Intelligence Programming” Course

Postgraduate Studies – **Python - Artificial Intelligence Programming**  
Part-time studies  
using distance learning methods and techniques  
Academic year 2024/2025

| Subject name                                           | Prem<br>symbol. | Number of hours |          | Form of<br>assessment/<br>ECTS credit |
|--------------------------------------------------------|-----------------|-----------------|----------|---------------------------------------|
|                                                        |                 | Wyk.            | Exercise |                                       |
|                                                        |                 | Internet        |          |                                       |
| First semester                                         |                 |                 |          |                                       |
| Linux operating system basics                          | PSOL            | 10              | 10       | Z/2                                   |
| Fundamentals of programming in Python language         | CSPP            | 25              |          | Z/4                                   |
| Numerical computing in Python - the NumPy library      | ONNP            | 5               | 15       | Z/3                                   |
| Fundamentals of Machine Learning - Pandas library      | CSPAN           | 5               | 15       | Z/3                                   |
| Basics of database construction and SQL query language | CSPBO           | 5               | 15       | Z/3                                   |
|                                                        | together        | 50              | 55       | 15                                    |
| Second semester                                        |                 |                 |          |                                       |
| Introduction to machine learning Scikit- learn package | WUMSL           | 10              | 15       | Z/4                                   |
| Introduction to deep learning - Keras package          | WUGK            | 5               | 15       | Z/2                                   |
| Advanced machine learning - Scikit- learn              | ZUMSL           | 5               | 15       | Z/2                                   |
| Advanced learning deep - Keras package                 | ZUGK            | 5               | 15       | Z/3                                   |
| Final design                                           | PSIPK           | 0               | 20       | Z/4                                   |
|                                                        | together        | 25              | 80       | 30                                    |

For course credit, the student performs a set of practical tasks from all modules, which he performs during and between classes.

Source: Prepared by the JICA survey team based on PJAiT materials

<sup>56</sup> <https://podyplomowe.pja.edu.pl/studia/podyplomowe/python-programowanie-sztucznej-inteligencji/>

Applicants selected and applied for their preferred course after reviewing the detailed course information published on the PJAIT website. Selection was conducted by assessing each applicant's abilities and suitability based on their application, through language proficiency screening, document review, and interviews.

## (2) Recruitment of Training Participants

Based on the above outline, a detailed implementation plan was developed. During the second survey mission in June 2025, a second round of consultations was held with PJAIT. As a result, PJAIT agreed to proceed with participant recruitment and selection for this training program in accordance with the procedures and steps shown in the table below.

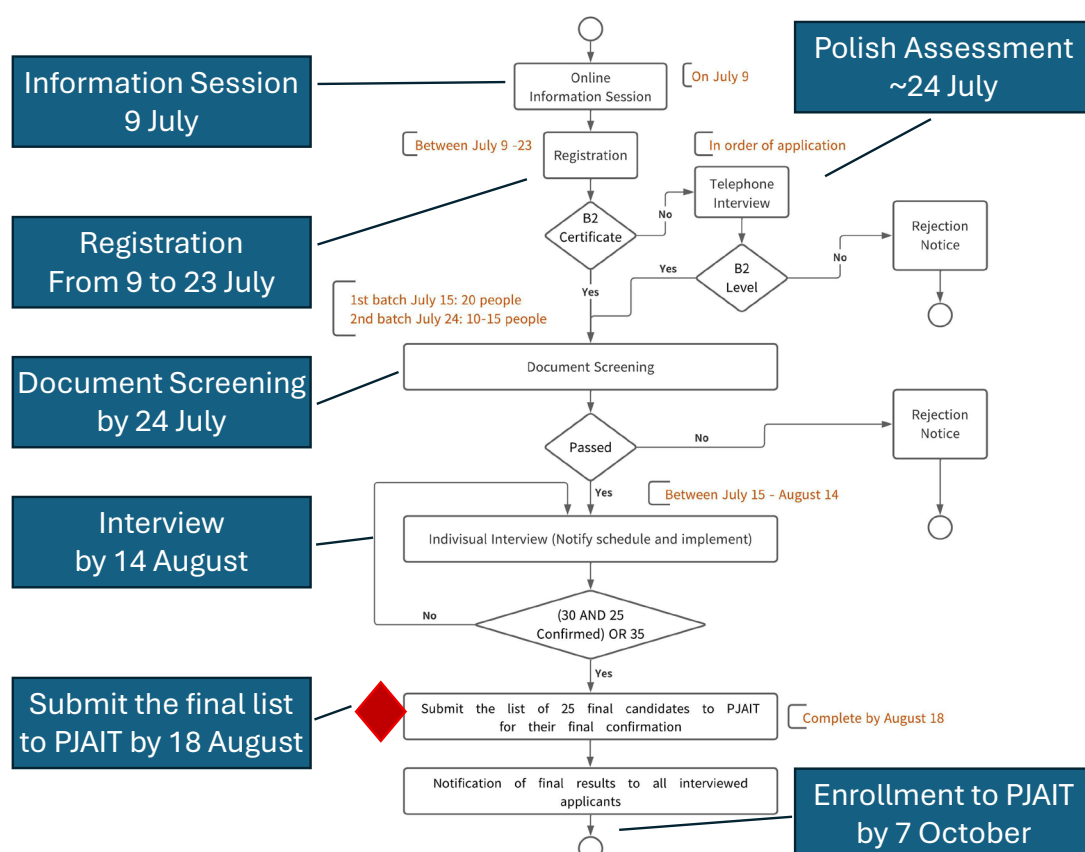
Table-40 Process of Participant Recruitment and Selection

| Schedule                                            | Main Tasks                                                                                                                                                                                                                                                                            | Responsible Party                                   |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| April 2025                                          | Formulation of IT Diploma Course Outline                                                                                                                                                                                                                                              | PJAIT, JICA survey team                             |
| May-June 2025                                       | Preparatory Work for Recruitment and Selection <ul style="list-style-type: none"> <li>Recruitment Brochure Creation</li> <li>Creation of Online Application Form</li> <li>Development of Selection Methods</li> <li>Preparation for recruitment information sessions, etc.</li> </ul> | JICA survey team                                    |
| June 27, 2025                                       | Recruitment Briefing Session at Job Fair                                                                                                                                                                                                                                              | JICA survey team                                    |
| July 9, 2025                                        | Online Recruitment Briefing Session                                                                                                                                                                                                                                                   | PJAIT, JICA survey team                             |
| July 9-23, 2025                                     | Recruitment (Online Application)                                                                                                                                                                                                                                                      | JICA survey team                                    |
| July 9-24, 2025                                     | Polish Language Screening, Document Screening                                                                                                                                                                                                                                         | JICA survey team, supported by experts in the field |
| July 24 - August 14, 2025                           | Interview                                                                                                                                                                                                                                                                             | JICA survey team, supported by experts in the field |
| August 18, 2025                                     | Report to PJAIT after selecting 25 candidates                                                                                                                                                                                                                                         | JICA survey team                                    |
| August 18 - October 7, 2025                         | Official registration via the PJAIT Enrollment Portal, Verification of graduation certificates and other required documents, individual contracts, course confirmation, and enrollment procedures                                                                                     | PJAIT                                               |
| Until the start of each course                      | Distribution of Onboarding Documents to trainees                                                                                                                                                                                                                                      | PJAIT                                               |
| Courses commence sequentially starting October 2025 | Necessary support for trainees                                                                                                                                                                                                                                                        | PJAIT, JICA survey team                             |
| January 2026                                        | Online Japanese IT Company Information Session                                                                                                                                                                                                                                        | JICA survey team                                    |
| January 2026                                        | Follow-up Survey and (Interim) Evaluation                                                                                                                                                                                                                                             | JICA survey team                                    |

Source: Prepared by the JICA survey team

Furthermore, based on this schedule, an overall flowchart was developed, and milestones were set for each process. The overall implementation flow shown in the figure below was finalized, and activities proceeded accordingly. Considering the enrollment period required at PJAIT and given that the 2025 Postgraduate Courses were scheduled to begin in September 2025, the JICA survey

team set a target of completing participant selection by August 18, 2025, and submitting a list of 25 candidates to PJAiT. As planned, the mission submitted the list of 25 candidates to PJAiT. Thereafter, PJAiT completed the formal registration procedures, verified documents such as graduation certificates, finalized individual contracts, and processed enrollment. The courses then commenced sequentially according to each annual schedule beginning in September 2025. As a result, the 25 selected participants are currently enrolled in their respective IT Diploma courses, aligned with their individual career plans.



Source: Prepared by the JICA survey team

Figure-30 Overall Workflow of Recruitment and Selection Process

The following section describes the progress of each step in the overall flow in chronological order. The final implementation results are presented in the table below.

Table-41 Results of Recruitment and Selection

| Process                                                               | Result                              | Number | Remarks                                                                              |
|-----------------------------------------------------------------------|-------------------------------------|--------|--------------------------------------------------------------------------------------|
| 1. Recruitment                                                        | Applications (including duplicates) | 118    | Multiple submissions from the same individuals were observed.                        |
|                                                                       | Applicants (duplicates removed)     | 110    | Pure applicants count after removing duplicates.                                     |
| 2. Polish Language Screening (for 110 applicants)                     | Passed                              | 72     | Holders of official certificates: 12<br>Passed interview: 60                         |
|                                                                       | Not passed                          | 38     |                                                                                      |
| 3. Document Screening (for 72 applicants who passed Polish screening) | Passed                              | 35     | Applicants were ranked based on scoring from application documents; top 35 selected. |
|                                                                       | Not passed                          | 37     |                                                                                      |
| 4. Interview (for 35 applicants who passed document screening)        | Passed                              | 25     | Applicants were ranked based on scoring; top 25 selected.                            |
|                                                                       | Not passed                          | 10     |                                                                                      |

Source: Prepared by the JICA survey team

For the “1. Recruitment” phase, a Polish-language brochure was prepared for distribution during briefings and consultation meetings. This brochure outlined the IT Diploma Courses and explained the online application procedure using QR codes, as shown in the figure below.

**BEZPŁATNE STUDIA PODYPLOMOWE W DZIEDZINIE IT DLA OSÓB Z UKRAINY W WARSZAWIE**

**DO WYBORU 25 KIERUNKÓW**

**Cyber Security**  
**UX Design** **Big Data**  
**Python media.ai**  
**Bioinformatics**  
**i wiele innych!**

Projekt organizowany przez:  
Japońską Agencję Współpracy Międzynarodowej (JICA)  
Polsko-Japońską Akademię Techniki Komputerowych  
ul. Koszykowa 86, 02-008 Warszawa

**ZWOLNIENIE Z OPŁAT ZA CZESNE**  
⇒ Agencja JICA pokrywa koszty studiów,  
dlatego nie jest wymagana żadna opłata za naukę.

**Wymagania aplikacyjne:**

1. Obywatelstwo Ukrainy, przebywający w Polsce z powodu konfliktu zbrojnego
2. Osoby poszukujące stałego zatrudnienia w branży IT
3. Dyplom ukończenia studiów co najmniej na poziomie licencjackim
4. Znajomość języka polskiego na poziomie B2 lub wyższym

**Czas trwania:** październik 2025~wrzesień 2026 (co 2. weekend)

\*Szczegółowe informacje o 25 kierunkach oraz pełne wymagania znajdywać można w ulotce dostępnej po zeskanowaniu kodu QR

Spotkanie informacyjne: 23 czerwca 2025 r.

**Złap szansę na rozwój kariery!**

**Studia podyplomowe**  
Dla osób z Ukrainy w Warszawie

**Lista kursów**

- Lider AI w Transformacji Cyfrowej
- Technologie i Zarządzanie w Branży Motoryzacyjnej
- Film animowany
- Komiks/Risa/Zin
- UX Design
- Cyberbezpieczeństwo dla Liderów w IT
- Specjalista TouchDesigner
- Psychologia gier
- Zarządzanie cyberbezpieczeństwem
- Marka Osobista IT
- Cyberbezpieczeństwo systemów informatycznych i telekomunikacyjnych
- Testowanie bezpieczeństwa systemów IT
- Python - Programowanie Sztucznej Inteligencji
- Big Data - inżynieria dużych zbiorów danych
- Bioinformatyka
- Bazy danych i ich aplikacje - studia zaoczne
- Content marketing i zarządzanie produkcją multimedialną
- Kreator kontentu multimedialnego- Grafiki 3D
- Neurozarządzanie
- Media ai
- Komunikacja wizualna
- Grafika artystyczna
- Prawo w IT
- Employer branding w branży IT
- Sztuczna inteligencja w biznesie

**Stypendium zapewnia:**  
JICA (Japońska Agencja Współpracy Międzynarodowej)

25 kierunków studiów podyplomowych oferowanych przez PJATK to standardowo płatne studia dostępne szeroko dla ogółu. W ramach projektu JICA, osoby które przysię pomysłnie proces rekrutacji, otrzymają od JICA stypendium pokrywające pełne koszty czesnego. Dzięki temu będą mogły w pełni wziąć udział w kursie bezpłatnie.

**Proces rekrutacji**

1. Spotkanie informacyjne
2. Zgłoszenie aplikacyjne
3. Ocena dokumentów
4. Rozmowa kwalifikacyjna

**Wymagania aplikacyjne:**

1. Obywatelstwo Ukrainy, przebywający w Polsce z powodu konfliktu zbrojnego
2. Osoby poszukujące stałego zatrudnienia w branży IT
3. Dyplom ukończenia studiów co najmniej na poziomie licencjackim
4. Znajomość języka polskiego na poziomie B2 lub wyższym

**Adres kontaktowy:**  
jica.project@esaga.pl

Zgłoszenia na spotkanie organizacyjne

Source: Prepared by the JICA survey team

Figure-31 IT Diploma Course Recruitment Brochure

Next, as the initial activity for recruitment and selection, the JICA survey team promoted the IT Diploma Courses at a job fair hosted by the Tent Partnership for Refugees (hereinafter “TENT”) on June 27, 2025, at The Westin Warsaw Hotel in Warsaw. An information and consultation booth

was set up to introduce the training content to prospective participants. The overview of the job fair and consultation session is presented in the table below.

Table-42 Overview of the TENT Job Fair and IT Diploma Course Information Session

| Item                                        | Remarks                                                                                                                                                                      |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Event Organizer                             | Tent Partnership for Refugees                                                                                                                                                |
| Date and Time                               | Monday, June 23, 2025, 10:00 AM - 6:00 PM                                                                                                                                    |
| Venue                                       | The Westin Warsaw Hotel (Warsaw)                                                                                                                                             |
| Number of Participants                      | Approximately 300–400                                                                                                                                                        |
| Number of Participating Companies           | IKEA, L'Oréal, Marriott, and 13 other companies                                                                                                                              |
| Purpose of JICA survey team's Participation | Promotion of the IT Diploma Course and recruitment of participants for the information session                                                                               |
| Achievements of the JICA survey team        | Approximately 70 participants visited the JICA survey team's booth.<br>Of these, 35 individuals expressed interest in attending the online information session held in July. |

Source: Prepared by the JICA survey team

As shown in the table above, approximately 70 individuals visited the consultation booth. Of these, 35 expressed interests in participating in the online briefing session scheduled for July, as described later. Photos of the job fair on the day are shown below.



Job Fair Venue



Consultation Booth Scene

Source: Prepared by the JICA survey team

Figure-32 Information Session at the TENT Job Fair

Subsequently, on July 9, 2025, PJAIT held an online recruitment briefing session for the IT Diploma Course, aimed at providing recruitment guidance, explanations, and consultations. Advance registration was required, and the session was conducted via Microsoft Teams operated by PJAIT. Recruitment was promoted by distributing the recruitment pamphlets to NGOs and international organizations that had been collaborating with the JICA survey team since the 2023 baseline survey.

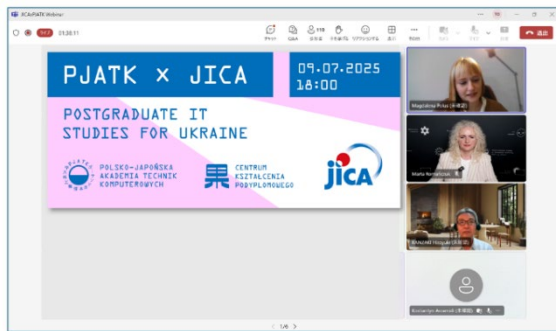
As a result, a total of 152 registrations were received, with approximately 120 participants attending the online session. The session content is outlined below. During the final Q&A session, individual participant questions were addressed via Polish-language chat, with inquiries primarily concerning the program content, application process, and selection criteria.

Table-43 Contents of the Online Information Session

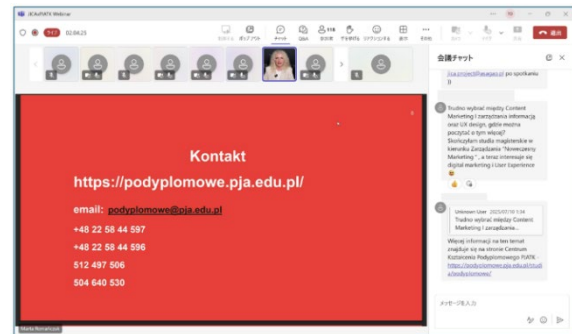
| Time        | Program                                              | Presenter                   |
|-------------|------------------------------------------------------|-----------------------------|
| 18:00–18:05 | Opening Remarks (Interpreted from English to Polish) | JICA survey team            |
| 18:05–18:15 | Overview of JICA Support for This Training (Polish)  | JICA survey team            |
| 18:15–19:00 | Introduction to the Postgraduate Program (Polish)    | PJAiT                       |
| 19:00–19:30 | Q&A (primarily in Polish)                            | PJAiT, The JICA survey team |

Source: Prepared by the JICA survey team

The scene of the briefing is shown in the photos below.



Introduction of the Postgraduate Program

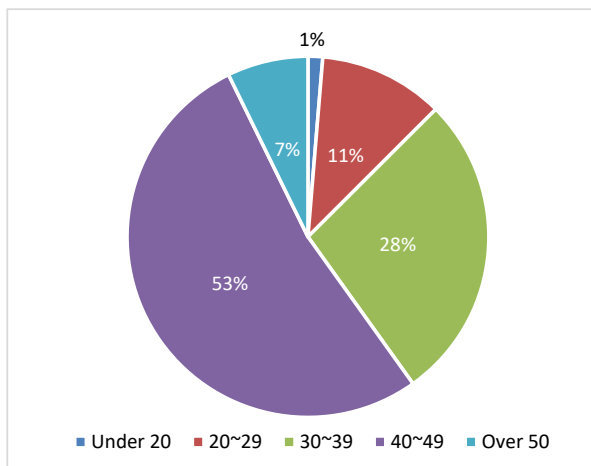


Q&amp;A via chat (in Polish)

Source: Prepared by the JICA survey team

Figure-33 Online Information Session

Analysis of the applicant profiles for the online briefing session revealed the following: women accounted for 87.5% (133 out of 152 applicants), and the largest age group was those in their 40s, comprising 53% of the total. The pie chart shows the age distribution, and the table below presents the aggregated figures by age and gender.



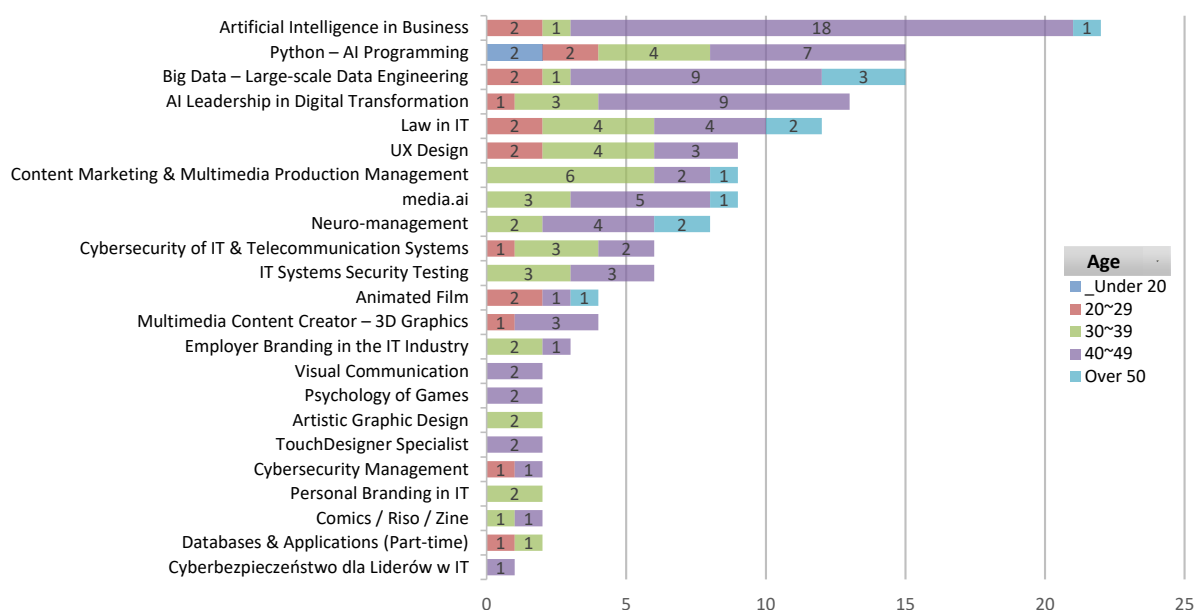
| Age group | Male | Female | No answer | Total |
|-----------|------|--------|-----------|-------|
| Under 20  |      | 2      |           | 2     |
| 20~29     | 4    | 13     |           | 17    |
| 30~39     | 4    | 37     | 1         | 42    |
| 40~49     | 8    | 72     |           | 80    |
| Over 50   | 2    | 9      |           | 11    |
| Total     | 18   | 133    | 1         | 152   |

Source: Prepared by the JICA survey team based on registration information

Figure-34 Profile of Applicants for Online Information Session (Gendr and Age Group)

Furthermore, when asked about their preferred postgraduate courses, the chart below (showing the number of applicants per course and their age distribution) indicates that AI-related courses were

consistently popular across all age groups.



Source: Prepared by the JICA survey team based on registration information

Figure-35 Preferred Courses of Online Information Session Applicants

Immediately after the online information session concluded, the application period began. Applications were submitted via a Google Forms questionnaire prepared by PJAIT. Applicants were required to enter or upload the information listed in the table below to collect the data necessary for the document screening process.

Table-44 Information Collected through the Application Form

| #  | Item                                                         | Remarks                                                                                                                                                                                                                            |
|----|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Name                                                         | Basic Information                                                                                                                                                                                                                  |
| 2  | Gender                                                       | Basic Information                                                                                                                                                                                                                  |
| 3  | Date of Birth                                                | Basic Information                                                                                                                                                                                                                  |
| 4  | Contact Information<br>(Email and Mobile Phone Number)       | For communication with applicants                                                                                                                                                                                                  |
| 5  | Nationality                                                  | To verify dual nationals, individuals who have changed to Polish nationality, etc.                                                                                                                                                 |
| 6  | Income                                                       | 2024 Net Annual Income (PLN)                                                                                                                                                                                                       |
| 7  | Government Support from Poland                               | Total Amount Received in 2024 (PLN)                                                                                                                                                                                                |
| 8  | Reasons for Applying and Future Career Plans                 | Up to 2,000 characters                                                                                                                                                                                                             |
| 9  | Polish Language Proficiency Certificate<br>(Upload PDF file) | Official certificates only (Certificates of completion issued by private language schools are not accepted)                                                                                                                        |
| 10 | Current Status<br>(Select one)                               | University student, Postgraduate student, Employed (full-time), Employed (part-time), Self-employed / Freelancer (B2B), Not currently employed (seeking a job), Not currently employed (not seeking a job), Other (please specify) |
| 11 | Job Search Status<br>(Select one)                            | Yes, I am looking for a job, including changing jobs as an option, No, I am NOT looking for a job                                                                                                                                  |
| 12 | Desired Postgraduate Course<br>(Select one)                  | Select from a list of 25 courses                                                                                                                                                                                                   |

Source: Prepared by the JICA survey team

Applications were accepted online from July 9 to 23 through the application form. As a result, a total of 110 applications were received, as shown in the table below. Immediately after the application deadline, the “2. Polish Language Screening” and “3. Document Screening” processes commenced.

Table-45 Number of Applicants for the Online Application Form

| Item                   | Applicants | Remarks                                                                                                                                                                   |
|------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of Applications | 118        | Number of applications received via the online application form. However, there were several instances where the same person applied multiple times for multiple courses. |
| Number of Applicants   | 110        | Final number of applicants after contacting those who submitted multiple applications, limiting each person to one course, and removing duplicate applications.           |

Source: Prepared by the JICA survey team based on registration information

The tasks for “2. Polish Language Screening” and “3. Document Screening” were carried out through a phased selection process, as outlined below.

➤ Polish Language Proficiency Assessment

A telephone interview was conducted by a Polish language lecturer. Successful candidates proceeded to the document screening stage.

➤ Document Screening

A scoring method was established for evaluating applicants. Successful candidates advanced to the interview stage.

The Polish language proficiency assessment was conducted to verify whether applicants possessed communication skills equivalent to the required B2 level of the Polish Language Proficiency Test<sup>57</sup>. B2 corresponds to one of the proficiency levels defined under the Common European Framework of Reference for Languages (CEFR)<sup>58</sup>, which consists of six levels: A1, A2, B1, B2, C1, and C2. The B2 level is positioned as the level at which individuals can comprehend the main ideas of discussions, including topics related to academic and specialized fields, as well as technical or abstract subjects.

First, through the online application form, applicants were requested to submit an official certificate of the above-mentioned Polish Language Proficiency Test demonstrating a level of B2 or higher. The JICA survey team verified the authenticity and level of the submitted certificates, and applicants were considered to have passed the language screening if the certificate was confirmed to meet the required criteria.

<sup>57</sup> Państwowa Komisja do spraw Poświadczania Znajomości Języka Polskiego jako Obcego

<https://certyfikatpolski.pl/>

<sup>58</sup> <https://www.britishcouncil.jp/programmes/english-education/updates/4skills/about/cefr>

On the other hand, for applicants who did not possess such certificates, a supplementary telephone interview was conducted by a Polish language lecturer. In this interview, the applicants' conversational ability, professional communication skills, and language comprehension in practical situations were comprehensively evaluated. As a result, applicants who were assessed as meeting the B2 level or above were advanced to the next stage, the document screening process.

The results of the Polish language proficiency assessment are shown in the table below. Of the 110 applicants, 72 passed the screening (12 applicants with official certificates and 60 who passed the telephone interview) and proceeded to the next stage, the document screening process.

Table-46 Results of Polish Language Proficiency Assessment

| Item                                                | Applicants | Remarks                                                         |
|-----------------------------------------------------|------------|-----------------------------------------------------------------|
| Number of Applicants                                | 110        | Final number of applicants after removing duplicate submissions |
| Successful Applicants (with official certification) | 12         | Passed screening with official language certificate             |
| Successful applicants (passed interview)            | 60         | Passed screening through phone interview                        |
| Applicants who failed document screening            | 38         | Failure notification sent                                       |

Source: Prepared by the JICA survey team

For the document screening process, the JICA survey team examined and established a scoring method in advance to ensure fairness and transparency. The evaluation items included suitability, work experience, motivation, income, and age. Point allocations were set based on factors such as the relevance between previous work experience and career plans, alignment with the intended field, and learning motivation. This enabled all applicants to be evaluated according to consistent criteria. The specific scoring framework is shown in the table below. Details of the document screening process are attached to this report as Appendix 1.

Table-47 Scoring Method for Document Screening

| Item                                  | Calculation Method                                                                                                                                                                                                                                                                                                                         | Weight (Ratio) |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Motivation for Applying / Career Plan | <ul style="list-style-type: none"> <li>Quantification of enthusiasm and purpose assessed during document screening (Scores normalized and min-max scaled)</li> <li>Calculate the average of three evaluators from the JICA survey team</li> <li>Confirming the evaluation baseline using a mock motivation statement beforehand</li> </ul> | 0.6            |
| Date of Birth                         | Younger applicants are given preference, considering adaptability to cutting-edge technology (Normalized scores using Min-Max scaling)                                                                                                                                                                                                     | 0.2            |
| Income                                | <ul style="list-style-type: none"> <li>Preferential treatment given to those with lower incomes, considering the need for financial support (Normalize scores and apply inverse Max-Min scaling)</li> <li>Total of 2024 net annual income and government support amount</li> </ul>                                                         | 0.2            |
| Polish language proficiency           | <ul style="list-style-type: none"> <li>Prioritize applicants with language proficiency higher than B2 (Normalized scores with Min-Max scaling)</li> <li>Not included in score calculation (already pre-screened) (weight 0)</li> </ul>                                                                                                     | 0              |
| Nationality                           | Not included in score calculation as only Ukrainian nationals were pre-selected (weight 0)                                                                                                                                                                                                                                                 | 0              |

Source: Prepared by the JICA survey team

The results of the document screening are shown in the table below. Based on the scoring method described above, applicants were ranked according to their total scores. As a result, 35 applicants out of the 72 who passed the Polish language screening were selected as successful candidates and advanced to the next stage, the interview process.

Table-48 Results of Document Screening

| Item                                              | Applicants | Remarks                                                                         |
|---------------------------------------------------|------------|---------------------------------------------------------------------------------|
| Polish language screening passers                 | 72         | Scores calculated from submitted documents and ranked                           |
| Document screening passers                        | 35         | The top 35 candidates were selected as qualified, and interviews were conducted |
| Applicants not selected in the document screening | 37         | Failure notification sent                                                       |

Source: Prepared by the JICA survey team

4. For the “4. Interview” process, given the essential need for specialized expertise in personnel evaluation, we conducted 20-minute online interviews per candidate with support from external specialists. The interview method and content are outlined below.

- Purpose: To evaluate the likelihood of successful completion of the Postgraduate Course and career suitability for this training program
- Language: Polish (a summary of the interview results was prepared in English)
- Duration: Approximately 20 minutes

The interviewer posed one open-ended question for each evaluation item, followed by additional questions as needed, documented the results, and scored each interview using the following five-point scale: Weak (1 point), Average (2 points), Good (3 points), Strong (4 points), Excellent (5 points). Based on this scoring, all applicants were ranked.

Table-49 Evaluation Criteria and Methods Used in the Interview

| Evaluation Item                        | Evaluation Method                                                                                                                      |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 1. Career Fit                          | Evaluate how well the selected postgraduate program aligns with the candidate's short-term and long-term career plans.                 |
| 2. Motivation and Commitment           | Evaluate the candidate's drive, enthusiasm, and potential for sustained engagement throughout the entire program.                      |
| 3. Self-directed Learning Ability      | Measure the candidate's independent learning ability, time management skills, and proactive approach to acquiring knowledge.           |
| 4. Feasibility and Practical Readiness | Confirm whether the candidate has realistically considered balancing studies with existing personal and professional responsibilities. |

Source: Prepared by the JICA survey team

Table-50 Results of Interviews

| Results             | Total Score  | Applicants | Assessment                  |
|---------------------|--------------|------------|-----------------------------|
| Excellent Candidate | 20           | 19         | All passed                  |
| Good Candidate      | 17~19        | 15         | Top 6 passed, others failed |
| Average Candidate   | Less than 17 | 5          | Failed                      |
| Cancelled           | N/A          | 1          | Failed                      |
| Total               |              | 35         |                             |

Source: Prepared by the JICA survey team

Based on the interview results scored above, applicants were ranked accordingly. As a result, the top 25 applicants were selected as the final candidates for this training program, and the list of selected candidates was formally submitted to PJAIT on August 18, 2025.

Following the submission, PJAIT conducted the final verification of admission eligibility and application details for the 25 selected candidates and subsequently completed the formal enrollment procedures. As a result, the respective Postgraduate Courses to which the participants were assigned began sequentially from September 2025, as shown in the table below, and each participant has commenced the required coursework.

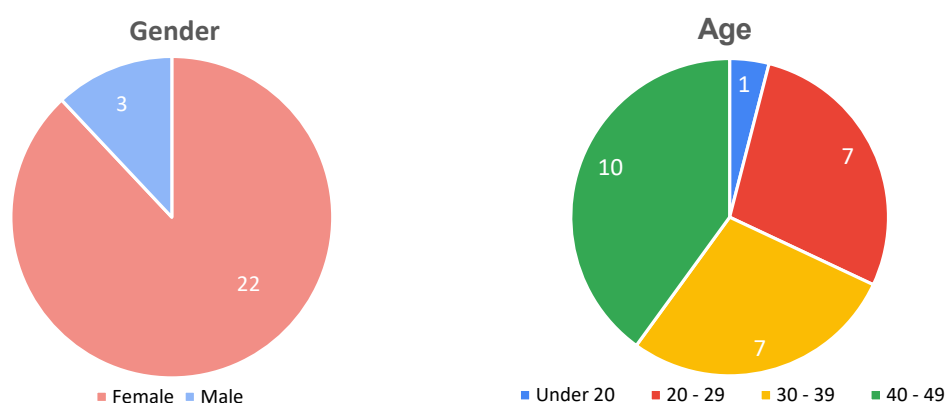
Table-51 List of Participants by Course

| # | Course                                    | Participants | Start Date | Completion Date |
|---|-------------------------------------------|--------------|------------|-----------------|
| 1 | AI leader in digital transformation       | 9            | 2025/10/25 | 2026/06/14      |
| 2 | UX Design                                 | 7            | 2025/10/25 | 2026/06/13      |
| 3 | Python- AI programming                    | 2            | 2025/09/30 | 2026/06/30      |
| 4 | Visual communication                      | 2            | 2025/10/04 | 2026/06/28      |
| 5 | Law in IT                                 | 2            | 2025/11/15 | 2026/06/07      |
| 6 | Big Data - engineering of large data sets | 1            | 2025/09/27 | 2026/09/13      |
| 7 | Databases and their applications          | 1            | 2025/09/27 | 2026/09/13      |
| 8 | Animated film                             | 1            | 2025/11/08 | 2026/06/14      |

Source: Prepared by the JICA survey team based on PJAIT materials

### (3) Profile of Training Participants

The profiles of the 25 training participants are shown in the figure below. Overall, similar trends were observed as in the IT Business Skills Training. For example, the majority of participants were women (88%, 22 participants), and the largest age group was those in their 40s (40%, 10 participants).



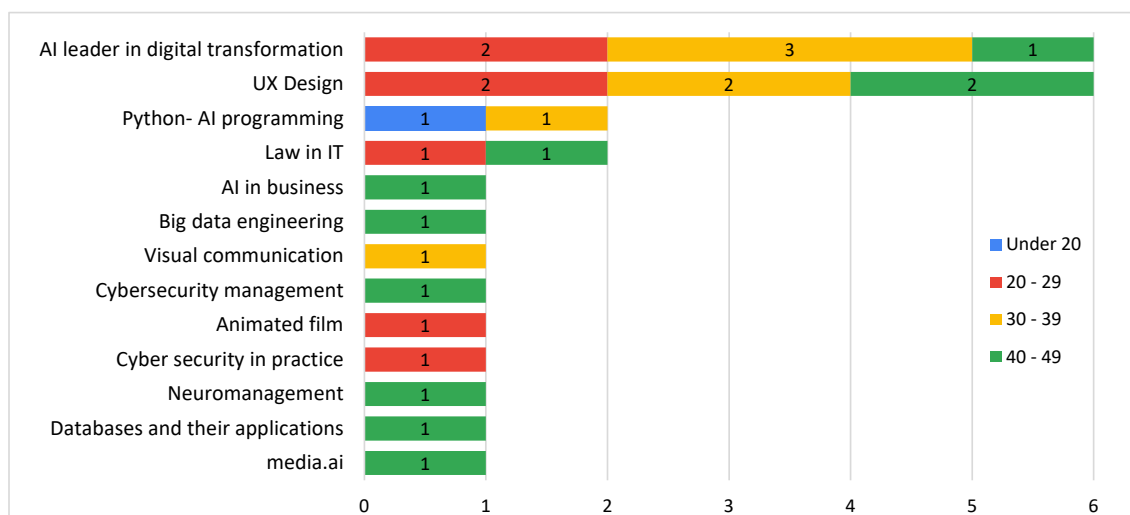
Source: Prepared by the JICA survey team based on registration information

Figure-36 Distribution of Participants by Gender and Age Group

Educational backgrounds include holders of an Engineering degree (8%), Bachelor's degree (24%), and Master's degree (68%), indicating a high proportion of highly educated participants. Regarding employment and job-seeking status, 44% of participants are employed full-time, 12% are employed part-time or as freelancers, while 32% are unemployed. 12% are categorized as others. However, 84% of participants are actively seeking employment

The breakdown of the preferred courses of the 25 training participants is shown in the figure below. The courses with the highest number of first-choice preferences were “AI Leader in Digital Transformation” and “UX Design,” with six participants each (although the actual number became nine and seven respectively due to course reassignment). It should be noted that these figures represent only the participants’ first choices. During the actual PJAIT enrollment procedures, there were cases where courses could not be attended due to exceeding capacity limits or cases where courses were not opened because the number of applicants did not meet the required minimum. In such cases, participants were reassigned to their second-choice course so that all participants could be placed on an appropriate course.

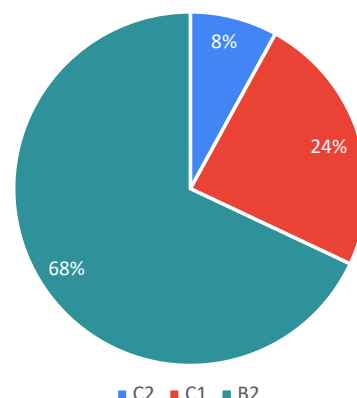
As a result, the final allocation differs slightly from the preference breakdown shown below. Specifically, the four applicants who initially applied for “Cybersecurity Management,” “Cybersecurity in Practice,” “media.ai,” “Neuro-management”, and “AI in business” were reassigned to “AI Leader in Digital Transformation” and “UX Design.”



Source: Prepared by the JICA survey team based on registration information

Figure-37 List of Preferred Courses and Number of Participants

The participants' Polish communication proficiency levels are shown in the table and figure below. While B2 or higher was set as the selection requirement for this training, it is notable that 32% of the participants possessed C1 or C2 level proficiency.



Source: Prepared by the JICA survey team based on registration information

Figure-38 Participants' Polish Communication Ability

Table-52 Participants' Polish Communication Ability

| Polish Language Level | Official Certificate | Telephone Interview | Total |
|-----------------------|----------------------|---------------------|-------|
| C2                    | 0                    | 2                   | 2     |
| C1                    | 3                    | 3                   | 6     |
| B2                    | 2                    | 15                  | 17    |
| Total                 | 5                    | 20                  | 25    |

Source: Prepared by the JICA survey team

In addition, based on information such as current occupation, educational background, gender, age group, employment status, and motivation, the characteristics and trends of participants in each course were organized and analyzed. The eight courses were categorized into four groups “AI-related courses (technical / managerial),” “Media-related courses (including UX design and visual fields),” and “IT Legal courses.” A comparative analysis was conducted across these categories to clarify the target participant profiles, career orientations, and directions for reskilling in each course. The results are presented below.

➤ AI-related Courses (Technical Track)

Target Courses: Python AI Programming, Big Data Engineering, Databases and their Applications

All participants in this group were job-seekers, primarily individuals seeking to transition into IT from adjacent or non-IT fields such as education, research, medical technology, and translation. Many were mid-career professionals with work experience, and several held master's degrees. Participants in this category demonstrated a strong desire to acquire new specialized skills by supplementing their scientific or educational foundations with practical AI implementation abilities. They sought hands-on, practice-oriented skills directly applicable to real-world work settings. Overall, these participants aimed to rebuild their

careers and reskill, aspiring to new professional opportunities through the acquisition of practical competencies.

➤ AI-related Courses (Management Track)

Target Course: AI Leader in Digital Transformation

This group included both employed individuals and job-seekers, with many participants having backgrounds in education, research, marketing, and management. Overall, the majority were mid-career professionals with substantial work experience, and many held master's degrees or higher—indicating their capacity and readiness to take on advanced roles. Among those currently employed, there was a strong intention to apply AI to business process improvement or educational domains, while job-seekers tended to aspire to roles involving the planning and promotion of AI implementation projects. Across both segments, participants expressed the motivation to utilize AI from the perspectives of “adoption, management, and social implementation,” placing greater emphasis on strategy, planning, and management rather than hands-on technical implementation. This group therefore consisted mainly of participants oriented toward organizational transformation through the application of AI.

➤ Media-related Courses

Target Courses: UX Design, Visual Communication, Animated Film

Participants in this category were predominantly women, with a high proportion of job-seekers. Many came from creative, non-IT backgrounds such as design, marketing, education, and the arts, and a significant number held master's degrees. Participants demonstrated a strong orientation toward exploring new forms of expression while leveraging their prior professional experience. Many expressed interests in themes linking people and technology—such as user-centered design, design thinking, and visual communication for social impact. Overall, there was a clear tendency toward rebuilding digital skills and pursuing re-employment or career expansion in the creative domain.

➤ IT Legal Courses

Target Course: Law in IT

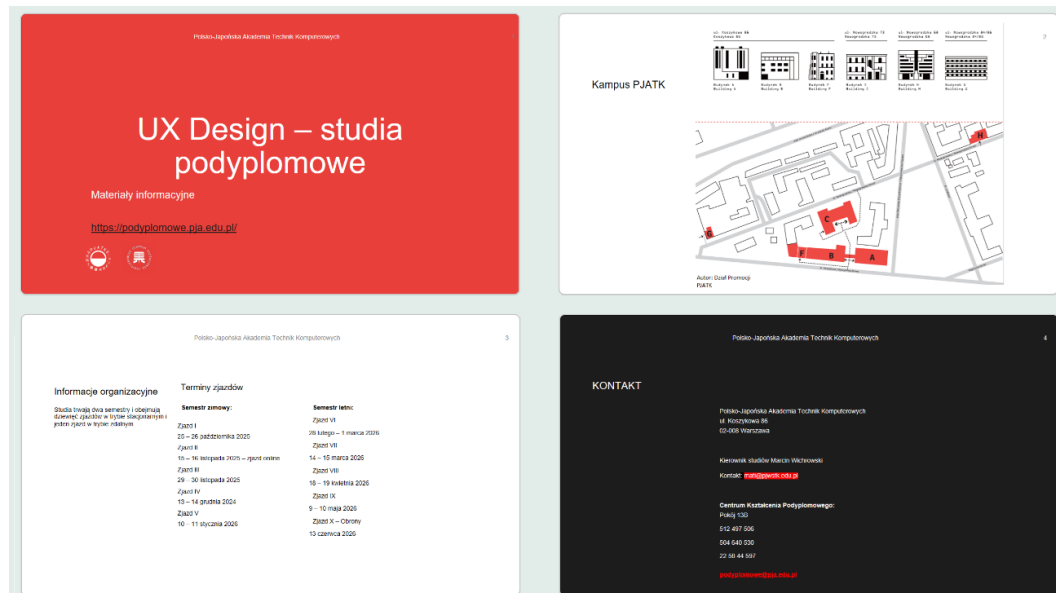
Participants in this category primarily came from legal and administrative backgrounds and included both younger and mid-career individuals. Both participants in this group were job-seekers and showed strong interest in legal issues in the digital society, such as legal systems and data protection (GDPR). There was a clear tendency toward strengthening IT literacy to expand their career paths from conventional legal roles into digital law and compliance domains. In other words, this group consisted of individuals seeking to transition from non-

IT fields into new specialized areas.

In summary, although the 25 participants in each course had diverse backgrounds and objectives, they commonly aimed to rebuild their careers and acquire practical skills once again. This demonstrates that this training program serves as a meaningful initiative that promotes the re-education and career reconstruction of individuals with diverse profiles.

#### (4) Training Progress

During the fifth survey mission conducted in October 2025, a meeting was held with PJAIT to confirm the progress of the training program. It was confirmed that each participant had received an “Onboarding Document” for their respective course prior to commencement. Based on this document, participants were able to prepare in advance and understand procedures related to inquiries during the training period. As shown in the sample (excerpt) below, the document consolidates and summarizes the necessary information for each course in a concise manner.



Source: PJAIT

Figure-39 Example of Onboarding Document (UX Design Course)

As of 23rd December 2025, PJAIT reported that all 25 participants have continued to take part in the training program and are sincerely engaged in their studies. During the survey period, the JICA survey team maintained regular communication with the Postgraduate Course coordinator at PJAIT through online meetings and email, sharing information on class progress based on the syllabus, participant attendance, and learning outcomes. Through this process, a system was maintained to continuously monitor and confirm both the implementation of the training and the participation status of the trainees.

## (5) Follow-up Survey

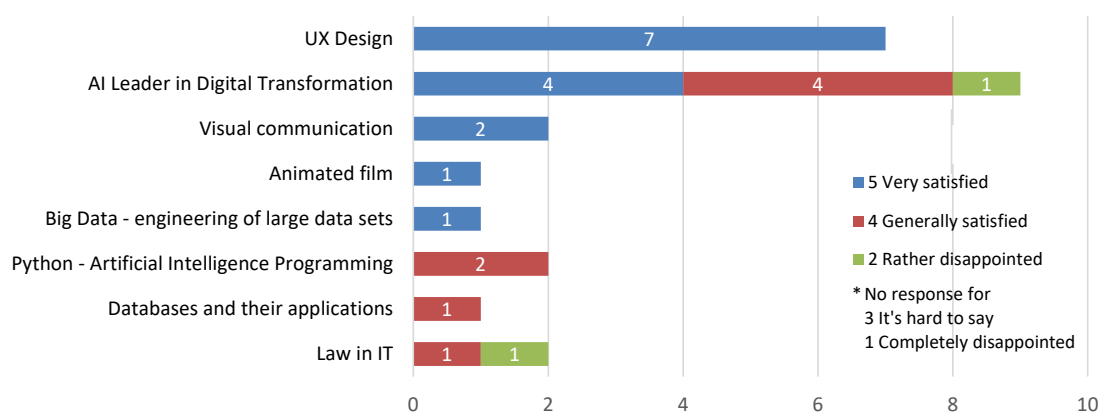
As a final check on the progress of the training under this survey, an online questionnaire-based follow-up survey was conducted in early December 2025, approximately one month after the start of all courses, targeting participants of the IT Diploma Course. This survey was positioned as a mid-term evaluation to assess participants' assessments of the training content, management of the training, and outcomes, and of obtaining information for future improvements and follow-up activities. All 25 trainees responded to the survey. An overview of the survey results is presented in the table below.

Table-53 Overview of the Follow-up Survey Results

| Question                                                            | Overview of the survey results                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overall satisfaction with the training                              | Satisfied or above: 23/25 participants (92%)<br>(Very satisfied + Generally satisfied)                                                                                                                                                                                                              |
| The difficulty level of the training content                        | Appropriate: 18/25 participants (75%)<br>(No issues related to difficulty were identified)                                                                                                                                                                                                          |
| Alignment with expectations for the training                        | Matched expectations: 20/25 participants (83%)<br>(Fully matched + Generally matched)                                                                                                                                                                                                               |
| Helpfulness for career development                                  | Helpful: 22/25 participants (88%)<br>(Very helpful + Helpful)                                                                                                                                                                                                                                       |
| Evaluation of the recruitment, selection, and enrollment procedures | <ul style="list-style-type: none"> <li>• Most respondents were generally satisfied, with no major complaints</li> <li>• A few were disappointed not to be placed in their preferred course</li> <li>• A few indicated insufficient pre-enrollment information and unclear course content</li> </ul> |
| Support considered necessary going forward                          | <ul style="list-style-type: none"> <li>• Strengthening employment and career support</li> <li>• Enhancing mentoring and individualized consultation</li> <li>• Introducing practical assignments through collaboration with companies (e.g. internships)</li> </ul>                                 |
| Other open-ended comments                                           | <ul style="list-style-type: none"> <li>• Many expressions of appreciation and gratitude toward JICA</li> <li>• Need to consider support measures that take individual circumstances into account</li> </ul>                                                                                         |

Source: Prepared by the JICA survey team based on the questionnaire survey results

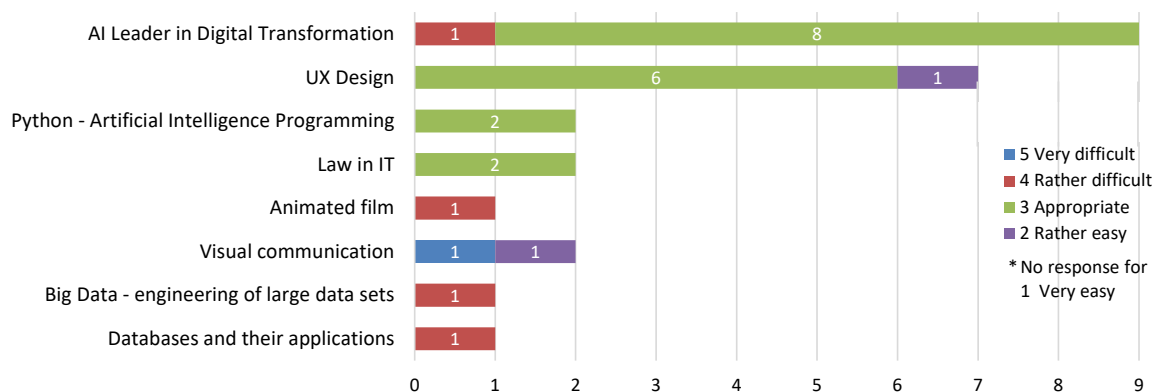
Regarding overall satisfaction with the training, 23 participants (92%) responded that they were “very satisfied” or “generally satisfied,” confirming that the overall evaluation of the training is at a very high level.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-40 Training Satisfaction (number of participants by course)

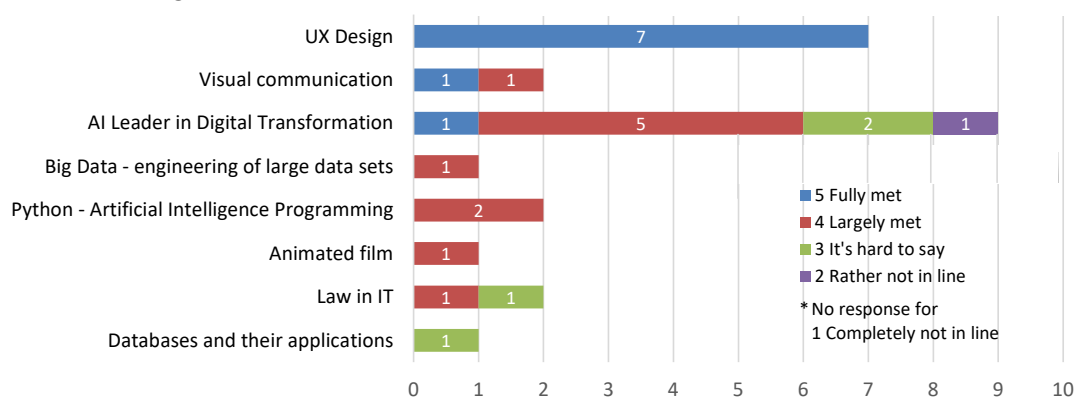
Regarding the difficulty level of the training content, the largest number of participants 18 trainees (75%) rated it as “appropriate.” Although a certain number of responses such as “somewhat difficult,” “rather easy,” and “very difficult” were also observed, no systematic issues attributable to the difficulty level were identified. Overall, the difficulty level can be assessed as appropriate for the participants.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-41 Training Difficulty (number of participants by course)

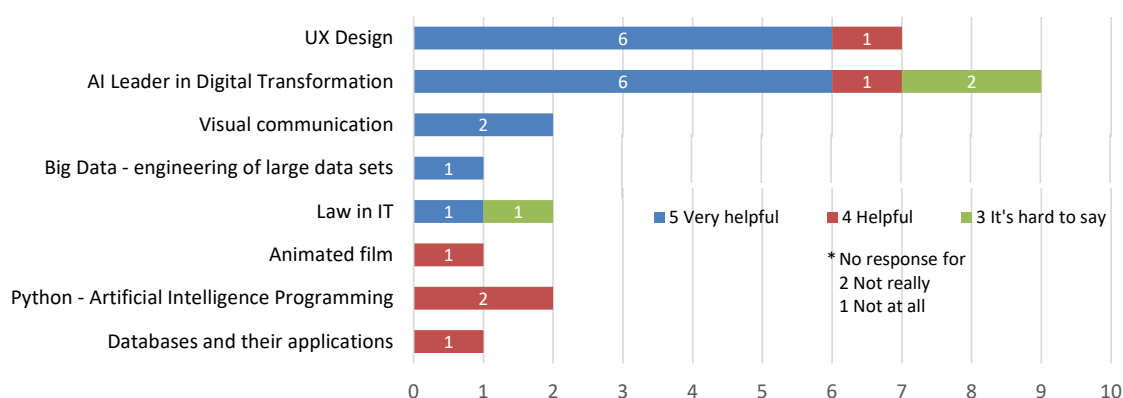
Regarding whether the training content matched participants’ prior expectations, 20 trainees (83%) responded that it “fully met” or “largely met”. These results suggest that there was overall consistency between the learning content and expected outcomes anticipated in advance and the actual training delivered.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-42 Alignment with Expectations for the Training (number of participants by course)

Regarding the helpfulness of the training for employment and career development after completion, 22 participants (88%) responded that it was “very helpful” or “helpful,” confirming that the training is perceived as beneficial for participants’ future career paths and practical work.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-43 Helpfulness for career development (number of participants by course)

Next, an overview of the results of the open-ended responses is presented below.

➤ Evaluation of the recruitment, selection, and enrollment procedures

Regarding the recruitment, selection, and enrollment procedures, the majority of respondents expressed that they were “generally satisfied” or had “no major complaints.” On the other hand, a few participants commented that they were “disappointed not to be placed in their preferred course” or that “information prior to enrollment was insufficient, making it difficult to understand the training content in advance.” These comments can be understood not as dissatisfaction with the system, but rather as requests for improvement in the provision of pre-enrollment information.

➤ Support considered necessary going forward

Regarding the support considered necessary going forward, the following points were frequently mentioned:

- Strengthening employment and career support
- Enhancing mentoring and individualized consultation
- Introducing practical assignments through collaboration with companies (e.g. internships)

These responses indicate that, while participants expressed a certain level of satisfaction with the training content itself, they are seeking stronger support to better connect the training outcomes to their post-training career paths and practical work.

➤ Other open-ended comments

In the open-ended comments, many expressions of appreciation and gratitude toward JICA were observed. In addition, a participant raised concerns about the financial burden associated with attending the program from distant locations, suggesting the need to consider support measures that take individual circumstances into account.

Finally, when examining the main characteristics and challenges by course, satisfaction levels were high across most courses. In particular, the UX Design course was identified as a notable success case, with all participants responding that they were “very satisfied.” On the other hand, in the AI Leader in Digital Transformation and Law in IT courses, one participant in each course gave a relatively lower satisfaction rating. However, even in these cases, no negative evaluations were observed regarding the training content or difficulty itself.

In the AI Leader in Digital Transformation course, the primary factor was the perception that “while the training content was good, it was unclear how it would connect to one’s own career.” In the Law in IT course, a few participants pointed out a partial mismatch between the expected level of specialization and practical application (such as concrete IT law cases) and the actual course content. These issues can be categorized as challenges that can be addressed through more thorough advanced explanations and clearer presentations of how the training can be utilized after completion.

Based on the results of this follow-up survey, it was confirmed that the IT Diploma Course has achieved outcomes largely in line with expectations at this mid-term stage, and that participants’ overall evaluations are favorable. Moreover, the issues identified were limited, and no systematic problems attributable to the quality or design of the training itself were observed. As this survey is scheduled to conclude at the end of February, PJAIT was requested to utilize the findings of this survey to inform future improvements and to handle specific follow-up actions from March 2026 onward.

#### (6) Online Japanese IT Companies’ Information Session

The JICA survey team, cooperating with PJAIT organized a trial online information session for Japanese IT companies, primarily targeting Ukrainian refugees enrolled in IT diploma courses. The session aimed to deepen their understanding of Japanese IT companies' activities and help them build connections with these companies. Individual online consultations with Japanese IT companies were offered to interested participants following the information session. The information session was held on January 15, 2026, with participation from six Japanese IT companies and approximately 15 attendees. The information session banner and program are shown below.



Source: PJAIT

Figure-44 Banner of Online Japanese IT Companies’ Information Session

Table-54 Program of Online Japanese IT Companies' Information Session

| Polish Time  | Session Topics                                                                   | Speakers                                                                                                                                          |
|--------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 08:30 -08:40 | Opening Remarks                                                                  | Mr. Hiroyuki Kanzaki, Japan Development Service Co., Ltd.                                                                                         |
| 08:40-08:50  | Beyond AlphaFold: The Missing Disease-Specific Data Layer for AI Drug Discovery  | MD., Ph.D. Akihiro Imura, CEO, COGNANO, Inc.                                                                                                      |
| 08:50-09:00  | From AI Training to Mobile Development: Your Career Journey with NetSTAR         | Ms.AI Sugawara, Manager of Global Development -Leading NetSTAR's Eastern European expansion and building international partnerships, NetSTAR Inc. |
| 09:00-09:10  | Why we launched R&D center in Poland                                             | Ms. Anna Siuta, Project Manager, HR Manager, Rococo Poland Sp. z o.o.                                                                             |
| 09:10-09:20  | From Ideas to Impact -The Simpleasy Way                                          | Mr. Yuta Arai, CEO, Simpleasy Inc.                                                                                                                |
| 09:20-09:30  | Future developments and personnel at WIT Co., Ltd. (World Innovation Technology) | Mr. Hiroyuki MATUURA, CEO, WIT Co., Ltd.                                                                                                          |
| 09:30-09:40  | About e-Jan Networks Co.                                                         | Mr. Shiro Sakamoto, Founder / CEO, e-Jan Networks Co.                                                                                             |
| 09:40-09:55  | Online Challenges (quiz)                                                         | Moderator                                                                                                                                         |
| 09:55-10:00  | Closing                                                                          | Moderator                                                                                                                                         |

Source: Prepared by the JICA survey team

#### (7) Collaboration with Other Organizations

The IT business skills training and IT diploma courses were implemented with the support of numerous related organizations in recruiting participants, as well as in conducting job consultation sessions and information sessions for Japanese IT companies. Additionally, Polish language training and soft skills training were provided courtesy of other organizations. The organizations that cooperated in implementing the IT business skills and IT diploma courses are shown in the figure below.



Source: Prepared by the JICA survey team

Figure-45 Cooperating Organizations for IT Business Skills and IT Diploma Courses

### 4.3 Distance Learning (Special Lectures)

#### (1) Implementation of Special Lecture Implementation

Results from the questionnaire survey of Ukrainian universities in the previous study (2023) confirmed that special lectures by practitioners are one of the most sought-after forms of cooperation. Consequently, the previous study proposed their implementation. As over a year has passed since the previous study, this survey presented a special lecture proposal to Ukrainian universities via a questionnaire survey to confirm their intentions. Many universities responded that they would recommend their students view the lectures. Therefore, as part of distance education, a webinar-format special lecture titled “Advanced Information Technologies and Their Industrial Applications: Toward International Cooperation with Ukrainian IT Experts” was held on October 28 and 29, 2025. This special lecture was organized with the support of the Ministry of Education and Science of Ukraine and with the cooperation of local consultants.

The special lecture was held primarily for third- and fourth-year students and faculty members in IT-related departments at Ukrainian universities. Its purpose was to share insights on cutting-edge technologies and research trends in the IT field, while also introducing potential business expansion opportunities in Ukraine and examples of international collaboration in education. The specific lecture themes for the special lectures were designed based on the results of the questionnaire survey of Ukrainian universities and consideration of available resources.

In organizing the special lectures, recruitment activities were conducted with the cooperation of the Ministry of Education and Science of Ukraine, JICA Ukraine Office, and local consultants. First, an overview of the special lecture was presented at a briefing session for Ukrainian universities hosted by the Ministry of Education and Science of Ukraine. Over 20 Ukrainian universities participated in this session. Subsequently, with the assistance of local consultants, detailed information about the special lecture was provided to various levels of personnel at these universities, including rectors, department heads, and faculty members, via email, telephone, and other means. Furthermore, the JICA Ukraine Office disseminated information about the special lecture through its contracted social networking services (SNS).

As a result of these promotional efforts, over 1,000 individuals registered for the special lectures, with 933 participants attending over the two days (excluding those who attended both days). Among registrants, university students accounted for 71%, and university faculty for 23%. Furthermore, the three major Ukrainian universities (National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute,” National Technical University “Kharkiv Polytechnic Institute,” and Ukrainian State University of Science and Technologies) comprised 72% of registrants. By region, registrants from universities in eastern Ukraine (Kharkiv Oblast, Donetsk Oblast, Luhansk Oblast, Dnipropetrovsk Oblast, and Sumy Oblast), the areas most severely affected by the invasion, accounted for 47% (504 individuals) of the total. The table below shows

the number of registrants and attendees for the special lectures.

Table-55 Number of Registrants and Attendees for Special Lectures

| Items                                                    | Day 1                                                                            | Day 2      |
|----------------------------------------------------------|----------------------------------------------------------------------------------|------------|
| Number of registrants                                    | 1,078 people (of whom 71% were university students and 23% were faculty members) |            |
| Number of participants (actual number of participants) * | 690 people                                                                       | 491 people |
| Number of Peak concurrent connections                    | 415 people                                                                       | 285 people |

\*The number of participants includes those who attended both days.

Source: Prepared by the JICA survey team

The special lecture commenced with opening remarks by Mr. Vitaliy Nosok, Head of the Technical Development Expert Group at Ukraine's Ministry of Education and Science. Day 1 featured two themes: the “Technology Track” and the “Industry and Society Track,” focusing on cutting-edge IT technologies and their real-world applications. Day 2 included presentations on potential business collaborations with Ukraine and international joint education initiatives. The programs for both days are shown in the table below. One representative each from PJAIT and NAWA took the stage.

Table-56 Special Lecture Program (Day 1)

| Ukrainian Time                                                                  | Lecture Topics                                                                                             | Speakers                                                               |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| 09:10-09:20                                                                     | Opening remarks                                                                                            | Mr. Vitalii Nosok, Ministry of Education and Science of Ukraine        |
| Technical Track: Introduction to Advanced IT Technology                         |                                                                                                            |                                                                        |
| 09:20-10:50                                                                     | Cutting Edge of Quantum Technology and Industrial Applications                                             | Assoc. prof. Dr. Kanao Taro, Shibaura Institute of Technology          |
| 10:50-12:20                                                                     | Applying informatics and AI to biology and the extended central dogma                                      | Prof. Dr. Kiyoko Kinoshita, Soka University                            |
| 12:20-12:30                                                                     | JICA Project Webinar: PBL/ COIL — International Online Training for IT Academics at Ukrainian Universities | Mr. Hiroyuki Kazaki, Japan Development Service Co., Ltd.               |
| Industry and Society Track: Industrial application and social utilization of IT |                                                                                                            |                                                                        |
| 12:30-13:30                                                                     | Local FabLab x Local Factory: Bridging Creativity, IoT, and Data Science                                   | Mr. Masato Takemura, executive director, Factory Scientist Association |
| 13:30-14:30                                                                     | The Challenge of ‘Virtual Matsumoto’                                                                       | Mr. Toru Sibuya, Representative, Virtual Matsumoto Promotion Project   |
| 14:30-14:35                                                                     | Closing and announcement                                                                                   | Moderator                                                              |

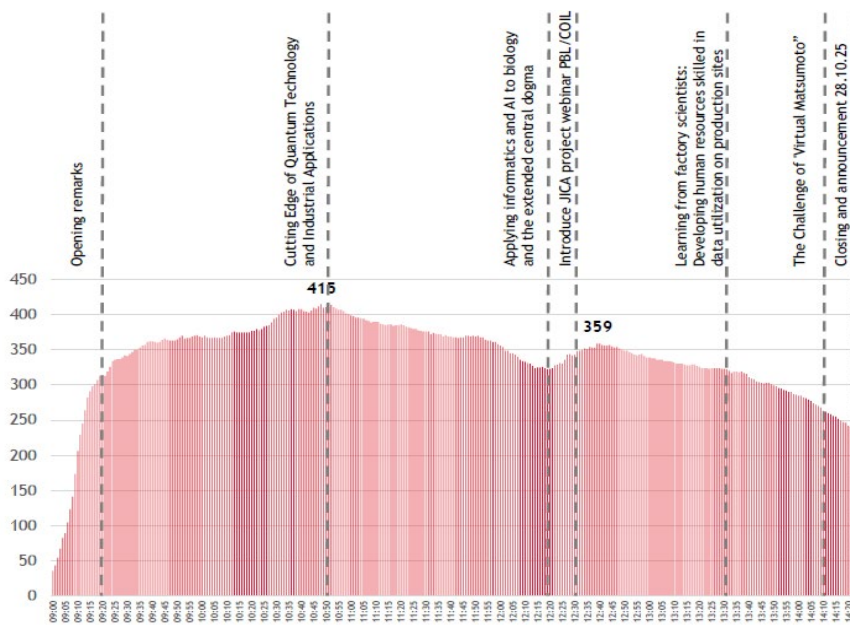
Source: Prepared by the JICA survey team

Table-57 Special Lecture Program (Day 2)

| Ukrainian Time                                                                     | Lecture Topics                                                         | Speakers                                                                                   |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 09:10-09:20                                                                        | Introduction                                                           | Moderator                                                                                  |
| Business Collaboration Track: Business collaboration with Japanese companies       |                                                                        |                                                                                            |
| 09:20-09:40                                                                        | Accelerating LLM Driven Drug Discovery with a Large Scale VHH Data Set | Prof. Dr. Akihiro Imura, CEO, COGNANO, Inc.                                                |
| 09:40-10:00                                                                        | From Ideas to Impact: The Simpleasy Way                                | Mr. Yuta Arai, President and Chief Executive Officer, simpleasy, Inc.                      |
| 10:00-10:20                                                                        | Panasonic Contribution for Reconstruction in Ukraine                   | Mr. Koji Terajima, Director, Panasonic Ukraine Ltd.                                        |
| 10:20-10:40                                                                        | Bridging Borders through Technology and Talent                         | Mr. Kevin Nasukawa, GlobalDeal, Founder & CEO                                              |
| 10:40-11:00                                                                        | Q&A                                                                    | Speakers and participants                                                                  |
| 11:00-11:10                                                                        | Break                                                                  |                                                                                            |
| International Collaborative Education Track: International collaborative education |                                                                        |                                                                                            |
| 11:10-11:50                                                                        | Beyond Mobility: How COIL Builds International Learning Opportunities  | Prof. Dr. Keiko Ikeda, Kansai University                                                   |
| 11:50-12:30                                                                        | International Collaboration in New Media Art                           | Prof. Dr. Jan Piechota, Dr. Olga Kulish, Polish-Japanese Academy of Information Technology |
| 12:30-13:10                                                                        | NAWA's International Programmes                                        | Mr. Radosław Podgrudny, Polish National Agency for Academic Exchange (NAWA)                |
| 13:10-13:15                                                                        | Closing & Announcement                                                 | Moderator                                                                                  |

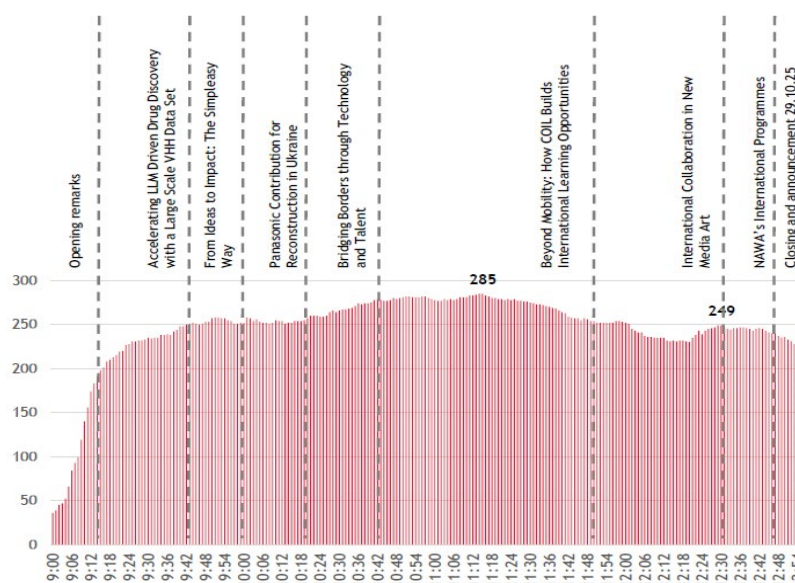
Source: Prepared by the JICA survey team

According to the trend in simultaneous webinar participants, both on the first and second days, a consistent number of participants remained from the start to the end of the special lectures. This indicates that the themes and content were effective in capturing participants' interest (see figure below).



Source: Prepared by the JICA survey team based on the Special Lecture results

Figure-46 Trend of Simultaneous Webinar Participants (Day 1)



Source: Prepared by the JICA survey team based on the Special Lecture results

Figure-47 Trend of Simultaneous Webinar Participants (Day 2)

In each section, participants did not merely listen to lectures passively; lively question-and-answer sessions took place. The questions posed by attendees revealed a high level of interest not only in cutting-edge trends in IT technology but also in collaboration with Japanese companies for talent development and exchanges with overseas universities, including Japanese institutions (see table below).

Table-58 Major Questions for Each Lecture in the Special Lecture Series

| Day 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Technical Track: Introduction to Advanced IT Technology</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Cutting Edge of Quantum Technology and Industrial Applications</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>• What tasks can quantum computers already solve better than classical computers?</li> <li>• How do you think science will change in 10 years?</li> <li>• When will quantum computers become commonplace?</li> </ul>                                                                                                                                                                                                                                                            |
| <i>Applying informatics and AI to biology and the extended central dogma</i>                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• Do you think that open access to large biochemical databases could create new challenges for biosafety?</li> <li>• Given that modern artificial intelligence algorithms can predict new molecules, could this lead not only to scientific progress but also to the risk of artificially created viruses or other biological threats?</li> <li>• Is it necessary to introduce international standards to restrict the use of biochemical data in generative models?</li> </ul> |
| <b>Industry and Society Track: Industrial application and social utilization of IT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Local FabLab x Local Factory: Bridging Creativity, IoT, and Data Science</i>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>• Can factory scientists be considered modern engineers who replace traditional technicians?</li> <li>• What IoT devices are most used for data collection in industrial settings?</li> <li>• How does the integration of data science and data engineering contribute to reducing losses and improving productivity in factories?</li> </ul>                                                                                                                                   |
| <i>The Challenge of 'Virtual Matsumoto</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• Do you think the trend toward modern digitalization leads to complete human isolation?</li> <li>• What tools or platforms are being used for visualizing urban data in this project (e.g., Unreal Engine, Unity, or a custom solution)?</li> <li>• Compared to learning in a physical environment, what are the advantages of learning on a virtual campus?</li> </ul>                                                                                                        |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Day 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Business Collaboration Track: Business collaboration with Japanese companies</b>                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Accelerating LLM Driven Drug Discovery with a Large Scale VHH Data Set</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>• How does the company solve the problem of limited data in biomedical research—by using synthetic data or transfer learning?</li> <li>• To what extent can the results obtained by artificial intelligence be considered reliable without laboratory confirmation?</li> </ul>                                                                                                                                                                                                            |
| <i>From Ideas to Impact: The Simpleasy Way</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>• What ways of cooperating do you see with classical universities that prepare IT specialists in Computer Science, especially?</li> <li>• What approaches, technologies, and tools related to application security are you using?</li> <li>• Are you planning to conduct internships only for IT engineers, or do you also need other specialists, such as managers, for example?</li> </ul>                                                                                              |
| <i>Panasonic Contribution for Reconstruction in Ukraine</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>• How does Panasonic plan to develop its presence in the Ukrainian market?</li> <li>• What skills are most important for young engineers and researchers to join Panasonic’s innovation programs?</li> </ul>                                                                                                                                                                                                                                                                              |
| <i>Bridging Borders through Technology and Talent</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• How exactly did blockchain help improve your product?</li> <li>• Does GlobalDeal offer any internship or training opportunities for young professionals interested in artificial intelligence and business analytics? What skills or technologies would you recommend focusing on to prepare for such a role?</li> <li>• How does a startup manage to combine scientific research in AI with commercial business tasks?</li> </ul>                                                      |
| <b>International Collaborative Education Track: International collaborative education</b>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Beyond Mobility: How COIL Builds International Learning Opportunities</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>• What were your main challenges while leading COIL projects? How did you deal with them?</li> <li>• How can Ukrainian teachers specifically participate in an upcoming JICA support training program?</li> <li>• As a 4th-year IT student who is highly motivated to cooperate with Japan, I’m wondering which opportunity would be more realistic to apply for — an internship in a Japanese company or a master’s degree program supported by JICA or partner universities?</li> </ul> |
| <i>International Collaboration in New Media Art</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• I’m very interested in studying at your university. Could you please tell me what steps we need to take to apply or study there?</li> <li>• Could you please let me know whether the program is tuition-free or if there are scholarships available?</li> </ul>                                                                                                                                                                                                                         |
| <i>NAWA’s International Programmes</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• We will reach out by email. We are interested in cooperation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                |

Source: Prepared by the JICA survey team based on the Special Lecture results

## (2) Evaluation

Following the completion of the special lectures (special webinar-style sessions), a participant survey was conducted. Among the 1,078 registered individuals and 933 unique participants over the two-day period, 73 responded (response rate: approximately 8%). The respondents consisted of 41% students and 59% faculty and staff. Although this response rate does not allow for claims of statistical representativeness, it is considered sufficient to provide useful insights into participant interests and to inform future improvements. This section summarizes the survey overview and evaluation results and outlines possible directions for continuing this series of special lectures in subsequent years.

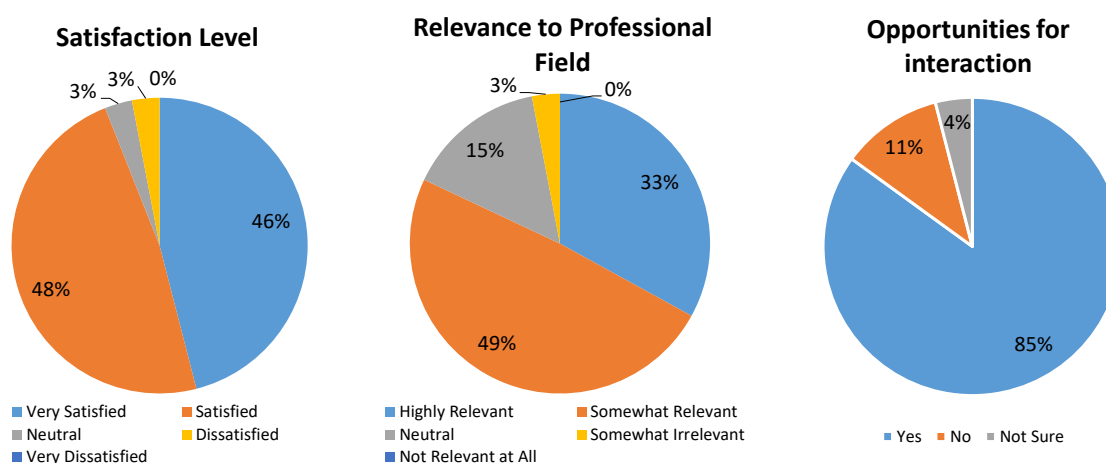
To begin with, the table and figure below present an overview of participants’ evaluation results and key participation indicators. High ratings were observed across all aspects—including overall satisfaction, relevance to participants’ fields of study, and opportunities for interaction—suggesting that the special lectures were highly meaningful. Notably, 94% of survey respondents

indicated they were “satisfied” or “very satisfied,” and 82% reported that the lectures were “highly relevant” to their own fields or interests. These results confirm the appropriateness of the lecture design and the accuracy of the targeted audience settings.

Table-59 Overview of Participant Evaluation and Engagement Indicators

| Survey Item                                           | Summary of Survey Results                                                                                                                                                 |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overall satisfaction level                            | The proportion of respondents who answered “Very satisfied” or “Satisfied” reached 94%, indicating an exceptionally high level of satisfaction.                           |
| Relevance to professional field                       | The proportion of respondents who answered “Very high” or “High” reached 82%, confirming a strong perceived relevance.                                                    |
| Opportunities for interaction (e.g., Q&A, discussion) | The proportion of respondents who indicated that “sufficient opportunities for interaction were provided” reached 85%, demonstrating a high level of positive evaluation. |

Source: Prepared by the JICA survey team based on the questionnaire survey results

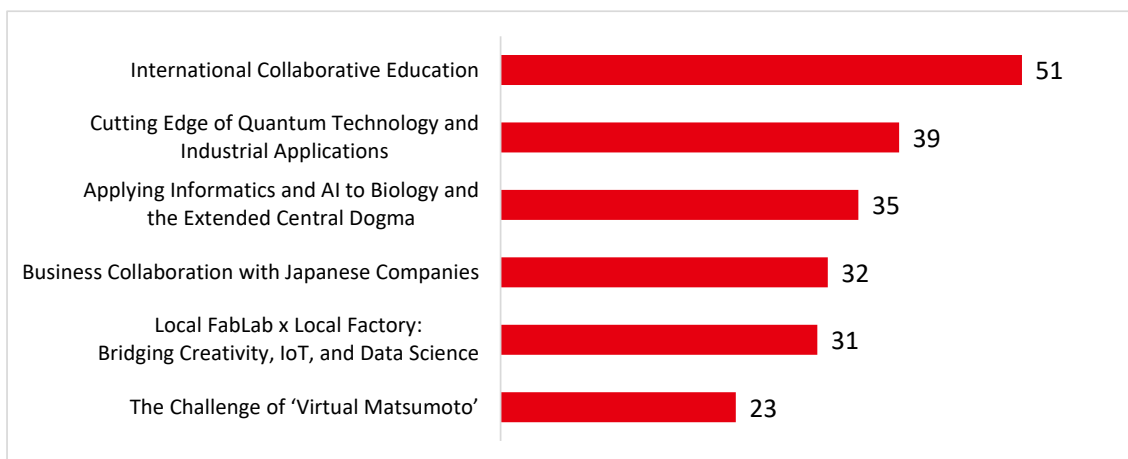


Source: Prepared by the JICA survey team based on the questionnaire survey

Figure-48 Participant Evaluation and Engagement Indicators

The figure below presents the number of respondents who selected each lecture as “the most beneficial,” arranged in descending order by track. The session that attracted the highest level of interest was “International Collaborative Education,” followed by advanced technology topics such as “Cutting Edge of Quantum Technology and Industrial Applications” and “Applying of Informatics Science and AI to Biology and Extended Central Dogma.” These results indicate that a combination of cutting-edge technological fields and internationally oriented collaborative learning is strongly supported by both students and faculty.

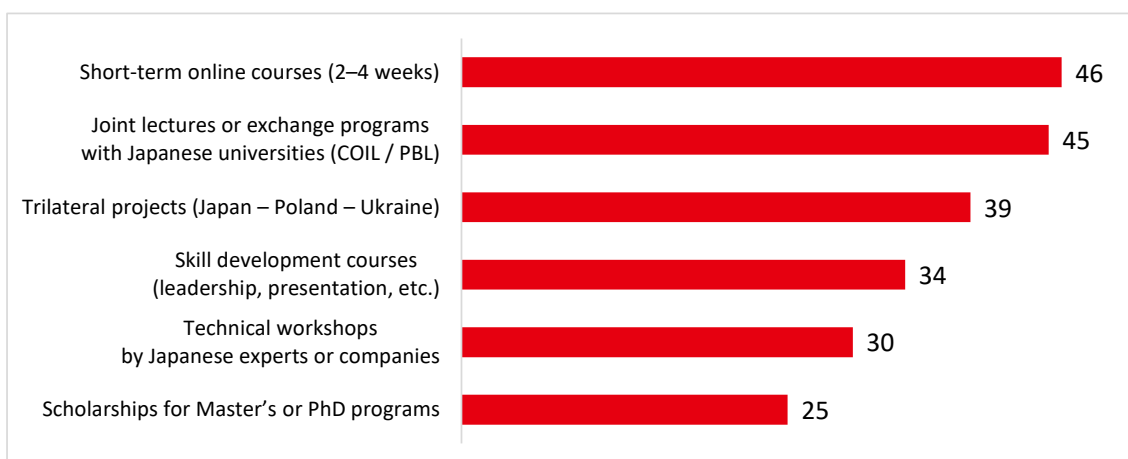
Moreover, even after accounting for variations in participant numbers by lecture date and time slot, all sessions were found to possess a consistently high level of usefulness. Sessions such as “Business Collaboration with Japanese Companies,” “Local FabLabs x Local Factory: Bridging Creativity, IoT, and Data Science” and “The Challenge of Virtual Matsumoto” also attracted a notable degree of interest from participants.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-49 Responses on the Most Beneficial Sessions

The figure below presents the results of a question asking participants which types of learning opportunities and programs, among those that JICA may support in the future they consider most useful. The figure summarizes the total number of responses provided by the 73 respondents. According to the survey results, the most preferred option was a “Short-term online course (2–4 weeks)”, followed by “Joint lectures or exchange programs with Japanese universities (COIL/PBL)” and “Trilateral projects (Japan, Poland, and Ukraine)”. These findings clearly indicate a strong preference for short, intensive, practice-oriented programs with a high degree of international collaboration, rather than long-term degree programs.

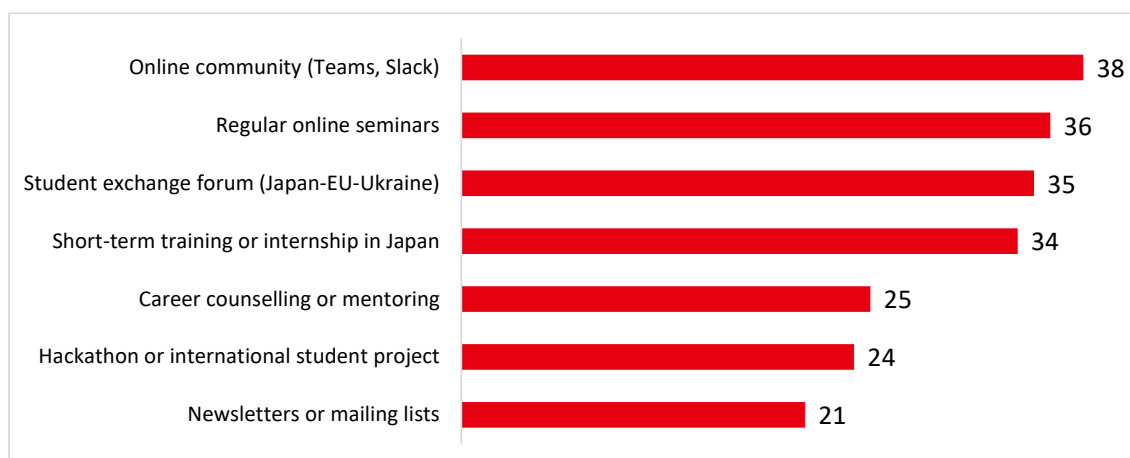


Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-50 Most Useful Learning Opportunities for Future JICA Support

Finally, the figure below presents the results of the question posed at the end of the seminar regarding “Most useful approaches for future JICA support,” namely the approaches they consider most useful for future JICA support. The figure summarizes the total number of responses provided by the 73 respondents. A large number of participants expressed interest in establishing an online community for information sharing (e.g., Teams, Slack), holding regular online seminars and

workshops, organizing student exchange forums among Japan, the EU, and Ukraine, as well as participating in short-term training programs or internships in Japan. These responses indicate a very high level of willingness among participants to remain engaged on an ongoing basis.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-51 Most Useful Approaches for Future JICA Support

Overall, these findings indicate that continuous educational support centered on short-term, intensive online international collaborative learning, including COIL and PBL approaches, would be highly effective. The results also provide quantitative justification for designing the next phase of this initiative, including modularizing short-term programs, strengthening trilateral collaboration among Japan, Poland, and Ukraine, and deepening the coverage of technical fields. Based on the survey responses, it is clear that participants wish to see the special lectures continued in the coming years. Accordingly, two patterns of continued implementation are considered appropriate.

#### ➤ Continuation of Seminar-Style General Lectures

The seminar-style general lectures will continue to be offered in the same format as this year. The goal is to increase the number of sessions and conduct them approximately twice a year, while expanding participant outreach to a certain scale. The scheduling will take into account periods when students and faculty can participate more easily such as before long holidays or after semester examinations and broad pre-event dissemination will be conducted, in coordination with the Ministry of Education and Science of Ukraine, to expand the range of target universities and faculties.

In addition, collaboration with Japanese universities and private companies will be strengthened to build a sustainable partner network that can participate on an ongoing basis. Routine administrative procedures will be streamlined, enabling more efficient seminar operations.

➤ Introduction of New Short-Term Intensive Courses

It is recommended to develop a new format of short-term intensive training, centered around the summer vacation period (early July to mid-August), when students are most able to participate. Each course would run for approximately two to three weeks and focus on a single theme, enabling concentrated learning. The training would be offered to small groups (approximately 20–30 participants) and would include not only lectures but also hands-on practical exercises, with the aim of establishing a practical remote training course model. Based on the results of this year's activities, it is desirable to design course themes around areas that received the highest levels of interest. Potential topics include quantum information theory, quantum computing implementation technologies, bioinformatics, IoT and AI applications in the manufacturing sector, the development of factory scientists, and applications of XR technologies (VR/AR). Consideration should be given to developing a broad range of themes focused on cutting-edge technologies and industrial applications.

The outcomes of this remote lecture series were later published on the official website of the Ministry of Education and Science of Ukraine<sup>59</sup>. In its statement, the Ministry commented as follows

- “The Ministry supports initiatives of this kind because it is essential not to rely on abstract theoretical lectures, but rather to achieve tangible results at the production site through joint projects between universities and industry. We have strong interest in the introduction of PBL/COIL through JICA's support, as well as in the development of dual education as a standard approach to IT human resource development. International collaborative education is expected to contribute directly to enhancing students' competencies and strengthening the competitiveness of the Ukrainian economy.”

These developments further confirm that this distance learning initiative (special lecture series), as the first pilot training program, received high evaluations and strong interest. They also clearly demonstrate the significant value and necessity of continuing to offer such programs in the future.

#### 4.4 Distance Learning (PBL/COIL Training)

##### (1) Implementation of PBL/COIL Training

Results from the questionnaire survey of Ukrainian universities in the previous study (2023) confirmed that joint development of educational programs is one of the most sought-after forms of cooperation. Consequently, the previous study proposed the pilot implementation of COIL-type

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<sup>59</sup> Article published on the website of the Ministry of Education and Science of Ukraine  
<https://mon.gov.ua/news/ukrainsko-iaponskyi-onlain-seminar-z-peredovykh-it-tekhnologii-obiednav-ponad-400-uchasnykiv?v=691469c5c7d48>

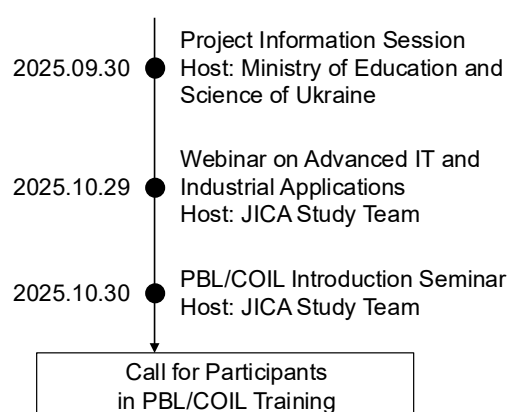
educational programs.<sup>60</sup> As over a year had passed since the preliminary survey, this survey presented a trial proposal for a COIL-type educational program in a questionnaire survey to Ukrainian universities to confirm their intentions. The results confirmed a high level of interest in trial implementation of COIL-type educational programs as extracurricular activities, consistent with the findings of the previous survey.

At the same time, the survey results revealed that while there is high demand for COIL-based education programs, they are not yet widely adopted as a form of international collaboration. Therefore, this project will focus on faculty training related to COIL-based education and PBL (Project-Based Learning), one of its activity formats, as well as developing a trial proposal for a COIL-based education module during the training.<sup>61</sup>

Participants (faculty members from Ukrainian universities) will join this training program while conducting regular classes under wartime conditions. Therefore, we recruited participants by providing sufficient information to enable them to understand the training content and workload beforehand, allowing them to decide whether to participate (see figure on the right).

Specifically, the JICA survey team first explained the entire project scope, including the PBL/COIL training, at a briefing session hosted by Ukraine's Ministry of Education and Science.

Over 20 Ukrainian universities participated in this session. Next, during the previously mentioned special lecture, the JICA survey team and Ms. Keiko Ikeda (Professor, Division of International Global Affairs of Kansai University; Vice Director, Institute for Innovative Global Education (IIGE)) explained the content of the PBL/COIL training and provided an overview of the COIL-based educational program. Following this, a half-day COIL/PBL introductory seminar was held on October 30, 2025. Forty individuals registered for the introductory seminar, with 23 attending on the day.<sup>62</sup> Professor Keiko Ikeda and Mr. Ryo Hishiyama (Founder/Director, Innovst Co., Ltd.) served as instructors for COIL and PBL, respectively. PJAIT personnel participated as observers.



Source: Prepared by the JICA survey team

Figure-52 Participant Recruitment Process for PBL/COIL Training

<sup>60</sup> COIL (Collaborative Online International Learning) is an educational approach that connects with other universities and institutions domestically and internationally online, facilitating exchange and collaboration both inside and outside the classroom.

<sup>61</sup> PBL (Project-Based Learning) is an educational approach where learners enhance their problem-solving and practical skills by identifying and resolving challenges themselves.

<sup>62</sup> The PBL/COIL training program includes both individual and group work, so the capacity was set at approximately 15 to 20 participants. Based on the assumption that about half of the registrants for the PBL/COIL introductory seminar would apply for this training, registration for the introductory seminar was closed once 40 participants had signed up.

The program for the COIL/PBL Introductory Seminar is shown in the table below.

Table-60 COIL/PBL Introduction Seminar Program

| Ukrainian Time | Lecture Content                                                                                                                                                     | Instructors                                        |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| 10:10 -10:20   | <b>Introduction to pilot PBL/COIL under JICA project</b><br>(Objectives, schedule, expected outcome and output of PBL/COIL training)                                | Mr. Kanzaki, JDS                                   |
| 10:20-10:50    | <b>Introduction to COIL</b><br>(Definitions of COIL benefits of students and teachers, problems to be solved, challenges, and required skills and preparation)      | Prof. Dr. Ikeda, Kansai University                 |
| 10:50-11:05    | <b>Q &amp; A</b>                                                                                                                                                    |                                                    |
| 11:05-11:35    | <b>Introduction to PBL</b><br>(Definitions of PBL benefits of students and teachers, problems to be solved, challenges, and required skills and preparation,        | Mr. Hishiyama, Founder/ Executive Officer, innovst |
| 11:35-12:00    | <b>Q &amp; A</b>                                                                                                                                                    |                                                    |
| 12:00 -12:30   | <b>Group Discussions (4 groups)</b><br>What kind of social, economic, and business issues can be resolved with IT using PBL/COIL for the reconstruction of Ukraine? | Participants                                       |
| 12:30-12:50    | <b>Group Presentation and Feedback</b><br>(5 mins x 4 groups)                                                                                                       | Participants, Prof. Dr. Ikeda, Mr. Hishiyama       |
| 12:50-13:00    | <b>Closing and Announcement</b>                                                                                                                                     | Mr. Kanzaki                                        |

Source: Prepared by the JICA survey team

These recruitment activities help prospective participants deepen their understanding of the PBL/COIL training program. Subsequently, the JICA survey team recruited participants for the PBL/COIL training, primarily targeting those who had registered for the COIL/PBL introductory seminar. As a result, by the deadline, 19 faculty members teaching IT-related subjects from eight universities applied.<sup>63</sup> The breakdown of the 19 applicants is as follows: department heads (2), professors (3), associate professors (10), lecturers (3), and researchers (1).

The training program, conducted over five days, aimed not only to acquire skills and knowledge for improving teaching methods by learning COIL and PBL, but also to design practical and implementable COIL modules incorporating PBL into activities, based on collaboration with universities overseas, including Japan. Professor Keioko Ikeda and Mr. Ryo Hishiyama served as instructors for COIL and PBL, respectively. PJAIT representatives participated as commentators in the final day's presentation session of the training program.

The training program consists of lectures, self-directed learning using on-demand materials, individual assignments, and group work. Additionally, participants were provided with the opportunity to view on-demand training developed by Shibaura Institute of Technology based on its own global PBL courses. The content of the PBL/COIL training and the on-demand training provided by Shibaura Institute of Technology are shown in the table below.

<sup>63</sup> The JICA survey team set the capacity at approximately 15 to 20 participants and began recruiting attendees.

Table-61 PBL/COIL Training Program

| Date and Ukrainian Time                                        | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                           | Instructor                                                       |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                                | Training Content                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                  |
| [Day 1]<br>11:00-12:00,<br>Nov., 6                             | <i>Understand the core concept and design steps of COIL</i><br><ul style="list-style-type: none"> <li>• COIL principles and key concepts of COIL</li> <li>• How to develop COIL modules (methodology, challenges, and design process)</li> <li>• Assessment and evaluation</li> <li>• Technology and tools</li> </ul>                                                                                                                         | Prof. Dr. Keiko Ikeda<br>Kansai University                       |
| [Day 2]<br>11:00-12:00,<br>Nov.12<br>(plus 3 hours self-study) | <i>Understand the educational value of COIL and the design framework</i><br><ul style="list-style-type: none"> <li>• Learning gains from COIL in the context of 21st-century skills</li> <li>• COIL design framework and reference information in collaborative learning between Ukraine and Japan</li> <li>• Introduction to COIL Toolkit (on-demand materials)</li> </ul>                                                                   | Prof. Dr. Ikeda                                                  |
| [Day 3]<br>11:00-13:00,<br>Nov., 13                            | <i>Identify essential components and success factors of effective PBL design</i><br><ul style="list-style-type: none"> <li>• PBL design elements and golden questions to design PBL courses</li> <li>• How to proceed with PBL project activities (example with IT theme)</li> <li>• Working on to-be and as-it-is analysis using a framework</li> <li>• Teams and individual reflections, challenges</li> </ul>                              | Mr. Ryo Hishiyama,<br>Founder/ Executive Officer, Innovst        |
| [Day 4]<br>11:00-13:00,<br>Nov., 17                            | <i>Create a draft PBL module that reflects your students' needs and institutional context</i><br><ul style="list-style-type: none"> <li>• Detailed explanation about the criteria for designing PBL courses (golden questions to design PBL courses)</li> <li>• Working on designing PBL courses for the participants' context</li> <li>• Assignment: design your own PBL courses</li> </ul>                                                  | Mr. Hishiyama                                                    |
| [Day 5]<br>11:00-14:00,<br>Nov., 21                            | <i>Create a draft COIL module that reflects your students' needs and institutional context, incorporating PBL activities</i><br><ul style="list-style-type: none"> <li>• Affirming the training objectives and expectations for Day 5 work</li> <li>• Working on designing COIL modules with the COIL course design worksheet (integration of PBL project activities into the COIL framework)</li> <li>• Presentation and feedback</li> </ul> | Prof. Dr. Ikeda,<br>Mr. Hishiyama,<br>representatives from PJAIT |

Source: Prepared by the JICA survey team

Table-62 Content of On-Demand Training Provided by Shibaura Institute of Technology

| No. | Content<br>(Time required: 3.5 hours)                          | Contents<br>(Time required: 4 hours)                                                                          | Content<br>(Time required: 20 minutes)           |
|-----|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 1   | Introductory remarks and group formation                       | Ice break. Explanation of the target task and data for PBL                                                    | Review of student activities using the TWIL form |
| 2   | Lectures on data analysis, overview of Data Science techniques | Lectures on data topics, lecture on the task. Group work: background research/ definition of a solution model | Review of student activities via TWIL form       |
| 3   | Group work: coding (pre-processing/ model implementation)      | Group work: coding (model implementation)                                                                     | Review of student activities via TWIL form       |
| 4   | Group work: model training, evaluation, improvement            | Preparation for interim presentation                                                                          | Review of student activities using the TWIL form |
| 5   | Interim presentation/review                                    | Excursion to Odaiba                                                                                           | Review of student activities via TWIL form       |
| 6   | Group work: model training, evaluation, improvement            | Group work: model training, evaluation, improvement                                                           | Review of student activities using the TWIL form |
| 7   | Group work: model training, evaluation, improvement            | Preparation for the final presentation                                                                        | Review of student activities using the TWIL form |
| 8   | Final presentation/ review/ questionnaire on PBL               | Farewell ceremony (feedback based on survey results)                                                          |                                                  |

Source: Shibaura Institute of Technology

Participants learned the principles of COIL, its design processes and methodologies, evaluation methods, learning outcomes, challenges, and countermeasures during the lectures on the first and second days. They also deepened their understanding of COIL through self-study using the COIL Toolkit (on-demand materials), developed jointly by the Institute for Innovative Global Education (IIGE), Kansai University, and COIL Connect for Virtual Exchange. On the third and fourth days, participants learned detailed procedures to consider when tackling projects in PBL classes, including the PBL design flow and design perspectives, using case studies. Afterwards, they worked individually on designing a PBL course proposal. Based on the understanding of COIL and PBL gained thus far, on Day 5, each participant brought the PBL course proposal they had developed on Day 4 to their group. Together, they collaboratively designed a COIL program proposal premised on collaboration with Japanese universities. For the design, each group utilized the Faculty COIL Module Design Worksheet provided by the instructor as a template. Since COIL involves creating and implementing learning programs jointly with universities from two or more countries, the groups were composed of faculty members from different Ukrainian universities. The table below lists the title of each group's COIL program proposal and a summary of the instructor's comments.

Table-63 Instructors' Summary Comments on the COIL Module Proposal

| <b>Title</b>                                                                         | <b>Summary of the Instructors' Comments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Free Food Website Project                                                            | The lecturers praise the project's strong interdisciplinary design and complementary collaboration between Ukrainian and Kansai students. They suggest clarifying student roles, project-major connections, and providing support for effective cross-university collaboration, especially early on and in asynchronous work.                                                                                                                                                                                                           |
| Smart-Shelter                                                                        | The lecturers praise the COIL project for its well-documented, detailed design, clear learning outcomes, and thoughtful planning of roles, hybrid collaboration, and support across Japan and Ukraine. They suggest adding an explicit intercultural learning component and considering how students can engage with physical prototypes remotely to further enrich the project and develop social skills alongside technical knowledge. Overall, the project is seen as practical, efficient, and ready for real-world implementation. |
| IoT-Based Microgrid Monitoring and Failure Prediction                                | The project's flexible design and mix of synchronous/asynchronous work effectively address time zones and language barriers. Careful attention to academic calendars, cultural context, and student motivation will help make the collaboration between Japanese and Ukrainian students meaningful and engaging.                                                                                                                                                                                                                        |
| Data Collection and Analysis in Multisensory Systems for Human Safety in Emergencies | The lecturers praise the project's flexible COIL design and balance of synchronous and asynchronous collaboration. They highlight the need to consider academic calendars, cultural contexts, and student motivation, noting the design is detailed and well planned despite time constraints.                                                                                                                                                                                                                                          |
| Deep Learning in Computer Vision                                                     | The lecturers note the need to align assessment and timelines between Ukraine and Japan to avoid conflicts in international teamwork. They praise the project's detailed design, student role as AI consultants, and suggest providing example problems to support creative solution-building and enhance collaboration skills.                                                                                                                                                                                                         |

Source: Prepared by the JICA survey team based on the PBL/COIL Training results

After the training concluded, certificates of completion were awarded to 14 of the 19 participants. These were given to those who attended all five days of the training or attended four days including the final day and submitted their individual work on the fourth day. The 14 participants were affiliated with the following universities: Lviv Polytechnic National University (5), Taras

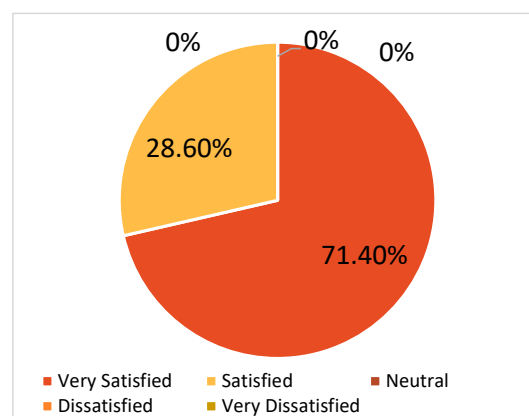
Shevchenko National University of Kyiv (1), Yuriy Fedkovych Chernivtsi National University (1), Sumy State University (4), Kharkiv National University of Radio Electronics (2), and National Technical University “Kharkiv Polytechnic Institute” (1). By position, they included one department head, one professor, nine associate professors, and three lecturers.

## (2) Participants' Evaluation of PBL/COIL Training

Following the completion of the training, an evaluation survey was conducted online from December 1 to December 10, 2025. Questionnaires were distributed to 14 training participants who completed the training, with responses received from 13 participants. The survey results indicate that this PBL/COIL training highly met the participants' expectations. Furthermore, it revealed that many respondents anticipate implementing PBL/COIL in collaboration with Japanese universities as the next step. The survey results are presented below.

### 1) Overall Satisfaction with the Training

Regarding overall satisfaction with the training, all 13 participants responded “Very satisfied” (71%) or ‘Satisfied’ (29%) to the question “How were you satisfied with the training overall?”, indicating a high level of positive feedback.

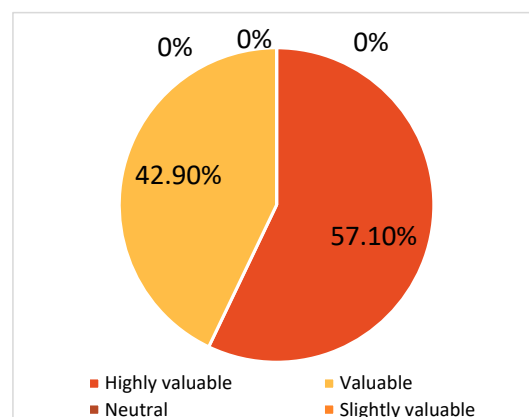


Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-53 How were you satisfied with the training overall?

### 2) Usefulness of the Training

Regarding the usefulness of the training, all 13 participants responded “very relevant” (57%) or “relevant” (43%) to the question “Will the training content be valuable to improve your teaching practices?”. This indicates that the training was meaningful and effective in helping to improve actual classroom instruction.

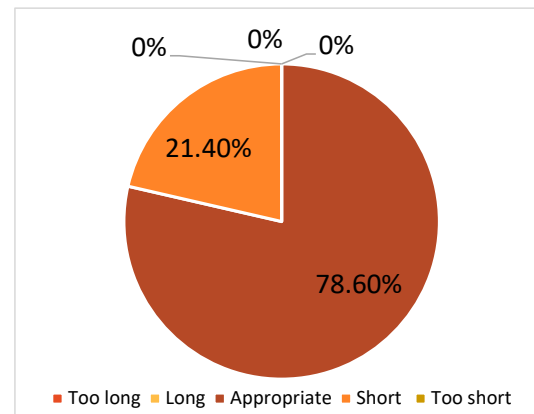


Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-54 Will the training content be valuable to improve your teaching practices?

### 3) Training Period

Regarding the training duration, in response to the question “Was the training period appropriate?”, 10 participants (79%) answered “Appropriate,” suggesting no major issues with the length. However, 3 participants (21%) stated it was “Too short.” As noted in the comments below, a few participants felt the time allocated for group work was insufficient.



Source: Prepared by the JICA survey team based on the questionnaire survey results

Figure-55 Was the training period appropriate?

### 4) Intent to Introduce PBL/COIL Modules

Regarding the willingness to introduce PBL/COIL modules at each university, all 13 respondents answered “Yes” to the question, “Are you interested in cooperating with Japanese universities and implementing PBL/COIL modules at your university?” This indicates high expectations for the implementation of piloting COIL-based educational programs in collaboration with Japanese universities.

### 5) Areas for Improvement in the Training

When the questionnaire asked about opinions on areas for improvement in the training using an open-ended format, the respondents commented on overall evaluations and points for improvement. The following is a summary of those comments.

#### Overall Evaluation

- The training was high-quality, professional, and well-structured.
- The content was practical and directly applicable to participants' educational activities and project work.
- There was an appropriate balance between theory, practical examples, and discussion.
- The instructor's responses and comments on assignments, group work, and questions were extremely thorough and insightful.

#### Areas for Improvement

- Increased time allocated for group work and extension of the training period.
- Adjustments to group team composition, such as pairing participants from the same university or the same field of expertise

- Receipts of mentor-style guidance during group work sessions.

#### 6) Future Cooperation with Japan

Finally, the questionnaire asked about opinions on future cooperation with Japan using an open-ended format. Many comments expressed expectations for the pilot implementation of COIL-type educational programs and for cooperation with Japan in research fields.

#### (3) Instructors' Evaluation of PBL/COIL Training

After the training concluded, the JICA survey teams conducted review meetings with the instructors. The instructors' comments regarding the overall evaluation of the training, areas for improvement, and future initiatives are as follows.

- Through the webinar and the PBL/COIL introductory seminar, participants were provided with advanced explanations of the training content and an overview of PBL and COIL, enabling the training to commence smoothly.
- The online training sessions generated more active discussions than anticipated, perhaps because faculty members with a strong interest in PBL and COIL participated in. On the other hand, adjustments were made, such as utilizing on-demand materials, as some participants participated in the training from locations with unstable internet connections.
- Participants from the same university might have had more active discussions if they had worked in groups. It would be preferable to confirm participants' preferences regarding this point in advance.
- Regarding the training period, if participants can secure the time, it is possible to extend the overall training period and allocate more time to individual and group work. It is also advisable to confirm participants' preferences regarding this point in advance. Alternatively, there is the option of conducting additional training as part of the preparation when piloting COIL-based education.
- Based on the quality of the PBL or COIL module proposals and questions raised during the training, there is variation in the participants' understanding of PBL or COIL. However, their motivation is exceptionally high. Therefore, it is desirable to provide ongoing support for piloting COIL-based education whenever opportunities arise. In doing so, it is preferable to offer broad participation opportunities to those who completed the training from the perspective of international collaborative learning, rather than capping participation by Ukrainian universities based on specific criteria.

## 4.5 Short-Term Training (Fellowship)

### (1) Implementation of the Short-term Training

This initiative aims to enhance the research capabilities of Ukrainian researchers through joint research among researchers at Ukrainian universities, PJAIT, and Japanese universities. After the initial identification of interested researchers in joint research, a seminar was held at PJAIT to exchange information on the latest research trends and match interest of researchers from the three countries as part of the training.

### (2) Identifying Researchers Interested in Joint Research

Through updating joint research topics, conducting a questionnaire survey of Ukrainian universities, consultations with Japanese universities, and initial contacts between researchers, the JICA survey team identified researchers from the three countries who are interested in joint research (see figure below).



Figure-56 Process for Identifying Researchers Interested in Joint Research

#### 1) Updates on Four Research Topics

In the previous survey, PJAIT proposed four research topics as potential joint research themes. As over a year has passed since then, the JICA survey team confirmed with PJAIT whether any changes had been made to the research topics. As a result, while the topics themselves remain unchanged, some content has been updated. The four research topics and their respective fields are listed in the table below. As these research topics include content not publicly disclosed at academic conferences or similar venues, the details of the research are not described in this report.

Table-64 Four Research Topics for Joint Research

| Topic No.        | Research Topic Name                                                      | Research Field                                                       |
|------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------|
| Research Topic 1 | Biological Signal Analysis                                               | Healthcare and Data Science                                          |
| Research Topic 2 | Multilingual and cross-lingual detection and debunking of disinformation | Natural Language Processing, Machine Learning, Large Language Models |
| Research Topic 3 | Anthropomorphism                                                         | Art and IT Integration                                               |
| Research Topic 4 | Transdisciplinary data-driven XR-based R&D                               | Human-Computer Interaction                                           |

Source: Prepared by the JICA survey team based on the PJAIT proposals

## 2) Approach to Researchers at Ukrainian Universities and Japanese Universities

In the questionnaire survey conducted at Ukrainian universities, the four research topic names and their contents were presented to check whether any researchers are interested in joint research in these topics. Additionally, the research topic contents were explained to several Japanese universities and companies, including those that had expressed interest in the previous survey, to explore the possibility of their participation in joint research. The results of the questionnaire survey and the inquiries to Japanese universities and companies revealed the following number of universities, companies, and researchers expressing interest at this stage, as shown in the table below.

Table-65 Number of Universities and Researchers Expressing Interest in Joint Research

| Research Topic Name                                                                           | Ukrainian Universities and Researchers | Japanese Universities and Researchers           |
|-----------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------|
| Research Topic 1:<br>Biological Signal Analysis                                               | • 12 universities (14 researchers)     | • 1 university (1 researcher)<br>• 1 company    |
| Research Topic 2:<br>Multilingual and cross-lingual detection and debunking of disinformation | • 9 universities (10 researchers)      | • 3 universities (3 researchers)<br>• 1 company |
| Research Topic 3:<br>Anthropomorphism                                                         | • 1 university (1 researcher)          | • 2 universities (2 researchers)                |
| Research Topic 4:<br>Transdisciplinary data-driven XR-based R&D                               | • 7 universities (9 researchers)       | • 1 university (1 researcher)<br>• 1 company    |

Source: Prepared by the JICA survey team

## 3) Initial Contact Among Researchers

The contact information for PJAIT's principal investigators of the research topics was exchanged with the researchers who expressed interest in the above item 2) and the researchers were asked to contact the respective principal investigators via email or online meetings to discuss potential joint research opportunities.

The number of Ukrainian universities, Japanese universities and companies, and researchers identified through the processes described in 1) to 3) above is shown in the table below.

Table-66 Number of Universities and Researchers Expressing Interest in Joint Research  
(After the initial contact)

| Research Topic Name                                                                           | Ukrainian Universities and Researchers | Japanese Universities and Researchers           |
|-----------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------|
| Research Topic 1:<br>Biological Signal Analysis                                               | • 1 university (1 researcher)          | • 0 university (0 researchers)<br>• 0 company   |
| Research Topic 2:<br>Multilingual and cross-lingual detection and debunking of disinformation | • 3 universities (4 researchers)       | • 3 universities (3 researchers)<br>• 1 company |
| Research Topic 3:<br>Anthropomorphism                                                         | • 0 university (0 researcher)          | • 1 university (1 researchers)                  |
| Research Topic 4:<br>Transdisciplinary data-driven XR-based R&D                               | • 0 universities (0 researchers)       | • 1 university (1 researcher)<br>• 1 company    |

Source: Prepared by the JICA survey team

As the next step, to build trust among researchers and confirm their commitment to joint research, PJAIT cooperating with the JICA survey team, hosted an in-person seminar where these researchers discussed the latest trends in their respective research fields and potential themes for joint research

### (3) Seminar for Joint Research

The seminar was held at PJAIT from December 9 to December 11, 2025, with the following objectives: i) to understand the content of the joint research topics proposed by PJAIT, ii) to understand each participant's research field, iii) to promote academic networking, and iv) to explore specific opportunities for joint research.

A total of 27 participants, including researchers and doctoral and master's students from PJAIT, Hokkaido University, Kitami Institute of Technology, Musashino University, Tokyo University of Technology (video participation), State University of Information and Communication Technologies, and Sumy State University (online participation), took part. The breakdown was 15 participants from Poland, 4 from Ukraine, and 8 from Japan.

At the seminar, 15 participants (including those joining via video) presented their respective research projects and proposals for joint research. Following this, participants were divided into groups based on research themes to discuss the potential for joint research across the three countries and the research areas suitable for collaboration. On the final day, two groups presented candidate research areas for joint research. The seminar program is shown below.

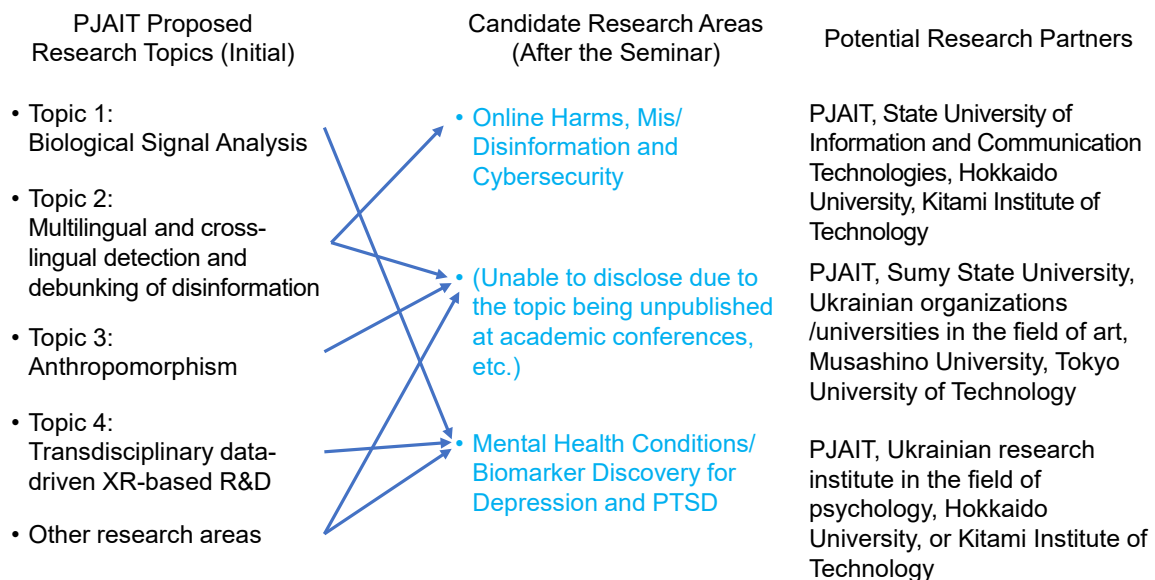
Table-67 Seminar Program

| Day 1 (December 9)             |                                            | Day 2 (December 10) |                                       | Day 3 (December 11)         |                                               |
|--------------------------------|--------------------------------------------|---------------------|---------------------------------------|-----------------------------|-----------------------------------------------|
| Arrival from Japan and Ukraine |                                            | 9:30–11:00          | Presentation by researchers           | 9:30-10:00                  | Presentation by researchers and AI Conference |
|                                |                                            | 11:00-12:30         | Presentation by researchers           | 10:45-11:30                 | Discussion/Planning by Research Topic         |
|                                |                                            | 12:30-13:00         | Discussion/Planning by Research Topic | 11:30-13:00                 | Presentation by Research Topic                |
| 13:00-14:00                    | Opening and Introduction                   | 13:00-14:30         | Lunch                                 | 13:00-14:30                 | Lunch                                         |
| 14:00-14:30                    | Outline of JICA Project and Joint Research | 14:30-16:30         | Discussion/Planning by Research Topic | 14:30                       | Closing                                       |
| 14:30–15:30                    | Presentation by researchers                | 16:30-19:30         | Guest Lectures                        | Leave for Japan and Ukraine |                                               |
| 15:30–16:30                    | Presentation by researchers                |                     |                                       |                             |                                               |
| 16:30–17:30                    | Presentation by Researchers                |                     |                                       |                             |                                               |
| 18:00-20:00                    | Welcome Reception /Networking              |                     |                                       |                             |                                               |

Light blue: Presentation of researchers' research work, Yellow: Group discussions, Orange: Presentation of potential research areas for collaboration

Source: Prepared by the JICA survey team

Potential research areas for joint research include online harms, mis/disinformation, cybersecurity, and mental health conditions/biomarker discovery for depression and PTSD. The relationship between the initial four joint research topics, these potential research areas and potential partners is shown in the figure below.



Source: Prepared by the JICA survey team based on the seminar for joint research

Figure-57 Candidate Research Areas for Joint Research

Additionally, the seminar saw progress in discussions regarding potential collaboration among the three countries beyond joint research, including discussions on the signing of an MOU between a

Japanese university and PJAiT, and the acceptance of Ukrainian students at a Japanese university. This can be considered a secondary benefit of holding the seminar in person.

#### (4) Evaluation of the Seminar for Joint Research

Following the seminar, an online survey was conducted from December 29, 2025, to January 12, 2026, to evaluate it. The survey was distributed to 26 seminar participants (excluding a video participant), and responses were received from 19 individuals. The breakdown of the 19 participants is as follows: 15 from Poland, 4 from Ukraine, and 7 from Japan. By position, there were 2 department heads, 2 professors, 7 associate professors, 1 lecturer/researcher, and 7 students (including doctoral candidates). A summary of the survey results is provided below.

- Participants expressed high satisfaction with the seminar overall, its content, duration, and other aspects.

##### **Relevant Results of the Questionnaire Survey**

###### (Overall Satisfaction)

- 94% of respondents were satisfied overall with the training.  
(Very satisfied: 68%, satisfied: 26%)

###### (Seminar Content)

- 90% of respondents felt the seminar content was appropriate.  
(Very appropriate: 53%, Appropriate: 37%)

###### (Seminar length)

- 89% of respondents felt the seminar duration was appropriate.  
(Appropriate: 89%)

###### (Understanding of the research areas of the participants)

- 73% of respondents felt they understood the research areas of each researcher.  
(Very well: 26%, Well: 47%)

- Participants actively interacted during the seminar period and showed enthusiasm for proposing joint research projects.

##### **Relevant Results of the Questionnaire Survey**

###### (Opportunities for interaction and discussion)

- 89% of respondents felt they had enough opportunities for interaction and discussion.  
(Very sufficient: 47%, Sufficient: 42%)

###### (Identification of collaboration opportunities)

- 85% of respondents felt the seminar helped them identify potential research partners.  
(Very helpful: 32%, Helpful: 53%)

###### (Willingness to prepare a research proposal)

- 58% of respondents expressed that they would be willing to prepare the proposal.  
(Yes: 58%, Not yet decided: 37%)

Excluding responses from students, 83% of respondents (12 individuals) indicated they would like to prepare the proposal.

- When preparing joint research proposals, researchers require clear guidelines regarding the budget framework, eligible expenses, research period, proposal submission procedures, proposal evaluation, and organizational arrangements.
- Constructive suggestions for future seminars of this kind included a clear wrap-up (including notification of upcoming plans), broader participation by Ukrainian researchers, and advance communication regarding seminar arrangements and content.

Based on these results, the JICA survey team drafted the Joint Research Implementation Framework (including the proposal application form and proposal evaluation criteria) and shared them with the researchers at the seminar follow-up online meeting. The draft Joint Research Implementation Framework is attached as Appendix 2 to this report.

#### (5) Seminar Follow-Up Online Meeting

Based on the points raised during the seminar, an online follow-up meeting was held on February 10, 2026, to share the seminar evaluation results and the draft implementation framework for the joint research. The agenda was as follows.

- 11:00-11:05: Opening remarks (JICA survey team, PJAIT)
- 11:05-11:15: Summary of seminar evaluation results (JICA survey team)
- 11:15-11:35: Draft joint research implementation guidelines (JICA survey team)
- 11:35-11:45: Joint research proposal submission procedures, including formats, evaluation criteria, budget (PJAIT)
- 11:45-12:15: Q&A session
- 12:15: Closing remarks (JICA survey team)

The online meeting was attended by 14 researchers and doctoral students, along with the JICA survey team and PJAIT (including the Vice President and Coordination Unit). Of the 14 participants, 8 were from PJAIT, 2 from Sumy State University in Ukraine, and 4 from Hokkaido University, Kitami Institute of Technology, and Musashino University in Japan<sup>64</sup>. By academic rank, there were 5 professors, 3 associate professors, and 6 lecturers/researchers (including doctoral students). The main questions and answers from the online meeting are shown in the table below.

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<sup>64</sup> The State University of Information and Communication Technologies was unable to attend this time due to deteriorating local power conditions preventing stable internet connectivity. However, the university has indicated that its intention to participate in the joint research remains unchanged that it will resume discussions as soon as internet connectivity improves.

Table-68 Questions and Answers from the Seminar Follow-Up Online Meeting

| Questions                                                                                                                                          | Answers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What is the budget limit? Is there any indication of how the budget should be divided among the partners?                                          | <ul style="list-style-type: none"> <li>• The total budget for joint research is as shown on the slide. However, no budget ceiling has been set for individual joint research projects at this stage.</li> <li>• Specific budget allocations will be determined by each research team based on the research content, implementation structure, and related factors.</li> </ul>                                                                                                                                                                                                                                                                |
| How can additional Ukrainian research partners be contacted, and is support available to facilitate collaboration?                                 | <ul style="list-style-type: none"> <li>• The JICA survey team can assist in identifying and connecting with additional Ukrainian partners.</li> <li>• During this survey, a questionnaire survey was conducted targeting 20 Ukrainian universities. Through this process, the JICA survey team has established contacts with several Ukrainian universities. The JICA survey team also maintains close communication with the Ministry of Education and Science of Ukraine. If a research team presents a specific research idea, the Ministry may assist by introducing potential Ukrainian partner universities or researchers.</li> </ul> |
| Can the Ukrainian partner be an artistic group (e.g., an art collective) rather than an academic institution?                                      | <ul style="list-style-type: none"> <li>• Yes. Participation is not limited to academic institutions; arts organizations may also participate if their research content is appropriate.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Can costs related to producing and implementing research results (such as equipment procurement and prototype creation) be included in the budget? | <ul style="list-style-type: none"> <li>• Yes. Procurement costs for equipment and other items may be included within the scope required to conduct the research and generate outcomes.</li> <li>• However, equipment procurement is contingent on the outcome of ongoing discussions between the Polish and Japanese governments.</li> </ul>                                                                                                                                                                                                                                                                                                 |
| When is the deadline for proposal submission?                                                                                                      | <ul style="list-style-type: none"> <li>• The tentative deadline for the joint research proposal is March 20, 2026, however, this is not a strict deadline, and adjustments may be made as necessary.</li> <li>• Subject to the outcome of discussions between the Polish and Japanese governments, the new phase is expected to begin around August 2026.</li> </ul>                                                                                                                                                                                                                                                                         |
| If a researcher submits one proposal, may they also participate as a co-researcher in another proposal?                                            | <ul style="list-style-type: none"> <li>• Yes, this is permitted.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Source: Prepared by the JICA survey team based on the seminar follow-up online meeting

#### (6) Matters to Address and Points to Note in Conducting Joint Research

Through the seminar and the subsequent follow-up online meeting, meaningful opportunities for discussion with potential partners were created. In addition, the framework for implementing joint research was clarified, helping to stimulate researchers' motivation toward joint research. The researchers are currently progressing with the formation of research teams and the preparation of joint research proposals. The next phase is expected to involve joint research. To ensure smooth preparation and execution, the following points must be considered.

- If a time gap arises before the start of the next phase, measures should be taken to prevent a decline in researchers' motivation. This includes sharing the status of preparations for the next phase, including the status of discussions between the Polish and Japanese governments, with PJAIT (Vice President and Coordination Unit).

- The feasibility of equipment procurement and the applicable procurement methods will depend on the outcome of discussions between the Polish and Japanese governments, as already explained to PJAIT and individual researchers. Once details are finalized, they must be compiled into implementation guidelines and shared with PJAIT and each researcher.
- In principle, the JICA survey team understands that PJAIT can assume responsibility for equipment procurement and budget management. However, the appropriate management structure for joint research should be discussed with PJAIT based on the content of the joint research proposals.
- Communication among researchers, particularly between researchers at Ukrainian universities and those at PJAIT and Japanese universities, requires careful monitoring. Although internet connectivity is expected to stabilize as the power situation improves with the arrival of spring, real-time discussions remain difficult at present.<sup>65</sup> To prevent Ukrainian university researchers from becoming isolated under these circumstances, PJAIT and the JICA team should monitor the status of discussions within each research team and address issues as necessary.
- Researchers at PJAIT and Japanese universities have expressed strong interest in greater participation from Ukrainian universities and research institutions. As needed, support should be provided to recruit additional partner universities and research institutions by leveraging the networks of individual researchers and the Ukrainian Ministry of Education and Science.
- Rather than leaving collaborative research entirely to individual teams, it is important to plan opportunities for face-to-face interaction, such as interim reporting sessions and study tours in Japan and Poland, to sustain engagement among all researchers.

## **5. JICA's Medium- to Long-Term Support Measures**

### **5.1 Directions for the Medium-to Long-Term Support Measures**

According to post-training questionnaires and interviews with relevant parties, each pilot training achieved certain results and received high evaluations from the participants. Furthermore, the trial implementation of various training clearly identified areas for improvement needed for full-scale implementation. Based on these points, it is appropriate to plan activities that essentially continue or build upon the pilot training conducted under this survey as medium- to long-term support measures, as outlined in the table below. Furthermore, from the perspective of supporting Ukraine from both Poland and Japan, it is desirable to collaborate with NAWA to support the development of Ukrainian IT talent and assist Ukrainian refugees in Poland.

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<sup>65</sup> Although real-time communication remains difficult, email communication is possible. Accordingly, researchers have decided to continue discussions with Ukrainian researchers by adopting measures such as using collaborative document editing software for proposal creation, as well as sharing meeting recordings and related materials.

Table-69 Direction of Medium- to Long-Term Support Measures

| Support Measures                              | Direction of Medium- to Long-Term Support Measures                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Implementation of IT Business Skills Training | The training program will be conducted in the same manner as in 2025, with the following improvements. However, the training content will be reviewed before implementation to assess AI utilization trends and other factors and modified as necessary. <ul style="list-style-type: none"> <li>• Introduction of a level-based class system and introduction of advanced courses</li> <li>• Enhanced career and job counseling sessions</li> </ul> |
| Implementation of IT Diploma Courses          | Based on the 2025 course evaluation, similar activities will be implemented unless significant issues arise. In addition to the current activities, we will fully launch career and job counseling sessions.                                                                                                                                                                                                                                        |
| Trail Implementation of PBL/COIL Modules      | Among the COIL module proposals designed during PBL/COIL training under this survey, those that received high instructor evaluations and are feasible for implementation will be selected. These will be piloted as extracurricular classes.                                                                                                                                                                                                        |
| Implementation of Joint Research Projects     | As a follow-up to the seminar for joint research, proposals for joint research will be submitted, and some of them will be implemented as joint research projects among researchers from the three countries.                                                                                                                                                                                                                                       |

Source: Prepared by the JICA survey team

On the other hand, these medium- to long-term support measures must be implemented with due consideration for the reception environment in Poland and Ukraine. For example, if the legal stay period for Ukrainian refugees in Poland expires on March 4, 2026, it will be necessary to confirm the actual impact of the Polish government's policies on Ukrainian refugees. Furthermore, particular attention must be paid to the deterioration in Polish public sentiment toward supporting Ukrainian refugees, especially over the past six months.<sup>66</sup>

## 5.2 IT Business Skills Training

As described in “4.1 IT Business Skills Training,” the IT Business Skills Training conducted at PJAiT’s Warsaw and Gdańsk campuses under this survey received highly positive evaluations from both participants and lecturers. Therefore, the continued implementation of this training is strongly recommended as a medium- to long-term support measure. This is because PJAiT’s training management system has become increasingly refined and efficient with each implementation, while collaboration and trust with JICA have been further strengthened, enabling PJAiT to maintain and further develop a high standard of education as a specialized IT training institution. In addition, networks with relevant organizations—, including Polish governmental bodies, NGOs, and international agencies—, have steadily expanded, establishing a foundation for sustainable implementation.

Moreover, the fact that applications for the Python course exceeded three times the capacity, together with feedback received from both lecturers and participants, confirmed the strong demand for more advanced content as well as the high level of latent learning needs among refugees in Poland. Taking these results into account, it is considered desirable that future training courses be structured as follows:

- Excel and WordPress Courses: Implement a two-tier structure consisting of a Basic level and an Applied (Practical) level.

<sup>66</sup> Based on interviews with Polish NGOs and other organizations as of January 2026.

- Python Programming Course: Introduce a two-classroom system at each campus and divide the course into two streams; “Data Analysis Course” and “Web Application Development Course”.

Based on the above, a proposed course structure for the 2026 IT Business Skills Training is shown in the table below.

Table-70 Proposed Structure of the IT Business Skills Training in 2026

| Course                                                        | Learning Objective                                                                                                                           | Contents                                                                                                              | Duration              |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------|
| Business Data Analysis (Excel Fundamentals)                   | Acquire basic skills to organize and analyze business data using Excel, enabling accurate data processing and report creation.               | Worksheet/Workbook management; Data management; Table data; Formulas & functions; Graphs; Pivot Tables                | 2 weeks (8 sessions)  |
| Business Data Analysis (Practical Excel)                      | Acquire skills to effectively analyze real business data using Excel and utilize it to identify business issues and support decision-making. | Data preparation; advanced functions; Pivot Tables; Power Query; VBA automation; Final presentation                   | 2 weeks (8 sessions)  |
| Website Development (WordPress Fundamentals)                  | Acquire skills to design and build basic websites using WordPress.                                                                           | Basic WP site creation; themes/plugins; multilingual; basic security/SEO; final presentation                          | 2 weeks (8 sessions)  |
| Website Development (Practical WordPress)                     | Acquire practical skills for building, operating, and optimizing websites using WordPress.                                                   | HTML/CSS/JS basics; custom themes; plugin extension; analytics GA; security; SEO; SNS integration; final presentation | 2 weeks (8 sessions)  |
| Python Programming Fundamentals (Data Analysis)               | Acquire basic data analysis skills using Python through data processing, aggregation, and visualization.                                     | Syntax; OOP; NumPy/Pandas; Visualization; Streamlit dashboard; final presentation                                     | 4 weeks (12 sessions) |
| Python Programming Fundamentals (Web Application Development) | Acquire basic skills to design and build dynamic web applications using Python.                                                              | Syntax; OOP; Flask; SQLite; API integration; deployment; final presentation                                           | 4 weeks (12 sessions) |

Source: Prepared by the JICA survey team

Based on the above proposed training structure, the implementation plan for PJAIT Warsaw and Gdańsk campuses is shown in the table below. Under this plan, the training scale in 2026 will be further expanded compared to the current year. Each campus will operate six courses, and the total number of participants is expected to reach 216.

Table-71 Implementation Plan of the IT Business Skills Training in 2026

| Training Course                                                 | Training Period                  | Warsaw | Gdańsk | Total |
|-----------------------------------------------------------------|----------------------------------|--------|--------|-------|
| Business Data Analysis Course<br>(Excel Fundamentals)           | 2 weeks<br>(8 days of lectures)  | 20     | 16     | 36    |
| Business Data Analysis Course<br>(Practical Excel)              | 2 weeks<br>(8 days of lectures)  | 20     | 16     | 36    |
| Web Site Development Course<br>(WordPress Fundamentals)         | 2 weeks<br>(8 days of lectures)  | 20     | 16     | 36    |
| Web Site Development<br>Course(Practical WordPress)             | 2 weeks<br>(8 days of lectures)  | 20     | 16     | 36    |
| Python Programming Fundamentals<br>(Data Analysis)              | 4 weeks<br>(12 days of lectures) | 20     | 16     | 36    |
| Pytho Programming Fundamentals<br>(Web Application Development) | 4 weeks<br>(12 days of lectures) | 20     | 16     | 36    |
| Total                                                           |                                  | 120    | 96     | 216   |

Source: Prepared by the JICA survey team

### 5.3 IT Diploma Courses

As noted in “4.2 IT Diploma Courses,” this training program also received high satisfaction ratings from participants in the current year, and participant evaluations conducted by PJAIT were extremely positive. Therefore, it is recommended that this training continue to be implemented in the following fiscal year and beyond unless significant issues arise in the proposed assessment below.

In the next fiscal year, it is recommended that an assessment of this year’s trainees first be conducted with the cooperation of PJAIT. Based on this, questionnaire surveys and interview surveys should then be carried out for the trainees, and the results used to formulate the training implementation plan for FY2026.

### 5.4 Enhanced Career and Job Counselling Sessions

It remains difficult for Ukrainians to secure jobs matching their skills or gain work experience in Poland. However, discussions between NGOs and government agencies indicate that if the profiles of individuals can be thoroughly understood and the timing of corporate recruitment aligns with job seekers' availability, the current training programs could increase the likelihood of matching Ukrainian refugees with companies seeking personnel or interns.

Therefore, when conducting career and job counseling sessions within IT business skills training or IT diploma courses, the JICA survey team proposes detailing profiles to include desired industries/ positions, learning/ training history, and work experience. The JICA survey team also recommends establishing formal agreements with NGOs and government agencies regarding job counseling and planning multiple career/job counseling sessions combining in-person and online formats. Through this opportunity, the JICA survey team will support internship and employment opportunities for Ukrainian refugees. Since the timing of career and job counseling sessions must be adjusted to accommodate corporate schedules, a support period of one year or longer is necessary.

## 5.5 Distance Learning (Special Lectures)

As described in Section 4.3 “Distance Learning (Special Lectures),” this two-day webinar-style remote education program, which attracted more than 900 participants, received highly positive evaluations from both IT students and faculty members at Ukrainian universities. Many respondents also expressed a strong desire for the program to be continued in the future. Accordingly, the continued implementation of this remote education initiative (special lectures) is strongly recommended as part of medium- to long-term support measures.

Based on this experience, it will be important to develop a medium- to long-term implementation plan while improving and streamlining the lecture management system of the JICA survey team, which will transition into the Project Team in the forthcoming project phase, drawing on the valuable experience and lessons learned from the 2025 implementation. Furthermore, cooperation and trust with the Ministry of Education and Science of Ukraine, which worked closely with the program and provided extensive support, have been further strengthened through this initiative. As a result, a foundation is being established for medium- to long-term support aimed at enabling leading Ukrainian universities in the IT field to maintain and further enhance their high educational standards.

Based on these circumstances, the following table presents proposed options for the continued implementation of the special lecture series, which are expected to be considered as part of JICA’s medium- to long-term support measures.

Table-72 Proposed Formats for Continuing the Special Lectures beyond 2026

| Lecture Format                | Frequency      | Proposed Timing                                               | Duration                | Expected Participants            | Notes                                                                                                                                                                                                                         |
|-------------------------------|----------------|---------------------------------------------------------------|-------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Webinar Format                | Twice per year | First session: Early July<br><br>Second session: Late October | Approximately 2 days    | Up to 1,000 participants         | First session: Held after the spring semester, when exams and classes have concluded, allowing higher availability and participation.<br>Second session: Held after the fall semester begins, once schedules have stabilized. |
| Short-Term Intensive Training | Once per year  | Early July to mid-August                                      | Approximately 2–3 weeks | Approximately 20–30 participants | Held after the spring semester and exams, coinciding with the summer break, when students and faculty have greater availability and higher participation can be expected.                                                     |

Source: Prepared by the JICA survey team

As shown in the table above, the implementation formats can be categorized into two types: webinar-style sessions and short-term intensive training courses. The overall structure of the special lectures is expected to follow the four-track format used this year, with a proposed structure outlined in the table below. The table presents preliminary concepts for both the webinar sessions and the short-term intensive training courses for each track.

Table-73 Proposed Tracks for Continuing the Special Lectures beyond 2026

| Track                                      | Webinar Format                                                | Short-Term Intensive Training                                   | Notes                                                                                                                      |
|--------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Introduction to Advanced IT Technologies   | Half-day session held twice per year (2–3 lectures each time) | One 2–3 weeks course held once per year (1–2 lectures annually) | Training topics to be considered include quantum information theory, quantum computing implementation, and bioinformatics. |
| Applications of IT in Industry and Society | Half-day session held twice per year (2–3 lectures each time) | One 2–3 weeks course held once per year (1–2 lectures annually) | Training topics to be considered include IoT/AI applications in manufacturing and XR (VR/AR).                              |
| Business Collaboration with Japan          | Half-day session held twice per year (2–3 lectures each time) | -                                                               | Webinar sessions will involve ongoing expansion of the network of cooperating Japanese companies.                          |
| International Collaborative Education      | Half-day session held twice per year (2–3 lectures each time) | -                                                               | Continued participation and cooperation from NAWA and PJAIT will be recommended.                                           |

Source: Prepared by the JICA survey team

In planning the implementation of the special lectures (both the webinar-style sessions and the short-term intensive training courses) for the 2026 fiscal year, it is advisable to begin preparations in April 2026, considering the experience gained during this year's implementation and anticipating a launch in early July. An outline of the implementation roadmap for 2026, reflecting these considerations, is presented below.

Table-74 Proposed Implementation Roadmap for the Special Lectures in FY2026

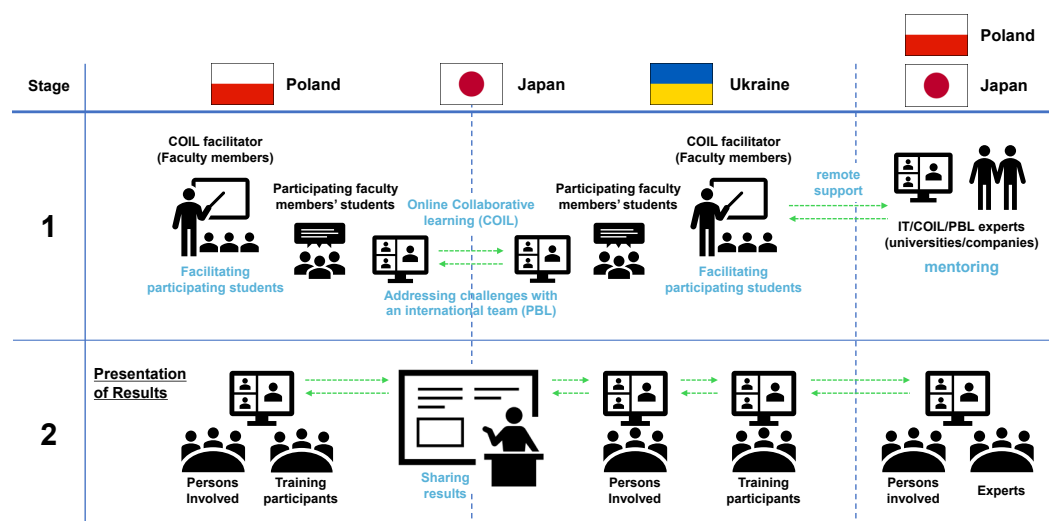
| Period         | Webinar Format                                                         | Short-Term Intensive Course         | Coordination with the Ministry of Education and Science of Ukraine           |
|----------------|------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------|
| April 2026     | Formulation of the detailed annual plan                                |                                     | Sharing the annual lecture plan and requesting dissemination of the lectures |
| May 2026       | Preparatory arrangements                                               | Preparatory arrangements            |                                                                              |
| June 2026      |                                                                        |                                     |                                                                              |
| July 2026      | 1st implementation (2 days)                                            | Training implementation (2–3 weeks) | Request participation in the opening remarks                                 |
| August 2026    | Preparatory arrangements                                               | Evaluation                          |                                                                              |
| September 2026 |                                                                        |                                     | Reporting of results (short-term intensive courses)                          |
| October 2026   | 2nd implementation (2 days)                                            |                                     | Request participation in the opening remarks                                 |
| November 2026  | Evaluation                                                             |                                     | Reporting of results (webinar format lectures)                               |
| December 2026  | Consideration of the implementation plan for the following fiscal year |                                     | Annual activity report and information sharing on next year's plan           |

Source: Prepared by the JICA survey team

## 5.6 Distance Learning (PBL/COIL)

The PBL/COIL training conducted under this survey concluded successfully, receiving high praise from participants. Additionally, multiple lesson plans (COIL module proposals) were developed during the training. Many training participants expressed a desire to continue implementing COIL-based education with Japan's support. Therefore, the JICA survey team proposes the implementation of COIL-based

education as a medium-to-long-term support measure. While the quality of PBL or COIL module proposals and the level of understanding among training participants vary, the motivation of those who complete the training is exceptionally high. Therefore, rather than cutting off Ukrainian participating universities based on fixed criteria, it is preferable to allow broad participation from the perspective of international collaborative learning. The figure below illustrates this concept.



Source: Prepared by the JICA survey team

Figure-58 Conceptual Diagram for Implementation of COIL-Based Education

However, introducing formal COIL-based education requires significant coordination to bridge differences in educational standards and semesters between universities in different countries. Therefore the JICA survey team proposes to first pilot COIL-based education over a 4-6 week period using time outside of regular classes. For participating universities in Ukraine, the universities where the PBL/COIL training graduates are affiliated will serve as the base. The theme will be determined through discussions between the participating universities in Japan and Ukraine, based on the draft PBL or COIL modules developed during this PBL/COIL training (Annex 3 and Annex 4).

The schedule for the pilot COIL-based education program is shown in the table below.

Table-75 Implementation Schedule for the Pilot COIL-Based Education Program

| Period                | Content                                                                                                                                                                             |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Before June 2026      | • Compiling the Pilot COIL concept.                                                                                                                                                 |
| June 2026             | • Through the JPN-COIL Council and other channels, advancing matching between Ukrainian and Japanese universities, provisionally determining participating universities and themes. |
| July–October 2026     | • Discussing and finalizing details such as module proposals.<br>• Recruiting participating students.<br>• Conducting additional training as needed.                                |
| October–December 2026 | • Conducting the pilot COIL for approximately 4-6 weeks.                                                                                                                            |
| January–February 2026 | • Evaluating the Pilot COIL.<br>• Discussing the feasibility of trials at other universities and expansion into formal COIL-based educational programs.                             |
| After March 2027      | • Preparing and supporting pilot programs at other universities and implementing formal COIL-based education programs as needed.                                                    |

Source: Prepared by the JICA survey team

## 5.7 Short-Term Training (Fellowship)

Through this survey, the capacity development of Ukrainian researchers was supported by facilitating exchanges with PJAIT and Japanese university researchers, enabling updates on the latest trends in each research field and the establishment of academic networks. Furthermore, the results of this survey revealed potential for joint research among researchers from the three countries in areas such as online harms, mis/disinformation, cybersecurity, and mental health conditions/biomarker discovery for depression and PTSD.

Based on these considerations, as a medium-to-long-term support measure, the JICA survey team proposes continuing to support the capacity development of Ukrainian researchers by formulating joint research plans, conducting joint research, and submitting papers, using the above research areas as candidates. The specific procedures and required timeframe are as follows.

Table-76 Procedures for Implementing Joint Research and Required Duration

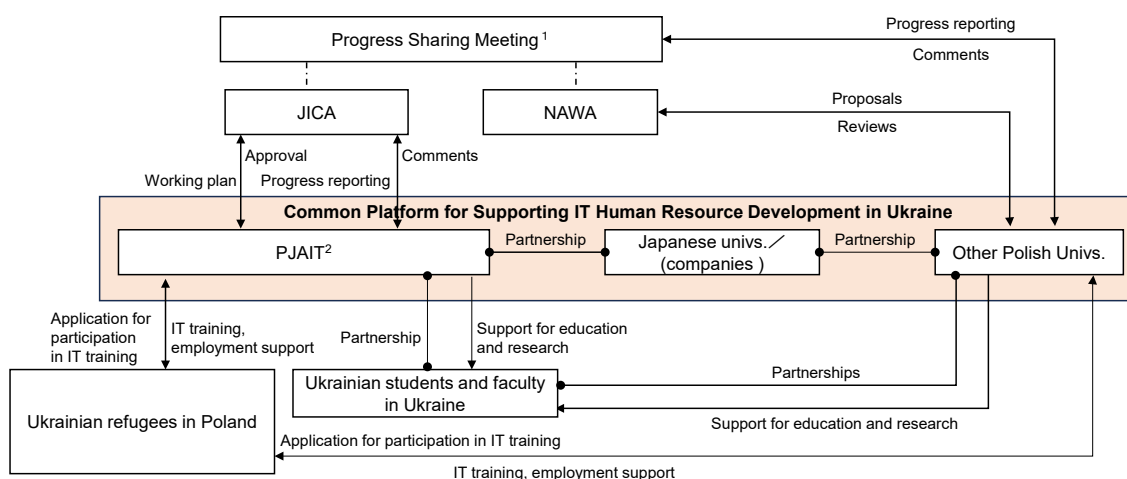
| No. | Procedure                                                                                                                                                                                                                              | Persons in charge                   | Duration   |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------|
| 1   | Revision of the draft Joint Research Implementation Framework (Based on the results of discussions between the Government of Poland and the Government of Japan, the current draft will be revised) and explanation to each researcher | JICA team / PJAIT Coordination Unit | 2 weeks    |
| 2   | Preparation of proposals for joint research                                                                                                                                                                                            | Each research team                  | 1.5 months |
| 3   | Evaluation of proposals for joint research                                                                                                                                                                                             | PJAIT representative(s) / JICA team | 2 weeks    |
| 4   | Preparation of joint research plans (minor revisions to joint research proposals)                                                                                                                                                      | Each research team                  | 2 weeks    |
| 5   | Implementation of joint research                                                                                                                                                                                                       | Each research team                  | 1.5 years  |
| 6   | Monitoring of joint research implementation                                                                                                                                                                                            | JICA team / PJAIT Coordination Unit | 1.5 years  |
| 7   | Evaluation of joint research outcomes                                                                                                                                                                                                  | PJAIT representative(s) / JICA team | Two weeks  |

Source: Prepared by the JICA survey team

## 5.8 Collaboration with NAWA

Throughout the implementation of this survey, progress and results were shared with NAWA on an ongoing basis. Concurrently, NAWA was involved in activities under the survey through cooperation such as dispatching lecturers for special lectures, participating in and providing congratulatory remarks at the IT business skills training graduation ceremony, and providing information on collaboration between Ukrainian and Polish universities.

As already discussed between NAWA and JICA, from the perspective of both Poland and Japan supporting Ukraine, it is desirable to collaborate with NAWA to support IT human resource development in Ukraine and assist Ukrainian refugees in Poland. Since JICA and NAWA have different support schemes, in practice, activities will be conducted under the common objectives of supporting IT human resource development in Ukraine and assisting Ukrainian refugees in Poland, based on their respective support schemes, as outlined in the structure below.



Note 1: The Ministry of Science and Higher Education of Poland and Ukraine will also be invited if necessary.  
Note 2: The JICA study team will work with PJAiT to implement the project.

Source: Prepared by the JICA survey team

Figure-59 Implementation Structure for Ukraine Support in Collaboration with NAWA

In other words, JICA provides support through schemes such as technical cooperation projects, collaborating with Japanese universities and companies via PJAiT. Meanwhile, NAWA uses its competitive programs to enable Polish universities, including PJAiT, to collaborate with Japanese universities and companies in providing support. Among NAWA's competitive programs, PROM, SPINAKER, and the Strategic Partnerships Programme are considered suitable for this purpose. An overview of these three programs is shown in the table below. It is noted that none of these programs is exclusively dedicated to supporting Ukraine.

Table-77 NAWA Competitive Programs Available for Ukraine Support

|                            |                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Program Name</b>        | <b>1. PROM -short term academic exchange (5-30 days)</b>                                                                                                                                                                                                                                                                                                |
| <b>Objectives</b>          | To improve the quality of education by implementing short-term international exchanges of staff, students and PhD students (fundingmobilities)                                                                                                                                                                                                          |
| <b>Eligible Activities</b> | participation in international conferences, teaching activities, preparing materials to doctoral thesis or research article, participation in summer schools and various forms of training (courses, workshops, study visits, etc.), archive/library searches, preparing international grant application, brokerage meetings with foreign partners      |
| <b>Duration</b>            | 12 months                                                                                                                                                                                                                                                                                                                                               |
| <b>Program Name</b>        | <b>2. SPINAKER -Intensive International Training Programmes (IITP)</b>                                                                                                                                                                                                                                                                                  |
| <b>Objectives</b>          | To enhance the quality of education due to short intensive programmes (IITP) in foreign languages                                                                                                                                                                                                                                                       |
| <b>Eligible Activities</b> | Preparing and implementing intensive programmes IITP, adaptation of existing programmes, developing competences of the staff (trainings, study visits) payment of scholarships for foreign students participatingin IITP, covering costof adaptation training for students organisation of lectures and classes (onsite and hybrid mode)                |
| <b>Duration</b>            | 6 -14 months                                                                                                                                                                                                                                                                                                                                            |
| <b>Program Name</b>        | <b>3. Strategic Partnerships Programme</b>                                                                                                                                                                                                                                                                                                              |
| <b>Objectives</b>          | To support higher education and science institutions in developing sustainable solutions for teaching, research and implementation cooperation implemented through strategic international partnerships                                                                                                                                                 |
| <b>Eligible Activities</b> | exchanges of students, doctoral candidates and staff; study visits, internships, summer/ winter schools, seminars, workshops etc.; preparation of new learning programmes and methods; developing quality management systems; promoting offer of Polish institutions abroad; supporting joint R&D activities; organising international conferences etc. |
| <b>Eligible Partners</b>   | 1 to 6 institutions, at least one strategic partner, which is a university or scientific unit located and registered abroad                                                                                                                                                                                                                             |
| <b>Duration</b>            | 12 -24 months                                                                                                                                                                                                                                                                                                                                           |

Source: Prepared by the JICA survey team based on NAWA materials

In these programs, projects are selected based on applications from Polish universities and evaluations by external reviewers. Since foreign universities are permitted to participate as partners in any of these programs, it is possible for Polish universities to collaborate with Japanese universities through these programs to support Ukraine in various ways. However, as NAWA's programs are competitive, NAWA cannot preemptively specify that proposed projects must focus on Ukraine support, nor can it designate Japanese or Ukrainian universities as partner institutions for Polish universities.

Regarding this matter, it is appropriate for NAWA and JICA to provide information to universities in the three countries and leave the decision to bid for the program to each university.<sup>67</sup> Specifically, the JICA survey team proposes gathering approximately three universities each from Poland, Ukraine, and Japan that are interested in supporting Ukraine, holding an online seminar, and introducing NAWA's programs. It is considered realistic to invite participation from Japanese universities and Ukrainian universities, centered on Polish universities that have already collaborated with Ukrainian universities through the NAWA program and that have cooperative relationships with Japanese universities through the Osaka Expo or academic agreements. Regarding the timing of the seminar, since the application period for the Strategic Partnerships Program proposal opens in December, it is desirable to hold the seminar around September.

Taking these points into consideration, the proposal for an online seminar co-hosted by JICA and NAWA is outlined in the table below.

Table-78 Proposed Agenda for Online Seminar Co-hosted by JICA and NAWA

|                                                                                    |                                                          |
|------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>Organizer</b>                                                                   | Co-hosted by NAWA and JICA                               |
| <b>Event dates</b>                                                                 | Around September 2026                                    |
| <b>Participating Universities</b>                                                  | Three universities, each from Poland, Japan, and Ukraine |
| <b>Seminar Agenda Draft</b>                                                        |                                                          |
| <b>Agenda</b>                                                                      | <b>Speakers</b>                                          |
| 1. Purpose of the Seminar (5 minutes)                                              | NAWA                                                     |
| 2. Introduction to NAWA programs and examples of collaboration (15 minutes)        | NAWA                                                     |
| 3. JICA's Support for Ukraine through PJAIT: results and achievements (15 minutes) | JICA/JICA team                                           |
| 4. Q&A Session (30 minutes)                                                        | Participants                                             |

Source: Prepared by the JICA survey team

<sup>67</sup> NAWA made this proposal, and the JICA survey team discussed the contents outlined in this section with NAWA. At the discussions, NAWA requested JICA's cooperation regarding outreach to universities in Japan for the seminar.

## **ANNEX**

## Annex 1 Document Screening for IT Diploma Training

For the document screening process, the JICA survey team examined and established a scoring method in advance to ensure fairness and transparency. The evaluation items included suitability, work experience, motivation, income, and age. Point allocations were set based on factors such as the relevance between previous work experience and career plans, alignment with the intended field, and learning motivation. This enabled all applicants to be evaluated according to consistent criteria. The specific scoring framework is shown in the table below.

Table-1 Scoring Method for Document Screening

| Item                                  | Calculation Method                                                                                                                                                                                                                                                                                                                         | Weight (Ratio) |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Motivation for Applying / Career Plan | <ul style="list-style-type: none"> <li>Quantification of enthusiasm and purpose assessed during document screening (Scores normalized and min-max scaled)</li> <li>Calculate the average of three evaluators from the JICA survey team</li> <li>Confirming the evaluation baseline using a mock motivation statement beforehand</li> </ul> | 0.6            |
| Date of Birth                         | Younger applicants are given preference, considering adaptability to cutting-edge technology (Normalized scores using Min-Max scaling)                                                                                                                                                                                                     | 0.2            |
| Income                                | <ul style="list-style-type: none"> <li>Preferential treatment given to those with lower incomes, considering the need for financial support (Normalize scores and apply inverse Max-Min scaling)</li> <li>Total of 2024 net annual income and government support amount</li> </ul>                                                         | 0.2            |
| Polish language proficiency           | <ul style="list-style-type: none"> <li>Prioritize applicants with language proficiency higher than B2 (Normalized scores with Min-Max scaling)</li> <li>Not included in score calculation (already pre-screened) (weight 0)</li> </ul>                                                                                                     | 0              |
| Nationality                           | Not included in score calculation as only Ukrainian nationals were pre-selected (weight 0)                                                                                                                                                                                                                                                 | 0              |

Source: Prepared by the JICA survey team

$$\begin{aligned}
 \text{Final Score} = & w_1 \times \left[ 1 - \frac{\text{Income} - \min(\text{Income})}{\max(\text{Income}) - \min(\text{Income})} \right] \\
 & + w_2 \times \left[ \frac{\text{Age} - \min(\text{Age})}{\max(\text{Age}) - \min(\text{Age})} \right] \\
 & + w_3 \times \left[ \frac{\text{Motivation} - \min(\text{Motivation})}{\max(\text{Motivation}) - \min(\text{Motivation})} \right] \\
 & + w_4 \times \left[ \frac{\text{Polish} - \min(\text{Polish})}{\max(\text{Polish}) - \min(\text{Polish})} \right]
 \end{aligned}$$

Final Score : Final evaluation score for document screening

W : Weight (ratio)

Income : Monthly income (sum of employment income + government support in Poland)

Age : Age (calculated based on date of birth)

Motivation : Motivation score (average rating by three JICA survey team members)

Polish: Polish language proficiency test level (B2 = 1, C1 = 2, C2 = 3)

Source: Prepared by the JICA survey team

Figure-1 Scoring Method for Document Screening

As shown in the table and calculation formula above, three items were set as evaluation criteria for the applicant selection process: motivation, income, and age. Each of these three elements reflects the following perspectives:

- “Motivation” : intention and aptitude to pursue a career in the IT profession
- “Income Level” : the degree of need for financial support
- “Age” : employment opportunity potential and anticipated social return

For the weighting of these evaluation items, the JICA survey team examined multiple literature sources and case examples<sup>68</sup> and established two final candidate options (Option A and Option B) as shown in the table below. The validity of both options was then comparatively reviewed.

Table-2 Proposed Weight Settings for Score Calculation

| Option (Policy)                                                   | Motivation | Income | Age (Date of Birth) |
|-------------------------------------------------------------------|------------|--------|---------------------|
| Option A: Balanced Approach (Conventional Proposal)               | 0.5        | 0.3    | 0.2                 |
| Option B: Motivation-Focused Type (The JICA Survey Team Proposal) | 0.6        | 0.2    | 0.2                 |

Source: Prepared by the JICA survey team

For the analysis, normalized data of the applicants who passed the Polish language screening was used, and scores were calculated based on each weighting option. Income was reverse-scaled on the assumption that “lower income indicates a higher need for financial support,” while the other two items were scaled in the standard manner. In addition, if the top 35 applicants would be selected as successful candidates, performance was compared using ROC-AUC to evaluate the consistency between the calculated scores and the assumed selection results. Furthermore, rank fluctuations between Option A and Option B were analyzed to confirm the impact of adopting Option B.

Table-3 Differences in AUC Values under Different Weight Settings

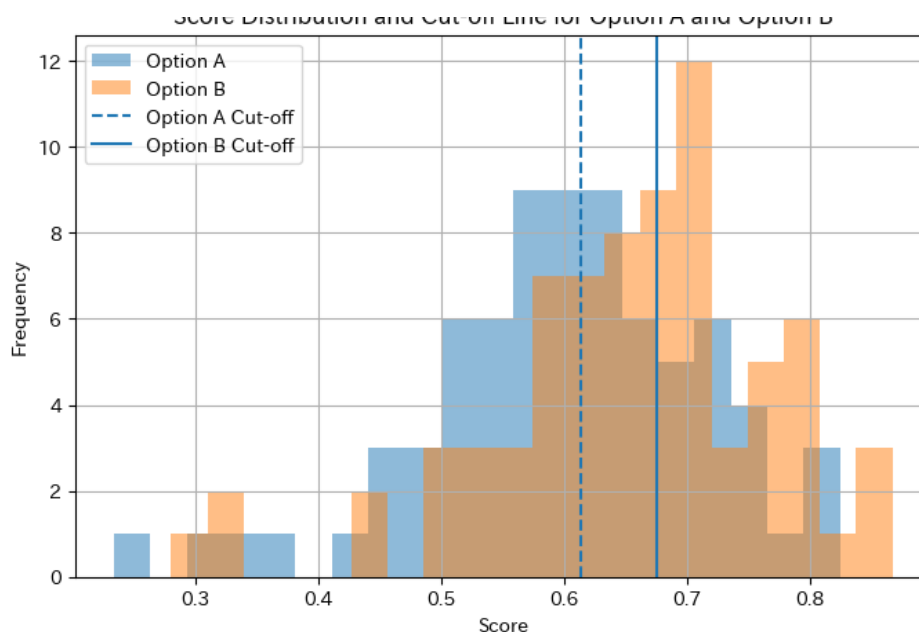
| Option (Policy)                                                   | Weight          | AUC Value | Classification Probability |
|-------------------------------------------------------------------|-----------------|-----------|----------------------------|
| Plan A: Balanced (Conventional Plan)                              | (0.5, 0.3, 0.2) | 1.0       | 100%                       |
| Option B: Motivation-Focused Type (The JICA survey team Proposal) | (0.6, 0.2, 0.2) | 1.0       | 100%                       |

Source: Prepared by the JICA survey team

As a result, in this analysis, both Option A (0.5, 0.3, 0.2) and Option B (0.6, 0.2, 0.2) yielded an ROC-AUC value of 1.0, indicating that both weighting configurations fully explained the successful candidate group. In other words, the two options showed equivalent consistency in numerical terms. However, Option B assigned a higher weight (0.6) to motivation, resulting in applicants with stronger motivation naturally ranking higher. In fact, under Option B, several highly motivated applicants (with motivation scores of 0.80–0.93) who were outside the passing range under Option A were newly included within

<sup>68</sup> See “Human Development Report 2021-22 HDI (Human Development Index)”  
<https://hdr.undp.org/content/human-development-report-2021-22>

the top 35. This aligns with the selection policy of this training, which places priority on motivation for pursuing IT professional careers.



Source: Prepared by the JICA survey team

Figure-2 Score Distribution and Passing Line by Weight Setting

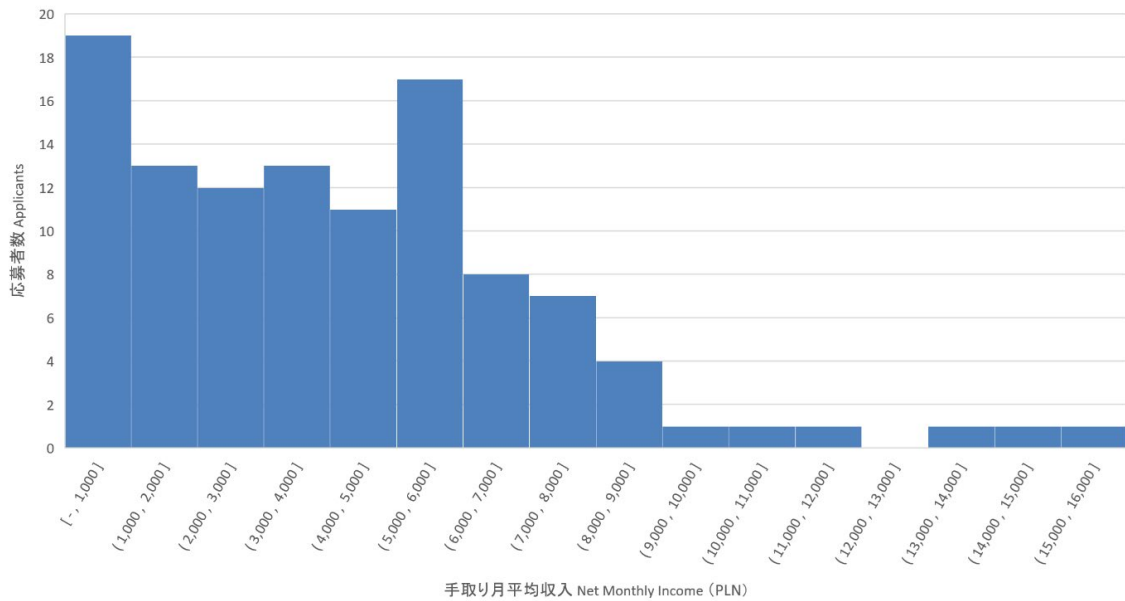
Based on the above analysis, Option B was ultimately adopted, as it was determined to be most consistent with the objective of this training program to support candidates with strong motivation to pursue IT professional careers.

Based on the responses submitted through the application form (n=110), the average monthly net income (converted to PLN) was calculated, and basic statistical indicators were compiled to understand the overall trend. The summary statistics are shown in the table below, and the distribution is presented in the figure below. As a result of this analysis, it was confirmed that the income data showed a relatively large standard deviation, with a notable degree of variation from the mean. Furthermore, the distribution did not exhibit a normal distribution shape. These findings suggest that there is considerable variation in income levels among the applicants, possibly reflecting differences in employment type, duration of employment, and degree of specialization.

Table-4 Basic Statistics of Applicants' Net Monthly Income (PLN)

| Item               | Value         |
|--------------------|---------------|
| Average            | 4,180 PLN     |
| Median             | 3,947 PLN     |
| Mode               | -             |
| Standard Deviation | 3,159         |
| Variance           | 9,978,953     |
| Minimum            | -             |
| Maximum            | 15,7421101101 |

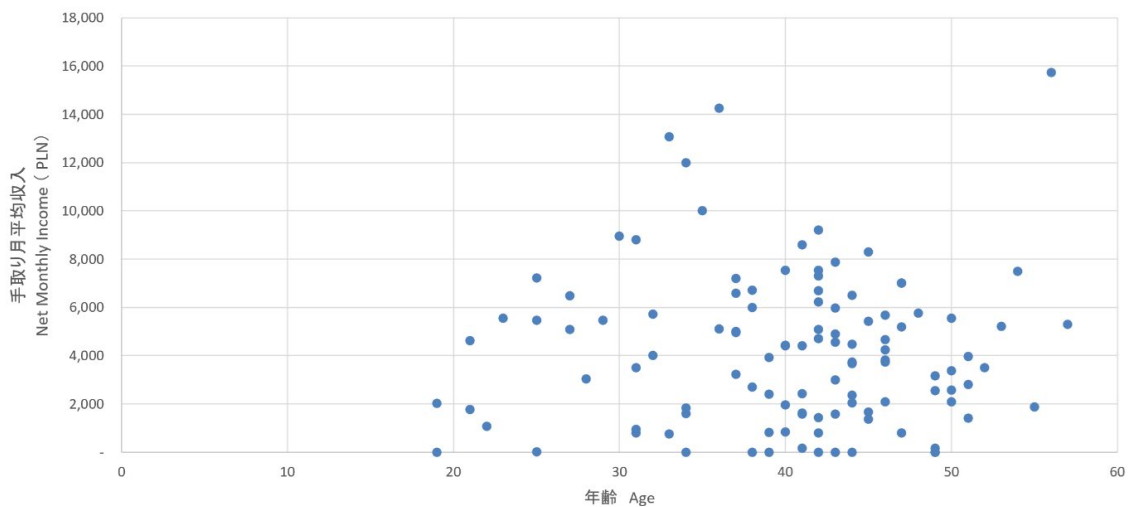
Source: Prepared by the JICA survey team



Source: Prepared by the JICA survey team

Figure-3 Distribution of Applicants' Net Monthly Income (PLN)

Furthermore, as shown in the scatter plot below (age vs. monthly net income), no clear correlation was observed between age and income (correlation coefficient: 0.01). This result suggests that income levels among applicants are not significantly influenced by age.

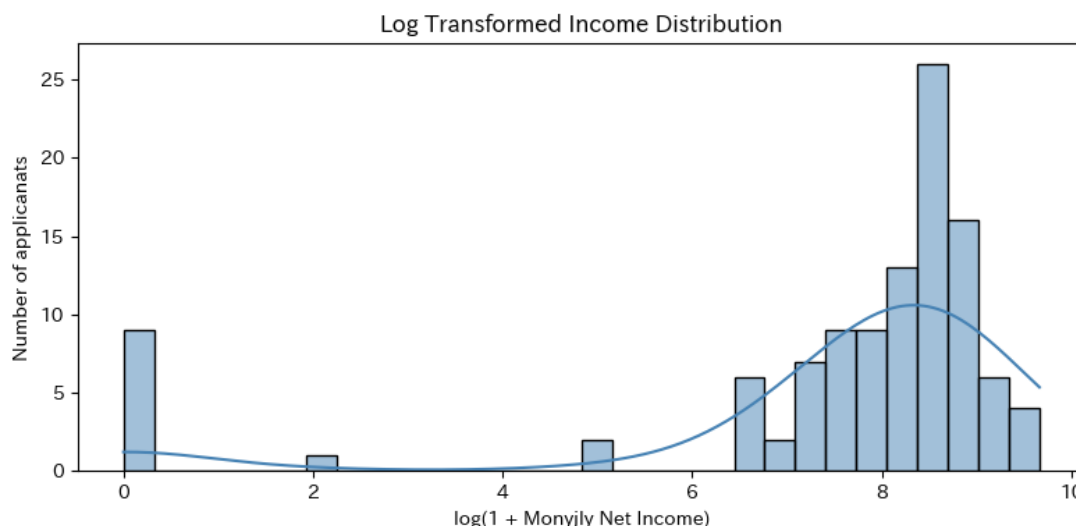


Source: Prepared by the JICA survey team

Figure-4 Scatter Plot of Age and Net Monthly Income (PLN)

As described above, the income data in this case cannot be regarded as a sufficiently large sample relative to the entire population of Ukrainian refugees in Poland and therefore has limitations in conducting highly accurate statistical analysis. Accordingly, as a supplementary approach, the income amounts were log-transformed, and an additional analysis was conducted assuming a log-normal distribution. As a result, although indicative, it became possible to segment the income levels into three groups (high / medium / low), and the analytical results are shown in the table and figure below. This

analysis suggests that the “medium income” group, located near the center of the distribution, had an average income of 4,287 PLN, indicating that income levels generally concentrated in the 4,000 PLN range. In other words, the peak of the normal distribution curve shown in the graph (with a horizontal axis value of approximately 8.36) represents the average income of the medium-income segment.



Source: Prepared by the JICA survey team

Figure-5 Distribution of Net Monthly Income (PLN) Based on Log-Normal Assumption

Table-5 Income Segmentation Based on Log-normal Distribution

| Income Segment | Sample Size | Average Income (PLN) | Median (PLN) | Standard Deviation (PLN) |
|----------------|-------------|----------------------|--------------|--------------------------|
| Low Income     | 34          | 1,557                | 1,613        | 754                      |
| Middle income  | 33          | 4,287                | 4,417        | 731                      |
| High Income    | 34          | 7,806                | 7,097        | 2,541                    |

Source: Prepared by the JICA survey team

According to the report “Poland: The Living and Economic Situation of Migrants from Ukraine in 2024,”<sup>69</sup> published in 2024 by the National Bank of Poland (NBP), the average monthly net income of Ukrainian refugees in Poland is approximately 4,000 PLN. Since the average income of applicants in this survey is close to this figure, it can be considered that the data collected in this survey reasonably reflects the actual situation of refugees residing in Poland. The report also indicates that the proportion of women accompanied by children is high, that their employment status tends to be concentrated in part-time work, and that regardless of age or length of stay, their income level remains lower compared with Polish citizens in similar situations. These findings suggest that a considerable number of applicants for this training program may be in similar employment and income circumstances. The analysis described above was conducted to verify the rationale and validity of including income as one of the selection scoring items.

<sup>69</sup> [https://home-affairs.ec.europa.eu/whats-new/publications/poland-living-and-economic-situation-migrants-ukraine-2024\\_en](https://home-affairs.ec.europa.eu/whats-new/publications/poland-living-and-economic-situation-migrants-ukraine-2024_en)

## Annex 2 Joint Research Implementation Framework Basic Information on Joint Research (Draft)

### Annex 2 Joint Research Implementation Framework Basic Information on Joint Research

The following content is subject to change depending on the outcome of ongoing discussions on the next phase of the project between the governments of Poland and Japan.

#### 1. Objective

To strengthen trilateral research collaboration and support the research development of Ukrainian researchers

#### 2. Eligible Topics

Any IT-related topics are eligible. Topics related to the challenges Ukraine will/has faced are desirable.

Research involving direct or indirect military applications (including dual-use technologies) are not eligible.

#### 3. Partner Institutions

Joint research among researchers from the three countries' institutions is desirable, on the assumption that researchers affiliated with Ukrainian universities are Ukrainian nationals.

Joint research between two countries (PJAIT and Ukrainian universities, or Japanese and Ukrainian universities) is also acceptable.

#### 4. Duration

1.5 years from August 2026 to January 2028

#### 5. Total Budget

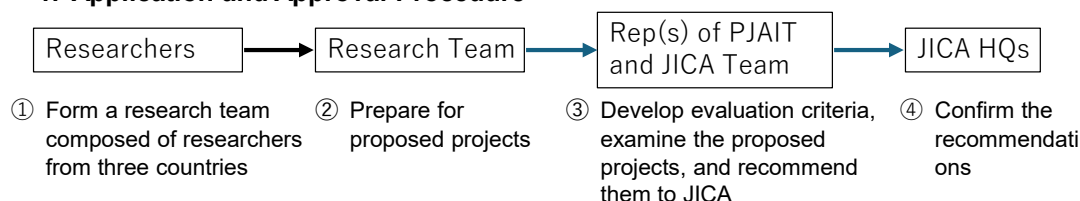
About 20 million yen (Approx. 130,000USD) for the research activities and 5 million yen (Approx. 32,000USD) for equipment

The budget for International travel for researchers will be separately secured.

1

### Joint Research Implementation Framework Application Procedures

#### 1. Application and Approval Procedure



#### 2. Content of the Application

- Title
- Team members, institutions
- Background issues
- Research objectives
- Expected output, application of output
- Methodology
- Work plan and timeline
- Budget plan

#### 3. Proposal Evaluation Criteria

Please refer to the slides on pages 4 and 5.

#### 4. Application Form

Please see the attachment.

2

## Joint Research Implementation Framework Proposal Evaluation Criteria

| Evaluation Items                                                      | Perspectives of Evaluation                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Relevance and Alignment                                            | Clarity of research objectives and alignment with project goals and international collaboration framework.                                                                                                                                                                                         |
| 2. Academic and Technical Quality                                     | Scientific soundness, originality, and appropriateness of research methodology.                                                                                                                                                                                                                    |
| 3. Feasibility within the research period                             | Realistic scope, timeline, and work plan achievable within one year.                                                                                                                                                                                                                               |
| 4. Quality of International Collaboration                             | Clear roles of Japan–Poland–Ukraine partners and added value of collaboration.                                                                                                                                                                                                                     |
| 5. Expected Outputs and Impact                                        | Clarity and feasibility of outputs (papers, presentations, pilot studies, etc.).                                                                                                                                                                                                                   |
| 6. Contribution to Addressing Ukraine's Current and Future Challenges | The extent to which the proposed research contributes to addressing current and/or future challenges faced by Ukraine, including but not limited to social, educational, technological, humanitarian, or reconstruction-related issues, through academic research and international collaboration. |
| 7. Budget Appropriateness                                             | Consistency between research activities and requested budget; compliance with rules.                                                                                                                                                                                                               |
| 8. Capacity Building and Future Potential                             | Contribution to researcher/student development and future collaboration potential.                                                                                                                                                                                                                 |

3

## Joint Research Implementation Framework Proposal Evaluation Criteria

### **JICA Compliance Checklist (Mandatory)**

Please confirm compliance with the following JICA requirements.  
Proposals that do not meet these conditions are not eligible for funding.

- The proposed research does NOT involve military, defense, or dual-use applications.
- The proposed activities are for peaceful and civilian purposes only.
- The budget excludes salaries or honoraria for the PI and co-researchers.
- The budget includes only eligible direct research expenses.
- The proposal complies with JICA regulations and ethical standards.
- The research team consists of researchers from three countries (Ukraine, Poland, and Japan) or at least two countries including Ukraine and Japan or Ukraine and PJAIT (Polish-Japanese Academy of Information Technology).

4

## Joint Research Implementation Framework Qualified Cost

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Direct Expenses:</b> Expenses directly necessary for conducting the research                                                                                                                                                                                                                                                                                                                                                                                   |
| <p>(Example)</p> <ul style="list-style-type: none"> <li>• Purchase of research equipment and consumables</li> <li>• Software required for data collection and analysis</li> <li>• Travel expenses for conferences or field surveys</li> <li>• Honoraria (for research collaborators, translation, data entry)</li> <li>• Printing and binding costs (papers, reports)</li> </ul>                                                                                     |
| <b>2. Indirect Expense:</b> Expenses required for the management and operation of the research institutions                                                                                                                                                                                                                                                                                                                                                          |
| <p>Indirect costs are budgeted as a fixed percentage of direct costs (15 % of direct expenses). Indirect expenses can be used for items such as the following:</p> <p>(Example)</p> <ul style="list-style-type: none"> <li>• Administrative support for research</li> <li>• Maintenance of facilities</li> <li>• Utilities related to research activities</li> <li>• Academic journal subscription fee, paper submission fee (article publication charge)</li> </ul> |
| <b>3. Prohibited Uses</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• Purchase of personal items</li> <li>• Any expenditure unrelated to the research purpose</li> <li>• Personnel costs for the principal investigator and co-investigator(s)</li> <li>• Food and beverage expenses</li> </ul>                                                                                                                                                                                                   |

5

## Joint Research Implementation Framework Reporting

| Reports         | Content                                                                                                                                                                                                                                                                                                                         | Timing                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Research plan   | <ul style="list-style-type: none"> <li>• Title</li> <li>• Team members and institutions</li> <li>• Research background</li> <li>• Research objectives</li> <li>• Expected output, application of output</li> <li>• Methodology</li> <li>• Work plan and timeline</li> <li>• Budget plan</li> </ul>                              | At the beginning of starting research projects |
| Progress report | Progress of research activities and the budget used                                                                                                                                                                                                                                                                             | Every six months                               |
| Final report    | <ul style="list-style-type: none"> <li>• Title</li> <li>• Team members and institutions</li> <li>• Research background</li> <li>• Research objectives</li> <li>• Output, application of output</li> <li>• Methodology</li> <li>• Work completed and timeline</li> <li>• Budget used</li> <li>• Future research areas</li> </ul> | At the end of the research projects            |

6

## Joint Research Implementation Framework Research Equipment

### 1. Location of equipment procured

This part is under consideration at JICA.

### 2. Where to procure the equipment

This part is under consideration at JICA.

### 3. Procurement Procedure

This part is under consideration at JICA.

7

## Joint Research Implementation Framework Research Answers to Questions

### 1. What is the qualified cost in such a project?

Please refer to the slide on Qualified Costs on page 5.

### 2. Can leaders count on personal financial support from the project?

As the slide of Qualified Costs on page 5 indicates, personnel costs for the principal investigator and co-investigator(s) are not eligible, but honoraria (for research collaborators, translation, data entry) will be covered by the project.

### 3. Can researchers from Ukraine be remunerated?

As the slide on Qualified Costs on page 5 indicates, researchers from Ukraine can't be remunerated.

### 4. If the equipment is purchased, where is its location – Poland, Ukraine, or Japan?

Under consideration by JICA.

### 5. How many years are such projects planned for?

Please refer to the slide on Basic Information on Joint Research on page 1.

8

## Joint Research Implementation Framework Research Answers to Questions

6. What is the procedure for submitting projects?

Please refer to the slide on Application Procedures on page 2.

7. Who decides whether or not to accept them?

Please refer to the slide on Application Procedures on page 2.

8. What is the frequency of progress reporting?

Please refer to the slide on Reporting on page 6.

9. What does the final report contain?

Please refer to the slide on Reporting on page 6.

10. Is it possible to include new partners from Ukraine and Poland (either individual researchers or institutions?)

Yes, it is possible.

11. Treatment of Intellectual Property Rights

Under discussion with JICA

## Joint Research Proposal Form– JICA Project

### Attachment 1 Joint research proposal form

| Details of the person preparing the Joint Research form: |  |
|----------------------------------------------------------|--|
| First and last name:                                     |  |
| University                                               |  |
| Department:                                              |  |
| Faculty:                                                 |  |
| Email:                                                   |  |
| Phone number:                                            |  |

| Joint Research title: |
|-----------------------|
|                       |

| Joint Research implementation period: (approx. 1.5 year) |
|----------------------------------------------------------|
|                                                          |

| Participating Countries: |
|--------------------------|
|                          |

| Lead Researcher (Name / Affiliation / Country): |
|-------------------------------------------------|
|                                                 |

| Co-researchers (Name / Affiliation / Country): |
|------------------------------------------------|
|                                                |

| Description of tasks of all partners (Max 200 words) |
|------------------------------------------------------|
|                                                      |

| Background and Purpose of the Joint Research: (Max 200 words)<br>Brief background of the research topic and objectives of the joint research. |
|-----------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                               |

| Research Content and Methodology: (Max 300 words)<br>Main research themes, methods, and division of roles among partners. |
|---------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                           |

| Expected Outputs and Outcomes: (Max 150 words)<br>e.g. Joint paper(s), conference presentation(s), pilot study, dataset, etc. |
|-------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                               |

| Significance and Value of the Joint Research: (Max 150 words) |
|---------------------------------------------------------------|
|                                                               |

## Joint Research Proposal Form– JICA Project

|                                                       |
|-------------------------------------------------------|
| Research Schedule: (approx. 1.5 year) (Max 100 words) |
|                                                       |

|                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------|
| Important information from the perspective of intellectual property rights to the project results: (Max 100 words) |
|                                                                                                                    |

|                                                                                            |
|--------------------------------------------------------------------------------------------|
| Other Joint Research-related information not listed above (if applicable): (Max 100 words) |
|                                                                                            |

### <Ethics and Compliance Declaration>

We hereby declare that the proposed research is conducted solely for peaceful and civilian purposes and does not involve military, defense, or dual-use applications.

The research activities comply with relevant JICA regulations, applicable laws and regulations, and standard research ethics guidelines.

All requested funds will be used exclusively for direct research-related expenses, and no salaries or honoraria for the principal investigator or co-researchers are included.

Any research activities requiring ethical review (e.g. involving human subjects, personal data, or sensitive information) will be conducted in accordance with the rules and procedures of the researchers' respective institutions.

We acknowledge that any violation of the above declarations may result in disqualification or termination of funding.

Name of Principal Investigator:

Affiliation:

Signature / Date:

### **Attachment:**

1. Project budget

## Attachment 2 Budget template attachment Joint research

### Budget Plan

Please provide a simple breakdown of the requested budget. Only direct research-related expenses are eligible.

- \* Indirect costs (Expenses required for the management and operation of the research institutions) shall be budgeted as a fixed percentage of direct costs (e.g., 15% of total direct expenses).
- \* Prohibited Uses: Purchase of personal items /Any expenditure unrelated to the research purpose/Personnel costs for the principal investigator and co-investigator(s)/Food and beverage expenses

| Category and name of the expense              | Name of the unit of measure | Number of units | Unit rate | Total |
|-----------------------------------------------|-----------------------------|-----------------|-----------|-------|
| <b>Travel/ Conference participation costs</b> |                             |                 |           |       |
|                                               |                             |                 |           | € -   |
|                                               |                             |                 |           | € -   |
|                                               |                             |                 |           | € -   |
|                                               |                             |                 |           | € -   |
|                                               |                             |                 |           | € -   |
|                                               |                             |                 |           | € -   |
| Total                                         |                             |                 |           | € -   |

|                                               |  |  |  |     |
|-----------------------------------------------|--|--|--|-----|
| <b>Supplies: Equipment Purchases/Licenses</b> |  |  |  |     |
|                                               |  |  |  | € - |
|                                               |  |  |  | € - |
|                                               |  |  |  | € - |
|                                               |  |  |  | € - |
|                                               |  |  |  | € - |
|                                               |  |  |  | € - |

|                                                                        |  |  |  |     |
|------------------------------------------------------------------------|--|--|--|-----|
| <b>Honoraria (for research collaborators, translation, data entry)</b> |  |  |  |     |
|                                                                        |  |  |  | € - |
|                                                                        |  |  |  | € - |
|                                                                        |  |  |  | € - |
|                                                                        |  |  |  | € - |
|                                                                        |  |  |  | € - |
|                                                                        |  |  |  | € - |

|               |  |  |  |     |
|---------------|--|--|--|-----|
| <b>Others</b> |  |  |  |     |
|               |  |  |  | € - |
|               |  |  |  | € - |
|               |  |  |  | € - |
|               |  |  |  | € - |
|               |  |  |  | € - |
|               |  |  |  | € - |

|                      |     |
|----------------------|-----|
| Total project costs: | € - |
|----------------------|-----|

## Annex 3 Proposed PBL Modules

### Participant 1

#### Fill in the blanks and design your PBL program

| Steps.                                                                                                                                                                                                                                                                                              | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The project focuses on developing an information system for the "Smart Shelter" - a dual-purpose infrastructure facility. Dual-Shelter functions as an educational co-working space in peacetime (or during periods of calm) and instantly transforms into a protective structure during air raids. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Identify Learning Goals                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>Hard Skills: System Modeling, Requirements Engineering, IoT Architecture Design and Digital Twin</li> <li>Soft Skills: Cognitive flexibility and complex problem solving, Team interaction in an Agile environment, Resilience and adaptability in a non-stable environment</li> </ul>                                                                                                                                                                                         |
| Craft the Driving Question                                                                                                                                                                                                                                                                          | <p>The Driving Question:<br/>           "How can we design an intelligent information system that can transform an open university space into an autonomous life support shelter in a matter of seconds (minutes), guaranteeing safety without compromising the educational process?"</p> <ul style="list-style-type: none"> <li>What data is critical for decision-making by a system without human intervention?</li> <li>How can the system operate when external networks are completely disconnected?</li> </ul> |
| Plan the Entry Event                                                                                                                                                                                                                                                                                | Request for Proposal from the Faculty administration (for example), smth like challenges. The optimal and rational project could be proposed on the City Administration level to be implement.                                                                                                                                                                                                                                                                                                                        |

Source: Larmer, J., Mergendoller, J.R. and Boss, S. (2015) Setting the standard for Project Based Learning: A proven approach to rigorous classroom instruction. Alexandria, VA: ASCD.

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#### Fill in the blanks and design your PBL program

| Steps                         | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Map Out Inquiry & Activities  | <p>The course structure is divided into sprints corresponding to the stages of system analysis</p> <ol style="list-style-type: none"> <li>1. Discovery: Students use stickers to model events in the domain</li> <li>2. Engineering Requirements: Role-Play Interviews: Instructor or invited experts play the roles of stakeholders</li> <li>3. System Modeling: Creation of use case diagrams and state diagrams using UML (for example). Emphasis on fault tolerance modeling</li> <li>4. Architecture and IoT: Building a virtual network of sensors and controllers. Configuring interaction logic</li> <li>5. Prototyping: Development of interfaces for two modes: "Peace" (seat reservation) and "War" (navigation, security status)</li> </ol> |
| Decide on Products & Audience | <p>Products: Software Requirements Specification, Comprehensive UML System Model, IoT Network Simulation (for example, Working Model in Cisco Packet Tracer or others), Interactive UI/UX Prototype</p> <p>Audience: University Administration, IT Companies, Security System Manufacturers, Student Self-Government, City Community and City Government</p>                                                                                                                                                                                                                                                                                                                                                                                            |

Source: Larmer, J., Mergendoller, J.R. and Boss, S. (2015) Setting the standard for Project Based Learning: A proven approach to rigorous classroom instruction. Alexandria, VA: ASCD.

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## Fill in the blanks and design your PBL program

| Steps                          | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Plan for Assessment            | <ul style="list-style-type: none"> <li>• Process assessments by Agile-Sprints, Daily Stand-ups</li> <li>• Requirements: Specification Review</li> <li>• Modeling: UML Diagram Analysis</li> <li>• Product: "Client Acceptance" Strategy</li> <li>• Soft Skills: Peer Review, Conflict Decision, Communication, conflict resolution, contribution to a common outcome.</li> </ul>                                                                                    |
| Plan for Reflection & Revision | <ul style="list-style-type: none"> <li>• Start/Stop/Continue: for example, after each phase, teams analyze which methods or decisions were effective and which should be abandoned.</li> <li>• Collective critique: before the final submission, students conduct inter-team question-and-answer sessions to find the product's weaknesses.</li> </ul>                                                                                                              |
| Prepare Scaffolds & Resources  | <ul style="list-style-type: none"> <li>• Visit (Open) Lecture or Seminars: involving an IoT specialist to explain the specific techniques</li> <li>• Template: requirements specification template with pre-filled sections and examples of non-functional requirements for security systems</li> <li>• UML Checklist: List of typical modeling errors</li> <li>• Event Storming Kit: Prepared boards in Miro/Lucidchart with a legend of sticker colors</li> </ul> |

Source: Larmer, J., Mergendoller, J.R. and Boss, S. (2015) Setting the standard for Project Based Learning: A proven approach to rigorous classroom instruction. Alexandria, VA: ASCD.

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## How the assignment will be evaluated:

| Design Step                       | 5 – Excellent                                                                                    | 4 – Good                                                        | 3 – Adequate                                           | 2 – Limited                                            | 1 – Beginning                            |
|-----------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|------------------------------------------|
| 1. Identify Learning Goals        | Learning goals are clear, specific, and connected to both content and 21st-century skills.       | Goals are mostly clear and related to learning outcomes.        | Goals are stated but somewhat general.                 | Goals are vague or incomplete.                         | No clear learning goals identified.      |
| 2. Craft the Driving Question     | The question is open-ended, meaningful, and promotes inquiry and creativity.                     | The question is open-ended and connected to real-world context. | The question allows limited inquiry or lacks focus.    | The question is closed or unclear.                     | No Driving Question provided.            |
| 3. Plan the Entry Event           | Entry event is engaging, authentic, and directly tied to the Driving Question.                   | Entry event is engaging but somewhat general.                   | Entry event connects to topic but lacks clear purpose. | Entry event is minimal or unrelated to the project.    | No entry event planned.                  |
| 4. Map Out Inquiry & Activities   | Activities show a clear sequence from inquiry → research → creation → presentation → reflection. | Flow is logical and mostly supports learning.                   | Flow is understandable but lacks coherence.            | Activities are disconnected or superficial.            | No clear activity plan.                  |
| 5. Decide on Products & Audience  | Final products are authentic and intended for a real or meaningful audience.                     | Products are relevant and clear but audience is limited.        | Products are simple or audience not well defined.      | Products are unclear or unrealistic.                   | No product or audience identified.       |
| 6. Plan for Assessment            | Assessment methods align with goals and include both formative and summative feedback.           | Assessment plan is clear but limited in variety or timing.      | Assessment is mentioned but not well linked to goals.  | Assessment is vague or only final.                     | No assessment plan included.             |
| 7. Plan for Reflection & Revision | Reflection and feedback are integrated throughout the process, guiding improvement.              | Reflection opportunities are planned but not continuous.        | Reflection is limited or only at the end.              | Reflection mentioned but unclear in timing or purpose. | No reflection or revision opportunities. |
| 8. Prepare Scaffolds & Resources  | Scaffolds and resources are well prepared, targeted to learning needs, and adaptable.            | Appropriate supports are identified and timely.                 | Some resources provided but not well matched to needs. | Supports are minimal or generic.                       | No scaffolds or resources prepared.      |

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## **Participant 5**

### **PBL Assignment**

#### **1. Identify Learning Goals**

##### **Key Knowledge & Understanding**

- Understand the core principles of Artificial Intelligence and its applications in information and documentation systems.
- Learn how to work with datasets, conduct basic data analysis, and interpret results.
- Gain knowledge of how to design intelligent services (classification models, recommendation systems, chatbots).
- Understand ethical, legal, and social aspects of AI usage in educational environments.

##### **Key Success Skills**

- Teamwork: effective role distribution, cooperation, and peer support.
- Critical thinking: asking deep questions, justifying decisions, evaluating evidence.
- Communication: preparing presentations, pitching a project to an external audience.
- Self-management: planning tasks, monitoring progress, meeting deadlines.

##### **Why use PBL?**

Because this topic requires students to investigate a real problem, gather information, test hypotheses, and design authentic AI-based solutions — something that cannot be achieved through lecture-only formats.

#### **2. Craft the Driving Question**

##### **Driving Question:**

**“How can we design an AI-based service that meaningfully addresses a real problem in our university community?”**

##### **Alternative options:**

- “How can Artificial Intelligence improve communication and learning processes in our university?”
- “What intelligent tool can we develop to support students and teachers more effectively?”

### 3. Plan the Entry Event

#### Entry Event (Launch Activity):

1. **Short introductory video** (2 minutes) showing how AI tools support universities worldwide (chatbots, analytics, automation).
2. **Mini-discussion:**  
*“What problems or challenges do students and teachers face in our university?”*
3. Presentation of the **Driving Question**.
4. Forming teams + initial brainstorming:
  - What problem could AI realistically solve here?
  - Who would benefit from it?

### 4. Map Out Inquiry & Activities

#### Week 1 Exploration

- User needs analysis (surveys, interviews).
- Create an **As-Is Map** of the current situation.
- Define the **To-Be vision** (ideal state).

#### Week 2 Definition

- Formulate a clear problem statement.
- Conduct **cause analysis** (fishbone diagram).
- Select one key issue to focus on.

#### Week 3 Ideation

- Generate possible AI-based solutions.
- Choose the type of AI tool (chatbot, classifier, recommender, prediction model).
- Create quick prototypes (Figma, Miro).

#### Week 4 Building

- Develop a minimal functional prototype (no-code tool or Python notebook).
- Test the prototype with a small group of users.

#### Week 5 Presentation

- Prepare the final presentation.
- Rehearse with peer feedback.
- Present the solution to external stakeholders.

## 5. Decide on Products & Audience

### Final Product

- A working AI-based prototype (e.g., chatbot, recommendation engine, automated classifier).
- A 7-10 minute presentation describing:
  - the problem,
  - the research process,
  - the solution and its AI logic,
  - expected impact.

### Audience

- University faculty members.
- IT specialists or digital transformation staff.
- Representatives of the university's startup or innovation center.
- Students - potential end users.

## 6. Plan for Assessment

### Formative Assessment

- Feedback after each project stage.
- Use of checklists and guiding questions.
- Mentor consultations during the development process.

### Summative Assessment

Evaluation criteria:

- Depth of problem analysis and research.
- Creativity and feasibility of the AI solution.
- Technical logic of the prototype.
- Clarity and persuasiveness of the presentation.
- Quality of teamwork and collaboration.

## 7. Plan for Reflection & Revision

### Team Reflection

- How did we communicate and divide responsibilities?
- What helped our team function well?

- What challenges did we encounter and overcome?

### **Individual Reflection**

- What new knowledge or skills did I gain?
- How did I contribute to the team?
- What would I like to improve for future projects?

## **8. Prepare Scaffolds & Resources**

### **Skills students may need support with**

- Data analysis basics.
- Introduction to Python or no-code AI tools.
- Prototyping in Figma/Miro.
- Presentation and pitching skills.

### **Scaffolds**

- Templates: Problem Statement, As-Is/To-Be map, Fishbone diagram.
- Examples of successful AI solutions.
- Checklists for evaluation.
- Mini-lessons on technical topics.

### **Resources**

- Google Colab / Kaggle datasets
- ChatGPT / Gemini
- Figma / Miro
- Interviews with real users

## Participant 6

### PBL Course Design: Deep Learning in Computer Vision



#### Identify Learning Goals

##### Key Knowledge:

- Convolutional Neural Networks (CNNs)
- Object Detection (YOLO, SSD)
- Image Segmentation

##### Key Success Skills:

- Collaborative coding (Git/GitHub)
- Critical thinking in model evaluation
- Managing trade-offs (Speed vs. Accuracy)
- Professional presentation skills

#### Craft the Driving Question

Define target audience and specific needs. After these create driving questions. For example:

- How can we design AI-powered vision system to improve safety and quality of life?
- How can AI help support accessibility for people with disabilities?
- How can computer vision improve quality control in manufacturing or agriculture?

## Plan the Entry Event

- **The Hook:** Students watch a short video showing how computer vision helps people across different areas.
- **Task:** Announcing an open challenge to develop an AI-powered computer vision solution for a real-world problem.
- **The Challenge:** Student teams act as AI Solution Consultancies. Their mission is to investigate a problem, explore available visual data, and propose an innovative vision-based system that delivers measurable impact.
- **Students Activity:** Students review a set of sample images or short video clips representing different challenge areas (e.g., environment, safety, accessibility, logistics, manufacturing). They brainstorm around a prompt such as: “How can we design AI-powered vision system to improve safety and quality of life?”
- **Goal** Trigger curiosity: “Wow, can we really build something like this?”

## Map Out Inquiry & Activities

- Week 1: Kickoff & Team Building
- Week 2: Define the Problem & Dataset
- Week 3: Deep Learning Foundations
- Week 4: Model Selection & Training
- Week 5: Evaluation & Iteration
- Week 6: Prototype Development
- Week 7: Final Polish
- Week 8: Public Presentation

## Decide on Products & Audience

Product:

- A working GitHub repository with reproducible code.
- A live demo processing a video stream.
- A technical white paper explaining model choices.

Audience:

- Industry partners
- Technology organizations
- Local government authorities
- University mentors
- Other CS students

They will provide authentic feedback and critique.

## Plan for Assessment

### Formative (Ongoing):

- Weekly Standups (Agile methodology)
- Code Reviews
- Model Performance Logs (mAP scores)

### Summative (Final):

- **Technical Rubric:** Code modularity, Model accuracy/latency trade-off
- **Presentation Rubric:** Clarity, Storytelling, Visuals
- **Collaboration Rubric:** Peer reviews on team contribution

## Plan for Reflection & Revision

- Midterm Reflection
- Final Reflection
- Individual Reflection
  - 'What technical concept did I struggle with most?'
  - 'How did I support my teammates during the crunch time?'

## Prepare Scaffolds & Resources

- Google Colab Starter Notebooks
- Datasets
- Examples of model design
- Team assignment templates
- Rubrics and guidance materials

## General context

- A course in Software Engineering bachelors program
- Aimed at second-year students
  - Could be adapted for first-year or third-year students, by making required results simpler or more complex
- Students already have basic knowledge of programming and general ideas about software engineering, but not enough experience with realistic projects
- Many students (and their parents) want their university studies to help with getting IT job
- However, many students feel intimidated by complexities of modern software development and unsure if they can become software developers
  - Too many technologies to study
  - Too many applications already developed – why develop something new?
  - By the time the students graduate, will AI take all the software development jobs?
- Students are afraid to try developing ambitious projects (because they may fail), feel that they lack experience – but if they never try, how will they get that experience?
- Software development companies are taking less entry-level job candidates (interns, junior developers) – because these roles could be filled by AI; getting job requires prior experience, but how to get prior experience without getting a job first?

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## 1. Identify Learning Goals

1. Students should learn to invent or identify the ideas for software applications that solve real-world problems
2. Students should learn to identify and specify requirements for software projects
3. Students should learn to pick the suitable technologies to develop their applications, and develop solution architecture
4. Students should learn to use AI tools to develop application prototype based on the requirements
5. Students should learn to work as a software development team using modern development processes (such as Agile) to implement a simple project

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## Why use PBL and not direct instruction?

| Learning Goal                                              | What can be taught by direct instruction                                                                                                    | Why PBL?                                                                                 |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| LG1. Suggest project ideas                                 | Conducting brainstorming session<br>Format of vision document                                                                               | Get experience with brainstorming project ideas<br>Evaluate project ideas by prototyping |
| LG2. Identify and specify requirements                     | Possible formats for specifying requirements                                                                                                | Get experience with requirements for a concrete project<br>Prioritize requirements       |
| LG3. Pick suitable technologies, develop architecture      | Most popular technologies and architectures used for different subject domains<br>Details of concrete technologies (LG3+4)                  | See how technology choice helps (or hinders) developing application prototype            |
| LG4. Develop prototype with AI tools                       | ??? (currently this is rarely taught – most teachers assume that students are already more familiar with AI tools than teachers themselves) | Get experience of what AI can and can't do<br>Quickly test ideas by developing prototype |
| LG5. Work in team using Agile software development process | Team roles, communication tools, processes/methodologies for developing software in teams                                                   | Experience of working in team<br>How to resolve issues and conflicts arising in teams    |

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## 2. Craft the Driving Question

- Main question: “There are so many apps already developed – is it possible to invent something new?”
- Sub-questions, leading questions
  - “To get a job in software development company, you need some experience – how can you get it? Could you do some side projects that will showcase your skills?”
  - “Many side projects are either too generic – such as todo apps, personal finance managers, web shops etc. – or copies of existing apps. Do you think such projects can help you when looking for a software development job? Do they show that you have relevant skills? Especially now when AI tools can generate such generic apps with a simple prompt?”
  - “Can meaningful applications be developed only by experienced developers or companies? Could you, as relative beginners in software development, create something that will be useful for real-world users?”
  - “Could you create something that is better than existing apps (including those developed by big companies)? You probably can't develop as many different features, but could you find one single feature that is feasible to develop, yet missing in existing apps? Or maybe some combination of existing features that currently require using different apps?”
  - “You are using existing apps all the time – can you see something in user experience that is missing, or could be improved?”
  - “You have an idea for some feature – how can you quickly see if it will work? Could you use modern AI tools to create a prototype?”
  - “Most meaningful applications are too complex to create by a single AI prompt – but could you first ask AI to split it into smaller parts, and then implement each part and integrate them together?”

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### 3. Plan the Entry Event

- Assume that entry event will be held on the first planned lesson (start of semester), with possible additional activities in asynchronous fashion
  - It may be better if it is possible to find more time for this event, but current study programs typically don't allow such longer events
- Few days before the first lesson, send to students a questionnaire form, asking about their previous experience in development, areas of interest and "how they see themselves in 5 years"
- Start lesson by sharing aggregated results of questionnaire
  - Hopefully it shows that most students see themselves either working in software development companies, or perhaps in startups
  - Teacher may need some creative ways of dealing with unusual answers
- Talk about current state of software development industry and challenges it faces
- Invited speakers – 1-2 former students who are now working in software development companies
  - If possible – one speaker from large outsourcing company and one speaker from product-oriented startup (to show different aspects of modern development)
  - Maybe current students can submit questions to invited speakers beforehand, and speakers try to answer them (asking questions during their talk is better, but may take too much time)
- Discuss what invited speakers told, stress importance of doing meaningful projects
- Introduce the driving question
- Tell students that teachers hope that projects students develop during this course will not only give them high grades in this course, but also provide something they will be not "ashamed" to show when seeking IT jobs
  - And hopefully students will develop more such projects on their own, or as part of further courses

### Forming teams

- Teacher may suggest teams, based on questionnaire results
  - Students interested in **same** subject domain
  - Students with experience and interests in **different** areas of development – e.g. backend, frontend, database, DevOps, testing, interacting with users, ...
- If students already have worked as a team – they may choose their own team
- Maybe additional activity – first identify team leaders (based on questionnaire results, possibly grades from previous courses), then these leaders pick team members from "pools" based on development areas – backend, frontend, ...'
- What to do with those students who failed to fill questionnaire, or provided generic answers?
  - Try talking to them individually, see if there are some issues that could be resolved
  - These students are potential "freeriders" who may fail the course, but also create issues for other students in their teams
  - Distribute them evenly among teams (and hope they will pick interest during projects)?
  - Or put them into a single team (expecting that such team may fail, but maybe they will get additional motivation to succeed as "underdogs" who nobody expects to do anything – and they will prove everyone wrong)

## 4. Map Out Inquiry & Activities

- Start by developing some project ideas – LG1
  - Existing ideas from different students
  - Brainstorming sessions
  - Talk to potential users – relatives, former students, teachers in different courses, local communities etc.
  - AI suggestions – but show students that currently they are too “generic” and “boring”, can use as starting point, but not as final idea
- Pick a single idea that the team will work on – LG1
  - Maybe keep a list of other ideas
  - It is possible that a team will want to “pivot” to a different idea during project development - such list will be useful
- Identify requirements – LG2
  - Research similar products already existing
  - Talk to potential users
  - Try to use similar products themselves and identify issues
- Prioritize requirements – LG2
  - Agile approach – don’t try to plan all features to develop before starting development, instead pick highest priority tasks and implement as many as possible – LG5
- Distribute tasks among team members – LG5
- Develop prototype using AI tools – LG4
  - Pick technology stack (possibly asking AI what to pick) – LG3
  - Develop general architecture, define components – LG3
  - Use requirement specifications as prompts
- Test prototype themselves, show prototype to users, gather their feedback, try to improve prototype – LG2, LG5
- Present their prototype at the end of semester
- Hold retrospective sessions to reflect on their experiences – LG5

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## Approximate time distribution

| Week | Activities                                                                                  | Week | Activities                                                                                                                                                                                  |
|------|---------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Intro, entry event, start forming teams                                                     | 8    | Finalize gathering initial feedback from users, intermediate retrospective, are changes needed? (requirements priorities, maybe add new requirements, in extreme cases pivot to a new idea) |
| 2    | Finalize teams, start brainstorming and researching project idea                            | 9    | Continue with implementation, start integrating final product                                                                                                                               |
| 3    | Finalize project ideas, pick what to work on, start working on requirements                 | 10   | Finalize integrating final version, show it to users, start gathering feedback                                                                                                              |
| 4    | Finalize some requirements, priorities, start working on architecture, start implementation | 11   | Finalize gathering feedback, work on presentations                                                                                                                                          |
| 5    | Finalize architecture, continue with implementation, perhaps start integrating              | 12   | Final presentations and demos – round 1 (teams who are ready first)                                                                                                                         |
| 6    | Produce some working version of product, continue with implementation                       | 13   | Final presentations and demos – round 2 (teams who were not ready for round 1, maybe second chances for those in round 1 who want to improve)                                               |
| 7    | Show initial version to users, start gathering feedback, continue with implementation       | 14   | Final retrospective                                                                                                                                                                         |

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## 5. Decide on Products & Audience

- Main outcome is working prototype
  - Hopefully deployed in such way that end users can easily try it out – public web site, published in app stores etc.
- Students are encouraged to continue working on these projects after the end of this course, perhaps to use in other courses, diploma projects etc.
- For each project, some “real users” should be found (suggested by students or teachers)
  - Other students
  - Their relatives, friends
  - Teachers from different courses (including those unrelated to software development – math, foreign language, humanities etc.)
  - University administration
  - Local communities, non-government organizations, volunteers
  - Representatives from software development companies
- Students show the developed prototype to these users, try to get them to use it in real-world scenarios, gather feedback
- If possible – some of these users are invited to end of semester demo, or at least asked to provide feedback beforehand

## 6. Plan for Assessment

- Formative assessment (during project)
  - Simple tests/quizzes about relevant topics (vision document – LG1, requirements specification - LG2, architecture – LG3, developing components, integrating components, testing, deployment – LG3+4, development process - LG5)
  - Questions themselves could be easily “answered” with AI – but also ask students to provide examples from their current project
  - Also feedback and questions from teacher based on current state of projects – students are encouraged to show their progress each week
- Final assessment (end of semester)
  - Project idea (LG1) – is it really useful for end users? Does it provide some new features (or new combination of features) compared to existing projects?
  - Requirements (LG2) – are they clearly stated? Are there some unneeded requirements, or obvious requirements that are missing? Are requirements properly prioritized?
  - Technology aspects (LG3) – is chosen tech stack meaningful for this project idea and previous experience of team members? Does final presentation explain why such stack was chosen? Is architecture relevant? Are there obvious and easy-to-fix tech issues? (but remember that final outcome is a prototype, don't focus too much on feature completeness and lack of bugs)
  - Implementation (LG4) – was it possible to implement all chosen requirements using AI tools? (it is expected that some features will be easier to implement, and other harder – can student identify such situations and find a way to resolve them? Or maybe switch to other features on time?)
  - Team work (LG5) – were all team members providing meaningful contribution? Did they follow some development process? Was time planning adequate, or did the team spend too much time on some parts of project and therefore unable to complete other parts?

## Failure is a learning opportunity

- Some parts of a project may fail
  - Project idea too vague, or too complex to implement
  - Too many requirements
  - Bad priorities
  - Bad choice of technologies
  - Implementation issues
  - Failure to gather feedback from users
  - Time management issues
- Teacher should identify such situations early
  - Don't tell students outright – ask leading questions instead
  - If they insist on doing it their way – let them, but try to think how they could recover later
- Final product will not be ideal – this is expected
  - It is better to pick an ambitious idea and implement 5-10% of it, than to pick something boring and implement 90-100% of it
  - This should be reflected in assessment criteria, and explained to students at the start of the course

## 7. Plan for Reflection & Revision

- Initial questionnaire – reflect on previous experiences
- Two retrospective sessions – in the middle, at the end
  - As a team, identify what was going well, what needs to be improved, what new ideas could be tried
  - See how results of first retrospective helped in the second part of project
- Students are encouraged to ask the teacher questions about their projects
  - Last few years, this seems to be a big issue – students are less willing to ask questions, maybe motivate them by showing interesting questions from previous years?
- Teacher observes projects and provides some feedback on relevant parts (based on formative assessment results)

## 8. Prepare Scaffolds & Resources

- What skills the students may lack
  - Researching and brainstorming project ideas
  - Identifying and specifying requirements
  - Prioritizing requirements
  - Choosing technologies
  - Creating solution architecture, decomposing into components, defining their interactions
  - Implementing features using different tools, frameworks and libraries
  - Testing
  - Team work, communication
  - Time management
- Actually a lot of skills may be missing – the idea of this course is to show students how they can do something meaningful even if they don't have any previous experience

## Resources to prepare

- Examples of project ideas (from previous years, created by teachers, suggestions from AI)
  - Encourage students not to copy previous ideas, but to use them as starting points for research and brainstorming
- Examples of requirement specification
- Examples of good and bad requirement prioritizing
- Examples of architecture, components, component interactions
- Technical resources based on most popular tech stacks – cheat sheets with main syntax, links to documentation, links to video tutorials, AI chatbots with predefined prompts
- Examples of using AI to implement features of different complexity, from different domains (saved chat logs, videos)
- Examples of presentation slides, maybe with comments and analysis – what worked well, what needed improvement
- Examples of different tasks, how much time they were expected to take, how much time they actually took (hard to use previous year results because of AI progress, but still possible to get useful estimates and ideas what to look for)
- Success and failure stories about team interactions, time management

## **Additional notes about resources**

- Prepare most resources in two forms
  - Ready to use – already provides all information in form of documents, tables, diagrams/infographics, video resources if applicable
  - AI prompts that give relevant information – try to test them on newest versions of AI models (what worked before might not work as well now, and some new prompts are working better)
- Don't give all resources at once
  - Identify key resources, give them out when appropriate stage arrives
  - But most resources are given "on demand", when students ask for them or struggle with some aspects
- Preparing these resources takes lots of time and effort from teacher
  - Try to use results from previous years
  - Ask other students

## Participant 9

| Course Title: IT Product Development Processes |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Steps                                          | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Identify Learning Goals                        | <ul style="list-style-type: none"> <li>In accordance with the curriculum, this course is mandatory for students majoring in "IT Product Management". It comprises 30 hours of lecture classes and 90 hours of teamwork, focusing on developing prototypes for IT projects across various subject areas. The main goal is to build both technical and soft skills through real-world challenges. This 12-week course immerses students in real-world IT challenges, encouraging them to design, develop, and deploy solutions collaboratively.</li> <li>This course is well-suited for learning through a project because it integrates software development, cybersecurity, data analysis, and cloud computing, with a strong emphasis on teamwork, communication, and critical thinking.</li> </ul>                                                                                                                                                               |
| Craft the Driving Question                     | <ul style="list-style-type: none"> <li>How to develop an IT product to solve a specific problem in a real subject area? What methodologies and tools exist for this? What knowledge and skill developers need for these?</li> <li>The process of developing IT products requires systematic analysis and research of the subject area, formulation of the problem and offering options for solving it using modern IT technologies.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Plan the Entry Event                           | <ul style="list-style-type: none"> <li>In the first lesson, I will present the general structure of the course, its relevance and the need for the acquired knowledge and skills for their future successful work in IT companies.</li> <li>I will propose a scenario for the implementation of course projects, a list of industries and problems, principles for forming teams and roles for each student, a calendar schedule for implementation and criteria for evaluating results, and provide the necessary methodological guidelines using the BPL approach.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                    |
| Map Out Inquiry & Activities                   | <ul style="list-style-type: none"> <li>Students will need to research the problem, propose solutions, select the optimal solution, and develop a prototype of an intelligent system to solve the problem. By the end of this course, students will: Design and implement full-stack IT solutions using modern tools and frameworks, and collaborate effectively in teams using Agile methodologies, apply cybersecurity best practices to protect digital assets, analyze and visualize data to inform decision-making, and deploy applications on cloud platforms with CI/CD pipelines.</li> <li>I will consistently hold sprint meetings every 2 weeks for ongoing monitoring, evaluation, and advice for further work. This course aligns with the 4C/ID model to scaffold the acquisition of complex skills. It also incorporates findings from recent studies showing that PBL in IT enhances engagement, collaboration, and real-world readiness.</li> </ul> |
| Decide on Products & Audience                  | <ul style="list-style-type: none"> <li>Each team will create a demonstration prototype of an Intelligent Software Product.</li> <li>Outside the classroom, invited industry representatives and IT companies could benefit.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Plan for Assessment                            | <p><b>Project Milestones (40%)</b> – Weekly deliverables with peer and instructor feedback. <b>Technical Documentation (20%)</b> – GitHub repos, API docs, and deployment guides. <b>Final Presentation (20%)</b> – Live demo and Q&amp;A with industry panel. <b>Reflection Report (20%)</b> – Individual write-up on learning journey and team dynamics.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Plan for Reflection & Revision                 | <ul style="list-style-type: none"> <li>Showcase projects to colleagues and industry mentors. Presentation tools: PowerPoint and GitHub Pages.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Prepare Scaffolds & Resources                  | <p><b>Resources &amp; Tools:</b> GitHub, VS Code, Postman, Figma, Free tiers of AWS, Google Cloud, and Access to online tutorials and documentation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Participant 10

### PBL Program for the course Communication Technologies

| Steps                          | Design your own PBL program by answering each step                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identify Learning Goals        | Students learn to use modern communication technologies (Slack, Teams, Discord, Miro), develop digital and media literacy, practice cross-cultural communication, and design effective communication models for global teams.<br><i>It is because only a real project generates “real-world pressure” as deadlines, misunderstandings, cross-cultural differences, digital barriers, and information noise.</i>              |
| Craft the Driving Question     | How can students design an effective communication system for a global, digital-first team?<br><i>The question is open-ended and encourages analysis and the creation of a practical solution.</i>                                                                                                                                                                                                                           |
| Plan the Entry Event           | Case presentation is a global startup failing deadlines due to chaotic communication. Students must propose how to fix their communication system.<br><i>This creates urgency and motivation.</i>                                                                                                                                                                                                                            |
| Map Out Inquiry & Activities   | Students work in a sprint cycle (2–3 weeks): <ul style="list-style-type: none"> <li>Analyze current digital communication channels (“as is”).</li> <li>Explore problems such as noise, duplication, and lack of structure.</li> <li>Compare tools and UX models of communication.</li> <li>Develop a “To be” model.</li> <li>Test their prototype in small teams.</li> </ul>                                                 |
| Decide on Products & Audience  | Product will be Digital Communication Blueprint that is an infographic, short video, or communication guide.<br>Audience are COIL instructors, student teams, university innovation groups.                                                                                                                                                                                                                                  |
| Plan for Assessment            | Formative assessment is: <ul style="list-style-type: none"> <li>Progress checks after each sprint.</li> <li>Mini-reflections after meetings.</li> <li>Evaluation of each participant’s contribution.</li> </ul> Summative assessment is: <ul style="list-style-type: none"> <li>Quality of the final Blueprint,</li> <li>Ability to justify the proposed solution,</li> <li>Presentation of results to the group.</li> </ul> |
| Plan for Reflection & Revision | Students reflect on what worked or failed in team communication, revise their solutions after feedback, and evaluate chosen technologies.                                                                                                                                                                                                                                                                                    |
| Prepare Scaffolds & Resources  | Templates (As is/To be), communication rules checklist, digital ethics guidelines, access to Slack/Teams/Miro, role-assignment protocols, sample team work workflows.                                                                                                                                                                                                                                                        |

## Participant 11

### PBL program for students «IoT-Based Microgrid Monitoring and Failure Prediction»

| Steps                      | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identify Learning Goals    | <p>Learning Goals:</p> <ul style="list-style-type: none"> <li>1. Studying the basic principles of energy distribution in energy systems and microgrids;</li> <li>2. Studying the architecture of the IoT network and communication protocols;</li> <li>3. Collecting and processing industrial data;</li> <li>4. Applying machine learning methods to predict failures;</li> <li>5. Acquiring skills in effective teamwork, project management, documenting results, and presenting projects to professional and non-professional audiences.</li> </ul> <p>In PBL, students can see how separate areas of knowledge (networks, ML, energy) come together in a real-world system. This boosts motivation and helps them develop a holistic understanding of the problem, develops critical thinking, and prepares them for potential challenges in the industry.</p> |
| Craft the Driving Question | <ul style="list-style-type: none"> <li>«How to build a reliable IoT monitoring system for a microgrid that accurately predicts failures in a timely manner, taking into account limited computing resources, incomplete and noisy data, and cybersecurity risks?»</li> </ul> <p>This question will require research into the literature, experiments with data, prototype development, and validation, rather than simply reproducing facts.</p>                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Plan the Entry Event       | <ul style="list-style-type: none"> <li>The project can be presented as a challenge from a large energy company: An imaginary company offers students an internship, but in order to get it, they must develop a prototype monitoring system that predicts power grid failures. Students must present a startup solution to the problem.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| Steps                          | Questions to answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Map Out Inquiry & Activities   | <ul style="list-style-type: none"> <li>1. Analysis of the problem, discussion of the power grid failure scenario; 2. Review of technologies to be applied, prototyping; 3. Data collection and processing; 4. Design of a machine learning model; 5. Risk analysis; 6. Project presentation; 7. Reflections – analysis of results and discussion.</li> </ul>                                                                                                                                                                                                                                                                                                        |
| Decide on Products & Audience  | <ul style="list-style-type: none"> <li>Students will create a prototype IoT system for monitoring the status of microgrids, prepare a project presentation and technical description. This could be useful for local communities, start-ups and universities, as further research could be developed based on this project.</li> </ul>                                                                                                                                                                                                                                                                                                                              |
| Plan for Assessment            | <ul style="list-style-type: none"> <li>Various assessment methods can be used during the project development process (depending on the project stage). These may include recording the results of each participant's work in a special journal, creating interim mini-presentations of achievements, and teams assessing each other.</li> <li>The final evaluation of the product should be carried out according to clearly defined criteria. For a project of this type, these criteria may include: 1. functionality; 2. accuracy of the model; 3. clarity of the presentation and completeness of the exposition; 4. presence of creative solutions.</li> </ul> |
| Plan for Reflection & Revision | <ul style="list-style-type: none"> <li>It is advisable to analyze learning and progress in the project in the middle of the project to obtain internal feedback and adjust plans (if necessary), as well as before the project presentation to discuss the results obtained.</li> <li>To obtain feedback, you can use special fields in applications such as Padlet, Google or Microsoft Forms surveys, and boards where students can visualize their ideas.</li> </ul>                                                                                                                                                                                             |
| Prepare Scaffolds & Resources  | <ul style="list-style-type: none"> <li>Students may need teacher support in areas such as role allocation, conflict resolution, managing deadlines and time in the project, and creating technical documentation.</li> <li>I can maintain a process checklist with project progress analysis, develop and conduct mini-lessons on soft skills development, and set aside a specific time each week (an hour, for example) to discuss any issues that have arisen.</li> <li>A lecture by a project management specialist can be organized.</li> </ul>                                                                                                                |

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## Participant 12

### *PBL Project: Software Automated Testing*

| Steps                                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Identify Learning Goals</b>          | <p>Key Knowledge &amp; Understanding</p> <ul style="list-style-type: none"> <li>To understand the principles of automated testing, its benefits, drawbacks and role in the software life cycle.</li> <li>To know the architecture and elements of the main test frameworks (in particular, Page Object Model, Data-Driven), its components and principles of their interaction.</li> <li>To be able to use automation tools: know the syntax and basic commands of the selected tools (in particular, Selenium WebDriver) and the corresponding programming language tools (Java, JUnit) to write effective test cases.</li> <li>To be able to interpret test results, generate understandable reports on test pass/fail and determine the causes of errors. Key Success Skills</li> <li>To execute projects in small teams: design test scenarios, assign responsibilities for framework implementation, and prepare reports.</li> <li>To debug complex automated tests, finding effective locators, handling dynamic elements and synchronization issues.</li> <li>To analyze tasks and determine which test cases are most critical for automation, select the optimal framework for a specific task.</li> <li>To plan project stages and adhere to established deadlines.</li> <li>To present the finished framework, explain technical solutions, and justify why they were chosen.</li> </ul> |
| <b>Craft the Driving Question</b>       | How can we build an effective automated testing system to ensure product quality?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Plan the Entry Event</b>             | <p><u>Introduction</u>: Each team of students is a team of QA engineers in a company. The development team has released a new release of a web application. The project manager (lecture) has set the task to develop and implement a pilot version of a robust automated testing system for a critical product feature within a month.</p> <p><u>Materials</u>: a link to the current release to be tested and a description of the key feature for automated testing.</p> <p><u>Feedback</u>: Students review the application and the description of the key functional requirements for the product, brainstorm, and note their questions that need clarification.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Map Out Inquiry &amp; Activities</b> | <ul style="list-style-type: none"> <li>Research popular UI automation tools (in particular, Selenium), analyze their advantages, disadvantages, language implementations</li> <li>Compile a list of test cases that will be automated</li> <li>Determine the architecture of the future framework (e.g., Page Object Model)</li> <li>Implement the framework in accordance with the test plan (setting up the environment, creating a project structure, implementing test classes, testing the framework's performance)</li> <li>Implement tools for generating reports (e.g., Allure Reports), which is important for communicating results</li> <li>Simulate integration with CI/CD</li> <li>Evaluate the results of another team's work</li> <li>Prepare a presentation of the results of one's work</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Steps                                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Decide on Products &amp; Audience</b>  | <u>Products:</u> automated testing framework, structured test plan, test cases, automated reports, logs, and final presentation<br><u>Audience:</u> Lecturer (as project manager), colleagues, quality control specialists from IT company                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Plan for Assessment</b>                | <u>Formative assessment:</u> weekly demonstrations of the current status of the task by team members, code reviews and lecture feedback<br><br><u>Summative assessment:</u> <ul style="list-style-type: none"> <li>• Assessment of the test plan by the instructor 10</li> <li>• Assessment of the implementation of the framework (selection of technologies, project architecture, correctness of the tests) by the instructor 40</li> <li>• Assessment of the level of presentation of the work results 10</li> <li>• Peer assessment 10</li> <li>• Summary testing 30</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Plan for Reflection &amp; Revision</b> | <u>Reflection:</u> <ul style="list-style-type: none"> <li>• Weekly meetings to discuss the current status of the project implementation (successful solutions, problems, etc.).</li> <li>• Demonstration of results after completion of each stage, discussion of the level of efficiency of team members, identification of weaknesses and making management decisions to improve the team's work.</li> <li>• Analysis of the results of the assessment of the structure from another team. Revision:</li> <li>• Students receive structured feedback from the instructor and from the review team. The work team has 3 days to improve their project based on the feedback.</li> <li>• During the final presentation, the audience provides feedback. Team members have 1 day to develop a plan for improving and/or developing their project.</li> </ul>                                                                                                                                                                |
| <b>Prepare Scaffolds &amp; Resources</b>  | <u>Skills Support:</u> <ul style="list-style-type: none"> <li>• Collaboration and Communication: effective teamwork, conflict resolution, use of control systems to jointly develop a structure.</li> <li>• Critical Thinking: search and analysis of technical documentation to solve specific problems.</li> <li>• Self-Management: planning and estimating the time required to complete individual tasks, control and self-discipline, ability to make informed decisions that lead to the achievement of goals, managing emotions in stressful situations</li> </ul> <u>Resources:</u> <ul style="list-style-type: none"> <li>• Documentation of the web application under test</li> <li>• Short instructions (or list of information sources) for setting up the development environment, project implementation tools</li> <li>• Test plan templates, checklists (peer and self-assessment), reports, project presentation</li> <li>• Clear evaluation criteria for each stage of project implementation</li> </ul> |

## Participant 13

### PBL program of free food website project (slide1)

| Steps                      | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identify Learning Goals    | <ul style="list-style-type: none"> <li>What standards, big ideas, or key skills do I want students to learn in this project?</li> </ul> <p>Key Success Skills.</p> <p>Collaboration - to share responsibility and make substantive decisions with other people.</p> <p>Knowledge Construction - to practice building new knowledge, which is knowledge interdisciplinary.</p> <p>Use of technology for learning - to use technology to support knowledge construction, ICT is necessary to that knowledge construction.</p> <p>Self-regulation - to have clear learning goals and expectations shared, opportunities plan and revise their own work.</p> <p>Skilled communication - to create effective communication.</p> <p>Real-world problem-solving and innovation - to learn solving authentic, real-world problems; to implement solutions in the real world.</p> <ul style="list-style-type: none"> <li>Why are these worth learning through a project rather than direct instruction?</li> </ul> <p>Amazon S3 is complex and complicated.</p> |
| Craft the Driving Question | <ul style="list-style-type: none"> <li>What open-ended, engaging question will frame this project?</li> </ul> <p>How to build a static website for a café offering free food?</p> <ul style="list-style-type: none"> <li>Does this question require inquiry and problem-solving, not just recall?</li> </ul> <p>Yes, hosting the website on Amazon S3 involves inquiry and problem-solving, not just memorization..</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

\*If your program does not fit in the blanks, you can use additional slides, or write in a different slide layout.

Source: Larmer, J., Mergendoller, J.R. and Boss, S. (2015) Setting the standard for Project Based Learning: A proven approach to rigorous classroom instruction. Alexandria, VA: ASCD.

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### PBL program of free food website project (slide2)

| Steps                        | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Plan the Entry Event         | <ul style="list-style-type: none"> <li>How will I launch the project so students are curious and motivated?</li> </ul> <p>There is a café offering free food, but its reputation is limited to people who have visited or heard about it from other café customers.</p> <ul style="list-style-type: none"> <li>What scenario, problem, or event will make the project feel real and urgent?</li> </ul> <p>Students suggest to the small business owners that they should expand community awareness of what the café has to offer. The café doesn't have a web presence yet, and it doesn't currently use any cloud computing services. However, that situation is about to change.</p>                                                                                                                                                                                                                                       |
| Map Out Inquiry & Activities | <ul style="list-style-type: none"> <li>What will students need to investigate, research, or create to answer the driving question?</li> </ul> <p>Students will investigate, research, and create a static website using Amazon Simple Storage Service (Amazon S3), applying architectural best practices to protect and manage their data.</p> <ul style="list-style-type: none"> <li>How will I sequence activities so students build knowledge and skills over time?</li> </ul> <p>Activity 1: Extracting the files that their need for this project.</p> <p>Activity 2: Creating an S3 bucket to host their static website.</p> <p>Activity 3: Uploading content to their S3 bucket</p> <p>Activity 4: Creating a bucket policy to grant public read access</p> <p>Activity 5: Enabling versioning on the S3 bucket</p> <p>Activity 6: Setting lifecycle policies</p> <p>Activity 7: Enabling cross-Region replication</p> |

\*If your program does not fit in the blanks, you can use additional slides, or write in a different slide layout.

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## PBL program of free food website project (slide3)

| Steps                          | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Decide on Products & Audience  | <ul style="list-style-type: none"> <li>What authentic product(s) will students create to show what they've learned?</li> </ul> <p>After completing this project, students should be able to do the following:<br/>           Host a static website by using Amazon S3.<br/>           Implement one way to protect their data with Amazon S3.<br/>           Implement a data lifecycle strategy in Amazon S3.<br/>           Implement a disaster recovery (DR) strategy in Amazon S3.</p> <ul style="list-style-type: none"> <li>Who outside the classroom could benefit from, critique, or use these products?</li> </ul> <p>Students and teachers at the university..</p> |
| Plan for Assessment            | <ul style="list-style-type: none"> <li>How will I check for understanding along the way (formative assessment)?</li> </ul> <p>Question 1: When viewing the website after Task 3, do you see the page in the browser?<br/>           How will I assess both the final product and the process students use?</p> <p>Question 2: What is another way to ensure maximum protection and prevent the accidental deletion of a preserved version?</p>                                                                                                                                                                                                                                |
| Plan for Reflection & Revision | <ul style="list-style-type: none"> <li>Where in the project will students stop to reflect on their learning and process?</li> </ul> <p>Question 3: Do you see the objects from your source bucket in the destination bucket?<br/>           How will I build in opportunities for critique and revision of their work?</p> <p>Question 4: Was the version that you just deleted from your source bucket also deleted from your destination bucket?</p>                                                                                                                                                                                                                        |

\*If your program does not fit in the blanks, you can use additional slides, or write in a different slide layout.

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## PBL program of free food website project (slide4)

| Steps                         | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prepare Scaffolds & Resources | <ul style="list-style-type: none"> <li>What skills (teamwork, research, time management) will students need support with?</li> </ul> <p>21<sup>st</sup> century literacy &amp; skills</p> <ul style="list-style-type: none"> <li>What scaffolds (checklists, protocols, mini-lessons) and resources can I provide?</li> </ul> <p><a href="https://docs.aws.amazon.com/AmazonS3/latest/userguide/HostingWebsiteOnS3Setup.html#step4-add-bucket-policy-make-content-public">https://docs.aws.amazon.com/AmazonS3/latest/userguide/HostingWebsiteOnS3Setup.html#step4-add-bucket-policy-make-content-public</a><br/> <a href="https://aws.amazon.com/r/s3/faqs/">https://aws.amazon.com/r/s3/faqs/</a><br/> <a href="https://docs.aws.amazon.com/AmazonS3/latest/userguide/object-lifecycle-mgmt.html">https://docs.aws.amazon.com/AmazonS3/latest/userguide/object-lifecycle-mgmt.html</a><br/> <a href="https://docs.aws.amazon.com/AmazonS3/latest/userguide/replication-example-walkthroughs.html#enable-replication-add-rule">https://docs.aws.amazon.com/AmazonS3/latest/userguide/replication-example-walkthroughs.html#enable-replication-add-rule</a><br/> <a href="https://docs.aws.amazon.com/AmazonS3/latest/userguide/setting-repl-config-perm-overview.html">https://docs.aws.amazon.com/AmazonS3/latest/userguide/setting-repl-config-perm-overview.html</a><br/> <a href="https://docs.aws.amazon.com/wellarchitected/latest/framework/oe-bp.html">https://docs.aws.amazon.com/wellarchitected/latest/framework/oe-bp.html</a></p> |

\*If your program does not fit in the blanks, you can use additional slides, or write in a different slide layout.

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## How the assignment will be evaluated:

| Design Step                       | 5 – Excellent                                                                                    | 4 – Good                                                        | 3 – Adequate                                           | 2 – Limited                                            | 1 – Beginning                            |
|-----------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|------------------------------------------|
| 1. Identify Learning Goals        | Learning goals are clear, specific, and connected to both content and 21st-century skills.       | Goals are mostly clear and related to learning outcomes.        | Goals are stated but somewhat general.                 | Goals are vague or incomplete.                         | No clear learning goals identified.      |
| 2. Craft the Driving Question     | The question is open-ended, meaningful, and promotes inquiry and creativity.                     | The question is open-ended and connected to real-world context. | The question allows limited inquiry or lacks focus.    | The question is closed or unclear.                     | No Driving Question provided.            |
| 3. Plan the Entry Event           | Entry event is engaging, authentic, and directly tied to the Driving Question.                   | Entry event is engaging but somewhat general.                   | Entry event connects to topic but lacks clear purpose. | Entry event is minimal or unrelated to the project.    | No entry event planned.                  |
| 4. Map Out Inquiry & Activities   | Activities show a clear sequence from inquiry → research → creation → presentation → reflection. | Flow is logical and mostly supports learning.                   | Flow is understandable but lacks coherence.            | Activities are disconnected or superficial.            | No clear activity plan.                  |
| 5. Decide on Products & Audience  | Final products are authentic and intended for a real or meaningful audience.                     | Products are relevant and clear but audience is limited.        | Products are simple or audience not well defined.      | Products are unclear or unrealistic.                   | No product or audience identified.       |
| 6. Plan for Assessment            | Assessment methods align with goals and include both formative and summative feedback.           | Assessment plan is clear but limited in variety or timing.      | Assessment is mentioned but not well linked to goals.  | Assessment is vague or only final.                     | No assessment plan included.             |
| 7. Plan for Reflection & Revision | Reflection and feedback are integrated throughout the process, guiding improvement.              | Reflection opportunities are planned but not continuous.        | Reflection is limited or only at the end.              | Reflection mentioned but unclear in timing or purpose. | No reflection or revision opportunities. |
| 8. Prepare Scaffolds & Resources  | Scaffolds and resources are well prepared, targeted to learning needs, and adaptable.            | Appropriate supports are identified and timely.                 | Some resources provided but not well matched to needs. | Supports are minimal or generic.                       | No scaffolds or resources prepared.      |

## Participant 14

### Project-Based Learning (PBL) Project Template

**Project Title:** Multisensory Robotic Systems for Human Safety in Emergencies

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#### 1. Identify Learning Goals

- **Key knowledge and big ideas:**
    - Students will understand both the architectural and practical foundations of multisensory robotic systems.
    - They will learn system integration (IoT, sensor networks, embedded systems, cloud), with an emphasis on how such technologies serve emergency safety.
    - Key skills: critical thinking, creativity, teamwork, international communication, leadership, time management, and especially intercultural competence.
  - **Social/cultural dimension:**
    - Students will investigate how emergency needs and solutions may differ across communities, urban/rural environments, and between different countries.
    - Particular attention will be paid to the adaptation of the robotic platform to both local and international contexts, aligning with SDGs 9 and 16.
  - **Why PBL for this topic?**
    - Global emergencies require integrative, applied problem-solving.
    - PBL ensures students actively synthesize content, apply it to complex, real-life challenges, and develop both technical and “soft” competencies—especially cross-cultural teamwork and stakeholder analysis.
- 

#### 2. Craft the Driving Question

- **Driving Question:**
    - How can we design and implement a multisensory robotic system that improves human safety in emergencies through real-time monitoring, analysis, and response, and adapt that solution for different cultural or operational environments?
-

### 3. Plan the Entry Event

- **Entry Event:**
    - The project opens with a simulation scenario of an urgent local or international emergency (e.g., chemical spill in a city center or earthquake in a rural area), highlighted by a two-minute news video, followed by a discussion of existing response gaps.
    - A local emergency responder or international partner briefly delivers a short Q&A, outlining real-world obstacles and cultural context differences.
- 

### 4. Map Out Inquiry and Activities

- **Sequence of major learning activities:**
    - Analyze current (“As Is”) emergency monitoring—mapping weaknesses and cultural/organizational gaps.
    - Compare with “To Be” scenario: vision for ideal integrated, automated, and culturally flexible monitoring and response.
    - Interview/survey stakeholders (students, staff, local administrators, and international COIL partners).
    - Design: Brainstorm system architecture; sub-teams focus on hardware, data fusion, mobile app, and local adaptation modules.
    - Prototype (Tinker CAD/Fritzing for hardware; basic internationalized mobile and dashboard UI).
    - Intercultural peer review after midterm; regular faculty/mentor scaffolding (formative feedback), including contributions from international colleagues.
    - Final public demonstration to the university, city authorities, community stakeholders, and international partners.
- 

### 5. Decide on Products & Audience

- **Authentic Products:**
  - System diagrams, simulation/prototype, and a scenario-based demo video.
  - Reflective blog/journal about the process, with a section comparing

international perspectives.

- **Audience:**
    - University administration, city officials, peer students, potential industry partners, and international COIL participants.
- 

## 6. Plan for Assessment

- **Criteria for success (rubric overview):**
    - Level of system integration and functionality.
    - Innovation, feasibility, and consideration of user experience (e.g., accessible interface).
    - Cultural adaptability of the solution.
    - Evidence of effective teamwork (including international) and leadership.
    - Quality and clarity of the public presentation and report.
    - Depth of peer/self/mentor evaluation and reflection.
  - **Formative:** Weekly milestone peer/self feedback using a structured rubric (clarity, prototype progress, and communication).
  - **Summative:** Final product rubric (above criteria).
- 

## 7. Plan for Reflection & Revision

- Students complete a mid- and post-project reflection:
    - What did we do well? What was most challenging in cross-cultural, technical, or team collaboration?
    - How did our understanding of the problem and solution change as we engaged with different stakeholders/partners?
    - What part of our team product could be improved for different audiences?
    - Apply KPT (Keep, Problem, Try) and SBI (Situation-Behavior-Impact) methods after the final public presentation and COIL exchange.
-

## **8. Prepare Scaffolds & Resources**

- Faculty provides:
  - Checklists (design, prototype, local/global adaptation, reporting).
  - Sample diagrams, code, and international project documentation examples.
  - Workshops (IoT basics, prototyping, team leadership, intercultural communication).
  - Mentor/TA access throughout, including from the COIL partner side.
  - Slack/Discord for global teamwork; online Q&A forums; shared multilingual FAQ where appropriate.

## Participant 16

### PBL program of the Web-technologies and web-design course

| Steps                                     | Design PBL program by answering each step                                                                                                                                                                            |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Identify Learning Goals</b>            | Students will acquire knowledge of web technologies, understand principles of web application development and web design, and be able to create web applications using HTML, CSS, JavaScript, and PHP.               |
| <b>Craft the Driving Question</b>         | How can we design and develop a functional and secure web application that meets modern usability and design standards?                                                                                              |
| <b>Plan the Entry Event</b>               | Introductory online session via Zoom: overview of web technologies, presentation of project idea (e.g., product catalog web app).                                                                                    |
| <b>Map Out Inquiry &amp; Activities</b>   | 10 joint online sessions: HTML basics → CSS design → JavaScript interactivity → PHP programming → Database integration → Security. Activities include coding exercises, collaborative design tasks, and discussions. |
| <b>Decide on Products &amp; Audience</b>  | Final product: a web-based application (e.g., product catalog) with user interface and database integration. Audience: peers, instructors, and external reviewers during project showcase.                           |
| <b>Plan for Assessment</b>                | Continuous assessment through lab tasks and collaborative coding; final evaluation based on project presentation and functionality.                                                                                  |
| <b>Plan for Reflection &amp; Revision</b> | Reflection session in the last meeting: peer feedback, discussion of challenges, and suggestions for improvement.                                                                                                    |
| <b>Prepare Scaffolds &amp; Resources</b>  | Shared resources: HTML/CSS/JS/PHP tutorials, code editors, project templates, Zoom breakout rooms for teamwork, and access to online learning platforms (e.g., MIX SumDU, W3Schools).                                |

## Participant 18

### **PBL Program «AI for Clinical Decision-making Support in Dermatology» (6-week timeline)**

#### **Identify Learning Goals (Week 1).**

Students are introduced to:

- Understanding the fundamentals of machine learning and deep learning techniques used in medical image analysis.
- Applying AI models for classification, segmentation, and decision support in dermatological diagnostics.
- Evaluating the performance, interpretability, and ethical implications of AI-driven clinical tools.
- Designing workflow-integrated AI solutions that support clinicians in diagnosis and treatment planning.
- Working collaboratively in interdisciplinary teams and communicating findings to both technical and non-technical audiences.

#### **Craft the Driving Question (Week 1)**

Students collaboratively refine the guiding question:

“How can artificial intelligence be designed, validated, and responsibly implemented to support clinical decision-making in dermatology?”

#### **The Entry Event (Week 1):**

To engage students, the course begins with:

A real-world clinical case presentation by a dermatologist (e.g., melanoma vs. benign lesion).

A short demo of an existing AI-based skin lesion classifier to highlight both its potential and limitations.

Introduction of the challenge: develop and justify an AI-based tool to support dermatologists in clinical decision-making.

#### **Inquiry & Activities (Weeks 1–4):**

##### *Week 1–2: Research & Data Exploration*

- Literature review on AI in dermatology.
- Exploration of datasets.

##### *Week 2–3: Data Preparation & Model Development*

- Preprocessing, normalization, augmentation of images.
- Development of ML (CNNs, transfer learning)
- Initial performance evaluation.

##### *Week 3–4: Model Iteration & Clinical Integration*

- Improving model performance, tuning hyperparameters.
- Applying explainability methods.

- Identifying ethical, bias-related, and regulatory considerations.
- Consultation with dermatologists and AI mentors.

## **Decide on Products & Audience (Week 5)**

### **Final Products:**

- A functional prototype of an AI decision-support model for dermatology.
- A technical report documenting methodology, evaluation, and limitations.
- A presentation/pitch supported by visual and interactive materials.

### **Target Audience:**

- Dermatologists and clinical staff.
- Technical stakeholders interested in medical AI.

## **Plan for Assessment (Weeks 1-6):**

### *Formative assessment (Weeks 1-5):*

weekly progress check-ins, peer reviews, mentor consultations, prototype demonstrations.

### *Summative assessment (week 6):*

- Quality and accuracy of the AI model.
- Depth of analysis in the technical report.
- Clarity and clinical relevance of the briefing.
- Teamwork effectiveness and professional communication.
- Reflection on ethical, legal, and interoperability issues.

## **Plan for Reflection and Revision (Weeks 3–6):**

Guided reflection sessions after major milestones (weeks 3-5).

Reflection session on ethical considerations and the impact of AI on clinical workflows (week 5).

Final reflective discussion on project challenges, collaboration, ethics, and learning outcomes (week 6).

To support learning, the course provides:

- Tutorials on Python, TensorFlow/PyTorch, image preprocessing, and evaluation metrics.
- Sample notebooks and baseline models.
- Access to curated datasets and annotation tools.
- Templates for reports, clinical briefs, and presentations.
- Guidance documents on ethics (bias, privacy, explainability) and medical device regulation.
- Consultation hours with clinicians and technical mentors.

## Participant 19

### PBL Program for the Project “Sign Language Translator”

(partly based on our past experience with the initial efforts of pioneering PBL implementation at Yuriy Fedkovych Chernivtsi National University, Computer Science Department)

| Steps                   | Design your own PBL program by answering each steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identify Learning Goals | <p><b>1. Identify Learning Goals</b></p> <p><b>1.1. IT competencies</b><br/>Students should develop and demonstrate:</p> <ul style="list-style-type: none"> <li>• basic/advanced programming skills (Python / JavaScript / another language, depending on the course);</li> <li>• understanding of the fundamentals of computer vision: <ul style="list-style-type: none"> <li>◦ working with a video stream/camera;</li> <li>◦ detection and tracking of hands, faces, and key points;</li> </ul> </li> <li>• basics of machine learning / deep neural networks: <ul style="list-style-type: none"> <li>◦ preparation of a gesture dataset;</li> <li>◦ training, validation, and evaluation of a recognition model;</li> </ul> </li> <li>• software engineering/prototype architecture: <ul style="list-style-type: none"> <li>◦ decomposition into modules (video acquisition → processing → recognition → text/speech output);</li> <li>◦ working with APIs (for example, TTS, log storage);</li> </ul> </li> <li>• UX/UI design for inclusive interfaces;</li> <li>• basic skills in testing (unit, integration, user testing) and deployment of a prototype (desktop/web/mobile demo).</li> </ul> <p><b>1.2. Entrepreneurial and startup competencies</b><br/>Students should:</p> <ul style="list-style-type: none"> <li>• be able to conduct Customer Development: <ul style="list-style-type: none"> <li>◦ identify user segments (people with hearing impairments, their relatives, support services, educational institutions);</li> <li>◦ collect and interpret feedback;</li> </ul> </li> <li>• formulate the startup’s value proposition: <ul style="list-style-type: none"> <li>◦ what exactly is the benefit of the sign language translator;</li> <li>◦ which existing pains/barriers it helps to remove;</li> </ul> </li> <li>• work with the Business Model Canvas: <ul style="list-style-type: none"> <li>◦ who will pay, who will use it, which access channels are needed, which partners are required;</li> </ul> </li> <li>• prepare a pitch presentation for potential investors/partners;</li> <li>• experience the basic principles of leadership and work in a startup team (roles, responsibilities, deadlines, risks).</li> </ul> <p><b>1.3. Social and ethical aspects</b><br/>Goals:</p> <ul style="list-style-type: none"> <li>• to understand the importance of inclusion and accessibility: <ul style="list-style-type: none"> <li>◦ which communication barriers people with hearing impairments face;</li> <li>◦ how technology can reduce them or, conversely, deepen them;</li> </ul> </li> <li>• to understand ethical issues of using AI: <ul style="list-style-type: none"> <li>◦ collection, storage, and anonymization of video data with gestures;</li> <li>◦ clearly informing users about what they are consenting to;</li> </ul> </li> <li>• to develop empathy and respect for the Deaf community, and to avoid stereotypes and a paternalistic approach.</li> </ul> |

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|                                   | <p><b>1.4. Integration of knowledge from previous courses</b><br/> The project makes it possible to apply:</p> <ul style="list-style-type: none"> <li>• algorithms and data structures (frame buffers, event queues, optimization of computations);</li> <li>• probability theory and statistics (model quality metrics, error estimation);</li> <li>• databases (storage of gestures, metadata, user profiles);</li> <li>• digital signal/image processing (filtering, normalization, feature extraction);</li> <li>• HCI / UX (interfaces convenient for people with different needs);</li> <li>• basics of project management (planning sprints, tasks, deadlines).</li> </ul> <p><b>1.5. Why a project-based format</b><br/> Because in this case, students:</p> <ul style="list-style-type: none"> <li>• see a real, socially significant problem rather than abstract exercises;</li> <li>• work with incomplete and vague requirements – as in a real startup;</li> <li>• go through the whole cycle: idea → prototype → testing → pitching;</li> <li>• simultaneously develop hard skills (ML, CV) and soft/entrepreneurial skills, which is very difficult to achieve in standard laboratory work.</li> </ul> |
| <b>Craft the Driving Question</b> | <p><b>Chosen Driving Question (main version):</b><br/> How can a team of students, within 6–8 weeks, create and test a prototype of a digital sign language translator that genuinely improves the everyday communication of people with hearing impairments at the university and beyond?</p> <p><b>Additional formulations (can be offered to students as options):</b></p> <ul style="list-style-type: none"> <li>• How can computer vision and AI be used to make communication between people with hearing impairments and hearing people simpler and more natural?</li> <li>• What should be the technological and business design of the startup “Sign Language Translator” so that people will actually use it?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Plan the Entry Event</b>       | <p><b>Scenario for the first session (90 minutes):</b><br/> <b>Emotional entry (10–15 minutes)</b></p> <ul style="list-style-type: none"> <li>• Show 1–2 short videos with real situations in which a person with a hearing impairment cannot explain something in a hospital, bank, or at the university reception.</li> <li>• Short discussion: “What do you feel when you watch this? What barriers can you see here?”</li> </ul> <p><b>Guest / recorded interview (15–20 minutes)</b></p> <ul style="list-style-type: none"> <li>• Invite a representative of the Deaf community (offline/online) or show their video story: <ul style="list-style-type: none"> <li>○ what communication difficulties he/she faces;</li> <li>○ whether he/she uses existing technologies and what they lack.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                |
|                                   | <p><b>Mini-research “what already exists” (10–15 minutes)</b></p> <ul style="list-style-type: none"> <li>• In teams: within 10–15 minutes, find 2–3 existing solutions for sign language translation on the internet and briefly list their advantages and disadvantages.</li> <li>• Each team presents 1–2 key conclusions.</li> </ul> <p><b>Formulation of the Driving Question (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• The teacher formulates the Driving Question and discusses with the group whether it is clear and “alive”.</li> <li>• Students rephrase it in their own words.</li> </ul> <p><b>Brainstorming of ideas (20–25 minutes)</b></p> <ul style="list-style-type: none"> <li>• In groups: “How can the technologies we already know / will be studying help solve this problem?”</li> <li>• Output – a board with the first pool of product ideas.</li> </ul> <p><b>Homework after the Entry Event</b><br/> Write a short reflection (½–1 page):</p> <ul style="list-style-type: none"> <li>• which problem you personally want to address in this project;</li> <li>• which roles you would like to try (ML, UX, PM, research, etc.).</li> </ul>                              |

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| <b>Map Out Inquiry &amp; Activities</b>  | <p><b>Approximate structure of the project (6 weeks)</b></p> <p><b>Week 1 – The problem and users</b></p> <ul style="list-style-type: none"> <li>• Interviews/surveys of representatives of the Deaf community (if possible – together with a partner organization).</li> <li>• Formulation of a user persona.</li> <li>• Review of existing solutions and a table of “advantages/limitations”.</li> </ul> <p><b>Week 2 – Technologies and solution design</b></p> <ul style="list-style-type: none"> <li>• Mini-lectures/workshops on computer vision and gesture recognition.</li> <li>• Choice of prototype format: mobile app, web service, or desktop demo.</li> <li>• Development of a draft architecture and UX wireframes.</li> </ul> <p><b>Week 3 – Data and the first model</b></p> <ul style="list-style-type: none"> <li>• Search for open sign language datasets (Ukrainian Sign Language/others).</li> <li>• Collection of a small in-house dataset (with ethical considerations and informed consent).</li> <li>• Creation of a baseline recognition model and its first metrics.</li> </ul> <p><b>Week 4 – Prototype development</b></p> <ul style="list-style-type: none"> <li>• Integration of the model into the prototype (interface + video processing).</li> <li>• UX optimization: how to present the translation (text, speech, pictograms).</li> <li>• Internal team testing.</li> </ul> <p><b>Week 5 – User testing</b></p> <ul style="list-style-type: none"> <li>• Pilot testing with a small group of users (people with hearing impairments/volunteers who know sign language).</li> <li>• Collection of feedback: accuracy, usability, usage scenarios.</li> <li>• Compilation of a list of improvements.</li> </ul> <p><b>Week 6 – Pitching and documentation</b></p> <ul style="list-style-type: none"> <li>• Preparation of a pitch deck (problem, solution, technology, business model, roadmap).</li> <li>• Final demo of the prototype.</li> <li>• Writing a short technical report and a reflective essay.</li> </ul> |
| <b>Decide on Products &amp; Audience</b> | <p><b>Final products:</b></p> <p><b>Technical product</b></p> <ul style="list-style-type: none"> <li>• A (minimally viable) prototype of a sign language translator: <ul style="list-style-type: none"> <li>◦ input: video from a camera / saved file;</li> <li>◦ output: textual and/or voice rendering of gestures.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                          | <p><b>Documentation</b></p> <ul style="list-style-type: none"> <li>• A short technical report: <ul style="list-style-type: none"> <li>◦ system architecture;</li> <li>◦ description of the model and data;</li> <li>◦ limitations and known issues.</li> </ul> </li> <li>• README/user manual.</li> </ul> <p><b>Entrepreneurial artifacts</b></p> <ul style="list-style-type: none"> <li>• Pitch deck (10–12 slides).</li> <li>• One-page value proposition (one-pager for a potential partner/ investor).</li> </ul> <p><b>Communication product</b></p> <ul style="list-style-type: none"> <li>• A demo video “how it works” (up to 3 minutes), which can be shown at an open day, a startup competition, etc.</li> </ul> <p><b>Real audience:</b></p> <ul style="list-style-type: none"> <li>• representatives of the Deaf community/organizations of people with hearing impairments;</li> <li>• university administration, center for inclusive education;</li> <li>• potential incubators, accelerators, and IT companies that support student startups;</li> <li>• other students and teachers (the internal community).</li> </ul> <p><b>Product quality criteria for this audience:</b></p> <ul style="list-style-type: none"> <li>• a straightforward, simple interface (can be used without a long manual);</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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|                                           | <ul style="list-style-type: none"> <li>adequate recognition accuracy for a limited set of gestures;</li> <li>response time (does not “freeze” for several seconds);</li> <li>scalability (ability to add new gestures and languages);</li> <li>transparency regarding data ethics and limitations (students do not promise a “magic wand”).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Plan for Assessment</b>                | <p><b>Formative (ongoing) assessment:</b></p> <ul style="list-style-type: none"> <li>Weekly stand-ups (5–10 minutes per team): what has been done, what is blocking, what is next.</li> <li>Intermediate demos: <ul style="list-style-type: none"> <li>end of Week 2 – presentation of the problem, user persona, UI sketches;</li> <li>end of Week 4 – first technical demo of the prototype.</li> </ul> </li> <li>Peer review: <ul style="list-style-type: none"> <li>teams mutually assess the clarity of the pitch and the UX mock-ups.</li> </ul> </li> </ul> <p><b>Summative assessment (approximate components): Technical part (30–40%)</b></p> <ul style="list-style-type: none"> <li>correctness of the prototype’s operation (on the agreed scenario);</li> <li>justification of the chosen algorithms and architecture;</li> <li>demonstration of the application of ML/CV in practice.</li> </ul> <p><b>Solving the problem and understanding the user (20–25%)</b></p> <ul style="list-style-type: none"> <li>depth of analysis of the Deaf community’s needs;</li> <li>realism of the proposed usage scenario.</li> </ul> <p><b>Entrepreneurial component (15–20%)</b></p> <ul style="list-style-type: none"> <li>quality of the value proposition presentation;</li> <li>logic of the business model (who, what, why, and for what pays).</li> </ul> <p><b>Teamwork and contribution (15–20%)</b></p> <ul style="list-style-type: none"> <li>transparent distribution of roles;</li> <li>interaction and responsibility;</li> <li>self-assessment and peer assessment.</li> </ul> <p><b>Reflection (10–15%)</b></p> <ul style="list-style-type: none"> <li>ability to critically evaluate one’s own solution, its limitations, and prospects for further development.</li> </ul> |
| <b>Plan for Reflection &amp; Revision</b> | <p><b>Key reflection points:</b></p> <ul style="list-style-type: none"> <li>after Week 1 (getting to know the problem and users);</li> <li>after the first technical demo (end of Week 4);</li> <li>after user testing (Week 5).</li> </ul> <p><b>Examples of reflection questions:</b></p> <ul style="list-style-type: none"> <li>What new things have we learned about the experiences of people with hearing impairments?</li> <li>To what extent does our solution really meet their needs, and where did we “fill in the gaps” for them?</li> <li>What technical/organizational mistakes did we make, and what did they teach us?</li> <li>What would we change if we had one more sprint?</li> </ul> <p><b>Organization of revision:</b></p> <ul style="list-style-type: none"> <li>each team maintains a backlog of tasks and marks which changes appeared after feedback;</li> <li>work with critical but friendly mutual review (each team gives another team 3 strengths and 3 areas for growth);</li> <li>before the final demo – a “ready for demo” checklist (technical, UX, pitch).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Prepare Scaffolds &amp; Resources</b>  | <p><b>Soft-skill scaffolds:</b></p> <ul style="list-style-type: none"> <li>short mini-sessions/handouts on: <ul style="list-style-type: none"> <li>how to conduct interviews with users (especially with vulnerable groups);</li> <li>how to give and receive constructive feedback;</li> <li>how to organize teamwork (the role of the PM, maintaining a Kanban/task board).</li> </ul> </li> </ul> <p><b>Technical scaffolds:</b></p> <ul style="list-style-type: none"> <li>starter notebooks/code templates for: <ul style="list-style-type: none"> <li>capturing video from a camera;</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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|  | <ul style="list-style-type: none"> <li>○ detecting hands/key points;</li> <li>○ a simple gesture classifier;</li> <li>• links to basic ML/CV tutorials;</li> <li>• small demo projects as examples of the architecture (front end + ML back end).</li> </ul> <p><b>Templates and checklists:</b></p> <ul style="list-style-type: none"> <li>• user interview/survey template;</li> <li>• pitch deck template (sections: Problem – Solution – Market – Tech – Business – Team – Ask);</li> <li>• technical report template;</li> <li>• assessment rubrics for: <ul style="list-style-type: none"> <li>○ the prototype;</li> <li>○ the presentation;</li> <li>○ teamwork;</li> <li>○ individual reflection.</li> </ul> </li> </ul> <p><b>Partners/mentors:</b></p> <ul style="list-style-type: none"> <li>• local or online organizations of people with hearing impairments;</li> <li>• teachers/researchers in sign language and inclusive education;</li> <li>• IT specialists with experience in CV/ML;</li> <li>• mentors from startup incubators/accelerators.</li> </ul> <p><b>Ethical and legal resources:</b></p> <ul style="list-style-type: none"> <li>• a short guide for students on: <ul style="list-style-type: none"> <li>○ how to obtain informed consent for video recording;</li> <li>○ how to anonymize data, where to store it, and when to delete it;</li> <li>○ how to communicate correctly with the Deaf community, respecting their culture.</li> </ul> </li> </ul> |
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## Annex 4 Proposed COIL Modules

### WORKSHOP DAY 5 (COIL Module Design Worksheet for Faculty)

#### Group1

#### 1. Module Overview

- Module Title: Free Food Website Project
- Term: Spring Semester 2026
- Faculty Leads: (Japan / Partner side) Kansai University
- Partner Institutions: (University names, countries, departments) Kharkiv National University of Radio Electronics, Sumy State University
- Target Learners: (Year, major, number of students) the 3d years, Computer Science, Electronics, Electronic Communications, Instrument Engineering and Radio Engineering, 2 teams with 5 persons
- Credits: 2 credits / 30 hours
- Overall Aim: Describe the intended learning experience and outcomes for students
- SDG / Social Issue Alignment: #1, #2, #3, #9 Industry & Innovation, #10, #13, #16 Peace & Justice
- Pedagogical Framework: Kolb (Experiential Learning), Vygotsky (Social Constructivism), Wenger (CoP)

#### 2. Weekly Design Matrix

| Week     | Learning Objective   | Main Activity                  | Mode         | Faculty Role             | Student Task                                        | Output                                             |
|----------|----------------------|--------------------------------|--------------|--------------------------|-----------------------------------------------------|----------------------------------------------------|
| Week 1   | Mutual understanding | Ice-breaking/ Cultural sharing | synchronous  | Facilitate introductions | Get to know and understand cultural characteristics | Development of intercultural communication skills  |
| Week 2   | Problem definition   | Issue research & framing       | asynchronous | Guide problem framing    | Formulation the problem Statement                   | Concise and Measurable description                 |
| Week 3-4 | Solution design      | PBL group work                 | asynchronous | Mentor group work        | Define system requirements and specifications       | Functional and non-functional requirements         |
| Week 5   | Peer review          | Peer evaluation & refinement   | asynchronous | Moderate review          | Validate assumptions and conclusions                | Assess readability and structure, verify reasoning |
| Week 6   | Final presentation   | Final presentation session     | synchronous  | Judge / Comment          | Demonstrate the expected results                    |                                                    |

Use this space to describe your plan above

### 3. Assessment & Reflection

| Evaluation Criteria              | Weight | Indicator                                                 | Evaluation Method              | Remarks |
|----------------------------------|--------|-----------------------------------------------------------|--------------------------------|---------|
| Social Relevance & SDG Alignment |        | Clearly addresses social relevance and SDGs               | Faculty + external evaluator   |         |
| COIL/PBL Design Quality          |        | Logical alignment between goals, activities, and outcomes | Peer review among faculty      |         |
| Feasibility                      |        | Realistic schedule, resources, and structure              | Pre-implementation review      |         |
| Student Engagement               |        | Level of teamwork and intercultural collaboration         | Learning log & survey analysis |         |
| Learning Outcomes                |        | Knowledge, skills, and attitudinal growth evidenced       | Rubric-based assessment        |         |

### 4. Implementation Plan

- Duration / Schedule: Start & end dates, milestones
- Platforms / Tools: Zoom, Padlet, Miro, JV-Campus, LMS, etc.
- Support System: TA support, translation, technical support
- Ethical & Copyright Considerations: Consent for recording, data sharing policies
- Budget & Resources: Funding, materials, technical infrastructure
- External Partners / Mentors: Industry, NGO, or expert collaborators

## **Group2**

### **1. Module Overview**

- Module Title: Smart-Shelter
- Term: Spring Semester 2026
- Faculty Leads: (Japan / Ukraine)
- Partner Institutions: (Sumy State University, Department of Information Technologies, Ukraine; NTU KhPI, Institute of International Education, Ukraine; Kharkiv national university of radio electronics, Software Engineering,
- Target Learners:  
(3rd–4th year undergraduate students)  
Majors: Information Systems, Digital Communication, International Studies,  
Expected number: 25–35 students (mixed groups)
- Credits: 2 credits / 30 hours
- Overall Aim: Team Work, Communication and Collaboration, Integration of International Best Practices, Languages
- SDG / Social Issue Alignment: #9 Industry & Innovation, #16 Peace & Justice
- Pedagogical Framework: PBL

### **2. Weekly Design Matrix**

| Week     | Learning Objective   | Main Activity                                                                  | Mode                                                           | Faculty Role             | Student Task                                                                                                                                             | Output                                                                           |
|----------|----------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Week 1   | Mutual understanding | Ice-breaking / Cultural sharing                                                | Synchronous (Zoom)                                             | Facilitate introductions | 1. Self-Presentation<br>2. Prepare a cultural introduction, interact with peers, establish communication norms.<br>3. Group Role Distribution            | team formation.                                                                  |
| Week 2   | Problem definition   | Issue research & framing                                                       | Asynchronous research + synchronous discussion in mixed teams. | Guide problem framing    | 1. Define the problem<br>2. Collect data<br>3. Create a shared problem statement.<br>4. Analysis of methods, techniques                                  | Problem Statement Slide + As-Is / To-Be map.                                     |
| Week 3–4 | Solution design      | PBL group work, brainstorming, prototyping in Miro / Figma / no-code AI tools. | Asynchronous collaboration + synchronous mentor check-ins.     | Mentor group work        | 1. Design an AI-supported solution addressing the chosen challenge<br>2. Modelling of the IS based on the designed AI-solution<br>3. Create a prototype. | Prototype mock-up + short feasibility document.<br>UML Diagrams IS Specification |

|        |                    |                                     |                                  |                              |                                                                                                 |                                         |
|--------|--------------------|-------------------------------------|----------------------------------|------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------|
| Week 5 | Peer review        | Peer evaluation & refinement        | Synchronous peer-review workshop | Moderate review              | 1. Give/receive feedback<br>2. Revise solution<br>3. Interactive prototype<br>4. Beta - Testing | Revised prototype + reflection notes.   |
| Week 6 | Final presentation | Final group presentations with Q&A. | Synchronous final event (Zoom).  | Judge / Comment/ Perspective | Deliver presentation, answer questions, overview of prospects, prepare final reflection.        | Final presentation + reflection report. |

### Use this space to describe your plan above

This COIL module aims to integrate AI literacy, intercultural communication, and collaborative problem-solving. Students from Japan and Ukraine work together in mixed teams to explore shared challenges in education and information systems. The weekly design progresses from team building and problem identification to AI-supported solution prototyping and final presentations. Emphasis is placed on authentic communication, experiential learning, and sustainable collaboration aligned with SDGs.

The project task focuses on developing an information system for the "Smart Shelter" - a dual-purpose infrastructure facility. Dual-Shelter functions as an educational co-working space in peacetime (or during periods of calm) and instantly transforms into a protective structure during air raids.

### 3. Assessment & Reflection

| Evaluation Criteria              | Weight | Indicator                                                 | Evaluation Method              | Remarks                    |
|----------------------------------|--------|-----------------------------------------------------------|--------------------------------|----------------------------|
| Social Relevance & SDG Alignment | 20%    | Clearly addresses social relevance and SDGs               | Faculty + external evaluator   | Focus on SDG 9 & 16        |
| COIL/PBL Design Quality          | 20%    | Logical alignment between goals, activities, and outcomes | Peer review among faculty      | Alignment check            |
| Feasibility                      | 15%    | Realistic schedule, resources, and structure              | Pre-implementation review      | Includes tech requirements |
| Student Engagement               | 20%    | Level of teamwork and intercultural collaboration         | Learning log & survey analysis | Engagement rubric          |
| Learning Outcomes                | 25%    | Knowledge, skills, and attitudinal growth evidenced       | Rubric-based assessment        | Includes prototype quality |

### 4. Implementation Plan

- Duration / Schedule: Start & end dates, milestones 6-week module between April–May 2026. Milestones: Week 2 problem statement, Week 4 prototype, Week 6 final presentation.
- Platforms / Tools: Zoom, Padlet, Miro, JV-Campus, LMS, etc. Zoom, Miro, Padlet, Google Drive, JV-Campus LMS, Figma, Google Colab.

- **Support System:** TA support, translation, technical support  
TA support (1 per institution), bilingual facilitation, and technical troubleshooting.
- **Ethical & Copyright Considerations:** Consent for recording, data sharing policies  
Consent for recording online sessions; restrictions on sharing personal data; clear citation rules for images, AI-generated materials, datasets.
- **Budget & Resources:** Funding, materials, technical infrastructure  
University-supported platforms, optional small grant for prototype development, technical infrastructure provided by all institutions.
- **External Partners / Mentors:** Industry, NGO, or expert collaborators  
Local IT companies, AI practitioners, local authorities, enterprises, NGO representatives working with digital transformation in education, invited guest speakers.

## **Group3**

### **1. Module Overview**

- Module Title: “IoT-Based Microgrid Monitoring and Failure Prediction”
- Term: Spring Semester 2026
- Faculty Leads: (Poland / Ukraine)
- Partner Institutions: (Lviv Polytechnic National University, Department of Specialised Computer Systems, Sumy State University, Department of Information Technologies, Ukraine, Warsaw University of Technology, Poland)
- Target Learners: (4 Year, Bachelor students, 20)
- Credits: 2 credits / 60 hours
- Overall Aim: 1) Studying the architecture of the IoT network and communication protocols.  
2) Acquiring skills in effective teamwork, project management, documenting results, and presenting projects to professional and non-professional audiences.
- SDG / Social Issue Alignment: #9 Industry & Innovation,
- Pedagogical Framework: Kolb (Experiential Learning), Vygotsky (Social Constructivism), Wenger (CoP)

### **2. Weekly Design Matrix**

| Week     | Learning Objective   | Main Activity                   | Mode                                          | Faculty Role             | Student Task                                                                                                                                                         | Output                                                                                                         |
|----------|----------------------|---------------------------------|-----------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Week 1   | Mutual understanding | Ice-breaking / Cultural sharing | Introductory meeting.<br>Introductory lecture | Facilitate introductions | Build teams. assign roles. Studying the basic principles of energy distribution in energy systems and microgrids                                                     | Distributed roles. Basic knowledge about the project scope                                                     |
| Week 2   | Problem definition   | Issue research & framing        | Meeting                                       | Guide problem framing    | Analysis of the problem, discussion of the power grid failure scenario                                                                                               | The problem has been identified, and a possible solution has been described (main aim and requirements).       |
| Week 3–4 | Solution design      | PBL group work                  | Meeting s, individual work                    | Mentor group work        | Prototyping, Data collection, and processing                                                                                                                         | A prototype IoT system for monitoring the status of microgrids, project presentation and technical description |
| Week 5   | Peer review          | Peer evaluation & refinement    | Group discussion, individual work             | Moderate review          | Review the interim results of the peer’s team work, evaluate the results, and provide recommendations. Improvement own project based on others’ team recommendations | Feedback, in special fields in applications such as Padlet                                                     |
| Week 6   | Final presentation   | Final presentation session      | Final meeting                                 | Judge / Comment          | Project presentation. Analysis of results and discussion.                                                                                                            | Improved own prototype<br><br>Final version of prototype                                                       |

Use this space to describe your plan above

### 3. Assessment & Reflection

| Evaluation Criteria              | Weight | Indicator                                                 | Evaluation Method              | Remarks |
|----------------------------------|--------|-----------------------------------------------------------|--------------------------------|---------|
| Social Relevance & SDG Alignment |        | Clearly addresses social relevance and SDGs               | Faculty + external evaluator   |         |
| COIL/PBL Design Quality          |        | Logical alignment between goals, activities, and outcomes | Peer review among faculty      |         |
| Feasibility                      |        | Realistic schedule, resources, and structure              | Pre-implementation review      |         |
| Student Engagement               |        | Level of teamwork and intercultural collaboration         | Learning log & survey analysis |         |
| Learning Outcomes                |        | Knowledge, skills, and attitudinal growth evidenced       | Rubric-based assessment        |         |

### 4. Implementation Plan

- Duration / Schedule: Start & end dates, milestones
- Platforms / Tools: Zoom, Padlet, Miro, JV-Campus, LMS, etc.
- Support System: TA support, translation, technical support
- Ethical & Copyright Considerations: Consent for recording, data sharing policies
- Budget & Resources: Funding, materials, technical infrastructure
- External Partners / Mentors: Industry, NGO, or expert collaborators

## **Group4**

### **1. Module Overview**

- Module Title: Data Collection and Analysis in Multisensory Systems for Human Safety in Emergencies
- Term: Spring Semester 2026
- Faculty Leads: (Japan / Partner side)
- Partner Institutions: (Sumy State University, Ukraine, Department of Information Technologies) (Lviv Polytechnic National University, Ukraine, Department of Specialized Computer Systems) (Taras Shevchenko National University of Kyiv, Ukraine, Department of Intelligent Software Systems) (partners from Japan - TBD)
- Target Learners: (fourth-year students majoring in Computer Science and Computer Engineering, 30-40 total) (maybe students majoring in relevant subject domains - architecture, robotics, aviation, economics, healthcare, ...)?
- Credits: 2 credits / 30 hours
- Overall Aim: To collaboratively design, simulate, and reflect on an emergency-oriented multisensory platform, integrating data collection, preprocessing, and analytical techniques with teamwork, mutual understanding, and intercultural communication skills.
- SDG / Social Issue Alignment: #9 Industry & Innovation, #11 Sustainable cities and communities, #16 Peace & Justice
- Pedagogical Framework: PBL, Kolb (Experiential Learning), Vygotsky (Social Constructivism), Wenger (CoP)

### **2. Weekly Design Matrix**

| Week | Objective                    | Main Activity             | Mode       | Faculty Role  | Student Task          | Output                        |
|------|------------------------------|---------------------------|------------|---------------|-----------------------|-------------------------------|
| 1    | Cultural sharing             | Icebreaker, team-forming  | Sync       | Facilitation  | Introduction          | Team roster                   |
| 2    | Problem definition           | search, stakeholder input | Sync/Async | Guide framing | Issue brief           | Problem statement             |
| 3    | Data Collection and Analysis | COIL-PBL groupwork        | Sync/Async | Mentor        | Brainstorm, research  | Solution description document |
| 4    | Solution design              | PBL group work            | Sync/Async | Mentor        | Brainstorm, prototype | Arch diagram                  |
| 5    | Peer review                  | Inter-team feedback       | Async      | Review        | Reflection            | Improved doc                  |
| 6    | Final pitch                  | Presentation              | Sync       | Judge         | Delivery              | Presentation                  |

#### **Synchronous**

Zoom meetings  
Weekly team sessions  
Guest lectures  
Final presentations

#### **Asynchronous**

Slack for daily communication  
GitHub for technical work  
Google Workspace for documents  
Recorded sessions

### Use this space to describe your plan above

During week 1, students from Ukraine and Japan get to know each other, perhaps sharing relevant stories from their respective cultures about the importance of data in preventing and mitigating emergencies. Also, teams are formed.

Week 2 introduces the problem: design a solution to gather data from multiple sources, process it, and present the results. If possible, international guest speakers are invited to introduce relevant issues. If they can't join e.g. in Zoom session, they may record videos which will be shared and discussed by teams.

Weeks 3 and 4 are dedicated to designing the solution. Week 3 focuses on data gathering and analysis (which data is needed, how to gather it, and whether there are existing datasets that could be used), while week 4 focuses on data processing and designing a prototype of an app. The students will likely end up with an overall design, including main components and their interactions. Building an actual working prototype is not required due to limited time, but if a team manages to implement something (perhaps using AI assistants), they may demo it during week 6. Students will do most of the work in asynchronous mode, but may organize regular meetings to coordinate, report their progress and discuss next tasks.

Week 5 provides students with an opportunity to perform a peer review, where each team can comment on the solutions of other teams. Based on feedback, teams can improve their proposals.

Week 6 is the final presentation and discussion. If possible, stakeholders are invited to listen, comment, and provide feedback on the proposals.

### 3. Assessment & Reflection

- Criteria:
  - Social Relevance & SDG Alignment; Relevance of Data; Quality of Design; Feasibility; Student Engagement; Learning and Growth (rubric-based)
- Methods:
  - Faculty/external panel + peer/survey/self
  - Logs, reflection essays

### 4. Implementation Plan

- Duration: 6 weeks
- Tools: Zoom, Slack, Miro, GitHub, LMS
- Support: TA/mentor support; real-time Q&A
- Ethics: Consent forms for recording/events
- Resources: Online tutorials, demo kits, industry feedback
- External Partners / Mentors: Industry, NGO, volunteers, or expert collaborators

## **Group5**

### **1. Module Overview**

- Module Title: Deep Learning in Computer Vision.
- Term: Spring Semester 2026.
- Faculty Leads: (Japan / Ukraine).
- Partner Institutions: (Japanese university; Yuriy Fedkovych Chernivtsi National University, Ukraine - Computer Science Department; Kharkiv National University of Radio Electronics - Department of Computer Intelligent Technology and Systems, Lviv Polytechnic National University - Information Systems and Networks Department).
- Target Learners: (4th year students, IT-students, 30).
- Credits: 2 credits / 60 hours.
- Overall Aim: The goal of this course is to enable students to understand, design, and implement deep learning models that solve real-world computer vision tasks. Understand foundations of convolutional neural networks, object detection models like YOLO or SSD, and image segmentation. Throughout the course, they will work with real-world image and video datasets, perform reproducible experiments, interpret results, and present their findings. Collaborative work, critical discussion of recent research papers, and iterative improvement of models are emphasized to help students connect theory with practical applications and current trends in the field.
- SDG / Social Issue Alignment: SDG #9 Industry & Innovation,
- Pedagogical Framework: Kolb (Experiential Learning), Wenger (CoP), PBL (project-based learning).

### **2. Weekly Design Matrix**

| Week     | Learning Objective                                                           | Main Activity                   | Mode   | Faculty Role                                                  | Student Task                                                                                      | Output                                                                             |
|----------|------------------------------------------------------------------------------|---------------------------------|--------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Week 1   | Build mutual understanding and align expectations for the course and project | Ice-breaking / Cultural sharing | Hybrid | Facilitate introductions, clarify assessment and deliverables | Introduce own background, form teams                                                              | Short intro (slide or Padlet post); list of groups with draft project topics       |
| Week 2   | Problem definition for a deep learning computer vision project               | Issue research & framing        | Hybrid | Guide problem framing, provide examples and constraints       | Explore potential datasets for the chosen task; perform brief literature scan.                    | Written project brief (problem statement, dataset description, evaluation metrics) |
| Week 3-4 | Design and implement baseline and improved DL models                         | PBL group work                  | Hybrid | Mentor group work                                             | Design the model architecture; implement data pipeline and training loop; train a baseline model. | Working baseline model and training script/notebook.                               |

|        |                                                                     |                                                      |        |                                          |                                                                                      |                                                                                             |
|--------|---------------------------------------------------------------------|------------------------------------------------------|--------|------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Week 5 | Critically evaluate models and refine solutions through peer review | Peer evaluation & refinement, error analysis session | Hybrid | Moderate review, provide expert feedback | Review another group's code, experiments, and interim report using a provided rubric | Peer review feedback summary. Updated project plan                                          |
| Week 6 | Final presentation                                                  | Final presentation session, Q&A                      | Hybrid | Judge / Comment; provide feedback        | Deliver a final presentation and live/recorded demo of the model                     | Final slide deck and demo; final report (method, experiments, results, limitations, ethics) |

### Use this space to describe your plan above

This COIL module connects Japanese and Ukrainian students to collaboratively design computer vision systems addressing real social issues. The module relies on PBL methodology, emphasizing inquiry, research, prototyping, and intercultural teamwork. Students work in international teams as “AI Solution Consultancies,” exploring datasets, selecting a social problem, and designing an AI-driven prototype. Weekly activities balance synchronous interactions with asynchronous development, supported by faculty mentoring and structured feedback. The final deliverable is a functional AI system aligned with SDGs and presented to an authentic audience, including industry or municipal partners.

### 3. Assessment & Reflection

| Evaluation Criteria              | Weight | Indicator                                                 | Evaluation Method              | Remarks                                                                   |
|----------------------------------|--------|-----------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------|
| Social Relevance & SDG Alignment | 10%    | Clearly addresses social relevance and SDGs               | Faculty + external evaluator   | Focus on responsible AI, fairness, dataset ethics                         |
| COIL/PBL Design Quality          | 20 %   | Logical alignment between goals, activities, and outcomes | Peer review among faculty      | Ensures coherence of the PBL approach and quality of instructional design |
| Feasibility                      | 20 %   | Realistic schedule, resources, and structure              | Pre-implementation review      | Checks dataset size, computational load, and clarity of milestones        |
| Student Engagement               | 20 %   | Level of teamwork and intercultural collaboration         | Learning log & survey analysis | Includes teamwork reflections and communication pattern analysis          |
| Learning Outcomes                | 30 %   | Knowledge, skills, and attitudinal growth evidenced       | Rubric-based assessment        | model correctness, reproducibility, experiment depth, ethical reflection  |

### 4. Implementation Plan

- Duration / Schedule: Start & end dates, milestones Start: April 2026  
End: June 2026

Milestones: Problem Definition → Prototype v1 → Peer Review → Final Presentation

End of Week 1 – Groups formed, tools tested, topics drafted.

End of Week 2 – Approved Project Brief.

End of Week 4 – Interim Presentation and baseline model ready.

End of Week 5 – Completed peer-review cycle, refined plan.

End of Week 6 – Final deliverables submitted and presented.

- Platforms  
Tools: Zoom/Microsoft Teams, Padlet, Miro, JV-Campus, GitHub, Google Collab.
- Support System: TA support, translation, technical support  
Support peer-review process (check rubrics, fairness, completeness).
- Ethical & Copyright Considerations: Consent for recording, data sharing policies  
Students must provide consent for recording live sessions, model demos, and presentations.  
Prefer open, properly licensed datasets (e.g., Creative Commons, research datasets with clear terms).
- Budget & Resources: Funding, materials, technical infrastructure  
Access to datasets, research papers, tutorials, notebooks, and baseline model implementations.  
Budget for cloud compute credits (AWS, Azure, Google Cloud, etc.)
- External Partners / Mentors: Industry, NGO, or expert collaborators  
Each group can be assigned an external mentor from IT Companies, NGO, IT Clusters, etc.  
Feedback on final presentations from an industry perspective (deployability, value, robustness).