DATA COLLECTION SURVEY FOR UKRAINIAN IT HUMAN RESOURCE DEVELOPMENT COLLABORATING WITH POLISH-JAPANESE ACADEMY OF INFORMATION TECHNOLOGY

WORK COMPLETION REPORT

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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) JAPAN DEVELOPMENT SERVICE CO., LTD (JDS)

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ABBREVIATIONS

Abbreviation	English/Polish		
AI	Artificial Intelligence		
API	Application Programming Interface		
AR	Augmented Reality		
AWS	Amazon Web Services		
B2B	Business to Business		
CAD	Computer Aided Design		
CAE	Computer Aided Manufacturing		
CAM	Computer Aided Engineering		
COIL	Collaborative Online International Learning		
CSS	Cascading Style Sheets		
CV	Curriculum Vitae		
DX	Digital Transformation		
EU	Furonean Union		
FWCI	Field Weighted Citation Impact		
FWVI	Fields-Weighted View Impact		
46	4 th Generation		
40 5G	5 th Generation		
GDPR	General Data Protection Regulation		
НР	Home Page		
HTI M	Hyper Text Markun Language		
IOM	International Organization for Migration		
IoT	Internet of Things		
IT	Information Technology		
IFTRO	Japan External Trade Organization		
	Japan International Cooperation Agency		
IDV	Japanese Ven		
MBA	Master of Business Administration		
MR	Mixed Reality		
NAWA	Polish National Agency for Academic Exchange		
NRP	Narodowy Bank Polski		
NGO	Non-governmental Organization		
PR	Peta Rytes		
PRI	Project Based Learning		
PC	Personal Computer		
PESEI	Powszechny Elektroniczny System Ewidencji Ludności		
PIAIT	Polish-Japanese Academy of Information Technology		
PhD	Doctor of Philosophy		
DI N	Polich Zloty		
SDGs	Sustainable Development Goals		
SNS	Social Networking Service		
IIAH	Ilkrainian Hruuni		
	User Interface		
UNHCR	The Office of the United Nations High Commissioner for Refugees		
UNICEE	The United Nations Children's Fund		
UNITAR	United Nations Institute for Training and Research		
2D	Two Dimensions		
3D	Three Dimensions		
UTF	Ukrainian Talent Foundation		
UX	User eXperience		
VR	Virtual Reality		
Web	World Wide Web		
XR	Cross Reality		

1. Outline of the Survey

1.1 Background of the Survey

Prior to Russia's invasion of Ukraine in February 2022, Ukraine's IT sector continued to grow, mainly through outsourcing, with the IT industry market size at \$4.5 billion (Investment Agency of Ukraine, 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 a large number of talented IT professionals each year, including 16,000 people with IT-related degrees annually (2022, JETRO).

After Russia's invasion of Ukraine, the Government of Ukraine has been working to protect its IT resources in order to continue state activities, including the migration of data from ministries and universities to the cloud using systems provided by Amazon Web Services (AWS) of the U.S. However, the continuous training of IT personnel has become a challenge. In particular, the prolonged invasion has caused significant damage to universities and other institutions, particularly in eastern Ukraine, and university personnel in IT-related fields have fled to Poland and other neighboring countries, making it difficult to maintain the same level of education as before the invasion.

In addition, 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 neighboring countries, of which Poland hosted 1.8 million people, or 60 percent. Although many have since returned home, as of September 2022, 1.4 million people still remain in Poland. Furthermore, the UNHCR points out that support for Ukrainian refugees is shifting from the emergency phase, in which benefits and supplies are provided to ensure their immediate livelihood, to the support phase, in which social services such as housing, healthcare, and education, as well as employment services, are provided to support their prolonged stay.

1.2 Purpose of the Survey

In light of the current situation, this survey will collect and confirm basic information necessary to support education and training in the IT field for Ukrainian refugees in Poland, which hosts a large number of refugees. The survey will be conducted with the Polish-Japanese Academy of Information Technology (PJAIT), with which JICA has cooperated for many years, as a cooperating organization, and information will be collected with a view to formulating a medium- to long-term, continuous cooperation plan for IT human resource development support for Ukrainian refugees in Poland with PJAIT as a hub. However, in view of the prolonged exodus of Ukrainian people from Ukraine, as access to appropriate information in Poland is essential for social and living stability, IT literacy improvement training for Ukrainian refugees will be implemented through PJAIT as an immediate support, and its effectiveness will be confirmed, apart from medium- and long-term planning including support for employment. (Hereafter, the IT literacy improvement training to be conducted under this survey for this purpose will be referred to as the "Pilot Training").

1.3 Survey Contents and Period

As shown in the figure below, the Survey consists of 1) collection of basic information (1-1 to 2-1 in the figure below), 2) implementation of IT literacy training in cooperation with PJAIT for non-IT engineers (2-2 in the figure below), 3) proposal for implementation of training and projects in cooperation with PJAIT (3-1 in the figure below), and 4) preparation of deliverables. (0-1, 1-6 and 3-2 in the figure below).



Source: Prepared by the JICA Survey Team

Figure-1 Overall Flow of the Survey Work

The study started in March 2023 and ended at the end of December 2023.

1.4 Composition of the JICA Survey Team

The Survey Team consists of four members. The affiliations and responsibilities of each member are listed in the table below.

Name	Company Name	Field of Expertise	
Hiroyuki Kanzaki	Japan Development Service Co., Ltd. (JDS)	Team Leader/Higher Education	
Tsutomo Ono	JDS	IT Literacy ①	
Yumi Yoshida	ASAGAO sp.zo.o	I IT Literacy ^②	
Nobuaki Hatakeyama	JDS	IT Resource Collaboration	

Table-1 Composition of the JICA Survey Team

Source: Prepared by the JICA Survey Team

2. Identification of Short-term Assistance Needs and Mid- to long-term Needs of Ukrainian Refugees

2.1 Policies of the Governments of Poland and Ukraine

- (1) The Government of Poland's Policy toward Ukrainian Refugees
- 1) General Policy

The Government of Poland allows Ukrainians affected by the Russian invasion of Ukraine, which began on February 24, 2022, to stay in the Republic of Poland.

The Law of March 12, 2022, on Assistance to Ukrainian Displaced Persons who have fled to Poland as a result of the armed conflict in Ukraine allows the following people to stay legally in Poland for 18 months. (The period has been extended. Please see the details below.)

- a. Ukrainian citizens who entered Poland after February 24, 2022, due to the Russian invasion of Ukraine (regardless of whether they entered directly from Ukraine or via a third country) and who have declared their intention to stay in Poland
- b. Spouses of Ukrainian citizens who entered Poland under (1), entered Poland under the conditions of (2) (regardless of their Ukrainian citizenship).

However, the following items are excluded from the above

- Holders of Polish permanent residence permits, holders of long-term residence permits in Poland, holders of short-term residence permits, people with refugee status, and persons who were admitted to stay as protected persons
- International applicants for protection (however, it is possible to withdraw an international application for protection, in which case it is legal to stay in Poland from the date of withdrawal). In this case, the applicant's stay in Poland is legal from the date of withdrawal.)

The services available to displaced people from Ukraine under the Law include the following.

Granting of PESEL Number (National Identification Number)

Special measures have been taken to allow for the granting of PESEL numbers to those who do not have the legal basis necessary to obtain a regular PESEL number. The application process for obtaining a PESEL number began on March 16, 2022, and applications are being accepted at administrative offices in Poland. Currently, displaced persons from Ukraine are required to obtain a PESEL within 30 days of their entry into Poland.

Access to the labor market

Access to public support for job seekers is now available, as well as simplification concerning employer procedures (employment is now possible with only an online employment notice).

· Access to education opportunities

As children and students of Ukrainian nationality, they are entitled to the same public education opportunities as Polish citizens.

• Access to public healthcare facilities

Public healthcare is available for Ukrainians in Poland.

• Access to public and private assistance

Access to assistance and support from government and private organizations for displaced persons from Ukraine is possible.

The temporary stay in Poland for Ukrainian displaced people is set for 18 months from February 24, 2022, until August 24, 2023, but the EU policy is to extend it until March 4, 2024, and the Government of Poland plans to follow this policy. In addition, as of April 1, 2023, displaced Ukrainian citizens who are working or have started a business (including sole proprietors) may apply for a temporary residence permit.

At the meeting with the Polish Ministry of the Interior and Administration, it was noted that from the beginning, Ukraine and Poland were sympathetic to the displaced people because of their close cultural and linguistic backgrounds and the fact that they had accepted Ukrainian migrant workers before the war and that this public opinion has not changed. Immediately after the invasion by Russia into Ukraine, the main focus was made on emergency assistance for food, clothing, and shelter, but now, more than a year later, the emphasis is on assistance for self-reliance, such as job placement assistance. Many of the displaced people from Ukraine are currently working in jobs that require fewer skills and qualifications than the jobs they held in their home country, and the challenge is to help them in finding employment that is commensurate with their skills and qualifications. According to the Ministry of the Interior and Administration, there are currently no plans to offer preferential treatment to displaced people in Poland according to their skills or occupation, but the Ministry will continue to work on the issue of assisting them in finding employment, including skilled jobs.

One of the challenges for future support is to enable people to move from evacuation shelters to regular apartments or other private housing. Partial payment of rent at shelters and other government and city-established shelters to promote self-reliance has also begun.

2) Role of Polish ministries and governmental institutions

The following chart describes the division of roles and policy implementation structure of the various ministries and agencies regarding support for Ukrainian refugees.

Name	Main Role	
Ministry of Family and Social Policy	Establishment of a system related to general life	
	support for refugees from Ukraine	
Ministry of the Interior and Administration	Legalization of Ukrainian refugees	
Department of International Cooperation in Warsaw	Social integration and livelihood support for Ukrainian	
	refugees staying in Warsaw	
Warsaw City Labour Department	Employment support for Ukrainian refugees in Warsaw	
(Department for Ukrainian Refugees)		

Table-2 Role of Polish Ministries in Assistance to Displaced People from Ukraine

Source: Created by the JICA project member

3) Policies and conditions on the education of refugees from Ukraine

Basic Policy:

The European Commission has issued basic guidelines for the admission of displaced people affected by the Russian invasion of Ukraine into the educational systems of EU member states through Ordinance No. 2022/382. The ordinance provides for the admission of children under 18 years of age who are under temporary protection due to the invasion of Ukraine into the educational system under the same conditions as citizens of their own country or the EU.

Access to Compulsory Education:

All children between the ages of 7 and 18 are required to complete compulsory education and must be accepted into a Polish school. The grade level of the Polish educational system to be attended is calculated according to the number of years of education of the child concerned.

The number of years of education is calculated based on the documents issued by the school the child attended in Ukraine or on the declaration of the child's parents. Documents from Ukrainian schools do not need to be translated into Polish. Registration of a Ukrainian child in the Polish educational system is completed by submitting a written application to the principal of the school the child wishes to attend. Public elementary schools in the child's area of residence will automatically enrol the child, and other schools will accept the child on a free space-available basis.

In addition, the right to access compulsory education is not dependent on the legality of the child's stay in Poland.

Access to Higher Education:

Students enrolled in a Ukrainian university and currently residing legally in Poland are eligible to apply to all Polish universities. The grade, field of study, and degree must correspond to those of the Ukrainian university in which the student is enrolled, and if there are differences in curriculum, the student must take an exam or internship to fulfil the difference. Many university institutions in Poland offer educational opportunities in Polish and English. Continuation or commencement of studies in Poland is authorized by the academic agreement between Ukraine and Poland, which allows students who do not have official documents to continue their studies in Poland by declaring that they were a student of a Ukrainian institution as of February 24, 2022, and that they were not a student of a Ukrainian institution as of February 24, 2022. The examination of the academic level will be carried out by the educational institution according to its regulations.

Ukrainian refugees who meet the following conditions are eligible for full exemption from university fees:

- 1. Recipient of refugee status
- 2. Receiving temporary protection in Poland
- 3. Holder of the "Pole's Card"
- 4. Relative of a Polish citizen(s) residing in Poland (children, grandchildren, great-grandchildren)

The following assistance in the field of education was implemented at the initiative of the Government of Poland.

Support	Content	
Acceptance into the Polish	Ukrainian refugees are allowed to continue their education in Poland	
education system	(see details above).	
Language support	Polish language classes are provided for children who need support in Polish	
	learning, with Ukrainian speakers assisting and supporting them.	
Introduction of chatbot in	A Polish-Ukrainian chatbot was introduced to provide information for parents who	
the Ukrainian language	wish to place their children in the Polish educational system.	
Free textbooks and	Free of charge books are provided to elementary school students obtaining	
educational resources	compulsory education.	
Ukrainian language	At the initiative of the Ministry of Education, Polish language training courses	
training offered	were provided to refugees who had taken teaching positions in Ukraine and wished	
_	to work in Polish schools.	
Financial support	Opportunity to apply for public support and student loans	

Table-3 Support for Ukrainian Refugees in the Field of Education

Source: Created by JICA project member based on the information provided by the Ministry of the Interior and Administration

4) Policies and conditions related to the provision of employment opportunities

As mentioned above, the law accepted on March 12, 2022, to support Ukrainian displaced persons who fled the armed conflict in Ukraine to Poland allows Ukrainian displaced people to obtain a PSESL (national identification number) and allows them to work in Poland under the following conditions:

- Legally residing in Poland and holding a residence permit, or
- Legally entered Poland from Ukraine after February 24, 2022, and declared their intention to stay in Poland

Free employment assistance is provided by the Polish state and municipal administrations. Counselling is available in person or over the phone, but information can also be obtained online through websites in Ukrainian and Russian.

In addition to the informational website, job information for Ukrainian refugees is also available online in Ukrainian.

The Government of Ukraine offers a consultation service for displaced people, which not only introduces job opportunities, but also provides information on suitable occupations, rewriting of qualifications, and opportunities for skill development.

In addition to gathering information, Ukrainian refugees, who legally stay in Poland, can register as job seekers with the Labor Office. The job seeker registration is also available to older people (men over 65 years old and women over 60 years old).

The portal, an initiative of the Polish government (Ministry of Digital Affairs of the Cabinet Office) for Ukrainian refugees seeking employment, offers a service that can be used with a login method linked to the Polish national identification number and weekly email notifications of job offers that meet the requirements of the job seeker. The portal is available in Polish, Ukrainian, and English.



Source: https://pracawpolsce.gov.pl/

Figure-2 Portal Site for Ukrainian Refugees seeking Work Led by the Ministry of Digital Affairs of the Cabinet Office

(2) Government of Ukraine's Policy on Displaced People

As a general policy toward its citizens who have fled abroad, the Government of Ukraine is committed to maintaining the identity of its citizens residing abroad. Article 12 of the Constitution of Ukraine declares that Ukraine will respond to the living and cultural needs of its citizens residing abroad. Ukrainian embassies and consulates abroad are encouraged to provide information to displaced people.

Basically, men between the ages of 18 and 60 are not allowed to move out of the country. In addition, according to Chapter 23 of the "On Mobilization Training and Mobilization" Act, which came into force on September 14, 2022, in Ukraine, it is the policy of the government not to allow the return of a male citizen (over 18 years of age) who has been enrolled in an overseas educational program to the country of their study. However, outward migration is permitted for permanent residence holders in a foreign country and for those whose relatives passed away abroad. Other persons who are allowed to move out of the country are as follows.

Exceptions to this rule allow the following people to leave the country:

- Any person with a disability, regardless of category, who holds one of the following documents:
 - Certificate that proves the applicable status;
 - Pension Certificate or Certificate of Appointment for Social Assistance indicating the type and cause of the disability; or
 - A certificate for persons with disabilities who are not entitled to social assistance to receive benefits (according to a form approved by the Ministry of Social Policy).
- Male servicemen leaving the country for treatment of war wounds who meet all of the following criteria:
 - Needs for referral for treatment in a foreign country,
 - Communication from the State Commission's Emergency Coordination Center, and
 - Acceptance for treatment by a foreign medical institution.
- A male who has minor children and meets one of the following conditions:
 - Has three or more minor children;
 - Is the sole guardian of a child under the age of 18;
 - Is the parent or guardian of a minor orphan; or
 - Is the father of a disabled child under the age of 18.
- Other family circumstances (the documents to prove the following situation needed)
 - If you are a full-time caregiver for a relative; or
 - One of the parents or spouse has a Category I or II disability.
- Job Duties
 - Ship crew members;
 - Rail transportation staff;
 - Aviation personnel on business or training trips;

- Scientific and educational personnel who present a military certificate with a recorded draft deferment and documents confirming the purpose of departure from the country;
- Drivers of vehicles transporting goods and passengers internationally;
- Volunteer drivers transporting military, medical supplies and humanitarian aid;
- Cultural workers leaving the country for charitable fundraising activities or to represent their country on the international stage;
- Athletes and coaches participating in official competitions and training; and
- Politicians and delegates with proper authorization based on the reason for their travel.
- (3) Current discussion on future developments regarding the overseas travel of Ukrainian citizens

Amid much controversy regarding the compromising nature of restrictions on men traveling abroad, a bill has been introduced in the Ukrainian parliament to allow all men to travel abroad, including for business purposes. Although it is at the draft stage and not yet accepted, the bill proposes to allow all men between the ages of 18 and 60 with military service obligations to leave the country in possession of one of the following documents:

- Decisions of public authorities regarding official business trips abroad, especially for the transport of humanitarian supplies;
- Documents certifying that the applicant is enrolled in or attending an educational institution in a foreign country;
- Certificate of approval for overseas travel from the Regional Employment and Social Assistance Center; or

Document confirming that the person has an account in one of the state-owned banks of Ukraine and has deposits guaranteeing the minimum living expenses of five able-bodied persons. In addition, an affidavit that the account will be replenished with compensation equal to the minimum tax on minimum wages for the entire period of their stay in the intervention during martial law, and permission to transfer funds from said account to a special account of the Ukrainian military at the relevant bank. (The passage of this draft will require the men to open an account with the state bank with a minimum deposit of 12,945 UAH and replenish it with 1,306.5 UAH per month during their stay abroad, and to authorize the bank to transfer these contributions to a special account of the Armed Forces of Ukraine).

- (4) Government of Ukraine's IT strategy
 - 1) IT roles in Ukraine's National Recovery Plan

Ukraine's National Recovery Plan was first presented at a conference held in Switzerland in July 2022, followed by an international conference held in Germany in October 2022¹, at which Japan and other Western countries confirmed their intention to support Ukraine's long-term recovery. The National Recovery Plan is led by the National Recovery Council of Ukraine, with 23 working groups developing specific measures in each area.

Through the Recovery Plan, the Government of Ukraine aims to improve its citizens' lives by digitizing the entire nation and facilitating support from the international community for the early realization of reconstruction. The role of IT in this national reconstruction plan includes the restoration of national infrastructure, digitization of public administration, and development of the digital economy, all of which are essential parts of the nation's recovery. Specifically, the following initiatives are being undertaken.

- **Restoration of the Digital Infrastructure:** The goal is to repair the telecommunications infrastructure destroyed by the Russian invasion and to provide high-speed Internet access to 95% of the population. It also plans to move 30% of government information to the cloud in cooperation with global IT companies such as Google and Microsoft.
- **Digitization of Public Administration:** The e-government application Diia² aims to enable all administrative services to be handled via smartphones. In addition to providing administrative services and information to citizens, they are also considering digitizing judicial procedures and referendums.
- Developing the Digital Economy: Deputy Prime Minister and Minister of Digital Transformation Mykhailo Fedorov proposed the Digital Marshall Plan³ at the Ukraine Reconstruction Conference in July 2022 to make Ukraine the most digital nation within three years. Within the plan, a new initiative called Digital4Freedom⁴, part of the UNITED24⁵ global platform, is being launched to work with private IT and telecommunications companies in Europe and the US to realize the plan.

¹ Ukraine Recovery Conference (URC2022) in Lugano:

https://www.eda.admin.ch/eda/en/fdfa/fdfa/aktuell/dossiers/urc2022-lugano.html

² One-stop administrative services, which means "Action" in Ukrainian Diia: https://diia.gov.ua/

³ It is analogous to the Marshall Plan, which the U.S. implemented after World War II to support the reconstruction of European countries.

⁴ Ministry of Digital Transformation (Digital4Freedom): https://thedigital.gov.ua/news/mintsifra-zapuskae-digital4freedom-mizhnarodnu-initsiativu-strimkogo-vidnovlennya-tarozvitku-ukraini-cherez-innovatsii-ta-tsifrovizatsiyu

⁵ Crowdfunding site launched in May 2022 to raise funds for defence, medical care, national reconstruction, etc.: https://u24.gov.ua/

2) Specific polities of "State in a Smartphone" with its actions

"State in a Smartphone", which is one of the projects the Ministry of Digital Transformation has promoted to digitize public administration, was announced in September 2019. Subsequently, Diia⁶ has been available to the public since February 2020. The future goal is to have 100% of public services online by 2024; for example, all citizens will be able to receive digital documents such as passports and licenses, maternity benefits, and various other business support services from their smartphones. Diia. Digital Education⁷, a service aimed at improving digital education and digital literacy, also offers the following services.

- **Online educational materials:** content includes mental health care for children at war and donation fraud prevention. A wide range of academic content is provided that is directly relevant to the lives of citizens during emergencies.
- **Digigram⁸:** offers an online IT literacy exam for the public, which is based on the EU DigComp⁹. The exam covers basic knowledge of digital literacy, secure data handling, digital content creation, and communication in the digital society. For example, the Citizen exam is an IT literacy exam for the general public, with 90 multiple-choice questions and a 40-minute exam duration.

Date	Specific policies with its actions	Remarks
Sep. 2019	Ukraine's Ministry of Digital Transformation was launched, and	
	State in a Smartphone Project announced	
Feb. 2020	Diia mobile application released. Digital driver's license and other	
	services are launched.	
Mar. 2020	Diia adds digital passport and new COVID-19 protection and	
	other services	
Aug. 2020	Diia.Business; Online services for businesses were launched	
Sep. 2020	Diia.Digital Education; Digital education platform was launched	
Jan. 2021	E-malyatko; Maternity benefits and other services were launched	
2022	Diia to add services such as digital health insurance cards and	Scheduled to be
	digital student ID cards to Diia.	implemented in 2022, but no
	Launch services for Diia.City	updated information on the
	Enhance the content of Diia.Digital Education	Ministry's website stating
	Expand the services of Diia.Business	that it has been implemented
	Improve security and usability of Diia.	
2023		No information on the
		Ministry of Digital
		Transformation website
		about the schedule for 2023
2024	Target 100% of public services to be online	

Table-4 Specific Policies of "State in a Smartphone" with its Actions

Source: Prepared by the JICA Survey Team based on Ministry of Digital Transformation of Ukraine¹⁰, and Diia

⁶ Diia https://diia.gov.ua/en

⁷ Diia Digital Education: https://osvita.diia.gov.ua/en

⁸ Diia Digigram: https://osvita.diia.gov.ua/en/digigram

⁹ The Digital Competence Framework for Citizens: https://joint-research-centre.ec.europa.eu/digcomp_en

¹⁰ https://thedigital.gov.ua/

3) Regarding the Government of Ukraine's trend toward the information cloud

The main trends related to the Government of Ukraine's information management shift to cloud services are as follows.

- In August 2019, under Deputy Prime Minister and Minister of Digital Transformation Mikhail Fedorov, the Ministry of Digital Reforms was established to promote reforms and innovation in the digital sector, and many experts from tech companies and others have been appointed.
- In September 2021, the Ministry of Digital Transformation was established to take charge of the digital strategy and promote reforms and innovations in the digital field. It uses data moved to the cloud, described below, to provide online administrative services to citizens and to manage information such as education and real estate registration.
- In order to maintain the continuity of state activities, digital information held by such as ministries, universities, and banks are being migrated to the cloud environment with the cooperation of AWS (Amazon), Azure (Microsoft), Google Cloud Platform (Google), and other US cloud service providers. For example, in cooperation with AWS, from February 24 to June 10, 2022, more than 10 PB (petabytes) of data from 27 Ukrainian ministries, 18 universities, and other institutions were migrated from traditional on-premises servers to the AWS cloud environment. The migration was performed in cooperation with AWS representatives and Ukrainian experts using AWS Snowball¹¹, a service that transfers petabytes of data to the AWS cloud using secure devices.
- 4) The state of the information and communications infrastructure

The table below compares Japan, Poland, and Ukraine regarding smartphone ownership and 4G/5G communication penetration (at the end of 2021). 5G penetration in Ukraine after 2022 has not yet progressed regarding mobile data communication coverage maps, etc. The 5G penetration in Ukraine after 2022 is not yet advanced as far as the mobile data coverage map¹² is concerned. On the other hand, from February 26, 2022, Ukraine will have access to the Internet by using Starlink¹³, a satellite communications network operated by Space X. It is said that several thousand Starlink ground terminals have been distributed to Ukraine.

¹¹ AWS Snowball Large scale data migration service to the cloud: https://aws.amazon.com/jp/snowball/

¹² nPerf Data Transmission Speed Test Service: https://www.nperf.com/

¹³ Starlink satellite services in Ukraine: https://en.wikipedia.org/wiki/Starlink_satellite_services_in_Ukraine

Country	Smartphone ownership rate	PC ownership rate	4G penetration rate	5G penetration rate
Japan	About 80% or higher	About 70% or higher	About 95% or higher	About 50% or higher
Poland	About 70% or higher	About 60% or higher	About 60% or higher	About 10-15%
Ukraine	About 60% or higher	About 40% or higher	About 50% or higher	About 0%

Table-5 Infrastructure Status of Information and Telecommunications (end of 2021)¹⁴

Source: Prepared by the JICA Survey Team based on Ministry of Internal Affairs and Communications of Japan¹⁵, Statista.com, and Ookla.com

The main telecommunications carriers in Ukraine that provide services related to information and telecommunications infrastructure, such as cell phones and the Internet, are listed in the table below. These telecommunications carriers have implemented various measures to ensure continuous service under all circumstances¹⁶, such as ensuring redundancy of telecommunications infrastructure and networks, security measures against cyber-attacks, and minimizing network downtime by implementing domestic roaming among telecommunications carriers. For example, measures to minimize network downtime by ensuring redundancy in telecommunications infrastructure and networks, security measures against cyber-attacks, and domestic roaming among telecommunications infrastructure and networks, security measures against cyber-attacks, and domestic roaming among telecommunications infrastructure and networks, security measures against cyber-attacks, and domestic roaming among telecommunications infrastructure and networks, security measures against cyber-attacks, and domestic roaming among telecommunications infrastructure and networks, security measures against cyber-attacks, and domestic roaming among telecommunications carriers.

Carrier	Outline	URL
Vodafone	Ukraine's second largest mobile operator with about 23.1	https://www.vodafone.ua/en
Ukraine	million users; partnered with Vodafone of the U.K. in 2015 and	
	now owned by NEQSOL Holding of Azerbaijan.	
Kyivstar	It is the largest mobile operator in Ukraine with approximately	https://kyivstar.ua/
	26 million users and is owned by VEON of the Netherlands.	
Lifecell	It is the third largest mobile operator in Ukraine with about 10	https://www.lifecell.ua/en/
	million users and is owned by Turkcell of Turkey.	
Ukrtelecom	It is the largest fixed-line operator in Ukraine, with about 7	https://ukrtelecom.ua/
	million subscribers, and offers Internet and TV services. ESU	
	of Cyprus currently owns it.	

Table-6Major Telecommunications Carriers in Ukraine

Source: Prepared by the JICA Survey Team

5) Ukraine's IT market, startups and cooperation with the IT sector

Ukraine's IT market was estimated to be worth approximately \$4.2 billion in 2021 before the Russian invasion and had been growing rapidly in recent years. Known as one of the world's leading IT outsourcing destinations, global companies have been actively expanding into Ukraine. The market is projected to reach approximately \$4.6 billion by 2022¹⁷, but the outlook for the market is uncertain. The Ukrainian IT market is dominated by outsourcing services and is characterized by high demand from Western countries.

¹⁴ https://www.statista.com/ https://www.ookla.com/articles/state-of-worldwide-5g-2021

¹⁵ https://www.soumu.go.jp/johotsusintokei/

¹⁶ Politico: https://www.politico.com/news/2022/09/07/hackers-ukraine-telecom-00055060

¹⁷ https://www.idc.com/getdoc.jsp?containerId=prJPJ48945122

In general, the following points can be characterized regarding collaboration between startups and the IT sector.

- Diverse and innovative startups: Ukraine is one of the fastest-growing countries in the IT industry, and startups in particular are developing and offering innovative products and services in a variety of fields, such as Petcube¹⁸, a unicorn company offering pet monitoring devices and services, and Grammarly¹⁹, which uses artificial intelligence to proofread English texts.
- Excellent Ukrainian IT workforce: Ukraine produces a large number of excellent IT professionals who are well educated in the sciences. There are more than 150 technical higher education institutions in Ukraine. The number of IT professionals in Ukraine stands at 184,000 and is expected to grow to 250,000 by 2025.
- Low investment costs: In Ukraine, labor and fixed costs are kept low; for example, the average salary of a software engineer in Ukraine is around \$25,000²⁰, which is low compared to software engineers at the same level in Western European countries and the United States.
- 6) Status of education on IT

General education in Ukraine consists of preschool education (3 years), primary education (4 years), secondary education (lower secondary education: 5 years, upper secondary education: 2 years), and higher education (bachelor: 3-4 years, master: 2 years, doctor: 4 years). The nine years of education from primary to lower secondary education are compulsory.²¹ Of these, higher education is offered at universities, colleges, and higher vocational and technical schools. Universities offer bachelor (3-4 years), master (2 years), and doctoral (4 years) programs, colleges offer bachelor (3-4 years) programs, and higher vocational and technical schools offer junior specialist programs (2-4 years). ²² The number of higher education institutions in the 2022/2023 academic year is 347, with 1,053,770 students. ²³

Regarding the state of education related to IT, the country has a long history of focusing on IT technology education in the higher education sector. It has produced many highly qualified IT engineers. Advanced IT-related education is offered at higher education institutions and vocational schools in Ukraine, with 150 of the country's 1,700 educational institutions offering IT-related bachelor's degrees or higher programs ²⁴. These IT-related higher education institutions (universities, etc.) produce approximately 16,000 to 17,000 new bachelor's degrees annually. The

¹⁸ https://petcube.com/

¹⁹ https://www.grammarly.com/

²⁰ JETRO 2020: https://www.jetro.go.jp/biz/areareports/2020/1fcb60ce8a07f93d.html

²¹ https://emergency.mon.gov.ua/educationalsystem/

²² Website above and hearing from the Ministry of Education and Science of Ukraine

²³ https://www.ukrstat.gov.ua/operativ/operativ2021/osv/vush_osv/arh_vuz_20_u.html

²⁴ Ukraine IT Report 2021 https://reports.itukraine.org.ua/en

number of graduates is expected to increase to 23,000 by 2025 due to the growing interest in IT professionals and the country's investment in IT. The following table shows the leading higher education institutions by region and the number of graduates, i.e., IT-related bachelor's degree holders, by region (2021).

Table-7	IT-related Higher Education Institutions and Number of Graduates
	(Pachalor's Degree) in 2021 ²⁴

(Bachelor's Degree)	in	2021	2
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Region	Major IT higher education institutions	Number of graduates	
Kyiv	National Technical University of Ukraine «Igor Sikorsky	5,053	
	Kyiv Polytechnic Institute»		
	National Aviation University		
	State University of Information and Communication		
	Technology (State University of Telecommunications)		
	Taras Shevchenko National University of Kyiv		
	Kyiv-Mohyla Academy		
Lviv, Ivano-Frankivsk	Lviv Polytechnic National University	2,825	
Ternopil	Ivan Franko National University of Lviv		
	Ternopil Ivan Puluj National Technical University		
	West Ukrainian National University		
	The Ukrainian Catholic University		
	Ivano-Frankivsk National Technical University of Oil and Gas		
	Vasyl Stefanyk Precarpathian National University		
Kharkiv	Kharkiv National University of Radio Electronics		
	Kharkiv Polytechnic Institute		
	V. N. Karazin Kharkiv National University		
Dnipro	Dnipro University of Technology 1.7		
Zaporizhzhia	Oles Honchar Dnipro National University		
-	Zaporizhzhia Polytechnic National University		
Odesa	Odessa Polytechnic National University		
	Odessa I.I. Mechnikov National University		
Vinnytsia	Vinnytsia National Technical University 516		
Other regions	3,345		

Source: Ukraine IT Report 2021

Looking at these numbers of 2021 graduates with bachelor's degrees by major, as shown in the table below, the top three departments, Computer Science, Computer Engineering, and Software Engineering, account for about 67% of the total, all in a wide range of fields related to computers and their applications. They all produce a large number of advanced IT professionals each year, requiring knowledge and skills in programming and coding, as well as mathematics and logical thinking skills.

Department of IT majors	Number of graduates
Computer Science	5,100
(The department deals with the academic aspects of the theory, design, development,	
and application of computers and information processing systems. A wide range of	
topics will be covered, including algorithms, data structures, programming	
languages, databases, artificial intelligence, and software engineering)	
Computer Engineering	3,300
(The department is concerned with the design, development, and maintenance of	
computer systems, with a focus on both hardware and software, as well as the areas	
of electrical engineering, electronics, microprocessors, and embedded systems)	
Software Engineering	3,000
(This department manages the entire software lifecycle, including software design,	
development, testing, and maintenance. It is also related to the field of improving	
high quality software at minimal cost by incorporating the latest technologies such as	
cloud computing and big data fields)	
Automation and computer-integrated technology	2,100
Cybersecurity	1,700
Information systems and technologies	700
Applied mathematics	600
Systems Analysis	500

 Table-8
 Number of Graduates (Bachelor's Degree Holders) in 2021 by Major in IT

Source: Ukraine IT Report 2021

On the other hand, the number of people needed by the IT industry cannot be provided by these formal educational institutions alone. In addition, it has been reported that about 50% of the new graduates who enter the IT industry have some extra IT education in addition to a university degree because educational programs do not meet the real needs of the IT industry and curricula are not regularly updated to meet the needs of the IT market. It has also been reported that approximately 20-30% of those who enter the IT industry do not have higher education in IT.²⁵

Analysis	 In the future, it is expected that development technology on cloud services such as AWS will become one of the essential skills for IT professionals regarding migrating government information to Clyde. Therefore, it will be crucial to provide training opportunities for the acquisition of these skills and qualifications. Regarding the development of telecommunications infrastructure, it is assumed that 5G will not be widely deployed until after 2022. Therefore, it will be necessary to develop advanced IT human resources in infrastructure-related fields such as high-speed, large-capacity data communications, large-scale networks, and cyber security for national reconstruction. In the mid-to-long term, children and students in Poland may wish to enter IT-related universities after returning to Ukraine. Therefore, it will be necessary to higher education while they are still in Poland.
Analysis	 information to Clyde. Therefore, it will be crucial to provide training opportunities for acquisition of these skills and qualifications. Regarding the development of telecommunications infrastructure, it is assumed that 5G will be widely deployed until after 2022. Therefore, it will be necessary to develop advance human resources in infrastructure-related fields such as high-speed, large-capacity communications, large-scale networks, and cyber security for national reconstruction. In the mid-to-long term, children and students in Poland may wish to enter IT-related univer after returning to Ukraine. Therefore, it will be necessary to provide them with information training opportunities that will enable them to find a pathway to higher education while the still in Poland.

²⁵ Do IT Like Ukraine 2022 Report https://itukraine.org.ua/files/reports/2022/DoITLikeUkraine2022_EN.pdf

2.2 Employment Needs of Ukrainian Refugees in Polish Industry and Private Companies (IT Companies)

(1) Industrial needs regarding employment of Ukrainian refugees

Regarding to the employment of displaced Ukrainians, the following comments were heard from industry as a whole.

- Due to historically low level of unemployment (3% as of February 2023 accordingly), there is a high need for overall employment throughout the industry. However, the demand is not directly linked to employment for displaced Ukrainians.
- Among the top occupations that are experiencing labor shortages, construction, warehousing, and transportation are among those traditionally considered men's jobs, and since 94.3% of Ukrainian refugees are women, supply and demand have not yet reached a point where they match.



Source: Created by JICA project member from the information provided by Deloitte



On the other hand, those who speak Polish or English and have IT skills or other skills that are not dependent on country-specific qualifications find employment relatively easy, while those who are lawyers, accountants, doctors, teachers, and other professionals whose qualifications are not directly applicable to their home country do not find employment based on their skills.

• Originally, it was difficult to provide more than temporary employment for Ukrainian refugees to lead to stable employment.

The war situation in the Ukraine invasion, which began on February 24, 2022, is uncertain, and according to a report by Deloitte, 70% of the Ukrainian refugees hope to return to Ukraine once the war situation settles. A situation has developed in which neither the employer nor the employee

wants long-term employment. The chart below shows the plans of Ukrainian refugees for their stay in Poland.



Source: Created by JICA project member from the information provided by Deloitte

Figure-4 Plans of Ukrainian Refugees Staying in Poland

It is rare for Ukrainian refugees to be offered special treatment in employment, and the participants of the Survey expressed the opinion that the first priority is to retain skills appropriate to the type of industry in which they are recruited.

As mentioned above, many Ukrainian refugees have not been able to find jobs at the same level as the jobs they held in their home countries. According to a survey by EWL, a private human resources firm that also handles a large number of employment placements for displaced people from Ukraine, approximately 85% of those who worked in Ukraine as highly skilled professionals are now working in the service industry (including hospitality and catering), manufacturing industry, and other occupations. There is also a high demand for support in rewriting qualifications acquired in Ukraine and training to work in Poland.

The language barrier is one of the biggest problems that Polish companies face when hiring Ukrainian refugees. Although Ukrainian and Polish are Slavic languages and are often said to be similar, many people are not considered to have sufficient language skills to work in Polish at the business level. This is followed by a lack of legislation knowledge, barriers to conventions, and difficulties in approving qualifications.





- (2) Private companies' need for employment of Ukrainian refugees
- 1) Survey on job information sites

Through interviews with government agencies, NGOs, and private companies, an analysis of job information sites in Poland helped survey the needs of private companies regarding the employment of Ukrainian refugees. For this reason, the needs analysis focused on job sites for Ukrainians in Poland. The main job sites surveyed are listed in the table below.

Job site	URL	Operation	Remarks
Praca.pl	https://www.praca.pl/	Private	One of the major job information sites
			in Poland
Pracuj.pl	https://www.pracuj.pl	Private	One of the major job information sites
			in Poland
Pracuj.pl	https://www.pracuj.pl/praca?ua=t	Private	Job offers site for Ukrainian operated
(Ukrainie)	rue		by Pracuj.pl
Indeed.pl	https://pl.indeed.com/	Private	Polish domestic version of Indeed, a
			global job offering giant
Justjoin.it	https://justjoin.it/	Private	Recruitment sites for the European
			tech industry
Nofluffjobs	https://nofluffjobs.com/pl	Private	Recruitment sites for the European IT
			industry
OLX	https://www.olx.pl/praca/q-job/	Private	Job information for online market in
			domestic
Glassdoor	https://www.glassdoor.com/	Private	Sites outside the country but with
			information on job openings in Poland
Gumtree	https://www.gumtree.com/uk/srp	Private	Sites outside the country but with
	search+poland		information on job openings in Poland
Pomagam	https://pomagamukrainie.gov.pl/	Government	Approx. 30 job openings; no new job
Ukrainie	ogloszenia/znajdz-pomoc/praca		openings since July 2022
Praca.gov.pl	https://warszawa.praca.gov.pl/ua	Warsaw City	A kind of recruitment information
		Labor Department	database with fewer job openings

Table-9 Main Job Information Sites in Polan	ıd
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Source: Prepared by the JICA Survey Team

Pracuj.pl (Ukraine), in the table above, is a subsite of Pracuj.pl, one of Poland's leading job sites, specializing in professional job matching for Ukrainians living in Poland. The site lists approximately 10,000 jobs for Ukrainians (as of March 31, 2023). Therefore, we conducted a detailed study of the site to identify and analyze the employment needs of displaced Ukrainians in the Polish private sector.

By accessing this job information site, the Survey analyzed the status of job openings for Ukrainians residing in Poland from the angles of position, employment type, category, etc.



Source: Prepared by the JICA Survey Team based on Pracuj.pl (Ukraine)

Figure-6 Example Search on Ukrainian Job Site (Pracuj.pl Ukrainie)

By position level, 90% of the jobs were for specialists and experts, while more than 20% of the jobs were for simple laborers, indicating that there are more jobs for specialists than for simple laborers (some jobs include more than one position, and the total number of jobs exceeds 100%). This may be partly due to the fact that there is an extensive supply route for simple workers dispatched to large companies' production sites as part of a team, for example, from temporary staffing and human resource outsourcing companies. Professionals are assumed to fill many jobs on this job information site with specific skills the companies seek. Regarding the number of jobs by employment type (type of contract), 90% are regular employment contracts. Still, more than 20% of B2B or sole proprietorship contracts suggest that many job seekers seek employment under business contracts that take advantage of their abilities.

When narrowed down by category, approximately 50% of all jobs are in IT and related technical fields. On the other hand, more than 20% of the jobs are for simple labor at production sites. In interviews with NGOs, the Warsaw City Labor Office, and other organizations, many respondents indicated that IT literacy is a prerequisite to apply for these general office jobs, as is the ability to use Microsoft Office applications. These IT literacy requirements for available clerical positions

include the ability to use Microsoft Office applications. In some cases, these Microsoft Office application operating skills are so essential for clerical positions that they are not stated in the job requirements. On the contrary, when they are specified as conditions, they often establish specific functional skills and experience, such as years of experience in Excel tabulation and graph creation.



Source: Prepared by the JICA Survey Team based on Pracuj.pl (Ukraine)

Figure-7 Example of Category Search in Pracuj.pl (Ukrainie)

When reviewing the job market for IT positions only, approximately 35% of all jobs on the site are in the IT professional category, with details of the two IT subcategories of IT professionals (IT software development and IT systems administration) as follows.

- There are approximately 2,000 IT software development jobs, of which about 500 are related to Python
- There are approximately 1,500 IT systems management jobs, of which 650 are related to AWS and Azure
- There are approximately 600 jobs that require Microsoft Office skills, mainly in administrative positions

A certain number of jobs also require Microsoft Office skills, regardless of industry. There are approximately 600 jobs available, and most of them are in clerical positions.

In addition, the analysis of the current job market revealed that there is a high demand for the following specialized IT jobs, all of which overwhelmingly require IT technical expertise and sufficient work experience.

- Front-end developer (UI/UX development with JavaScript)
- Back-end developer (Middleware development with databases)
- Full-stack developer (Both front-end and back-end developments. Requires a higher skill set)
- Mobile apps developer (Mobile phone apps development)
- AI developer (Experience with Python and machine learning and data science are necessary)
- Gaming programmer
- Business analyst
- Graphic designer
- Project manager

In addition to these highly specialized IT engineering skills, the trend is also strongly toward the requirement of business-level English. This is because the companies hiring are international companies, working abroad, working remotely from abroad, or their clients are companies in other European countries, the U.S. or Canada.

The table below shows examples of AI engineers from the IT software development category with particular job openings. Here is an example of a job offer with internship conditions at the junior level. As shown in the table, the internship also guarantees a certain level of compensation. On the other hand, a certain number of working hours are required. The application conditions require Python programming skills, often considered AI engineers' skills. In addition, experience with machine learning frameworks and data science libraries, which are essential for AI development, is also required. This is a similar trend seen in other AI engineering jobs. In addition to these IT skills, experience with software development processes is also needed, which is essential if you are a team development member. In other words, they need the skills to understand and implement the software development process procedures, such as requirement definition, system design, programming, testing, and implementation and operation.

Item	Content	Remarks
Position	AI Engineer Internship (Python)	
Condition (Monthly)	PLN 4,000~5,900	About JPY130,000~190,000
Requirements	• Python coding experience. Optionally, Java coding	Internships also explicitly
	experience is additional point.	include not only
	• Development experience with machine learning	
	frameworks (Pytorch, Transformers) and common	development experience
	Python libraries such as OpenCV, Scikit-learn, Pandas	with frameworks and
	 Rapid prototyping development skills 	libraries, as well as skills in
	• Algorithmic and heuristic problem-solving skills	the software development
	• 30 hours per week during the semester and 40 hours	process that are essential for
	per week during the summer	team development.

Table-10 Case Study of IT Software Development (AI Engineer Internship)

Source: Prepared by the JICA Survey Team based on Pracuj.pl (Ukraine)

Based on the AI engineer case study, the following figure illustrates the structure of the private sector's needs regarding the employment of Ukrainians, i.e., the IT skill level of IT professionals that private sector firms seek.



Ukrainie Talent Foundation (UTF) https://www.utf.org.ua/en

Source: Prepared by the JICA Survey Team

Figure-8 Examples of Skill Sets Required for IT Software Development (AI Engineers)

Not only AI engineers but also IT software development jobs require skills such as frameworks and business-level language skills, as the basis for programming is the foundation of a IT skill set. As a result of job openings, there has been an increase in the number of requests for specific skills such as cloud development, along with the recent boom in the transition from on-premises to cloud systems for IT software development processes, and the current situation has emerged in which it is impossible for companies to meet their job needs by simply improving their IT skills alone. On the other hand, surveys in NGOs and elsewhere revealed there are NGOs which provide a wide range of IT training and business-level language training programs for Ukrainian refugees living in Poland. Therefore, it was decided to consider the content of pilot IT training with a view to utilizing these external training programs.

2) Interview survey for private companies

Company interviews were conducted in parallel with the survey of the job sites with the following points about their needs regarding the employment of Ukrainian refugees in Poland.

• Short-term support needs: Gathering input and comments on pilot training for employment of Ukrainian refugees, internship opportunities and potential employment with companies after pilot training, additional training and skill development needed before employment, etc.

Medium- to long-term support needs: Gathering opinions and comments on the development of course content in collaboration with PJAIT, recruitment matching, introduction of IT professional jobs and required skills, provision of educational content, and provision of work opportunities (internships) for high achievers, in relation to IT human resource development support for the reconstruction of Ukraine's IT industry.

The following is information on the needs of the companies collected in the interviews. Since these are not official responses from the companies and include many personal impressions of the interviewees, the names of individual companies are not indicated but rather focus on the main points by categories.

[Skills Required for IT Professionals]

- A bachelor's degree or higher and equivalent work experience are prerequisites. Those with these degrees and IT work experience are the most likely to be hired, while those with such specialized skills and Polish or English language skills are more likely to meet the needs of companies. In addition, the unemployment rate in Poland has become lower in recent years, and labor costs are rising due to a seller's market for skilled personnel, especially IT specialists. For this reason, jobs for IT specialists are special in that they offer high income, and general knowledge alone is often not enough to find a job.
- It is difficult to find employment as an IT professional simply by learning the basics of programming languages. In addition to these programming skills, practical experience with frameworks and libraries used in IT development is essential. For example, Python is becoming very popular in the AI field, but in addition to this, skills and experience with machine learning frameworks and data science libraries are required. However, these should be taught at universities.
- Web development is highly sought-after and highly valuable in the IT talent market. However, even for junior-level positions, more than learning the basics of JavaScript programming is needed to get a job. After learning the basics, these JavaScript frameworks²⁶ (such as React and Angular, which are used in actual development) must also be mastered in order to get the job. The same is true for Python, which requires several months to several years to learn at an operational level, depending on the individual. The same applies to Python, which requires several months to several years, depending on the individual. Therefore, it is essential to continue training repeatedly. The typical career path for IT professionals is from college graduate to junior-level positions via an internship.

²⁶ Famous JavaScript frameworks include React, Angular, Vue.js, etc. https://ugo.tokyo/react-angular-vue/

[IT skills required for general office jobs]

- Among Microsoft Office applications, Excel skills are most needed. This is an important skill for general office management tasks such as preparing materials for reports and compiling data. In general, people with Excel skills can use Word and PowerPoint as well.
- If the applicant can acquire Microsoft Office application skills during his/her stay in Poland, he/she will be able to use these skills to find a job after returning to Ukraine in the future. The fastest and most reliable way to check Microsoft Office application skills, for example, is to have the candidate directly operate a PC during an interview.
- With recent advances in information technology, the productivity and operability of IT tools have evolved and improved. By learning how to operate these tools and acquiring the skills to utilize them, there may be a path to IT-related jobs without having to major in IT in earnest.
- While the above-mentioned use of IT tools is correct, on the other hand, it should be taken into consideration that simply learning to operate tools does not constitute a full-fledged IT professional career.
- In terms of IT tools, if you have skills in WordPress, HTML, etc., you may be able to find easy IT jobs. WordPress, in particular, is a popular tool for website development around the world and can be found on a certain number of job sites.

[Language Skills]

- English is essential to work in the IT industry, an industry that requires a willingness to learn, and we would like to immediately hire people who are fluent in English and have practical IT skills as immediate assets, regardless of nationality, even if they are refugees.
- English proficiency is essential when working for an international company, and in addition, English proficiency in an industry-specific specialty, such as medicine or IT, for example, is important.
- Companies will accept anyone who has leadership skills, is willing to learn, and has language skills. English language skills are essential.
- Jobs such as support work related to IT for customers require English language skills to be able to communicate smoothly with customers.
- At least a B2 level of language proficiency (C1, C2 preferred) is required. This is true for both internship and permanent employment; even if your CV is good, you will not be able to find a job without language skills. In international companies, Polish is not always required.
- Proficiency in Polish is required for employment in Polish companies. As for international personnel who can speak English, finding a job in Poland or any other country is possible.

Through these interviews with companies, two conditions emerged: many job offers require IT skill sets consisting of multiple IT skills rather than a single IT skill, and business-level language skills (English and Polish) are required in addition to IT skill sets.

Based on a comprehensive review of the above-detailed analysis of job information websites and information obtained from company interviews, it was decided that the following three patterns of job types, i.e., general clerical jobs, IT specialists, and jobs utilizing IT tools, etc., would be the policy for preparing a pilot training proposal.

- Microsoft Office skills are essential for general clerical positions. There are many jobs that require Excel skills in the accounting and accounting departments of indirect corporate departments, specifically, data tabulation, data analysis, and graph creation.
- In the IT professional job market (especially in IT software development, where there are many job openings), many websites offer positions at manager, senior, junior, and other levels depending on the level of IT skills possessed and years of experience. Many job sites have specific and detailed descriptions of IT skills and minimum work experience. In addition to programming skills, skills and experience with frameworks and libraries used in the business are also considered important.
- It is also possible to find IT-related employment in a relatively short period of time, for example, by using IT tools, without requiring as advanced IT skills as IT professionals. Based on job information websites and interviews with companies, it is estimated that there is a certain need for personal business and simple website production positions, for example. Specifically, there is a possibility of finding employment or earning income by acquiring digital marketing skills, such as website production, advertisement production, use of SNS and website access analysis, etc.

· Analysis	When considering a pilot training proposal, it is difficult to satisfy the human resource needs of a company with that training alone. Therefore, it is necessary to consider an effective combination of training from other NGOs and other organizations, if necessary. IT skills alone are not sufficient to meet the needs of companies, and business-level language skills are also required as a prerequisite. For this reason, it will be necessary to consider combining language training in Polish and English in the pilot IT training, if necessary. While programming training is fundamental and of paramount importance, it is difficult to meet the employment needs of companies on its own. Therefore, after the pilot training, students need to have opportunities to gain work experience through internships and more advanced IT training. In light of this situation, the pilot IT training should not be designed for immediate employment, but from a mid- to long-term perspective. For example, it would be necessary to consider training for the youth who wish to enter an IT-related university in the future and/or to look for a career change, so that they can be shown the path to such a university.
	look for a career change, so that they can be shown the path to such a university.

2.3 Current Situation and Assistance Needs of Ukrainian Refugees in Poland

(1) Current Situation of Ukrainian Refugees

Russia's invasion of Ukraine has caused civilian deaths and injuries and infrastructure destruction in Ukraine, forcing millions of refugees to flee across the border into neighboring countries and displacing many more within the country.

According to UNHCR statistics, as of November 7, 2023, the number of Ukrainian refugees recorded worldwide was 6,242,200, the number of Ukraine refugees recorded in Europe was 5,850,100, and the number of Ukraine refugees registered under temporary protection or similar national protection systems in Europe and neighboring countries was 5,300,300. ²⁷ By country, Poland had received the largest number of Ukrainian refugees, followed by Germany and the Czech Republic, as shown in the table below.

Table-11Number of Ukrainian Refugees Registered in Temporary Protection or Similar NationalProtection Schemes by Country (Europe, top 10 countries)

Country	Number of Ukrainian Refugees (persons)
Poland	1,593,860
Germany	934,420
Czech Republic	515,836
United Kingdom	203,700
Spain	175,962
Italy	175,107
Bulgaria	157,943
Romania	130,387
France	118,994
Slovakia	114,628

Source: Operational Data Portal Ukraine Refugee Situation (UNHCR):

https://data.unhcr.org/en/situations/ukraine (Accessed on November 12, 2023)

There are Ukraine refugees registered in the temporary protection or similar state protection system who have already left the country concerned or returned to Ukraine. UNHCR estimates that the actual number of Ukrainian refugees in Poland has been declining. ²⁸ In September 2022, there were 1,409,139 Ukrainian refugees staying in the country, and most recently (October 2023) there were 958,935. The table below shows the number of Ukrainian refugees staying in Poland.

²⁷ https://data.unhcr.org/en/situations/ukraine

²⁸ UNHCR Poland Factsheet; Factsheets are published monthly, but some do not include the (estimated) number of Ukrainian refugees staying in Ukraine.



Source: UNHCR Poland Factsheet

Figure-9 Number of Ukrainian Refugees in Poland (estimate)

(2) Attributes of Ukrainian Refugees

The table below shows the demographics of the respondents to the questionnaire in this study and the results of surveys conducted by other organizations.²⁹

²⁹ In addition to this questionnaire survey, a separate SNS-based questionnaire survey was conducted in this JICA Survey mainly for the study of the proposed medium- to long-term cooperation plan, but it is not included in this table because the questions are different.

Organization of the survey	Narodowy Bank Polski (NBP) ¹	Deloitte Poland ²	UNHCR ³	JIC Data Collection Survey
Number of samples (person)	3,165 (adult)	1,206	3,829	274
Survey methods	Face-to-face interview	Online	Face-to-face interview	Online
Survey Period	4/17/2022-5/12/2022	10/24/2022-12/31/2022	11/1/2022-11/22/2022	4/13/2023-6/29/2023
Gender	Adult female	Female (85%),	Female (86%),	Female (88%),
	(Approx. 90%)	Male (13.5%)	Male (14%)	Male (11%)
Age	29 under yo (5%)	18-39 yo (59%)	0-5 yo (12%)	18 under yo (7%)
	30-44 yo (41%)	40-59 yo (36%)	6-10 yo (14%)	19-29 yo (13%)
	45-59 yo (19%)	60+yo (5%)	11-14 yo (10%)	30-39 yo (38%)
	60+yo (15%)		15-18 yo (7%)	40-49 yo (30%)
			19-25 yo (4%)	50-59 yo (9%)
			26-59 yo (42%)	60+yo (3%)
			60+yo (12%)	
Academic background	Univ. degree or higher (50%)	Univ. degree or higher (69%)	Univ. degree or higher (51%)	Univ. degree or higher (79%)
Accompanying family	One or two children (60%)	Children under 16 yo (53%)	At least one child or infant	At least one child under 18 yo
		Elderly relatives (18%)	(Approx.40 %)	(Approx.66%)
		Disabled people (9%)	At least one elderly person (20%)	
Employment status	Employed (30%)	Employed (28%)	Employed (36%)	Employed (Approx.74%)
	Job seeking (50%)	Employed, but working, but lower-	Unemployed (34%)	Unemployed (Approx.26%)
		level positions (19%)		Job seeking (Approx.89%)
		Can't work due to childcare (17%)		
Polish language proficiency	Speak it well (5%)	N/A	N/A	Polish as a Foreign Language Exam:
	Understand it a little (49%)			C2 (Less than 2%)
	Not speak it (46%)			Cl (Approx.4%)
				B2 (Approx.11%)
				B1 (Approx. 22%)
				A2 (Approx. 30%)
E 4 males	$(1 - 1)^{-1} = (1 -$			AI (Approx.23%)
Future plan	Stay permanently in Poland (16%)	Return to Ukraine ASAP the situation	Plan to stay in Poland in near future	Stay permanently in Poland
	Longer than one year but not	permits (48%)	(08%)	(Approx.40%)
	Shorter than a year in Deland (50%)	Stay in Poland (22%)	Move to enother country (79)	Longer than one year but not
	Shorter than a year in Poland (59%)		Move to another country (7%)	Permanently in Poland (Approx.15%)
				(A pprox 2%)
				No ideas (Approx 11%)
				No ideas (Approx.44%)

Table-12 Attributes of Ukrainian Refugees in Poland in Various Surveys

Source: 1) "The living and economic situation of Ukrainian refugees in Poland (2022), 2) "Ukraina Refuge Plus", 3) "Refugees from Ukraine in Poland Profiling Update" (November 2022), 4) "Survey of Ukrainian citizens about their needs for additional training" (2023)

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[Gender]

88% of the respondents to the questionnaire in this survey were female. Although a very high number, it is consistent with official Polish statistics on the refugee population, which state that 80% of Ukrainian refugees over the age of 18 are female.³⁰ The figure is also at the same level in other surveys. This reflects the Government of Ukraine's restrictions on the departure of males in the military age group.

[Residence]

Excluding the "other" responses, approximately 34% of respondents reside in Warsaw, 22% in Krakow, and 11% in Gdańsk. The distribution of residence was influenced by the locations of the support centers and projects of NGOs which cooperated with the Survey.

[Age]

About 7% of respondents were under 18, 13% were 19-29, 68% were 30-49, 9% were 50-59, and 3% were 60 or older. The ages of respondents in this survey are younger than those indicated by official Polish statistics, which show that 12% of respondents are over 60 years old.³¹ This may have been due to the fact that this survey was conducted online, which may have made it less accessible to older respondents.

[Education]

Respondents have a high level of education, with 27% reporting that they have a bachelor's degree and 51% reporting that they have a master's degree. Despite the high level of education, these numbers are comparable to the results of other online surveys on training needs. For example, in a survey conducted by the Ukrainian Talent Foundation, 14.43% reported having a bachelor's degree and 60.56% a master's degree.³² On the other hand, there may be some upward bias due to the small number of older respondents and the fact that the survey was conducted online.

[Accompanying Families]

About 66% of the families evacuated with at least one child under the age of 18 to Poland. Childcare considerations may have affected their job search.

³⁰ According to official Polish statistics (PESEL databases), the percentage of women is 80% and 20% of men.

³¹ According to official Polish statistics (PESEL database), 55% of the Ukrainian refugees are aged 18-39, 32% are aged 40-59, and 12% are aged 60 or older.

³² Survey of Ukrainian citizens about their needs for additional training (Ukrainian Talent Foundation, 2023) The survey also includes Ukrainian refugees who have fled to countries other than Poland. The proportion of Ukrainian refugees who have fled to Poland is approximately 73% of the respondents.

[Employment status]

The percentage of those who are employed is 74%, while 26% are not employed, and 89% are looking for work. The percentage of those who are working is higher than in the other surveys in the table above, but according to the EWL survey, 82% of those who fled to Poland have found work.³³ In addition, judging from the high percentage of those who are looking for a job despite the high percentage of those working, we can assume that many of them are in jobs of a lower level compared to the qualifications they obtained and their work experience in Ukraine, as pointed out by other surveys and interviews from related organizations.

The survey also asked about challenges in finding a job (multiple responses allowed), with language skills (57%), skills (50%), and work experience (44%) being the most common problems. The most common job types they wish to take, regardless of whether full-time or part-time, were IT, education, and commerce, in that order, with the exception of "others".

[Polish language proficiency]

About 6% of the respondents answered that their Polish language skills were at a level where they could use it without difficulty (Polish as a Foreign Language Exam C1 and C2), about 11% at a level where they could use it in their work (Exam B2), about 22% at a daily conversational level (Exam B1), and about 53% at a one-language level (Exam A2 and A1). The majority of respondents answered that they could use the language at the level necessary for their work (B2). The majority of the respondents do not have the necessary language skills for their work. As the respondents themselves are aware, their lack of Polish language skills is a major obstacle in their job search.

[Future Plan]

The majority of the respondents (39%) do not know what their future plans are at this point, as it depends on the situation. This was followed by 36% who thought they would live in Poland permanently. About 14% of the respondents do not intend to stay permanently but plan to stay for more than one year. About 3% are considering returning to Ukraine or leaving for other Western countries in less than a year. The results show a close match between those who are undecided about their future and those who intend to live in Poland permanently. Uncertainty about their future may be a psychological burden that negatively impacts their willingness to look for work or learn a language.

(3) Assistance Needs of Ukrainian Refugees

According to the Survey questionnaire, professional training (approximately 45%) was the most frequently cited support need in the future (multiple responses), followed by training to learn Polish (approximately 37%), financial support (approximately 29%), and job search assistance

³³ WAR REFUGEES FROM UKRAINE. A YEAR IN POLAND (2022, EWL)

(approximately 28%). Although the different questions asked do not allow for simple comparisons, financial support, learning Polish, finding a job, and medical-related assistance are high on the list of other surveys.





Source: Refugees from Ukraine in Poland Profiling Update (November 2022, UNHCR)



Figure-10 Assistance Needs of Ukrainians Refugees in Other Surveys

2.4 Cases of Employment and Vocational Skills Training (in the IT sector) Support for Ukrainian Refugees and Challenges in Job Search

(1) Initiatives of the Warsaw City Labor Office

The Warsaw City Labor Office offers the following free employment services to Ukrainian refugees:

- Consultation at the Warsaw Municipal Labour Office
- Phone counselling
- Consultation by connecting to an information line called "Green Line"



• Access to information in Polish

and English, as well as Ukrainian and Russian, on the website of the Warsaw City Labor Office (https://warszawa.praca.gov.pl/), including information on job vacancies

• Registration as a job seeker

Other projects are conducted in cooperation with international organizations, local NGOs, etc. The following is a guide to a job fair held at the National Stadium on May 8, 2023.

The number of people who have used the service to date is as follows.

- Number of registered job seekers: 6,369 (as between of March 15, 2022 to March 13, 2023)
 - Number of employees: 1,606
- Services provided by phone and e-mail: 32,688 times

Among the Ukrainian citizens who registered as job seekers, the following occupations were listed as desired.

- Catering •
 - Beauty sphere (beauticians, cosmetologists)
- Cleaning
- Sales & marketing •

Logistics (warehouse workers)

- Factory workers
- IT

•

Care services (childcare, elderly care)

Of the registrants, 50% self-reported Polish as their preferred language, 32% were English speakers, and 2% were German speakers. The percentage of registrants by gender was 84% female and 16% male.

(2) International Donor's Initiatives

The table below shows the support provided by UNHCR, UNICEF, and IOM to Ukrainian refugees for employment or vocational skills training in general.

International Donors	Employment and Vocational Skills Training Support
UNHCR ³⁴	UNHCR has call centers, eight Blue Dots ³⁵ (established in collaboration with UNICEF), six
	community centers, and mobile outreach teams to coordinate with relevant agencies, protect
	refugees, ensure their social and economic inclusion, disseminate information to them, and
	provide cash, accommodation, and supplies. Among these, activities directly related to the
	employment and professional development of Ukrainian refugees are the protection and social
	and economic inclusion of the refugees.
	As part of its protection activities, UNHCR provides legal counselling and assistance,
	including access to employment. It also supports the socio-economic inclusion of refugees by
	connecting them to employment opportunities and encouraging self-reliance.
	In 2022, UNHCR held a coordination meeting with authorities, stakeholders and potential
	employers to conduct a capacity analysis for Ukrainian refugees seeking work in Poland.
	UNHCR also co-hosted job fairs in Warsaw, Krakow, and Lublin in collaboration with local
	authorities and partners. More than 150 companies and NGOs participated in the job fairs,
	which attracted 2,000 job seekers.
	UNHCR is also preparing a job matching platform called Refugee Employment Platform. It
	will be implemented on a trial basis in six countries: Cyprus, Greece, Ireland, Romania, Spain,
	and the United Kingdom. Poland, along with Bulgaria, the Maldives, and Ukraine, is one of
	the countries that may introduce the platform after its implementation in these six countries,
	but at this time the timing, content, and local partner organizations have not yet been
	determined.

Table-13	Employment a	and Vocational S	Skills Training	Support for	International Donors
10010 10	2			~~~~~~	moornan D omore

³⁴ Prepared based on Ukraine Emergency - Based on UNHCR Poland Factsheet (01 March 2023, UNHCR), UNHCR Poland Operation Update (15 February 2023, UNHCR), and interviews with UNHCR.

³⁵ Blue Dots is a counselling center that provides a safe space and immediate support to people of all nationalities, women, men, and children fleeing Ukraine. (https://bluedothub.org/)

International Donors	Employment and Vocational Skills Training Support
UNICEF ³⁶	UNICEF established a UNICEF Refugee Office in Poland in March 2022 to help displaced children from Ukraine learn and their families live healthy and safe lives, and to provide support in the areas of education, access to health care, child protection, adolescent and adolescent development and participation, social and behavior change activities, and humanitarian assistance. Among these activities, support in the field of education is described as activities indirectly related to employment and vocational skills development of the refugees. UNICEF is assisting displaced children and youth from Poland to access formal and informal education. Specific activities include hiring and assigning Ukrainian teaching assistants, providing training and support to Polish teachers, establishing IT labs and libraries, and distributing digital tablets and computers to children, teachers, and schools to speed up
UNITAR	Ianguage learning and eliminate learning gaps. UNITAR is implementing a training program, "Bolstering Livelihoods: Digital Reskilling for Ukrainian Women Evacuees in Poland" from mid-September 2023 to March 31, 2024. ³⁷ The program targets Ukrainian women who have taken refuge in Poland and aims to equip them with digital skills to increase their chances of finding decent employment and income sources in Poland, neighboring EU countries, Japan, or remotely. The training courses consist of business analytics, digital graphics and web design, cybersecurity and basic data protection, geographic data analysis, The training will be conducted in three phases. After attending the first phase of training, about 50 participants will be selected for their outstanding performance. The second phase will provide opportunities for further skill development, creation of business ideas, etc. From these 50 students, 10 top performers will be selected to move on to the third phase. In the third phase, they will have the opportunity to present their ideas in front of potential investors, donors, and experts in the field.
IOM ³⁸	IOM established an office in Poland in 2002. Its activities in Poland include: providing assistance to state authorities in migration management; building a better understanding in the receiving society of migration and the migration process itself; promoting ethical recruitment practices in the private sector; developing tools for digitalization and global mobility; providing support for voluntary return and providing support for reintegration; preventing and combating trafficking in persons; and working with the European Border and Coast Guard Agency. In relation to the provision of support for voluntary return and reintegration, among these is the development and implementation of business-specific Polish language training.

Source: Prepared by the JICA Survey Team based on each organization's website, materials provided by each organization, and interviews

(3) Private company initiatives

As for private sector initiatives, the initiatives of EWL³⁹ and Universality⁴⁰ are presented here.

1) EWL

EWL is a Polish staffing, outsourcing, and recruiting company founded in 2007. The company specializes in hiring foreign workers, mainly from Eastern European and Asian countries. The company provides human resources to many companies in Poland in sectors such as manufacturing, logistics, and agriculture. The company is also active in providing assistance to refugees from Ukraine, and one of its activities is operating a Counseling Center on the second floor of the bus terminal in front of Warsaw's West Railway Station. The center is a reception facility for refugees

³⁶ Prepared based on https://www.unicef.org/eca/poland and interviews with UNICEF.

 $^{^{37} \} https://www.unitar.org/about/news-stories/news/call-applications-digital-reskilling-ukrainian-women-refugees-poland$

³⁸ Prepared by https://poland.iom.int/pl/iom-w-polsce and interviews with IOM.

³⁹ https://ewl.com.pl/en/

⁴⁰ Universality https://universality.io/?lang=en

arriving from Ukraine to stay for a short time, and the Blue Dot of UNICEF and UNHCR is inside the center. The center also serves as a first point of contact for displaced persons arriving in Poland by bus or train from various parts of Ukraine and is equipped with cots and other amenities. The center is equipped with cots, etc. It also provides information on accommodation and transportation to their next destination. Generally, the stay at the center is limited to 24 hours, but those with nowhere else to go may stay longer. In terms of business, EWL has secured employment opportunities for 13,000 evacuees by 2022. As a result, EWL has a detailed database of displaced persons' profiles, such as their backgrounds, the nature of their work in Ukraine, and the occupations they have held since they arrived in Poland. Based on these data, the report "War Refugees from Ukraine: A Year in Poland"⁴¹ was published, summarizing the current situation of displaced persons in Poland.



Source: Photo by the JICA Survey Team

Figure-12 Counselling Center Operated by EWL (Location, entrance and inside of the facility)

2) Universality

Universality is a private company that provides an integrated ecosystem for students, teachers, and employers through a cloud service that combines online higher education on an online platform with job placement assistance or job matching with employers in four countries, used by more than 20,000 students in four countries, as well as universities in Poland and Ukraine. After the Russian invasion of Ukraine, the company has been supporting the establishment of human networks between Ukrainian universities and Polish educational institutions and NGOs in Poland, and in this survey, the company has a cooperative relationship in the work of gathering basic information, including introductions to Ukrainian IT universities that use the company's services.

(4) INCUBATING FREEDOM for Ukraine

INCUBATING FREEDOM for Ukraine⁴² is a large-scale project that advocated "INCUBATING FREEDOM - Adapting Women to Digital Economy" during a large international conference in Lublin in December 2022, also under the auspices of the Polish First Lady, and the project plans to provide IT training to 30,000 women Ukrainian refugees over the next three years. Technical higher

⁴¹ https://ewl.com.pl/en/report-war-refugees-from-ukraine-a-year-in-poland/

⁴² INCUBATING FREEDOM – Ukrainki i Polki dla cyfrowej przyszłości - Portal edukacyjny Perspektywy

education institutions from both countries, including Polish technical universities and Ukrainian technical universities are participating in the international conference and are expected to provide technical support for the project.

The lead organizations for the project are two non-profit organizations that have been active in both Poland and Ukraine for some time, and each serves as a contact point for recruiting trainees and planning training programs. The Ukrainian counterpart is the Ukrainian Talent Foundation⁴³, and the Polish counterpart is the Perspectywy Educational Foundation⁴⁴. A fact-finding survey for thousands of refugees has already been conducted, and the results are available on the Ukrainian Talent Foundation's website⁴⁵.

The training is mainly aimed at developing inexperienced people into IT professionals. In addition to MS Office courses, digital marketing, and graphic design, programming courses such as Python and Java are also offered. Students participate in online training, and upon completion of the program, they have the option of finding employment in Poland, where there is a shortage of IT personnel, or returning to Ukraine after the war to find employment. Some training programs are supported by private companies such as Intel, Goldman Sachs, Amazon, and Cisco Systems, and job fairs are held in cooperation with partner IT companies to provide employment support to trainees.







⁴³ https://www.utf.org.ua/en/about

⁴⁴ https://perspektywy.org/fundacja/about-foundation/who-we-are

 $^{^{45} \}quad https://www.utf.org.ua/_files/ugd/caedb6_a00da0632d0642e3a4a88242e33d85ea.pdf$

(5) NGO Initiatives

Numerous NGOs are assisting Ukrainian refugees in various ways, including psychological, educational, legal, employment, and language support. As a result of our visits to these NGOs, the JICA Survey Team found that several of them have started providing or are planning to provide IT training to Ukrainians refugees as part of their livelihood and employment assistance. A summary of this information is shown in the table below. Details are analyzed in Section 3.2 (1), "Summary of Pilot Training Proposals".

Items/ Organization	Ukrainian Talent Foundation, Perspektywy Education	Ukrainski Dom w Warszawie	Upwardly Global
organization	Foundation	W 41324 W 10	
Purpose	Reskilling and upskilling to get (new) jobs	Reskilling and upskilling to get (new) jobs	Reskilling and upskilling to get (new) jobs
Goal	30,000 for next three years	Scale up depending on training results	1,000 by 2024 (500 employed) in 2024
Status	Scheduled to start in March 2023	Already started	Already started in October 2022
Target	Ukrainian refugees (female)	Ukrainian refugees (mainly female)	Ukrainian refugees
Contents	 Office101 JAVA Core Programming Language Computer Graphics and Design Social Media Marketing Systems in Digital Economy Methods and Tools of Digital Marketing Digitalization of Business Finances and Financial Analytics English for IT Professionals 	 IT Support and Digital Marketing and E- Commerce MS Office training (Microsoft, WordPress, google tools) 	Digital education provided by Udemy, MS, Amazon, etc.
Method	Online	 Online Face to face 	Online
Number of participants	50-100 persons/course	1. 600 persons 2. 20-30 persons	140 registered (of which 60-70% are actively participating.)
Languages	Ukrainian except for language courses	 English or Ukrainian (selective) Ukrainian (mainly), English and Polish 	English

 Table-14
 Cases of IT Training for Ukrainian Refugees (1)

Source: Prepared by the JICA Survey Team based on interviews with NGOs

T . 1	D 111 .1	T C D C	
Items/	Polki moga wszystko	Tent for Refugee	Polish Migration Forum
Organization			Foundation
Purpose	Improved IT literacy will	Reskilling and upskilling	Increased IT literacy will enable
	enable them to keep in	to get (new) jobs	them to keep in touch with
	touch with their relatives	8 () j	relatives make friends apply for
	touen with then relatives.		relatives, make mends, apply for
			government assistance, and bank
			online smoothly.
Goal	N/A	N/A	N/A
Status	Already started since early	In discussion with relevant	In the planning stages
	2023	parties.	
Target	Ukrainian refugees	Ukrainian refugees	Ukrainian refugees
Ū.	(60+yo)		-
Contents	Basic use of IT equipment	Accenture and 10 other IT	TBD
	and communication	companies are discussing	
	software	IT education.	
Method	Face to face	TBD	TBD
Number of	15 persons x 2 classes	TBD	TBD
participants	-		
Languages	Ukrainian	TBD	TBD

 Table-15
 Cases of IT Training for Ukrainian Refugees (2)

Source: Prepared by the JICA Survey Team based on interviews with NGOs

None of the organizations had any information on what kind of Ukrainian refugees had taken the training, what kind of jobs they had after completing the training, or whether they were taking further training. However, of these organizations, the "Incubation Freedom for Ukraine project" conducted by the Ukrainian Talent Foundation and the Perspektywy Education Foundation conducted a questionnaire survey to determine the skill levels of Ukrainian refugees in the use of IT and software products. A summary of the questionnaire survey is shown in the table below.

Table-16	Results of the Ukrainian Talent Foundation's IT Level Survey
of samples	4 956 (of which about 73% live in Poland)

Number of samples	4,956 (of which about 73% live in Poland)	
Method	Online	
Implementing period	September 2022-January 2023	
Gender	Female (About 99%), Male (About 1%)	
Age	Under 18 yo (Approx.1%), 18-19 yo (Approx.19%), 30-39 yo (Approx. 43%),	
	40-49 yo (Approx. 29%), 50+yo (Approx. 7%)	
Educational background	Bachelor (Approx. 14%), Master (Approx 61%), Doctorate (Approx 2%)	
Employment status	Employed (Approx. 36%), Not employed (Approx. 65%)	
IT skill level	• The level of basic digital skills (ability to work with basic office programs and the	
	ability to use appropriate digital solutions for everyday communication) is quite	
	high. About 60% say they can use Windows and Microsoft Office at work.	
	• Digital skills of higher levels are an advantage of only a certain part of the	
	respondents. The lowest level of mastery among the respondents is connected	
	with the software development skills.	
Desired training	• Computer graphics and design (Approx. 51%), Polish business course (Approx.	
	45%), Social Media Marketing (SMM) systems in Digital Economy (Approx.	
	39%) are the most desired courses in that order.	
	• Approx. 26% of the respondents want training in programming and Approx.	
	19% in Office software based on Microsoft Office	

Source: Survey of Ukrainian citizens about their needs for additional training (Ukrainian Talent Foundation, 2023)

(6) IT Literacy Improvement Needs of Ukrainian Refugees

From interviews with organizations and companies that support the employment and vocational skills training (mainly in the IT field) of these Ukrainian refugees, it can be inferred that there is a need to improve IT literacy as shown in the figure below.



Source: Prepared by the JICA Survey Team based on interviews with organizations and companies that support employment and vocational skills development (IT sector)



(7) Job Search Challenges

While the questionnaire in the Survey also asked about issues related to job search, interviews with organizations and companies that support employment and job skills training revealed the following issues.

Low motivation

If their stay in Poland is perceived as temporary and short term, or if the duration of their stay is uncertain, they are not sufficiently motivated in their efforts to learn Polish or to look for a better job. Low motivation is also influenced by psychological conditions, war trauma, and other severe experiences.

• Lack of Polish language proficiency

Many female refugees have not mastered Polish at a level that can be used in various types of business (Polish at B2 level or above). This limits their possibilities to search for work and obtain information about job opportunities, making it difficult for them to find work effectively.

· Care for infants and school-aged children, the elderly, and people with disabilities

Many women fled to Poland with their young children, school-aged children, elderly, and disabled persons. For such women, working outside of specific working hours does not allow them to take care of their infants, school-aged children, elderly, or disabled persons. This limits their freedom to search for work.

· Recognition in Poland of official qualifications

Due to lack of necessary documentation and complicated procedures, people often give up on obtaining recognition in Poland of official qualifications obtained in Ukraine and decide to work below their qualifications in order to make a living, even persons with high qualifications, such as accountants, teachers, and doctors.

· Lack of knowledge about legal matters when doing business

Often, people with business experience in Ukraine try to set up businesses in Poland as well, but their lack of knowledge of Polish and EU standards prevents them from setting up their businesses smoothly.

• Lack of professional skills

Due to differences in curriculum and occupational requirements, Ukrainian refugees may not be competent enough to fill similar positions in Poland.

The national government, local governments, international organizations, private companies, and NGOs all have their advantages in assisting with these challenges, but the wide range of issues faced by Ukrainian refugees and the fact that they face different challenges on an individual basis makes collaboration with each organization essential when providing assistance.

2.5 Current Status of PJAIT

(1) Overview

PJAIT was established in 1994 under an agreement between the Governments of Poland and Japan. As one of the best private universities in Poland, PJAIT has trained specialists in the fields of computer science, information management, cultural studies, interior design, art, and graphic design over the years.



Source: PJAIT

Figure-15 Appearance of PJAIT

The table below provides an overview of the academy as of October 2023.

Table-17	PJAIT Overview	

Items	Contents
Year of establishment	1994
Number of students (number of Ukrainian students)	8,542 (1,009)
Number of full-time faculty (number of Ukrainian faculty)	358(9)
Employment rate within one year of graduation	98%
Number of faculties	Four (Computer Science, Information
	Management, New Media Arts, Japanese Culture)
Education	Bachelor, Master, Doctorate, Postgraduate
	Diploma Courses
Language	English, Polish
Campus	3 locations (Warsaw, Gdańsk, Bytom)
Laboratories	More than 40 computer rooms

Source: PJAIT

The total number of students in 2023-2024 is 8,542, of which 1,009 are Ukrainians. The number of students by education level shows that bachelor degree students account for about 71% of the total number. In addition, 70% of the students are majoring in computer science. The table below shows a breakdown of the number of students by education level and major.

Education Level	Number of the Students	Out of which, Ukrainian Students
Bachelor's	7,400	855
Master's	1,138	154
Doctorate	4	0
Total	8,542	1,009

Table-18 Number of Students by Education Level

Source: PJAIT

Major	Number of the Students	Out of which, Ukrainian Students
Computer Science	6,022	659
Information Management	808	70
New Media Art	1,357	260
Cultural studies – Culture of Japan	355	20
Total	8,542	1,009

Table-19 Number of Students by Major

Source: PJAIT

In Poland, tuition at public universities is free of charge, but PJAIT is a private institution and therefore charges fees. Tuition fees range from PLN 20,000-29,000/year (744,000 JPY-1,078,800 JPY/year) for the bachelor's program and PLN 11,500-14,300/semester (427,800 JPY-531,960 JPY/semester) for the master's program (calculated at 1 PLN = 37.2 yen).

Education Level	Tuition Fees (PLN/year or semester) ¹		
Bachelor's	1 st year	20,000 PLN	
		25,000 PLN	
	2 nd year	22,000 PLN	
		26,400 PLN	
	3 rd year	24,000 PLN	
		29,000 PLN	
	7 th semester	13,300 PLN	
		16,000 PLN	
Master's	1 st semester	11,500 PLN	
		13,000 PLN	
	2 nd semester	12,700 PLN	
		14,300 PLN	
	3 rd semester	12,700 PLN	
		14,300 PLN	
Doctorate		0 PI N	

Table-20Tuition Fees by Education Level

1: Upper row: tuition for classes in Poland, lower row: tuition for classes in English Source: PJAIT

(2) Education and Research Programs

PJAIT has campuses in Warsaw, Gdańsk, and Bytom and offers bachelor's and master's programs, doctoral programs, and diploma courses. The bachelor's and master's programs are offered in four faculties and six majors, with some faculties offering both bachelor's and master's programs and others offering only bachelor's programs. The table below shows the structure of the bachelor's and master's degree programs and the specializations offered by each faculty.

Fac	culty/field of study	Campus/Studia	Specializations		
Fac	culty of Computer So	cience	• • • • • • • • • • • • • • • • • • •		
	Computer Scienece	Warsaw/Bachelor's program	Databases software and database engineering, systems and network programming, intelligent data processing systems, parallel and distributed systems, multimedia, multidedia-3D animation, Multimedia-game programming, robotics, programming of business applications, mobile networks, data warehouses		
		Warsaw/Master's program	Data science, engineering of software, business processes and databases, technologies for mobile and cloud computing, human- computer interaction, project management		
		Gansk/Bachelor's program	Engineering of software and databases, computer graphics, computer games engineering, internet applications, computer systems and networks, artificial intelligence, internet of things		
		Bytom/Bachelor's program			
Fac	culty of Information	Management			
	Information Management	Warsaw/Bachelor's program	Project management, management decision support system, business process analysis, IT systems implementation, E-commerce		
		Warsaw/Master's program	Business analytics and big data, architecture of IT systems		
Fac	lty of New Media A	rt			
	Graphics	Warsaw/Bachelor's program	Animation (classical animation 2D and 3D), visualosation, multimedia communication, multimedia in performing arts		
		Warsaw/Master's program	Animation, visualisation		
		Gdansk/Bachelor's program	Graphic design		
	Interior Design	Warsaw/Bachelor's program	Interior design, exhibition design		
	Graphics Design and Multimedia Art	Warsaw/Bachelor's program	Design intelligent, interactive space based on multimedia installations, designing games and graphics for extended reality (XR), user experience (UX) and interactive graphics design		
Fac	culty of Culture of Ja	ipan			
	Culture studies	Wargow/Dachalar's program	Culture studies		

Table-21 PJAIT's Faculty, Field of Studies and Specializations

Culture studiesWarsaw/Bachelor's programCulture studiesSource:PJAIT' brochure and PJAIT's website

With regard to doctoral programs, the problem in Poland is the low quality of doctoral dissertations and the low number of students who complete them, compared to the large number of students who go on to PhD programs.⁴⁶ In response, the establishment of doctoral programs and the evaluation of research results have been made more rigorous. In addition, rules have been established to accept students entering doctoral programs on the assumption that they will work as researchers while still in universities, etc., and to offer scholarships to those who enter the programs.⁴⁷

Against this backdrop, PJAIT has also become more selective in the selection of students for admission to the doctoral program, accepting only the best students. The number of doctoral students

⁴⁶ https://www.gov.pl/web/edukacja-i-nauka/doktoranci-i-szkoly-doktorskie

⁴⁷ https://www.gov.pl/web/edukacja-i-nauka/stypendium-doktoranckie

at PJAIT for the 2023-2024 school year is four. The research topics covered are listed in the table below.

Table-22	Research '	Tonics	at PIAIT I	CT &	Design	Doctoral	School
1 auto-22	Research	ropics	at I JAII I	CIA	Design	Docioral	SCHOOL

Discipline - Computer Science Technical and Yele communications
I. Identification and re-identification of a person based on gait recorded under uncontrolled conditions
II. Detection of anomalies in the video stream with their approximate temporal and spatial location
III. Recommendation systems resistant to users' cognitive errors
IV. Tools and algorithms to support the work of those involved in assessing the reliability of content on the
Internet
V. "Security by design" in the design of ICT solutions for the elderly
VI. Applied machine learning methods in the study of marine mammal sounds
Discipline - Fine Arts and Art conservation
I. Research on text-based communication design
II. Research on social design
III. Innovative IT tools for artists and designers
IV. Research on social design intervention

Source: PJAIT website:

https://pja.edu.pl/en/szkola-doktorska/szkola-doktorska-ictdesignszkola-doktorska/o-programie/

From interviews with PJAIT, it is found that PJAIT is a small university and does not have a large amount of research, but that PJAIT has 15 researchers, two of whom are top-level researchers and the others are general-level researchers.⁴⁸ As mentioned earlier, due to the rigorous evaluation of research results, PJAIT's guideline for research results is four papers published in top-level journals in four years. International collaborations are conducted with universities and research institutes in China, the U.S., Australia, Austria, Italy, France, and other countries as partners. In recent years, there have been no joint research projects with Japanese universities or research institutions. There is one ongoing collaboration with a Ukrainian university, Khmelnytskyi National University.

In addition, PJAIT offers an IT diploma course for university graduates, and PJAIT established the Center for Postgraduate Studies in May 2022 to develop and operate courses to train personnel with practical skills in specific areas of IT. PJAIT has been developing diploma courses for university graduates at a rate of 10 courses per year and currently offers 20 courses. The IT diploma course is described in detail in section 4.2 (2) IT Diploma Courses.

(3) PJAIT's Management Structure

The Senate is the decision-making body of the university, and the Rector is the chief officer. The Senate decides on PJAIT's important matters, such as curriculum, student recruitment/admissions and educational policies, approval of budget proposals, and selection of the Rector of PJAIT. Under the Rector, there is a Vice-rector in charge of academic affairs, a Vice-rector in charge of development, and a Vice-rector in charge of scientific research, and a Chancellor to assist the Rector in managing the Academy.

⁴⁸ The number of researchers, 15, is the minimum number that can run a doctoral program.



Source: PJAIT



(4) Support Activities for Ukraine in the IT Sector

To date, PJAIT has supported Ukraine by providing academic and living support to Ukrainian students at the Academy and online training to IT specialists in Ukrainian public institutions. The following assistance has been provided to Ukrainian students.

- Scholarships
- Online studying
- Deferring payment, spreading payments into installments.
- Flexible examinations dates.
- Creating and conducting two IT podcast cycles
- Running a point at PJATK that would provide full information support, informing and facilitating contacts with both the administrative as well as didactic
- Adapting PJATK to the needs of these people by translating the website into the Ukrainian language.
- Both advisory and psychological support.
- Career counsellor support and job fairs.
- Support of flagship partners Orange (the largest telecommunications company) and WP (the oldest technology company)

In addition, the table below shows the content of online training provided to IT specialists in Ukrainian public institutions.

Items	Contents
Titles	Cyber Security in Ukraine
Objectives	To develop practical cybersecurity skills that will enable participants to test the
	internals of Ukraine's IT systems.
Number of participants	50 IT specialists from four Ukrainian organizations
Delivery method	Online (using Cyberskiller's platform)
Period	12 months (02.01.2023 - 01.31.2024)

Table-23	Cyber	Security	Training	Content

Source: PJAIT

(5) Available resources for conducting pilot training

After discussions with PJAIT, the following was confirmed.

- During the summer vacation (July to September), the PC classrooms are available all day, including weekends. There are two types of PC classrooms: standard (16 PCs) and larger (20 PCs), both of which are used.
- Assigning faculty members or tutors (students) is possible if the schedule and conditions can be arranged in advance. The schedule and conditions with faculty members and tutors (students) should be arranged between the beginning of May and the beginning of June 2023.
- Since there are costs involved in providing resources, the JICA Survey Team should consider how to cover the cost.

The JICA Survey Team examined the possibility of using the Center of Education and Development in Warsaw as a public facility in the vicinity but confirmed that UNICEF has already used the Center and that it would be impossible to use it for this pilot training.

(6) PJAIT's position in university rankings in Poland

The JICA Survey Team confirmed PJAIT's position in the Perspektywy University Ranking 2023, a ranking of universities in Poland. The ranking is produced by the Polish educational foundation Perspectiwi, and is now in its 24th year.⁴⁹ The ranking evaluates universities that meet certain criteria, such as having bachelor's, master's, and doctoral programs, using 30 indicators and publishes an overall university ranking, a university ranking by academic discipline, a ranking by university type, and eight evaluation criteria groups (prestige, graduates on the labor market, innovation, academic potential, academic efficiency, publications, education conditions, internationalization).⁵⁰

⁴⁹ https://www.rp.pl/prawo-dla-ciebie/art38673141-najlepsze-uczelnie-w-polsce-dwoch-liderow-rankingu-perspektyw

⁵⁰ https://2023.ranking.perspektywy.org/

In the overall university ranking, PJAIT is ranked 45th out of 102 universities. The top three are Jagiellonian University in Kraków, University of Warsaw, and Warsaw University of Technology. Looking at the relative positioning of each evaluation criteria group, PJAIT is rated relatively high in the market value and internationalization of its graduates. In a national survey on the salary level of graduates one year after graduation, which forms part of the evaluation of graduates in the labor market, PJAIT's computer science graduates top the pay scale.⁵¹ PJAIT's ranking (overall) for each of the evaluation criteria groups is shown in the table below.

Criteria group	Overall ranking	Prestige	Graduates on the labor market	Innovation	Academic potential	Academic efficiency	Publications	Education conditions	Internatio nalization
Ranking	45	49	21	Under 50	Under 50	35	30	Under 50	28
			_						

Table-24 Perspektywy Ranking by Criteria Group

Source: Prepared by JICA Survey Team from Perspektywy University Ranking 2023

The Perspektywy University Ranking 2023 also ranks universities by field of study. In the IT field (IT Studies), PJAIT is ranked 8th out of 27 universities. The top three universities in IT are Warsaw University of Technology, AGH University of Science and Technology in Krakow, and Wrocław University of Science and Technology. Academic discipline rankings rank universities in the field of IT on 12 indicators. The JICA survey team re-did this ranking into 6 criteria (prestige, market value of graduates, teaching ability, research ability, and internationalization) to confirm PJAIT's position. PJAIT is relatively highly rated in terms of prestige, market value of graduates, and internationalization.

Table-25 PJAIT's Perspektywy University Ranking by Subject (IT Studies) 2023

Orienall	Ranking by Criteria Group						
Ranking	Prestige	Graduates on the labor market	Education	Research	Internationalization		
8	5	7	13	12	2		

Source: Prepared by JICA Survey Team from Perspektywy Ranking by Subject (IT Studies) 2023

On the other hand, PJAIT's ranking for research strength is lower than the ranking of the university in the IT field, but a breakdown of this ranking shows a low ranking for number (papers), but a relatively high ranking for quality ("citations" and "papers in top 10 journals"). This suggests that PJAIT does not publish many papers, but the quality of the papers it does publish is high.

Table-26 PJAIT's Perspektywy University Ranking (IT Studies) 2023 in Criteria of Research

Overall Ranking	Publications	Citation	Fields-Weighted Citation Impact (FWCI)	Fields-Weighted View Impact (FWVI)	Publications in Top 10 Journal Percentiles
8	21	9	5	13	6

Source: Prepared by JICA Survey Team from Perspektywy Ranking by Subject (IT Studies) 2023

⁵¹ https://pja.edu.pl/en/po-informatyce-ii-stopnia-w-pjatk-zarobisz-najwiecej/

From this analysis, it can be said that PJAIT has strengths in practical IT human resource development rather than being a research university, and that it conducts excellent research in a limited number of fields. Many of the companies interviewed by this survey also commented that PJAIT is a university that produces excellent IT professionals, suggesting that PJAIT has established a certain reputation in the labor market for training IT personnel.

3. Implementation of Training with Immediate Impact and Confirmation of Effectiveness (Pilot Training)

3.1 Preparation and Implementation of IT Literacy Checks (including needs assessment of Ukrainian refugees)

(1) Implementation of Questionnaire Survey

A questionnaire survey was implemented to identify the demographics of Ukrainian refugees, their support needs, IT literacy levels and IT training needs. Since the Survey is to be conducted within the European Union (EU) and the target population is sensitive, namely Ukrainian refugees, the Survey was conducted in cooperation with NGOs that have access to Ukrainian refugees while complying with the "EU General Data Protection Regulation (GDPR)". On the other hand, there is a possibility of some bias in the profile of the Ukrainian refugees due to the limited number of samples that can be collected because of the limited survey period and the fact that each NGO has its own areas of expertise and areas of assistance. To compensate for this, a survey using a social networking service (Viber) was also implemented. Viber is a well-known social networking service among Ukrainian refugees in Poland and has their community.⁵² With the cooperation of Viber, the survey was conducted by posting the advertisement shown in the figure below.

⁵² According to "Refugees from Ukraine in Poland Profiling Update November 2022" (UNHCR), after Telegram and Facebook, Viber is the preferred social media channel of Ukrainian refugees.



Source: Photo by the JICA Survey Team

Figure 17 Survey advertisement for refugees posted on SNS

Sufficient time was spent coordinating with these cooperation organizations, and the survey was conducted sequentially, with a set implementation period for each organization. The survey was implemented shown in the table below.

Cooperation Organization	Implementation Period	Implementation Method
Ukrainski Dom w Warszawie	4/17/2023-5/10/2023	Online
Caritas Polska	4/21/2023-5/15/2023	Online
Fundacja Ocalenie	6/20/2023-6/28/2023	Online
Viber (SNS)	8/28/2023-9/12/2023	Online

Table-27 Implementation of Questionnaire Survey

Source: Prepared by the JICA Survey Team

The questionnaire was designed to allow statistical data analysis from multiple perspectives with IT as a keyword, including not only questions on IT literacy and IT training needs, but also questions on respondents' attributes, employment history, support needs, future plans and hopes (such as employment in Poland, emigration to a third country, etc.), and living environment surrounding the Ukrainian refugees.⁵³ The composition of the questionnaire is shown in the table below. The questionnaire form is attached as Appendix 1.

⁵³ The number of questions and items asked in the survey through NGOs and the survey through SNS were different, so they were tabulated separately. In the questionnaire through SNS, questions in the survey through SNS were narrowed down based on advice from the Viber side. On the other hand, questions that would contribute to the drafting of a medium- to long-term cooperation plan were added.

No.	Major Categories	Sub-categories	Question Items			
1	Current situation	Attributes	Gender, age range, area of residence, accompanying			
		family, educational background				
2		Employment status	Employment status/occupation, job search status/			
			occupation, and challenges			
3		Support needs Future support needs, expected length of stay in Pola				
4		Language ability Proficiency level of English, Polish, etc.				
5	IT literacy level	IT skills possessed History of use of various IT devices, software, and SNS				
6		IT training course	Participation in IT training or not, and details of IT training			
		history	attended			
7	IT training needs	Desired IT training Desire to participate in IT training, available time and				
		contents hours, and training desired contents				
8		Future plan	Desired career path and job search plans after attending the			
			training			

Table-28 Structure of IT/Digital Literacy Check Questionnaire

Source: Prepared by the JICA Survey Team

(2) Results of the Questionnaire Survey

The survey was conducted using "Annex 1: IT literacy questionnaire in English, Ukrainian and Russian" The following table shows the number of respondents by cooperation organization and language in use.

Nome of Organization	Number of respondents					
Name of Organization	English	Ukrainian	Russian	Total		
Ukrainski Dom w Warszawie	0	83	0	83		
Caritas Polska	0	144	0	144		
Fundacja Ocalenie	0	10	37	47		
Viber (SNS)	0	313	0	313		
Total	0	587	37	624		

Table-29 Number of survey respondents by language

Source: Prepared by the JICA Survey Team

The results of the Survey are shown in "Annex 2: Results of IT literary questionnaire survey". A summary of the tabulated results is shown in the table below.

No.	Category	Sub-category	Summary
1	Status of	Attribute of	Similar to other survey results and information obtained from interviews,
	Terugees	leiugees	parents. In terms of education, 55% of the respondents have a master's degree and 80% of all respondents have a college degree or higher
2		Employment status of refugees	Similar to the information obtained from other surveys and interviews, more than 70% of the respondents are employed in some kind of job. On the other hand, many evacuees are looking for employment in specialized fields, with the most common request being for employment in the IT field
3		Assistance needs	In terms of future support needs, many respondents would like training to acquire professional skills and training opportunities to learn the Polish language. In terms of the expected length of stay in Poland, more than half of the respondents wanted to stay in Poland for more than one year or to settle down, which is almost the same as the number of respondents who said they were unsure depending on their future situation
4		Language proficiency	Compared to Ukrainian and Russian, the levels of English and Polish tend to be lower. On the other hand, many respondents who were asked specifically about their level of Polish indicated that they have a certain level of language proficiency
5	IT literacy level	Possessed IT skills	Given the high number of PC and smartphone users and usage, basic computer literacy is assumed to be at an acceptable level. In terms of software use, in addition to basic applications such as e-mail and browsers, there are a certain number of users of Microsoft Office. The number of users of the Internet and social networking services and the amount of time they spend using these services are also high, suggesting that communication with IT devices is not a problem. In terms of messaging applications used, Viber, WhatsApp, and Telegram make up the majority, with roughly the same percentage
6		Record of IT training	Some of the respondents have attended training courses in Microsoft Office and other software. The reason for this could be that they may have already participated in training programs offered by the NGOs that cooperated with the Survey
7	Needs of IT training	Desired IT training content	The overwhelming preference for participation in IT training is to participate if the opportunity arises. In terms of Microsoft Office, Excel was the most popular choice, followed by programming, website development, and computer graphics. Other popular topics were programming, website development, and computer graphics. In terms of available time and date of participation, a certain number of respondents confirmed that they would be able to participate even during weekday daytime hours, that they would be able to participate in half-day training two or three days a week, and that they would be able to participate in full-day training once a week
8		Confirmatio n of future plans	In terms of their desired career path and job search plans after attending the training, many respondents wanted to look for jobs in the IT field and B2B jobs. Many of the respondents also wanted to continue improving their IT skills, suggesting that there are a certain number of evacuees who wish to reskill in the IT field

Table-30	Results of the	Questionnaire	Survey	(Summary)
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Source: Prepared by the JICA Survey Team

 Many respondents have some familiarity with PC operation at the IT literactive we will consider a training plan that requires basic PC operation skills participation. In terms of IT training needs, many respondents are familiar with Micro Excel. In addition, there are many who wish to participate in website creat Therefore, we will consider training plans such as increasing the number provide many refugees with the opportunity to participate. Since the training is held only during the summer vacation period of PJ. training with a policy of concentrating the training in a short period of the According to the results of the Survey, a certain number of respondents are in half-day training during the daytime on weekdays, two or three days a wo once a week. For this reason, we will consider dividing the training into content and offering each module as an intensive training program lasting see of available participants will be adjusted in consultation with NGOs that c participants. Based on the results of the Polish language level checks, it will be a prereque conducted in Polish. On the other hand, consider preparing a team-type Ukrainian-speaking foreign students and others as training assistants. 	v level. For this reason, as a prerequisite for soft Office, especially ion and programming. of training sessions to AIT, implementing the ne will be considered. e willing to participate eek, or all-day training modules according to yeral days. The number an help recruit training tisite that the course be e support system with
--	---

3.2 Preparation of Pilot Training Implementation Plan

(1) Overview of Pilot Training Implementation Plan

Based on the results of the desk survey, field survey, and online interviews described thus far, a plan for implementing the pilot training was developed. The table below provides a summary of the results for each survey item and how each was addressed in the pilot training.

Survey item	Survey result	Correspondence in pilot training
Industry needs for employment	Poland has a low unemployment rate and a shortage of human resources, but there is a mismatch between the human resources sought by industry and the attributes of refugees	Considered training for female to help them find employment in the private sector
Employment needs (Job information site)	Microsoft Office skills are essential for general clerical positions. Excel skills are primarily necessary for data management and other duties in the office	Training modules were considered with the goal of developing practical skills in Microsoft Office, particularly Excel.
	There are many opportunities to hire B2B sole proprietorship contracts. People doing personal businesses require their websites, such as public relations and product sales	WordPress is a globally popular tool that allows users to create websites without IT expertise and was considered as a training module.
	Website development also includes many jobs in marketing (website access analysis) and content development (graphic design)	Considered proposing a roadmap to take training courses such as Digital Marketing and Graphic Design from other NGOs as well.
	The programming language is Python, as is the global trend, especially AI-based jobs. On the other hand, these job requirements also call for IT skills other than programming. Therefore, it is difficult to find a job as an IT professional just by being able to program.	Python programming continues to spread in a wide range of fields. For this reason, it is necessary to provide essential programming training modules for the youth who wish to major in IT. Also, considered inviting IT specialists from companies and PJAIT graduates to introduce their voices from the field.
Needs of private companies regarding employment (Company interviews)	Microsoft Office skills are essential for general clerical positions. Excel skills are primarily necessary for data management and other duties in the office	Training modules were considered with the goal of developing practical skills in Microsoft Office, particularly Excel.
	Business-level language skills (English and Polish) and work experience required	Considered roadmap to utilize business language training courses offered by other NGOs
	In addition to programming, practical skills such as frameworks used in the development are required	This training focused on programming fundamentals, and was considered as a training module that would provide an opportunity to think about future career plans, with the target audience being the youth.
IT literacy questionnaire survey	Many of the women are highly educated. There is a certain number of refugees who use PCs on a regular basis and are looking for IT jobs	In accordance with the other survey results discussed, the training plan was reviewed based on the prerequisite that participants be able to operate a basic PC.
	A certain number of refugees are able to participate in training in Polish according to self-assessment	When applying for the training, the participants were informed that the training would be conducted in Polish, and when it was implemented, a team of lecturers, Ukrainian students, and Ukrainian training coordinator provided support.
	A certain number of refugees are able to participate in training even during weekday daytime hours. On the other hand, there are many who wish to participate online	Considered that the training was held during the summer vacation period, a schedule that concentrated on longer training sessions was also considered. Online delivery of the training was also considered.

Table-31Results of Each Survey Item and Pilot Training Policy

Source: Prepared by the JICA Survey Team

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In addition, in reviewing each module of the pilot training, suggestions were made for appropriate combinations of IT training courses offered by other organizations, as identified during the field survey. A list of these IT training courses is provided in the table below.

Organization	Training course	Implementation	Content
PJAIT	Python Project Lab	University	The course covers introductory programming to
		classroom	programming common data structures and
			algorithms (strings, arrays, queues, stacks,
			graphs). This training builds a foundation to
			begin learning advanced topics such as machine
			learning
	Cybersecurity for	Private facilities	Practical IT skills training in the field of
	Ukraine	Online	cybersecurity, using CyberSkiller's ⁵⁴
			specialized labs. Training to become able to
			diagnose vulnerabilities inside Ukrainian and IT
			systems.
Ukrainian	Office101	Online	Acquires basic operations of Word, Excel,
Talent			PowerPoint, Outlook, and Access
Foundation ⁵⁵	Computer Graphics	Online	Understand how to design and edit images and
	and Design		learn to operate Adobe Photoshop and Illustrator
	Social Media	Online	Acquire practical skills in using social networks
	Marketing Systems in		as a means of marketing communication systems
	Digital Economy		for modern companies
	Methods and Tools of	Online	Learn how to use digital marketing tools such as
	Digital Marketing		social media marketing (SMM), Google and
			Facebook advertising, and web analytics using
			Google Analytics
	Digitalization of	Online	Learn how to optimize your marketing strategy
	Business Finances and		with business building and financial analysis
	Financial Analytics		
	JAVA Core	Online	Understand the fundamentals of object-oriented
	Programming		programming and algorithms and be able to
	Language		write simple programs
	Python Data Science	Online	Understand the fundamentals of object-oriented
			programming and algorithms and be able to
			write simple programs
Ukrainski	Office training	NGO's facility	Flexible training based on the needs and level of
Dom w			the participants. Instructors are NGO staff
Warszawie	IT Support by Google	Online	Learn the basics of technical support, including
	Professional		operating systems, system administration, and
	Certificate (Coursera)		security, and develop basic skills in the field of
			information technology
	Digital Marketing and	Online	Learn how to use tools such as Canva, Constant
	E-Commerce by		Contact, Google Ads, Google Analytics,
	Google Professional		Hootsuite, HubSpot, Mailchimp, Shopify,
	Certificate (Coursera)		Twitter, etc.
ITSkills4U	AWS Cloud	Online	Learn about AWS cloud concepts, AWS services,
	Practitioner		security, architecture, pricing, and support. After
			the training, participants can take the certification
			exam of the same name free of charge.
Polki mogą	IT literacy training	NGO's facility	Learn how to use IT tools for communication,
wszystko			such as Gmail and Zoom

Table-32 List of IT Training Courses Offered by Other Organizations

Source: Prepared by the JICA Survey Team

⁵⁴ https://cyberskiller.com/

⁵⁵ Some training videos are being made available to the public: https://www.youtube.com/@utf_live/.

The overview of the pilot training plan developed from the table above is shown in the figure below. In the figure, the entrances lead to the prerequisites for participation in the training, and the exits offer the roadmap after involvement in the training.



Source: Prepared by the JICA Survey Team

Figure-18 Overall View of the Pilot Training Plan (includes entrance and exit)

As shown in the figure above, an important exit route after participating in the pilot training is to continue to improve one's skills by attending IT training courses offered by other organizations. The scope of the three areas of the pilot training shown in the figure above is discussed below.

(2) Consideration of scope of the pilot training

Based on the results of the aforementioned study, this pilot training focused on three training areas for three target groups, as shown in the table below, to concretize the training goals.

Target group	Area of training	Goal of training
1. Refugees looking for employment opportunities	Microsoft Office (Excel)	Become able to use
Non-IT personnel looking for work, mainly	basics and practical	Microsoft Office (Excel)
clerical positions in companies, etc.		on the job
2. Refugees looking for employment opportunities	Website authoring	Become able to create and
Non-IT personnel looking for work in personal	(WordPress) basics	operate simple websites
business or website development		
3. The youth aiming to major in IT at university	Python programming	Understand object-
Computer programming basics	basics	oriented programming
		fundamentals in Python

Table-33 Target Groups and Areas of Pilot Training

Source: Prepared by the JICA Survey Team

The following chart shows the process that led to the narrowing of the above table to three training areas. Detailed data on the analysis in each figure is provided in "Annex 3: Results of job information sites survey".

[1. Microsoft Office (Excel) Basics and Practical]

An analysis of Microsoft Office (Excel) job details on the job posting site Pracuj.pl (Ukrainie) revealed that many jobs required practical Excel skills, such as data compilation, data analysis, and business report writing using Excel. In addition to Excel skills, many jobs require industry business knowledge and experience. By business, many of the jobs in indirect sectors involved administrative work in data management in human resources, finance, and accounting. By industry, many jobs in the transportation, manufacturing, and retail sectors involve data management related to logistics, procurement, sales, and other operations in the direct industry. For this reason, a roadmap was developed to improve skills by attending training courses on specialized work offered by other NGOs.



Source: Prepared by the JICA Survey Team based on the Pracuj.pl (Ukraine)

Figure-19 Jobs by Position and Responsibilities related to Microsoft Excel

An example roadmap to employment for job requirements related to Microsoft Office (Excel), based on the results of these analyses, is shown in the figure below.



UTF: Ukrainian Talent Foundation MOS: Microsoft Office Specialist

Source: Prepared by the JICA Survey Team



[2. Website authoring (WordPress) basics]

A detailed analysis of jobs related to website authoring (WordPress) on Pracuj.pl (Ukrainie), a job information website, revealed that there were many jobs related to website development and management using WordPress. On the other hand, there were also many jobs related to marketing, such as website access analysis, and content development using graphic design tools. For this reason, a roadmap plan was developed to improve skills by taking training courses in similar fields offered by other NGOs.



Source: Prepared by the JICA Survey Team based on the Pracuj.pl (Ukraine)

Figure-21 Website Authoring Jobs by Roles

An example roadmap to employment for job requirements related to Website authoring (WordPress), based on the results of these analyses, is shown in the figure below.



UTF: Ukrainian Talent Foundation, UDW: Ukrainski Dom w Warszawie Source: Prepared by the JICA Survey Team



[3. Python programming basics]

The needs survey of private companies revealed that there are many jobs in Python, but a detailed analysis of jobs related to programming was also conducted for the Java language, which has a similar number of jobs as Python. 575, which is almost the same as the number of jobs in Python and Java. In terms of distribution by position, as is the case for both languages, there are more jobs for seniors and specialists (87% of the total), while there are fewer jobs for interns and juniors (6% of the total). Therefore, it can be inferred that even if basic Python programming training is provided in the pilot training program, it is difficult to link it to immediate employment, due in part to the small number of junior-level job openings, which are candidates for these employment opportunities.



Source: Prepared by the JICA Survey Team based on the Pracuj.pl (Ukraine)

Figure-23 Programmer Jobs by Language

Based on the results of these analyses, Python programming will be considered as a training module for the youth who are considering entering an IT-related university or working in the IT industry in the future, rather than as immediate job placement assistance.



UTF: Ukrainian Talent Foundation

Source: Prepared by the JICA Survey Team

Figure-24 Example of a Roadmap to Employment for Job Requirements (Python Programming)

(3) Structure of proposed Pilot Training

Based on the results of the study up to this point, the table below shows the module structure for the pilot training.

Category	Title	Prerequisite	Content	Target	Duration
Module 1	Microsoft	Basics PC	Worksheet and Book	Up to 40	Approx.
*For Employment	Office	Operation	management	years old	10 hours
	(Excel		Cell and Cell Range data		
	Basic)		management		
			Table and table data management		
			Formulas and functions (1)		
Module 2	Microsoft	Excel	Formulas and functions (2)	Up to 40	Approx.
*For Employment	Office	Basic	Creating graphs	years old	10 hours
	(Practical		Pivot table		
	Excel)		Techniques to improve		
			efficiency		
Module 3	Website	Basics PC	HTML/CSS basics	Up to 40	Approx.
For Employment	Authoring	Operation	WordPress basics	years old	20 hours
	basics		Website authoring and		
	(WordPress)		management		
Module 4	Python	Basics PC	Fundamentals of Python	The	Approx.
For Education	Programmin	Operation	Object-oriented programming	youth	36 hours
	g basics		basics		

Table-34 Module Structure of Pilot Training

* Module 1 and Module 2 will be held as one continuous course Source: Prepared by the JICA Survey Team

Based on this structure, the specific content was reviewed by each instructor in charge. The details and schedule of each of these pilot training modules are shown in the "Implementation of Pilot Training" section.

(4) PJAIT's Comments on the Pilot Training

The PJAIT's comments were reflected as necessary in the formulation of the pilot training implementation plan. The main comments of PJAIT and the JICA Survey Team's responses are shown in the table below.

Table-35 PJATT's Comments on the Pilot Training and the JICA Survey Team's Responses	Table-35	PJAIT's Comments on	the Pilot Training and the	JICA Survey Team's Respo	nses
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PJAIT's Comments	JICA Survey Team's Response
The majority of Ukrainian refugees will be women, but	Do not limit training participants to women only.
participation in the training will not be limited to	
women only.	
A hybrid type of training is preferred. The training	The training will be designed in a modular format.
content should be modular so that participants of	Hybrid training will also be considered, with lectures
different levels can participate.	streamed and a high-flex format that allows trainees to
	choose between classroom or online participation at
	PJAIT.
There are likely to be a variety of needs depending on	In addition to the questionnaire survey to be conducted
individual circumstances. It is advisable to review	in this survey, existing surveys and efforts of related
various existing surveys to be as representative of the	agencies will be reviewed.
needs of Ukrainian refugees as possible.	
It is recommended that the outcomes of each module	Assume an exit and post-training path for each training
be clearly defined and that the content of the training	module and prepare the content.
be organized in terms of what will be learned to achieve	
those outcomes. It is not possible to teach the entire	
Office in a 12-nour training course, so the training	
should be structured to focus on basic operations and	
ofter the training	
Since large differences in the level of the trainees and	Pearuit and select participants by setting appropriate
their language abilities will hinder the training great	training participation requirements based on the
care should be taken in the selection of participants	Results of the Questionnaire Survey
It is necessary to confirm the profiles of the trainees in	Conduct a rehearsal with relevant personnel before the
advance and discuss arrangements for the training	training is conducted
system. The language of the training should be	
discussed at the arrangement meeting prior to the	
training, such as i) Polish by the faculty (with foreign	
students assisting with explanations), ii) interpretation	
by foreign students as appropriate, iii) lectures by	
foreign students on behalf of the faculty, etc.	
An orientation time is required on the first day of	Incorporate orientation into the training schedule.
training to explain the operation of the PCs in the	
classroom and how to communicate with the instructor.	
In order to place lecturers and Ukrainian students, it is	Discuss with PJAIT the content of the pilot training,
necessary to provide conditions by May or June and	the work to be outsourced to PJAIT, and the necessary
secure schedules during the summer vacation.	budget during the week of May 22.
The standard PC classroom has 16 PCs, but training	Design a pilot training program with 20 participants per
can be more efficiently conducted with a smaller class	class because 10 participants per class is too limited.
of about 10 trainees (based on previous training	
experience, smooth communication between instructor	
and trainees is possible).	

Source: Prepared by the JICA Survey Team based on PJAIT comments

3.3 Implementation of Pilot Training

(1) Recruitment of Training Participants

The recruitment of training participants was conducted with the cooperation of various supporting organizations, including NGOs, the Warsaw City Labor Office, and a company employing Ukrainian refugees. When recruiting participants from Ukrainian refugees, the JICA Survey Team carefully handled personal information in accordance with the GDPR. For those who applied, a

training coordinator took the lead in selecting applicants and providing the necessary support with the procedures and necessary assistance before the start of the training. For example, the training coordinator confirmed the participants' Polish language level, and their desire to participate in online Polish language training were confirmed, and in the case of participants who were evacuated with their children, whether or not they wished to receive childcare services was also confirmed. Once the participants were selected for the training, WhatsApp group for each training course were created and from it the necessary administrative communications, etc. were conducted.

A deadline was set for the recruitment of participants, but if the maximum number of participants was reached before the deadline, the recruitment was stopped. After their willingness to participate was confirmed, and if there were vacancies, the recruitment was rescheduled. Therefore, it is not possible to see the exact number of applicants for each course, but there was a reasonable demand for each course, since the number of applicants reached the maximum number before the application deadline and vacancies could be easily filled.

(2) Profile of Training Participation

An anonymous online questionnaire was administered on the last day of each training course to collect profile information on the training participants. The aggregate results are presented below.

Regarding the gender of the participants, as shown in the figure below, 81% of the participants were female and 19% were male, like the findings in the interim report.





Figure-25 Gender of Participants



Participants ranged in age from under 18 to over 60. Among them, the core group was the 35-49 age group, which accounted for about 64% of all participants, as shown in the figure below.

Source: Prepared by the JICA Survey Team

Figure-26 Age Range of Participants

In terms of educational background, many of the participants are highly educated. As shown in the figure below, 16% of the participants had a bachelor's degree and about 61% had a master's degree or higher, meaning that 78% of the total participants had a higher education. On the other hand, 22% of participants had less than a high school diploma.





Figure-27 Educational Background of Participants

Regarding the participants' job search status, 78% of all participants were looking for work. Of these, 24% were currently employed and 53% were unemployed. Some participants were seeking to upgrade IT skills required by their current workplace.



Source: Prepared by the JICA Survey Team

Figure-28 Job Search Status of Participants

The JICA Survey Team interviewed some training participants to collect information on their detailed work history, including their work experience in Ukraine, their place of employment (or potential place of employment) in Poland, and the main obstacles in their career development, with their consent on condition of anonymity. Some interviews results are shown in the following table.

Educational background	Work experience in Ukraine	Work experience in Poland	Obstacles of finding jobs in Poland
Double Master's	- Tax police officer	Looking for IT jobs	1) No working experience in IT
degrees	- Opening private business and		2) Lack of IT skills
	work as private lawyer		3) Lack of language fluency (English, Polish)
Master's degree	- Sales representative	E-commerce (freelance)	1) Lack of language proficiency (Polish, English)
	- Regional sales representative		2) Differences in working from Ukraine
	- Sales Manager (E-commerce)		3) Status of the foreigner
			4) Uncertainty about period of staying in Poland
Master's degree	- Financial manager	Museum assistant	1) Lack of language proficiency (Polish)
	- Manager of educational courses		2) Status of foreigner & refugee
	- Workshops with children		3) Lack of documents confirming educational history
Bachelor's degree	- Sales manager	Receptionist	1) Lack of job experience in the EU mainly
	- SMM-management		2) Not sufficient skills for the Polish job market
Master's degree	- Administration officer	- Administration officer in company in	1) Lack of language fluency (English)
	- Manager	Ukraine (remote work)	
		- Looking for IT jobs	
Double Master's	Patent examiner	Looking for jobs as patent examiner	1) Different standards between Ukraine and Poland
degrees			2) Polish citizenships required
			3) Lack of language fluency (Polish, English)
			4) Few job vacancy position
			5) Not ready for physical work
Master's degree	- Lawyer	Looking for jobs as Graphic	1) Certificate to show skills and/or diploma
	- Graphic designer & photographer	designer/Photographer belonging to	2) Diploma in the field of the jobs
		companies	3) Difference in recruitment practice from Ukraine
			4) Lack of language fluency (English and Polish)
Bachelor's degree	- Sales manager	3D designer (freelance)	Willing to continue to work as 3D designer and motion designer
	- Department head		(Freelance)
Master's degree	- Teacher	Looking for jobs as service desk (tester)	1) Lack of language fluency
	- Service desk officer (tester)		2) Lack of license for teaching in Poland
Master's degree	- Lawyer	- Packing at a factory	1) Polish citizenship
		- Looking for jobs like lawyer or IT jobs	2) Special level of Polish (Polish for legislation certificate)
			3) Permission to work in legislation sphere in Poland
			4) Lack of language fluency

Table-36 Profiles of Training Participants (Partial)

Source: Prepared by JICA research team based on the results of interviews.
The results revealed that, similar to the aforementioned questionnaire, many of the training participants had a high level of education and yet had extensive work experience in Ukraine. The survey also revealed that even with these high educational backgrounds and extensive work experience in Ukraine, difficulties in recognition of their official qualifications in Poland, lack of Polish and English language skills, lack of necessary IT skills, and differences in job-hunting practices have all hindered their ability to work and seek employment, leaving them either unable to get a job or working below their abilities to make ends meet.

(3) Implementation of pilot training

The training was conducted at PJAIT's computer lab from July 18 to August 11, during the summer vacation. The computer lab was equipped with 20 PCs for practical training, and these PCs were installed with Windows and Microsoft 365. Other software required for the training was prepared for the training by PJAIT's system administrator, who installed the software in advance.



Photographed by the JICA Survey Team



Figure-29 PJAIT Computer Lab

The implementation structure of the pilot training is shown in the figure below. The training was conducted by a team consisting of PJAIT faculty, Ukrainian student support, and a Ukrainian training coordinator. Before the start of the training course, the training implementation team members discussed how to proceed with the lectures and how to support the trainees after the confirming the training participants' profiles.

On the first day of the training, an orientation was held in the computer lab where participants confirmed their Teams accounts and practiced using Teams during the training. During the training, Teams was used to share information between the instructor and the participants. Each participant used Teams to check his or her schedule, download training materials and exercises, and communicate with the instructor.



Source: Prepared by the JICA Survey Team

Figure-30 Implementation Structure for Pilot Training

The implementation procedures for the pilot training are shown in the table below. Each module of the training was implemented according to this implementation procedure. The implementation of each module was led by the training coordinator, who coordinated the necessary work.

No.	Action item	Persons in charge	Tasks in charge			
[Bef	[Before start of the training module]					
1	Obtain a list of participants from	Training Coordinator	Allocate the maximum number of participants			
	NGOs, etc.	JICA Survey Team	to each organization to adjust the number of			
			people			
2	Creation of a training management	Training Coordinator	Enter the list of participants and share with			
	sheet	JICA Survey Team	PJAIT after completion			
3	Kick-off meeting before the start	PJAIT, JICA Survey Team,	Confirmation of training content and schedule			
	of the training	Participating Organizations,	Review participant profiles			
		Training Coordinator	Discussion, concerning the training as a whole			
		Lecturer in charge				
		Ukraine students (assistant)				
4	Advance communication of	Training Coordinator	Administrative contact including start date			
	necessary information to NGOs,		and meeting time			
	distribution of transportation		Individual support for participants, etc.			
	cards, and support for users of					
	childcare services, etc.					
[Tra	ining modules are being held]					
5	Orientation	Training Coordinator	Explanation of overall outline of the training			
			(schedule, implementation structure, evaluation			
			methods, certificates, etc.)			
6	Training	Training Coordinator	Manage participant attendance			
		Lecturer in charge	Necessary individual support for participants,			
		Ukraine students (assistant)	etc.			
7	Questionnaire shortly after the	Training Coordinator	Collection of questionnaires and compilation			
	training	JICA Survey team	of attendance management results			
[Aft	er completion of the training module]					
8	Evaluation meeting after the	PJAIT, JICA Survey team,	Summarize the results of the participants'			
	training	Training Coordinator	pass/fail decisions			
		Lecturer in charge				
		Ukraine students (assistant)				
9	Issuing certificate of completion	PJAIT, JICA Survey team	Preparation of certificate of completion			
10	Distribution of certificates of	PJAIT, JICA Survey team	Awarded at the closing ceremony			
	completion					
11	Compilation of training results and	PJAIT, JICA Survey team	Shared the results between PJAIT and JICA			
	debriefing		Survey Team			

Table-37	Procedures	for	Pilot	Training
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Source: Prepared by the JICA Survey Team

The following table shows the schedule for the pilot training. The training was divided into three groups. The table below also shows the visits of important persons during the training period. In the mornings (9:00-12:00) an open lab was set up with the assistance of Ukrainian students to allow for free self-study for each training course. Instructor-led training sessions were held from 13:00 to 17:00.

Date	Schedule	Visits by participating organizations and dignitaries
July 10	Kick-off meeting	Cooperating Organizations for
		Participant Recruitment
July 17	Opening meeting, friendly get-together	Ambassador Miyajima's Message to the
		Participants
July 17~July 21	1 st group training (Excel, WordPress)	July 20: JICA President's Visit
July 24~July 28	2 nd group training (Excel, WordPress)	
July 31~August 10	3 rd group training (Python programming)	
August 11 Special lectures, employment counselling,		Ministry of Education and Science,
	graduation ceremony	Embassy of Japan, JICA, Cooperating
		organizations, private companies, etc.

Table-38	Schedule	of Pilot	Training
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Source: Prepared by the JICA Survey Team

The pictures below shows from the pilot training implementation.



Kick-off meeting

Opening meeting



Opening meeting

Friendly get-together



1st group training

JICA President's Visit



Closing ceremony

Closing ceremony

Source: PJAIT



The schedule and content of each of the training courses are listed in the tables below.

Schedule	Main contents	Remarks
Day 1	Basic Excel operations	Cells, worksheets, columns, rows, menu operations,
		data entry and editing, printing, saving, etc.
Day 2	Creating Tables and Graphs	Create tables and charts (line charts, pie charts,
		column charts, etc.)
Day 3	Calculations, Logic Operations, Excel	Calculation (sum, average, and other calculation
	Functions	functions, and, or, if, and other logical operation
		functions)
Day 4	Reference, filter, and sort	Relative, absolute, and compound references, data
		filtering and sorting, etc.
Day 5	Conditional formatting, formatting of	Prepare and submit final assignment Excel
	numbers and currencies, and final	spreadsheet
	assignment	

Table-39 Training Content (Excel)

Source: Prepared by the JICA Survey Team based on PJAIT's documentation

Schedule	Main contents	Remarks	
Day 1	Website Development with WordPress	Overview of domain and web server, WordPress	
		installation and basic settings, etc.	
Day 2	WordPress Operation Exercises	Basic operation of WordPress	
		(How to use the admin panel and visual editor)	
Day 3	WordPress Plug-ins	Installing the Elementor plugin and developing	
		websites with the plugin	
Day4	WordPress Theme	Create custom themes and developing websites with	
		the themes	
Day 5	Preparation and presentation of final	Complete and present the website, register the final	
	assignment	project on the PJAIT web server.	

Table-40 Training Content (WordPress)

Source: Prepared by the JICA Survey Team based on PJAIT's documentation

Schedule	Main contents	Remarks
Day 1	Introduction to Python and the basics of	Python installation and development environment
	programming	setup, Python code execution, console work, basic
		calculations, REPL, variables and data types, Python
		keywords
Day 2	Operators and Expressions	Arithmetic operators and expressions, relational
		operators and expressions, logical operations (and,
		or, not), identity, bits
Day 3	Control flow and decision making	Python execution order, conditional branching (if,
		else, elif), comparison operators, nested if
		statements, loops (while, for)
Day 4	Data Structures	String and operations on string, lists, tuples, set and
		operations on set, dictionary and operations on
		dictionary
Day 5	Function	Defining and Calling Functions, Arguments and
		Parameters, Anonymous Functions (Lambda
		Functions), Variable Scope and Lifetime
Day 6	File Operations	Reading and writing files, Handling exceptions and
		errors in file operations
Day 7	Basics of Object-Oriented Programming	Classes and Objects, Attributes and Methods,
		Inheritance and Polymorphism
Day 8	Basics of API	Creating HTTP Requests Using Requests library,
		Processing JSON Responses, Creating APIs Using
		FastAPI
Day 9	Program Designs	Apply concepts learned in the course. Complete a
		final project

Table-41 Training Content (Python Programming)

Source: Prepared by the JICA Survey Team based on PJAIT's documentation

On August 11, the last day of the program, special lectures were given by private companies, as shown in the table below.

Company Name	Theme at company briefing	Communication at employment counselling sessions
CHI Software	Introduction of IT skill training	Questions about vacancies and details of company's
		training programs
		CV submission
		(Further skills training will be offered free of charge.)
Infopulse	Skills needed for IT jobs, how to	
	get those skills	
Fujitsu Technology	The beginning of your IT	Questions about required skills/languages, how to
Solutions	journey with Fujitsu	start an IT career, and vacancies.
		CV correction requests and CV submission.
UNIQLO Poland	N/A	Questions about vacancies and required skills
		CV submission
		Possibility of holding a group job search consultation
		on another day

Table-42 Contents of Special Lectures

Source: Prepared by the JICA Survey Team

The special lecture is shown in the pictures below. The lecture focused on IT skills needed for employment and advice for attendees seeking employment in the IT industry. After the lectures, each company set up a counselling booth where attendees could review job openings, submit CV, and receive employment advice.



Source: PJAIT

Figure-32 Scenes from the Special Lecture (From left: CHI Software, Infopulse, Fujitsu Technology Solutions)

Scenes from these pilot training sessions were posted on the PJAIT website⁵⁶, along with an introductory video⁵⁷.

(4) Polish Language Training

In implementing the pilot training program, Polish business conversation classes were also offered in parallel with the IT literacy training, as improving language skills, especially business conversation in Polish, is important for finding employment. The Polish language training was conducted in cooperation with the Social Welfare Corporation Fukudenkai (Hiroo, Tokyo), and classes were held three times a week for 90 minutes from July 11 to August 11, 2023. Although many participants expressed their willingness to participate in the online classes, due to the intensive

⁵⁶ Introductory article about the training

https://pja.edu.pl/en/youtube-pjatk-podsumowanie-kursu-zainicjowanego-przez-jica-we-wspolpracy-z-pjatk/

⁵⁷ Introductory video about the training https://www.youtube.com/watch?v=Vw77JlBdI8I

nature of the classes and the last-minute scheduling, the number of participants who completed the course remained at 15, compared to 86 at the start. The participants also expressed difficulty in balancing work and lessons and the lack of available computers, etc.

3.4 Collaboration with Other Organizations

As mentioned in "2.4 Cases of Employment and Vocational Skills Training (in the IT sector) Support for Ukrainian Refugees and Challenges in Job Search", various organizations are involved in supporting Ukrainian refugees, and cooperation that takes advantage of the characteristics of each organization is essential for providing effective support. Therefore, this pilot training was also conducted in cooperation with other organizations as shown in the table below.

Items/ Organization	Fundacja Ocelenia	Caritas	Ukrainski Dom w Warszawie	Ukranian Talent Foundation	Labor office (City of Warsaw)	CHI Software, Infopulse, Fujitsu, UNIQLO	Social Welf Corporation Fukudenkai	CHI Software
Recruitment of participants	0	0	0	0	0			
Business Polish language training							0	
Career and workplace introductions						0		
during training						0		
Employment counsel	0	0	0	0	0			
Further skill-up training								0

Table-43 Collaboration with Other Organizations

Source: JICA Survey Team based on discussions with each organization

3.5 Evaluation of Pilot Training

(1) Evaluation of Pilot Training

The results of the pilot training are shown in the table below. Of the 100 participants, 86 completed the training. The 14 absentees were either absent for personal reasons, such as work or relocation abroad, or were present only on the first day of the training and did not attend thereafter.

Table-44	Number of Registrants, Ab	sences, and Com	pletions for Pilot	Training
	8, ,	,	1	

Group (itinerary)	Course	Number of registrants	Number of absentees	Number of Graduates
1 st Group	Excel	20	5	15
July 17 -July 21				
	WordPress	20	3	17
2 nd Group	Excel	20	1	19
July 24 -July 28				
	WordPress	20	0	20
3 rd Group	Python	20	5	15
July 31 - August 11	Programming			
Total		100	14	86

Source: Prepared by the JICA Survey Team

The pilot training was evaluated by analyzing the results of an online questionnaire administered on the last day of each course (82 respondents). The results of the evaluation are described below.

The following figure shows that 90% of participants of the participants gave high marks, a rating of 5 (Excellent) or 4 (Very Good) on a scale of 1 to 5 to the question, "<u>How was the training?</u>".



Source: Prepared by the JICA Survey Team

Figure-33 How was the training?

The following figure shows that 81% of the participants answered "very short" or "short" to the question, "<u>Was the training period appropriate?</u>" On the other hand, 23% answered "just right" and 0% responded "long" or "very long".



Source: Prepared by the JICA Survey Team

Figure-34 Was the training period appropriate?

The figure below shows that 84% of the participants gave a rating of 5 (Very easy) or 4 (Easy) on a scale of 1 to 5 to the question "<u>Was the Polish lecture easy to understand?</u>", indicating a high rating, i.e., that the Polish lectures were easy to understand. Similarly, the feedback from the lecturers and the Ukrainian student support staff indicated that the participants understood the lectures in Polish.



Source: Prepared by the JICA Survey Team

Figure-35 Was the Polish lecture easy to understand?

The figure below shows that 84% of the participants gave a high score of 5 (Extremely improved) or 4 (Very improved) on a 5-point scale to the question "<u>How much have your skills improved</u> <u>compared to before the training?</u>", indicating that all participants responded that their IT skills had improved as a result of this training. In particular, many participants were learning WordPress and Python for the first time, so the level of skill improvement was high. On the other hand, it is assumed that a certain number of participants had some knowledge of Excel prior to attending the training.







These results indicate that the pilot training program met the training needs of refugees seeking employment in Poland as planned and showed positive results in developing IT skills.

(2) Follow-up Survey of Those Completing the Pilot Training

A follow-up survey was conducted to confirm the participants' efforts and results in their job search activities after the pilot training was completed, as outlined in the table below. The results of the questionnaire survey are shown in Annex 5.

Item	Questionnaire survey	Interview survey
Implementation period	November 13, 2023 to November 30, 2023	December 14, 2023
Implementation method	Online Questionnaire	Face to face and online
	86 persons completed the pilot training	3 of those who completed the pilot
Target goup		training and were able to find
		employment
	Attributes (gender, age, training courses	Courses taken, work at the place of
	attended), planned duration of stay in Poland,	employment, effectiveness of the
Question Items	job search after the pilot training and its	pilot training in finding a job, job
Question items	results, effectiveness of the pilot training in	search activities, important issues
	finding a job, reasons for difficulties in	for finding a job in Poland, and
	finding a job, future support needed	future plans

Table-45 Implementation of Follow-up Survey

Source: JICA Survey Team

Of the 86 targets of the questionnaire survey, 41 responded. 16 respondents completed the "Microsoft Office (Excel) Basics and Practice" course, 23 completed the "Website Creation (WordPress)" course, and 8 completed the "Basic Python Programming" course.⁵⁸

31 of the 41 respondents were seeking employment after completing the pilot training, and their specific job search activities (multiple responses) are shown in the figure below. The most common response was "Sent my resume to the company" (22 respondents), followed by "Participated in further skills training, including language training" (16 respondents), "Attended job fairs and seminars" (13 respondents), and "Received employment counseling" (12 respondents).





Figure-37 Specific Job Search Activities After the Pilot Training

⁵⁸ Because some participants attended more than one course, the total number of participants does not equal the number of respondents.

31 replied to the question about whether they found a job or not as a result of these job searches, and eight of them responded that they were able to find a job. The types of job placements are shown in the figure below: three were in IT-related jobs that required what they learned in the pilot training; three were in non-IT-related jobs that required what they learned in the pilot training; and two were in non-IT-related jobs that did not require what they learned in the pilot training.



Source: Questionnaire survey (follow-up survey)

Figure-38 Type of Employment

When the eight respondents who were able to find employment were asked what aspects of the pilot training they found useful (multiple responses), four replied that the contents of the training, four replied the PJAIT certificate, and two replied the business Polish language training.

On the other hand, 40 respondents gave reasons for not being able to find a job, with "Lack of English language skills" being the most common, followed by "Lack of hard skills," "Lack of experience working in Poland," and "Lack of Polish language skills," in that order.



Source: Questionnaire survey (follow-up survey)

Figure-39 Obstacles to Finding a Job

In terms of training needed in the future, in relation to the reasons for not being able to find a job, the top requests were for English language training, hard skills training, Polish language training, and providing work experience in Poland, in that order.



Source: Questionnaire survey (follow-up survey)

Figure-40 Assistance Needed in the Future to Find Employment

In addition to the questionnaire survey, three of the eight students who found employment were interviewed. Three were employed in IT jobs that required what they learned in the training (one), non-IT jobs that required what they learned in the training (one), and non-IT jobs that did not require what they learned in the training (one). The major findings from the interviews are as follows.

- All of them understand that the labor market is competitive and are highly motivated to use various resources and independently study languages, hard and soft skills.
- Knowledge of IT is a must for employment in any industry. In this regard, the PJAIT's certificate of the training completion and what they have learned in the PJAIT training are highly valuable. The completion of the pilot training has allowed them to create a good-looking CV. In addition, it has more or less compensated for the negative aspect of their lack of work experience in Poland.
- In order to find a better-paying job, it is necessary to be able to communicate in English in addition to Polish.
- In addition to hard skills, soft skills such as CV writing, interview delivery and presentation should also be improved.

JICA Survey Team also received the following comments from the organizations that helped recruit the pilot training participants regarding the next training to be conducted.

• When recruiting participants, it is necessary to provide clear information in advance and allow sufficient time for pre-testing. This will help to select highly motivated participants. If the next

training course, which is usually a fee-based course, has its tuition covered by JICA, it is necessary to also establish rules that allow for a partial refund of tuition for those who drop out of the course midway through. Such rules would provide an incentive for continued participation in the training.

Some of the pilot training participants are well versed in how to find a job in Poland, while others are searching for a job based on hearsay or other uncertain information from friends. In the next training, it would be better to introduce the Polish labor market, major job machining sites, job counseling agencies, etc., and to incorporate individual job hunting counseling, minijob fairs, etc., to make the training more job-oriented.

(3) Suggestions and Recommendations

Based on the evaluation results of the pilot training and follow-up surveys, the following are recommendations for improvement when conducting full-scale IT skills training in the future. Based on these recommendations for improvement, the materialization will be considered in the drafting of the medium- to long-term cooperation plan described below.

• About the training participants

Many participants were enthusiastic about learning and made effective use of the open lab. For example, the open lab usage rate in the first group was about 60-80%, and it is recommended that the open lab continue to be used in future trainings. The participants are actively applying what they have learned in the training to their jobs. For example, in the WordPress course, one student had already created a website for his personal business during the training period. This confirms that the IT skills training was practical. Therefore, consider that trainings with similar participants in subsequent trainings.

Consideration of improving the selection process for training participants

All of the instructors assigned to each course reported that there were differences in the IT skill levels of the participants. Therefore, in this pilot training, the lectures were flexibly adapted to the level of these participants on a case-by-case basis. Therefore, in subsequent trainings, it will be necessary to check the skill level of the participants before the training starts and divide them into groups according to their skill level. For example, consider checking the IT skills of applicants by taking measures such as conducting an online test in advance. Thus, sufficient time should be allowed for the selection of participants.

Consideration of preparation before the training begins

For subsequent trainings, consider sending training materials to participants in advance, one to two weeks before the training begins. In addition, consider providing online pre-training opportunities for participants to learn in advance or at the beginning of the training to help them reach the entry level of the training.

Consideration of training period (Excel course, WordPress course)

Since many respondents indicated that the training was too short, it will be necessary to consider the length of the training in subsequent trainings. For example, the Excel course should be extended to two weeks to reinforce data analysis, including Pivot Tables and Power BI. Also, consider extending the duration of the WordPress course to 2 weeks to enhance web design, including HTML/CSS and JavaScript.

Consideration of training period (Python programming course)

Programming takes time to learn (it requires continuous learning), requires all the skills of logic, mathematics, critical thinking, and technology, and requires longer lecture intervals to allow for sufficient review time, plus a basic knowledge of English. For these reasons, consider increasing the length of the training to 3 weeks (3 days/week) or 4 weeks (2 days/week) for subsequent trainings to provide a schedule with enough time to allow sufficient review time for skill acquisition.

Consideration of adding soft skills training

The importance of soft skills in finding employment was pointed out by those who completed the training and by the organizations that helped recruit participants. UNIQLO Poland has also offered to provide one-day training in communication skills, presentation skills, and cross-cultural training, so soft skills training will be considered for the next round of training.

Consideration of providing information on job hunting and additional mentoring functions

Consider providing information on the Polish labor market, major job machining sites, and job counseling agencies and opportunities for individual job search counseling and mini-job fairs, etc.

· Consideration of flexible arrangements for business Polish language training

The results of the follow-up survey indicate that there is a high demand for training in Polish, as learning Polish at a business level is essential to finding a job in Poland. The next time when Polish language training program is conduced, it should be considered not limiting the training period to the IT training period, and take sufficient time to coordinate with the participants regarding time, format (online or face-to-face), and PC arrangements, etc.

4. Proposals for Implementation of Training and Projects in Cooperation with PJAIT

4.1 Proposals of Medium- and Long-Term Cooperation Plan (Draft)

Although the number of Ukrainian refugees in Poland is lower than it was at one time, about 1,000,000 persons are still staying in Poland. The percentage of Ukrainian refugees who are undecided about their future stay and the percentage of those who have decided to stay permanently in Poland are close to each other. The Polish government has been assisting Ukrainian refugees since shortly after the start of the Russian aggression, focusing on securing food, clothing, and shelter. More than a year after the Russian aggression, the emphasis of assistance has shifted from providing emergency assistance to helping Ukrainian refugees become self-reliant, but the survey in this study shows that many people are still unable to find jobs due to problems with recognition of their official qualifications in Poland, language proficiency (Polish or English), skills, and differences in customs of job search, or are working in jobs that don't match their capabilities to make ends meet.

The needs assessments of Ukrainian universities indicate that Ukrainian universities are using available resources to provide as much education as possible online, face to face, and in hybrids, but they are concerned that the Russian aggression will reduce academic exchange with foreign universities, which will reduce the quality of education and research.

In light of this situation, this survey examined a medium- and long-term cooperation plan (draft) from the perspective of (1) support for Ukrainian employment in Poland and (2) support for the development of IT human resources for the reconstruction of Ukraine's IT industry, and proposed the four support measures shown in the figure below as a draft medium- and long-term cooperation plan. The following sections describe the process of considering each support measure.



COIL: Collaborative Online International Learning

Source: Prepared by the JICA Survey Team



4.2 IT Skills Enhancement for Ukrainian Refugees in Poland

(1) Business IT Skills Courses

As described in "Implementation of Pilot Training", "Evaluation of Pilot Training," and "Followup Survey", the training was very well received by the many refugees who participated and had a certain degree of demand. In addition, events such as visits by dignitaries at the opening and graduation ceremonies and support for participants from the private companies regarding employment were also very well received. Furthermore, the results of the follow-up survey showed that the pilot training was effective to some extents in supporting participants in finding employment. In light of the above, the JICA Surve Team proposes that the pilot training be continued as "Business IT Skills Training" in the Medium- and Long-Term Cooperation Plan as a full-fledged training program with a larger scale. In the continued implementation of this training program, it is recommended that the following improvement plans be considered based on the experience gained from the pilot training and the findings from the evaluation results.

	Excel	WordPress	Python		
Pilot Training Evaluation	(<u>More than</u>	<u>very good)</u> s			
	Wanted to learn more data analysis methods	Wanted to learn more detailed web-site development	• Programming takes time to learn (Requires continuous learning)		
Follow-up Survey of Those Completing the Pilot Training	Employment status: 8 out of 31 respondents indicated that they were able to find employment Type of employment: IT-related work requiring what was learned in training (3), non-IT-related work requiring what was learned in training (3), non-IT-related work not requiring what w learned in training (2) Effectiveness of training: PJAIT certificate, content of training, Polish language training Obstacles to finding a job: lack of English, lack of hard skills, lack of Polish language skills, lack of work				
Proposal Improvements to the pilot	 Applicant screening by online tests Distribution of textbooks in advance Add prior learning before the opening 				
training	 Add more data analysis methods & soft-skill training Increase the duration to <u>2</u> weeks 	 Add more detailed web- site development & soft- skill training Increase the duration to <u>2</u> weeks 	 Add soft-skill training Increase the duration to <u>4</u> weeks (3 lectures per week) 		

Source: Prepared by the JICA Survey Team

Figure-42 Evaluation of Pilot Training, Follow-up Survey and Summary of Proposed Mediumand Long-Term Cooperation Plan As shown in the figure above, all three courses implemented in the pilot training received high ratings, and the results of the follow-up survey also confirmed certain effects. Thus, it is recommended that they be continued in the future as business IT skills training with essentially the same module structure. As a point for improvement in the continuation of the program, the instructor in charge of the training reported that there were differences in the IT skill levels of the participants, and that he had a hard time adjusting the lecture content and responding to the participants at the beginning of the course. For this reason, it is recommended that a preliminary check of participants' IT skill levels be conducted in the future, for example, by conducting a screening test of applicants. Additional preparation will also be considered, such as recommending preparatory study by distributing materials in advance and conducting pre-study to ensure that all participants have reached the entry level of the training on the day of the course. In addition, many survey respondents said that the training period was too short for each course. Specifically, in the Excel and WordPress courses, there were many requests for a longer training period and more in-depth learning. Therefore, consider to extending the training period for these two courses from one to two weeks to further enhance the content. In addition, the Python programming basics course was found to take a long time to learn, so consider extending the training period from two to four weeks to make it a full-fledged Python programming course. In addition, the need for soft skills training (e.g., crosscultural understanding, communication skills, presentation skills, etc.), job hunting information, and a mentoring function should also be considered for each course, as these are necessary for job hunting in Poland. In addition, it is desirable to conduct Polish language training with a sufficient period of prior coordination, as the need for such training remains high.

Thus, the content of the Business IT Skills Courses should be based on the continuation of the same three courses as the pilot training, but in light of future changes in the situation of the invasion by Russia and the resulting mobility of the Ukrainian refugees in Poland, as well as changes in the necessary IT skills trend in Poland, it is desirable to continue the training with discussing the content and scale of the training with PJAIT annually. The following table shows the proposed implementation of Business IT Skills Courses in 2024 as agreed with PJAIT at the time of the October 2023 field survey.

	Pre-study	Classroom Training	Location	Classroom Capacity	Number of Times	Total Participants
Introduction to Data	2 weeks	2 weeks	2 campuses	20 people	2 times	80 people
Analysis Course						
(Excel)						
Website Creation	2 weeks	2 weeks	2 campuses	20 people	2 times	80 people
Course (WordPress)						
Python Programming	2 weeks	4 weeks	2 campuses	20 people	1 time	40 people
Basics						
Total						200 people

Table-46 Proposed Business IT Skills Courses (2024)

Planned to be held at PJAIT campuses in Warsaw and Gdańsk Source: Prepared by the JICA Survey Team As shown in the table above, the 2024 Business IT Skills Training will consider increasing the number of locations to two in 2024. In other words, the number of participants will be doubled from 100 in the pilot training to 200 by holding the training at two PJAIT campuses, Warsaw and Gdańsk, at the same time. PJAIT has already agreed to hold the training at these two campuses. In addition, as indicated in the proposal to improve the pilot training, the duration of each course should be doubled, which substantially requires four times the number of instructors and human resources to support the Ukrainian students compared to the pilot training (due to the doubling of the number of classrooms and the duration of the training, respectively).

Additional proposed topics indicated in the proposal to improve the pilot training are listed in the table below. The details will be finalized after further discussion with PJAIT and the instructors in charge of each course. Regarding the Python Programming Basics in the pilot training, the JICA Survey Team has agreed with PJAIT to remove the word "Basic" from the name of the course and make it a full-fledged 4-week programming training course. This will allow us to provide more opportunities to improve IT skills and is expected to further support the career planning of the training participants.

Course	Goals & Objectives	Contents	Period
Introduction to	Develop skills in the	 Worksheet and Book management 	2 weeks
Data Analysis	compilation and analysis	 Cell and Cell Range data management 	(5 days / w)
Course (Excel)	of company business data	 Table and table data management 	
		 Formulas and functions 	
		Creating graphs	
		 <u>Data analysis using Pivot table</u> 	
		 Data analysis with Power BI Desktop 	
		 <u>Soft skills training (1 day)</u> 	
Website Creation	Acquire the ability to	• Creating a website with using the latest	2 weeks
Course	create full-fledged	version of WordPress features	(5days / w)
(WordPress)	websites	 Full-fledged website development with 	
		themes and plug-ins	
		• Extend website with HTML, CSS, and	
		<u>JavaScript</u>	
		• Website management, maintenance, and	
		security measures	
		 <u>Soft skills training (1 day)</u> 	
Python	Understand object-	• Python Programming for Beginners (From	4 weeks
Programming	oriented programming in	the first step of programming to	(3 days / w)
Basics	Python and write simple	understanding object-oriented programming	
	programs	programming)	
		 <u>Soft skills training (1 day)</u> 	

Table-47	Business IT	Skills	Courses	Content and	Additional	Proposed	Topics
10010 17		SILLID	0041000	concente ana	1 I d d l l l l d l d l d l d l d l d l d	1100000	100100

Additional topic suggestions are <u>underlined</u> in the "Contents" column. Source: Prepared by the JICA Survey Team The proposed schedule for the 2024 Business IT Skills Training developed from the proposal above is shown in the figure below. As with the pilot training, it is assumed that the training will be held during PJAIT's summer vacation (July 10 to September 15), using the computer lab.⁵⁹ Based on our experience with the pilot training, we anticipate that it will take some time to recruit, select, and register participants, so it is recommended to begin the tasks of planning and designing the training and developing content (for additional topics) no later than April 2024. In addition, for future business IT skills courses, consider distributing course materials to participants before the opening ceremony and allowing a pre-learning period of about 2 weeks. This will reduce the differences in the level of participants at the beginning of the course and improve the efficiency of the training operation. The sequence of events from the opening meeting to the special lecture, job counselling, and graduation ceremony on the last day should be conducted in a similar manner, taking into account the experience gained from the pilot training, so that the content of each event can be further improved to help participants find employment.

				Train	ing	
Task	4	5	6	7	8	9
Planning / design, content development						
Selection of participants / registration						
Prior learning(2 weeks at home)						
Opening, Orientation				\diamond		
Training (2-4 weeks at PJAIT)						
Submission of final assignments					\diamond	
Event, Job consultations, Closing					\diamond	

Source: Prepared by the JICA Survey Team

Figure-43 Proposed 2024 Schedule for Business IT Skills Courses

(2) Postgraduate IT Diploma Courses

In the development of the Medium- and Long-Term Cooperation Plan, the development of more advanced IT training courses for refugees who want to become IT professionals was also considered, in addition to business IT skills courses. Specifically, a practical IT professional development course was considered to support the improvement of IT skills of refugees living in Poland and seeking employment as IT professionals. For this study, we conducted a survey on what kind of support would be effective in formulating a Medium- and Long-Term Cooperation Plan from a wide range of refugees in Poland, using the Viber (SNS) questionnaire survey described in "Preparation and

⁵⁹ The winter break is only two weeks long, making it impossible to conduct the training.

Implementation of IT Literacy Checks (including needs assessment of Ukrainian refugees)". The results of this survey provided us with the necessary information to know that many refugees in Poland are interested in pursuing careers as IT professionals, and what kind of support is needed by refugees seeking employment as IT professionals in Poland. Specifically, as shown in the figure below, the top support needs were found to be scholarships to study at university IT departments, opportunities to study at diploma (non-degree) courses offered jointly with IT companies, and internship opportunities at IT companies.



12. What kind of support do you think is essential?

Answer Choices	Responses				Ratio					
Provide scholarship to learn IT at universities	85				29.72%					
Provide IT professional courses, collaborating with companies and universities (non-degree courses)		149						52.1%	6	
Provide internship opportunities at IT companies		168				58.74%				
Provide jobs matching services		89						31.12	%	
Provide programming workshops for high school students		47						16.43	%	
Provide business-level language training (English, Polish)		160						55.94	%	
Other		9						3.15%	6	
	0	20	40	60	80	100	120	140	160	180
Provide scholarship to lear Provide IT professional courses, collaborating with compani	n IT at universities es and universities				_	85			149	
Provide internship opportuniti	es at IT companies				_		_			168
Provide jobs matching services Provide programming workshops for high school students Provide business-level language training (English, Polish)				17		89			16	60
	Other	9								

[English] Questionnaire on IT/digital literacy

Source: Prepared by the JICA Survey Team

Figure-44 Questionnaire Survey Results

(regarding support needed for displaced persons seeking IT professions)

As shown in the figure above, more than 91% of the survey respondents want to work as IT professionals, and as a necessary support, they are looking for educational opportunities at universities and internship opportunities at IT companies to become IT professionals.

Based on these results, a proposal was initially developed to develop a new IT professional course to be held during PJAIT's summer vacation period, similar to the Business IT Skills training. These proposals are outlined in the two figures below. This is a draft proposal to develop a data science course and a Web application development course to develop practical IT professional human resources.



Source: Prepared by the JICA Survey Team





Figure-46 Initial IT Professional Course Proposal (Web application development)

Source: Prepared by the JICA Survey Team

The two proposed IT professional courses, shown in the figure above, are aimed at developing more practical, work-ready IT personnel with the cooperation of experts from Japanese universities and private companies. The goal was also to develop practical training courses with the cooperation of active IT engineers, including system development exercises using PBL.⁶⁰ Based on this draft, detailed discussions were held with PJIAT during a site visit in October 2023. As a result, it was found that instead of the original proposal for an IT professional course, it would be preferable to offer the course as a Postgraduate Diploma Course for university graduates, which is offered to the public by PJAIT from the aspect of the objectives of the Medium- and Long-Term Cooperation Plan. Therefore, an agreement was reached with PJAIT to open the PJAIT's exiting postgraduate diploma courses to mainly Ukrainian refugees and incorporate the new diploma courses into the Medium- and Long-Term Cooperation Plan. In addition, the basic direction was decided to seek IT companies (including Japanese companies) to cooperate in the development of the new Postgraduate Diploma Courses, and to form a business alliance with these IT companies and jointly develop the courses with PJAIT.

PJAIT plans, develops, and manages these diploma courses for university graduates in its "Center for Postgraduate Studies", which was established in May 2022. The diploma course is a program that falls between the bachelor's and master's degree programs of the university and is outlined below.

- Admission Requirements: Bachelor's degree or higher (any department and any major)
- Date and duration of course: 1 year (2-semester system from October to June of the following year), Every other weekend (Saturday and Sunday) all day
- Period of study: 160-280 hours of study (1 hour of 45-minute lectures) with 16 full-day sessions, with Saturday and Sunday lectures twice a month (8 hours per day for 36 days)
- Form of training: Mostly face-to-face training, but some courses are online depending on the content.

The following table shows the Postgraduate Diploma Courses that are available to the public as of December 2023.

⁶⁰ PBL (Project Based Learning). In Japanese, it is translated as "problem-based learning" or "problem-solving learning.

Name of the Course	Fee	Lecturer	Overview
TouchDesigner Specialist	11,000 PLN	PJAIT Professor	2D and 3D animation production course using Touch Designer. For
			those who aim for graphic design of games, etc.
IoT programmer	9,500 PLN	PJAIT Professor, CEO of	A course for embedded engineers, including development using
		CyberSkiller	ArduinoIDE, microcontrollers, sensors, etc., and data management
			collected on the cloud side.
Artificial intelligence in HR	9,500 PLN	Business owner	A course focuses on how AI can be used to manage human resources
			within a company. Up-to-date content including how to use ChatGPT
			for human resource management.
Psychology of games - designing	9,500 PLN	Business owner	A course on the creativity of games and their use in business and
computer game scenarios			education
Bioinformatics	9,500 PLN	PJAIT Professor, CEO of	PJAIT's unique and popular course on life information science, with
		CyberSkiller	Python programming exercises.
Python artificial intelligence programmer	9,500 PLN	PJAIT Professor, CEO of	Data analysis course using Python, including Pandas, Scikit-learn,
		CyberSkiller	Keras, etc. Exercises with Python libraries
Cyber security of information and	11,000 PLN	PJAIT Professor	For aspiring security engineers (networking); courses in UNIX/Linux
telecommunications systems		(Head of the Department of Data	environment
		Science)	
Security testing of IT systems	9,500 PLN	PJAIT Professor	For aspiring security engineers (systems-based). Courses on cyber-
		(Head of the Department of Data	attack and defence tools, software vulnerability assessment tools (Kali
		Science)	Linux, Wireshark, Nmap, Metasploit, OWASP ZAP, etc.)
Cyber security management	10,000 PLN	Business owner	For security department managers. Courses on security policies and
			guidelines, policies, employee awareness, incident response, CSIRT,
			and other organizational aspects.
Big Data - engineering of large data sets	11,000 PLN	PJAIT Professor	Data analysis in Python and R with Cassandra, HBase, MLlib, Spark,
		(Head of the Department of Data	Mahaut, Microsoft Azure Machine Learning, SAS Cloud Analytics
		Science)	Services, Google Cloud Platform, and Viya.
Project graphic design	9,500 PLN	PJAIT Professor	A course that provides comprehensive, practical, and up-to-date
		(Head of the Department of New	preparation for working in the field of graphic design, and aim to
		Media)	acquire the necessary skills
Graphic design	9,500 PLN	Associate Professor at the Academy	Advanced level course for those who already have a basic knowledge
		of Fine Arts in Warsaw	of graphic design

Table-48 List of PJAIT's Postgraduate Diploma Courses⁶¹

⁶¹ PJAIT Center for Postgraduate Studies https://pja.edu.pl/en/kursy/centrum-ksztalcenia-podyplomowego/

Name of the Course	Fee	Lecturer	Overview
Neuro-management - effective team	9,500 PLN	Business owner	A course to learn about innovative management methods through
management			neuro-management (management utilizing brain science research) that
			are effective in the IT industry.
Employer branding - building an	9,500 PLN	Business owner	A course on the ability to promote a good corporate image as an
employer image in the IT industry			attractive employer, especially important in the IT industry where there
			is a high need to recruit qualified employees.
Interactive and practical teaching of	7,000 PLN	PJAIT Professor, CEO of CyberSkiller	A course that provides the necessary skills for those who want to
computer science in school			become computer science teachers in schools.
Content marketing and multimedia	9,500 PLN	Business owner, Journalist	A course to train professionals in the field of multimedia production
production management			management for teams of content marketing and content creators
Managing the organization's image in	8,900 PLN	Business owner	A course that provides practical knowledge on how to use
new media			communication tools to build an organization's image.
Databases and their applications - part-	9,500 PLN	PJAIT Professor	Courses in relational databases; exercises in SQL, OLAP (data
time studies		(Head of the Department of Database)	warehousing), etc. (face-to-face training)
Databases and their applications - online	8,000 PLN	PJAIT Professor	Courses in relational databases; exercises in SQL, OLAP (data
studies		(Head of the Department of Database)	warehousing), etc. (online training)
Information systems, applications and	8,000 PLN	PJAIT Professor	Relational DB course. User interface development exercises. Exercise
databases		(Head of the Department of Database)	environment is Edux. https://gakko.pjwstk.edu.pl/

Source: Prepared by the JICA Survey Team based on the PJAIT's web site

These existing Postgraduate Diploma Courses are planned and developed primarily based on the suggestions of the main lecturers. The lecturers range from professors from PJAIT and other universities to experts from private companies and are developed based on each lecturer's rich experience and ideas in the IT field. The courses can be divided into several categories, such as courses for media designers, IT management courses, courses for prospective IT teachers, and courses for IT engineers, etc. A wide range of IT technology fields are covered. In particular, there is a strong lineup of courses related to data science and cybersecurity. The average tuition fee for these courses is around PLN 10,000 (approximately \$370,000 at the November 2023 exchange rate).

The Center for Postgraduate Studies also offers MBA courses. For example, the "MBA for aviation IT industry⁶²" is a one-year MBA course developed in cooperation with LOT Polish Airlines, with tuition fees of PLN 29,000. The current course has more than 20 participants, a mix of participants sent by companies in the aviation industry and self-financed participants. About 70% of the participants are male and 30% female, and most are in their 30s and 40s. The Postgraduate Diploma Courses can also be jointly developed and implemented in this way, after discussions between cooperating companies and PJIAT to clarify the division of roles and form a business alliance.

The maximum number of students varies depending on the course but is usually around 20. Lecturers can be PJAIT lecturers (they vary from full-time lecturers to part-time lecturers working separately as professionals in companies, etc.), professionals from private companies, etc. A master's or Ph.D. degree is not required to be a lecturer if the specialization is high enough.

The basic format of the lectures is two weekends per month, with full-day lectures (8 hours) on Saturday and Sunday. The lecture format can be face-to-face, online, or a combination of the two. In other words, it can be flexibly arranged to fit the work schedules of the cooperating IT companies for which the lecturer works. Lectures can be shared between PJAIT and private companies, depending on the subject. New Postgraduate Diploma Courses must be approved by the University's Advisory Board (chaired by the President) before it can be launched. After this approval, PJAIT and the cooperating IT company will discuss the details of the new diploma courses, develop a concrete schedule, and then sign a contract between the two organizations for the implementation of the diploma courses. For example, if the course is expected to start in October 2024, this approval process must be completed by May of the same year at the latest. Based on the above, to implement a graduate diploma program starting in 2024, the following considerations must be made, as shown in the table below.

⁶² MBA for aviation IT industry https://pja.edu.pl/en/kursy/studia-mba/mba-dla-branzy-it-w-lotnictwie/

Items	Matters to Consider	Remarks
Period	1st: October 2024 - June 2025	Need to get approval from the committee
	2nd: October 2025 - June 2026	by the end of May 2024 in case of new
	(How many courses and how many times)	course development
Capacity	Approx. 20 students per class ⁶³	To be considered by PJAIT and
		cooperating IT companies
Form of training	Face to face, online, hybrid, etc.	To be considered by PJAIT and
		cooperating IT companies
Theme of training	Areas of expertise of the cooperating IT	To be considered by PJAIT and
	companies, etc.	cooperating IT companies
Syllabus	Co-developed with cooperating IT	To be considered by PJAIT and
	companies and PJAIT	cooperating IT companies
Materials and	Co-developed with cooperating IT	To be considered by PJAIT and
Assignments	companies and PJAIT	cooperating IT companies
Tuition fee	Assistance Program (for Ukrainian refugees,	To be considered by PJAIT and JICA
	for Ukrainians in need of tuition assistance)	

Table-49 Things to Consider for the Development of New Postgraduate Diploma Courses

Source: Prepared by the JICA Survey Team

At present, several IT companies (Japanese, Polish and Ukrainian) have been approached to participate and cooperate in this plan. It is hoped that negotiations will continue as soon as possible after this medium- and long-term cooperation plan is finalized. The training theme of the course has not yet been officially determined. Therefore, depending on the situation, it may be necessary to conduct another IT market survey. In addition, it will be important to plan a diploma course that avoids duplication of content with existing diploma courses and that is in a technical field in which the cooperating IT companies excel and has a highly marketable training theme. For example, in the case of Japanese companies, themes related to the use of the latest IT, such as AI and IoT, in advanced production management technology in the manufacturing and automotive industries, which are their strengths, the promotion of DX in factories, and digital KAIZEN technology that uses IT in factory KAIZEN activities can be considered as themes. Another idea is to consider the use of IT for environmental protection measures and SDGs. For example, measures to promote an oxygen-free society and the use of IT in the field of environmental technology, such as green technology, are areas not currently covered in the diploma course and can be considered as themes for the new course.

The Postgraduate Diploma Course is open to any participants, but the targets of JICA's support are limited to Ukrainian refugees in Poland and Ukrainians in Poland who, due to economic or other circumstances, require financial assistance to pay for the course.⁶⁴ The mid- to long-term cooperation plan will consider providing necessary tuition assistance to these participants. The eligibility of participants will be determined on the basis of their income level, consistency with the

⁶³ Including support for Ukrainians participating in existing postgraduate diploma courses, the number of participants in JICA-supported IT diploma courses is expected to be 20-40 per year.

⁶⁴ From the viewpoints of fairness, this does not preclude, for example, Polish nationals from participating in said course at their own expense.

course content and work history, family situation, and other factors. For this reason, eligibility guidelines should also be established in advance. The following table provides a draft example of items to consider when establishing a tuition assistance program.⁶⁵

Matters to Consider	Remarks
Criteria for Motivation to Learn	
Criteria for determining the appropriateness	
of education and ability	
Criteria for determining consistency with	
work history and career plans	
Criteria for financial status	Consider criteria that also consider family situation, not just
	income.
Other	Dealing with participants who quit in the middle of the course.
	Consider in advance some kind of penalty to the participant or
	adjustment of the amount of support to PJAIT.

Table-50 Things to Consider for Designing Tuition Assistance Program (Draft)

Source: Prepared by the JICA Survey Team

The cost of running the new diploma course will be covered by the scholarship and the regular tuition paid by the general participants. For this reason, the diploma course will also be open to all interested participants, not only the Ukrainian participants mentioned above, who will pay their tuition fees as usual. After receiving formal agreement from the cooperating IT companies, work with PJAIT and JICA to determine the details of the training program, including course content, division of roles, the burden on the companies, such as the companies' cost to send lecturers, and whether face-to-face or online training will be used. Finally, once the scope of these new diploma courses is finalized and agreed upon between PJAIT and the cooperating IT companies, the business arrangements between the two organizations will be determined, including the distribution of the total tuition fees that will be generated. Currently, the following timeline for implementation is envisioned.

- Agreement between PJAIT and cooperating IT companies (including Japanese companies) by approximately the end of April 2024
- Obtain Advisory Committee approval by approximately the end of May 2024.
- Formulate a tuition assistance program by approximately the end of July 2024.
- Prepare syllabus, teaching materials and assignments, and recruit participants by approximately the end of September 2024.

Based on the above, the table below provides a general overview of the Business IT Skills Courses and IT Diploma Courses, the two main pillars of strengthening the IT skills of Ukrainian refugees

⁶⁵ PJAIT commented that it is operationally difficult to use economic status as a criterion for judgment.

(in Poland). These courses are divided into three levels, and the target audience, timing and implementation of each course are shown in the table below.

Level	Target participants of JICA Support ⁶⁶	Course (Period)	Implementation Method
Able to find a job as an	Ukrainian refugees	Postgraduate Diploma	Opening existing courses
IT professional or can	• Ukrainians who need	Courses	to the participants
change jobs depending	financial support to	(Held every other weekend	Jointly developed and
on their skills.	study in Poland	for two semesters)	implemented by PJAIT
	(determined by	,	and IT companies.
	income level and		(Tuition assistance for
	years of experience)		Ukrainian participants by
			JICA)
Able to reach entrance	Ukrainian refugees	Python Programming	Implemented by PJAIT
to the IT industry		(Summer vacation period)	with support from JICA.
			(Outsourcing the
			Management of Training
			Operations to PJAIT)
Able to work with the	Ukrainian refugees	Introduction to Data	Implemented by PJAIT
IT skills required for	_	Analysis Course (Excel)	with support from JICA.
the job.		(Summer vacation period)	(Outsourcing the
		Website Creation Course	Management of Training
		(WordPress)	Operations to PJAIT)
		(Summer vacation period)	

 Table-51
 Training Course, Level, Target Participants, and Implementation Method

 for IT Skills Enhancement

Source: Prepared by the JICA Survey Team

(3) Online platform for IT skills enhancement training

In the medium- and long-term cooperation plan, the training management tasks are expected to increase due to the increase in the number of participants and locations as a result of the extension of the training period and the addition of new courses. Therefore, human resource management by training coordinators, as was the case in the implementation of the pilot training, has its limitations. Therefore, we propose to build an online platform that can be used in all training courses for Ukrainian displaced persons (in Poland) to improve their IT skills. By introducing this platform, the project aims to provide a one-stop service from recruitment management of training participants, provision of pre-training learning to job placement support. This IT system is expected to improve the efficiency of training management operations. The platform will also be equipped with data analysis functions to visualize the progress of the training program. It can be assumed that the IT system that will serve as the foundation of the platform will be based on a contract with an existing domestic online platform operated by Polish IT companies, such as Universality and

⁶⁶ For the postgraduate diploma courses, those participants who are not eligible for JICA's support, but who pay their own participation fees shall not be precluded.

ChallengeRocket⁶⁷, and will be customized as needed. By adopting such a method, it is desirable to be prepared to start providing training management services efficiently, inexpensive and quickly.



Figure-47 Overview of the Online Platform (training management, pre-study, job placement support)

The online platform is also a medium to long-term database of Ukrainian refugees who have participated in the training, as shown in the figure above. In other words, it is an IT system with a mechanism to provide necessary services to refugees at different points in time, while the data of the same refugees continuously change to different statuses: applicant, participant, graduate, and job seeker. By analyzing this database, it is possible to visualize the progress and results of medium- to long-term cooperation and to provide follow-up support to the refugees.

(4) Overall Picture of IT Skills Strengthening among Ukrainian Refugees in Poland

The overall overview of the IT skills strengthening in Ukrainian refugees (in Poland) described so far is shown in the table below. The two training courses for IT Skills Courses are "Business IT Skills Courses" and "Postgraduate Diploma Courses", and the following table shows the cost (tuition fees) of each training course, the form of cooperation in the medium- and long-term cooperation plan, and the alliance with cooperating IT companies for conducting the training.

⁶⁷ A job matching system that is also used in the "Job Fair for Recruiting Central and Eastern European IT Talent" by the Ministry of Economy, Trade and Industry and provides IT skills diagnostic services. https://challengerocket.com/polishjapanese-job-fair-forum

Courses	Training fees (tuition)	Form of cooperation in medium- and long-term cooperation plan	Alliance with cooperating IT companies
Business IT Skills Courses	Free	Outsource training implementation to PJAIT (support training management costs)	Cooperating IT companies will provide company explanations, employment counselling, and training to further improve IT skills)
Postgraduate Diploma Courses	Paid	Provide tuition to PJAIT (equivalent to a scholarship to the participant)	Cooperating IT companies will recoup input costs such as instructor fees from the tuition collected

Table-52 Overall Overview of IT Skills Strengthening among Ukrainian Refugees in Poland

Source: Prepared by the JICA Survey Team

Finally, the overall picture of the support to Ukrainian refugees (in Poland) within the medium and long-term cooperation plan for strengthening their IT skills is shown in the figure below. As shown in the figure, an online platform will be established for refugees participating in all training courses, which will be used to improve training outcomes and support job search activities. Participants in the Business IT Skills courses will also be provided with a pathway to upgrade their skills to Postgraduate Diploma Course. PJAIT also offers MBA courses so that participants can upgrade their skills from Postgraduate Diploma Course to these MBA courses. In this way, participants can enhance their individual skills while choosing training courses that are in line with their own career plans. Thus, the medium- and long-term cooperation plan is expected to be an integrated system of employment support for refugees in Poland.



Source: Prepared by the JICA Survey Team

Figure-48 Overall Picture of IT Skills Strengthening among Ukrainian Refugees in Poland

4.3 Strengthening IT Education and Research in Ukrainian Universities

(1) Identification of cooperation needs

In order to understand the cooperation needs of the Ukrainian side, the JICA Survey Team conducted interviews and questionnaire surveys of Ukrainian universities as shown in the table below, in addition to interviews with the Ministry of Education and Science of Ukraine. The basic data for the subject universities are shown in Annex 6.

Item	Interview Survey ¹	Questionnaire Survey ³		
Universities covered	Interviews: 8 universities	58 universities and research interviews ⁴		
	Collection of Interview sheets: 14			
	universities ²			
Replies	-	21 ⁵		
Implementation period	September to November 2023	September 23, 2023 to October 6, 2023		
Method	Online interviews/answers to interview	Online survey		
	sheets			
Major questions	• Original and relocated location, basic information and contacts of the universities,			
	• Forms of classroom lectures provided, connection to Internet			
	• Educational cooperation needs with PJAIT and Japanese universities in the			
	field of IT			
	• Research cooperation needs with PJAIT and Japanese universities in the			
	field of IT	-		

Table-53 Overall Overview of IT Skills Strengthening among Ukrainian Refugees in Poland

1: With the cooperation of Ukrainian Ministry of Education and Science, Ukrainian Talent Foundation (NGO), Universality (educational platform management company), and CHI Software (software development company), the interviews were set.

2: Including 8 universities to be interviewed

3: The questionnaire was sent to Ukrainian universities through Polish National Agency for Academic Exchange (NAWA)'s network with the cooperation with NAWA.

4: Universities and research institutions that have used NAWA's academic programs in the past

5: 17 universities replied because responses from different departments of the same university were included.

Source: JICA Survey Team

The names and locations of the universities that were the subjects of the interviews and questionnaires are shown in the figure below.



Source: Interview and Questionnaire surveys

Figure-49 Names and Locations of the Universities where the Interview and Questionnaire Surveys were Conducted

- 1) Current situation of higher education under the Russian aggression
 - a. Damage to Higher Education Institutions

There are 402 institutions of higher education, 251 professional pre-higher Institutions, and 498 Separate structural units of a HEIs in Ukraine. The table below shows the damage to these institutions and the current format of teaching.

Category	Number of institutions	Number of students	Institutions damaged	Temporary relocation	Format of teaching
Universities, academies, and other institutions	402	Over 0.9 millions	Damaged:	31	Face to
Professional Pre-higher Institutions	251	Over 47 millions	Complete	65	face :37% Online:9%
Sperate structural unit of a HEIs	498	Over 0.1 millions	21	44	Blended:55%

Table-54Damage to Higher Education Institutions

Source: Materails from Ministry of Education and Science in Ukraine

The Russian aggression damaged 157 of these institutions and completely destroyed 21 of them. In order to continue offering classes under these conditions, 31 institutions of higher education, 65 professional pre-higher institutions, and 44 sperate structural units of a HEIs have been forced to temporarily relocate. At many of these institutions, faculty and students have been evacuated to safe areas of the country or overseas, and education is provided remotely from relocated universities only to those students who can be contacted. According to the interviews conducted for this study, Donbas State Engineering Academy had 10,000 students before the relocation, but has only7 2,000 students who can be contacted after the relocation. The figure below shows examples of university relocations from areas along the eastern and southern fronts to the west.



Source: Ukrainian Innovation Ecosystem "Sikorsky Challenge Ukraine" (Sikorsky Challenge Ukraine (SCU), Kyiv 2022) and interviews with Ukrainian universities

Figure-50 Examples of university relocations following the Russian aggression

Regarding the format of the classes, the Ministry of Education and Science reported that 37% were conducted face-to-face, 9% online only, and 55% in a blended format. The interviews and questionnaires in this study were face-to-face (14%), online (43%), and blended (43%), with a higher percentage of universities offering classes online than in the data from the Ministry of Education and Science. In addition to hardware requirements such as on-site power generation, shelters, PCs and Wi-Fi infrastructure, the need for teachers and teaching materials were cited as necessary resources for distance education. Regarding distance education tools and learning support systems, it was found that Moodle, Zoom, Teams, etc. are used to the

extent available, although there is a lack of functionality. Four universities (13%) reported unstable Internet access, and most are located in the eastern or southern part of the country.

Classroom Format ¹		Connection to the Internet		B osources for Distance Education ²	
Face to face	Online	Blended	Stable	Unstable	Resources for Distance Education
2 (14%)	6 (43%)	6 (43%)	27 (87%)	4 (13%)	Power generation (12), shelters (7),
					lecturers (10), teaching materials (6),
					PC/Wi-Fi (5), Virtual lab (1), Online
					platform (1)

Table-55 Classroom Format and Resources for Distance Education

1: The results were confirmed by interview survey only.

2: Numbers in parentheses indicate the number of universities that mentioned the item.

Source: Interviews and Questionnaire Surveys

In addition, there are examples of Ukrainian universities providing distance education to other universities in the country. The figure below shows examples.



* Kharkiv National University of Radio Electronics doesn't specify name of other universities.

Source: Interviews and questionnaire surveys

Figure-51 Examples of Providing Distance Education to other Universities in Ukraine

b. Higher Education Policy and Planning of the Government of Ukraine

Under these circumstances, the Ukrainian government views the current situation as the first stage of the war and postwar reconstruction, and is in the process of reviewing various policies and plans and reconsidering the role and tasks of higher education institutions for the economy, state, and society, with the keywords of preparation for EU membership, the end of post-Sovietism, and the transition from "gray zone" to "western world".⁶⁸ Ukraine's draft recovery plan, released in July 2022, outlines 15 national programs, along with a timeline, to boost Ukraine's recovery and achieve its growth targets (see figure below). Of these, (8) "Grow value-adding sectors of economy by accelerating Ukraine's competitiveness" and (12) "Improve Education system with focus on key competences and innovation" are national programs related to the IT sector.



Source: Draft Ukraine's National Recovery Plan (National Recovery Council, July 2022)

Figure-52 15 National Programs in Ukraine's Draft Recovery Plan

The IT sector is included in the national program [®] "Grow value-adding sectors of economy by accelerating Ukraine's competitiveness" along with agriculture, metallurgy, machine building, construction and materials, and furniture and wood processing. The contents of the national program on the IT sector are shown in the table below.

⁶⁸ According to the Ministry of Education and Science, as of September 2023, this recovery plan is a draft.

Sector	Ukraine's	Challenges and	Key projects of
	competitiveness	limitations	the National Program
Information Technology (IT)	 Fast-growing exports Educated and cost competitive talent pool 	 Low diversification Under-invested start- up space 	 Grow quantity and quality of talent pool Stimulate start-ups, incl. through funding Attract global R&D, incl. in automotive, telecommunications, health

Table-56 Ukrainian Government's National Programs related to the IT Sector (1)

Source: Draft Ukraine's National Recovery Plan (National Recovery Council, July 2022)

In addition, "Improve Education system with focus on key competences and innovation" describes the content of the national program in each of the fields of primary and secondary education, higher education and vocational education, and science.

 Table-57
 Ukrainian Government's National Programs related to the IT Sector (2)

Category	Contents	Indicators	Current status	2032 indicative target
Higher and	 Higher education system harmonization 	Ukraine's universities	6	20
vocational	with European Higher Education Area	in TOP-1000 QS		
education	• Invest in R&D (grants for researchers,	World		
	private co-investment in researchers) and	University Rankings		
	think-tanks on a base of key universities	Attractiveness of	35%	55%
	• Co-development of IT programs in TOP-	vocational education		
	5 universities together with private	for school graduates		
	sector			
	 Reform of vocational education: 			
	curriculum redesign, teachers studies,			
	optimizing network, prioritizing areas,			
	private sector engagement, including			
	integration to IT innovation hubs			
Science	• Performance based grants system for	Average impact of	7.7	12.8
	researchers	articles as measured		
	 Creation of Centers of Excellence 	by citations/article		
	(science parks) in cooperation with TOP			
	international centers			

Source: Draft Ukraine's National Recovery Plan (National Recovery Council, July 2022)

According to interviews with the Ministry of Education and Science in Ukraine, the IT sectors considered key to industrial development during Ukraine's reconstruction period are cybersecurity, drone technology, edtech, agritech, healthtech, energytech, fintech, digital skills, software, demining, defense tech, telecom, online safety, and artificial intelligence (AI). The universities listed in the table below were identified as those that will play an important role in the reconstruction period and are potential partners for future JICA projects. These are the top-ranking technical universities in Ukraine.
	State/University Name				
K	yiv				
	Taras Shevchenko National University of Kyiv				
	Kyiv National Economic University Named after Vadym Hetman				
	State University of Information and Communication Technology (State University of Telecommunications)				
	National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute»				
	National University of Kyiv-Mohyla Academy				
K	harkiv				
	Simon Kuznets Kharkiv National University of Economics				
	Kharkiv National University of Radio Electronics				
	V.N. Karazin Kharkiv National University				
	National Technical University "Kharkiv Polytechnic Institute"				
	National Aerospace University "Kharkiv Aviation Institute"				
0	Odesa				
	Odesa I.I. Mechnikov National University				
	Odessa Polytechnic National University				
S	Sumy				
	Sumy State University				
D	onipro				
	Oles Honchar Dnipro National University				
	Dnipro University of Technology				
K	Khmelnytskyi				
	Khmelnytskyi National University				
С	hernihiv				
	Yuriy Fedkovych Chernivtsi National University				
L	viv				
	Ukrainian Catholic University				
	Ivan Franko National University of Lviv				
	Lviv Polytechnic National University				

Table-58Ukrainian Universities Playing an Important Role in the Reconstruction Period

Source: Ministry of Education and Science in Ukraine

c. Support for Ukraine's higher education sector by international organizations

The table below shows the support provided by international organizations to Ukraine's higher education sector. According to interviews with the Ministry of Education and Science of Ukraine, it was confirmed that in addition to the projects listed in the table below, a project including the construction of an educational platform was selected for Erasmus+ by the EU⁶⁹, and that there are no projects supported by international organizations or other organizations that focus on IT education. The project adopted by Erasmus+ (Digital University-Open Ukrainian Initiative project) is a project proposed by several Ukrainian universities, and the platform built will be open to other universities for free. At this time, the educational programs (subjects) to be covered by the project have not been determined.

⁶⁹ https://www.eeas.europa.eu/delegations/ukraine/press-conference-%E2%80%9Ceu-support-higher-educationdevelopment-ukraine-erasmus-digital-university-%E2%80%93-open_uk?s=232

Project title	Partner	Country	Short description	Budget	Terms
Double Degree Project	Cormack Consultancy Group, Universities UK International (UUKi)	UK	Development and launch of a double degree program	GBP 500 000	2023-2025
Support for master's entrance examinations	OECD		Support for the development of tasks for master's entrance exams, organization of their conduct	EUR 30 000	2022
Integrated Education and Child Protection Initiative/Summer Campus	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 2.5 mill	2022-2023
Support of higher educational institutions	UNESCO		Purchase of educational equipment	USD 20 000	2023
Twinning	Cormack Consultancy Group	UK	Partnership between educational institutions to support Ukrainian higher education through both short-term aid and long-term activities that help support and restore Ukrainian universities, the economy and society	GBP 21 mill.	2022
Twinning Initiative/Ініціатива "Єднання"	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	GBP 15 mill.	2022-2023
Twinning Research Support	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 5 mill.	2023
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 31.5 bill (access is open to Ukraine as a partner country together with EU member states and other countries of the world)	2021-2027
Promotion of the development of professional education in agricultural colleges of Ukraine	GFA Consulting Group GmbHm, 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 1, 419, 967	2021-2024

Table-59Projects Supported by International Organizations and others in Ukraine's Higher Education Sector

Source: Ministry of Education and Science in Ukraine

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d. Examples of cooperation between Ukrainian universities and local IT companies

According to a Ukrainian IT company (software development), cooperation with companies is common in Ukrainian universities, and the company conducts such cooperation activities as i) holding webinars and master classes, ii) participating in various university events, iii) lectures by active IT specialists, iv) reviewing educational programs, and v) inviting students to internship programs, etc. The universities request companies to give lectures to attract students. The lectures are usually held as part of regular classes, based on the request from the universities, including theme, time, etc. There is no fixed theme, and it varies depending on each university's student recruitment strategy and other factors. In addition, when universities open new programs, companies with a good understanding of labor market trends are sometimes asked to advise on program contents. The companies accept students for internships in order to recruit good human resources, but the companies pay the students a fee to participate in the internship programs. In this way, both the universities and the companies are engaged in collaborative activities with benefits for both parties. The table below shows the benefits of collaboration from the perspective of both the universities and the companies.

Company Benefits	University Benefits
• Attract students to internship programs	• Improve the quality of education by involving IT
• Raise awareness of the company and its academy	practitioners in the learning process
among students	• Review educational programs (compliance with IT
• Participation of university lecturers as instructors in	market requirements)
company-sponsored training programs	Create job opportunities
 Improve the quality of university education 	· Collaborate with IT companies to attract more
	students to the university

Source: Interviews with companies

2) Educational Cooperation Needs

The needs assessment through interviews and questionnaires asked whether there were any educational collaboration needs and possible collaboration details, based on the assumption of collaboration with PJAIT, Japanese universities, and possibly private companies.

Regarding the need for collaboration, 19 out of 21 responses (90%) in the questionnaire survey and all universities in the interview survey indicated that they have a need for collaboration.

Regarding possible contents of cooperation and areas of cooperation, responses from each university (multiple responses, open-ended) were categorized and the frequency of responses was checked by category. Cooperation needs regarding possible contents of cooperation are shown in the figure below.



Source: Questionnaire and interview surveys



From the results of the needs assessment survey, many universities mentioned "special lectures by practitioners," "internship opportunities for teachers," "use of educational platforms," "students and faculty interactions and exchanges," and "joint provision and development of educational programs". Specific details (examples) of each category are shown in the table below.

Classified Needs	Specific Contents
Internship opportunities for teachers	Internship for academics, intensive training courses
Use of Educational Platforms	Access to education platform (usage of materials and more education
	programs, and usage for education management), development of
	educational platform
Special lectures by practitioners	Special English lectures by practitioners, professional lectures
Joint provision and development of	Joint modification and development of educational programs,
educational programs	collaborative online courses, cross-institutional credit transfer, double
	degree program, international project-based studying
Student and faculty interactions and	Academic mobility of students and teachers, student exchange
exchanges	programs, visiting professors
Dissemination of digital knowledge to	Dissemination of digital knowledge and information activity skills
experts in other fields	among specialists of other specialties.
Joint conferences and seminars	International successful experiences, best practical sharing, round
	tables to discussions
Improvement of medical education	Implementation of an industrial control system for improved medical
	education
Human resources and hardware	Human resources and hardware support
support	
Establishment of the virtual lab	Establishment of the virtual lab and access to the lab
Joint use of licensed software	Specialized professional software, modern learning resources

 Table-61
 Specific Educational Cooperation Needs (Examples)

Source: Questionnaire and interview surveys

The interviews revealed that each university is concerned that the Russian aggression will reduce exchanges with foreign universities at the level of students, faculty, and researchers respectively, resulting in a decline in the quality of faculty and researchers, and consequently in the level of education and research. In addition, since the outbreak of the new coronavirus infection (COVID-19), each university has been struggling with how to provide classes that students are interested in and how to maintain the quality of education as online classes have continued to be offered. These circumstances are likely to be reflected in the needs regarding the content of the abovementioned collaboration. Looking at the specifics of the use of educational platforms, while some universities expressed a desire to develop educational platforms with functions such as virtual laboratories, many respondents expressed a desire to have access to educational platforms with the expectation of accelerating access to educational materials and new educational programs. As with the contents of possible collaboration, the responses from each university (multiple responses, open-ended) for the IT field were categorized, and the frequency of responses was checked by category. The figure below shows the results. Many universities listed "Artificial Intelligence (AI)," "Cyber Security," "Data Science," "Robotics," "Information Technology," and "Embedded Control Systems. Of these, responses were particularly concentrated in "Artificial Intelligence (AI)" and "Cyber Security.



Source: Questionnaire and interview surveys

Figure-54 Educational Cooperation Needs by IT Field

The table below shows the relationship between the needs for collaboration in these fields and the faculties of PJAIT. With the exception of "Robotics," "Cell Regeneration Technology," and "Geo-Information Technology," all of these fields are covered by PJAIT education at the faculty level.

PJAIT's faculties
CS, IM
CS, IM
Not applicable
CS, IM
CS
CS, IM
NM
CS
CS
Not applicable
IM
Not applicable
Not applicable
NM, CS

 Table-62
 Relationship Between the Desired Field of Cooperation and the Faculties of PJAIT

Source: Questionnaire and interview surveys

3) Research Cooperation Needs

As with the educational cooperation needs, the JICA Survey Team identified the existence of research cooperation needs, and possible cooperation details, based on the assumption of collaboration with PJAIT, Japanese universities, and possibly private companies. Regarding the possibility of collaboration, 17 (81%) of the 21 responses in the questionnaire survey and all universities in the interview survey indicated that there is a need for collaboration. Regarding possible contents of cooperation and areas of cooperation, responses from each university (multiple responses, open-ended) were categorized and the frequency of responses was checked by category. The figure below shows the cooperation needs related to the possible content of the research collaboration.



Source: Questionnaire and interview surveys

Figure-55 Research Cooperation Needs by Content

From the results of the needs assessment survey, responses were concentrated in the areas of "Internships/Training for Researchers" and "International Research Cooperation. As mentioned in the Educational Cooperation Needs section, this reflects the recognition that exchange with foreign universities is essential to maintain or improve the quality of education and research even under Russian aggression. Specific contents (examples) of each categorized needs are shown in the table below.

Categories of Needs	Specific Contents
International Research Cooperation	Proposals for international joint research projects, participation in
	international joint research, co-authored papers
Internships/training for Researchers	Short-term: study tours, exchange of ideas on research topics, and
	training on how to prepare proposals for competitive funding
	Long-term: participation in research projects, technical training, proposal
	preparation
Scholarships for PhD Students	1-2-week scholarship for PhD students to work on their research and
	network with peers.
Summer and winter joint schools for	Joint summer/winter research schools for undergraduate and graduate
students and graduate students	students on IT topics
Research Resource Sharing	Distributed computing, cloud facilities, research equipment
Search for Research Partner	Search for research partner
Research institute	Research centers and institutes
Grants and financial assistance	Grant and financial assistance
Joint Conference	Knowledge sharing, co-authored paper presentations, and roundtable
	discussions on IT research perspectives

 Table-63
 Specific Research Cooperation Needs (Examples)

Source: Questionnaire and interview surveys

As with the contents of possible collaboration, the responses from each university (multiple responses, open-ended) for the IT field were categorized, and the frequency of responses was checked by category. The figure below shows the results. Many universities cite "artificial intelligence (AI)," "cybersecurity," "software engineering," "robotics," and "big data."



Source: Questionnaire and interview surveys



The JICA survey team further inquired about specific research topics, but most universities responded that they could not inadvertently provide detailed information in situations where participation in JICA projects or partner researchers/universities had not yet been decided, as research topics are extremely important assets for each university and researcher. Research topics proposed by some universities are listed in Annex 7. Regarding the ways of deciding and proceeding with joint research themes, there were opinions that the Japanese side should set research areas and conditions in advance and seek proposals from Ukrainian universities, or that mutual understanding among PAJIT, Japanese universities, and Ukrainian universities should be promoted through conferences and study tours in order to find common research themes.

4) Possibility of face-to-face cooperation

Interviews were conducted with Ukrainian universities and the Ministry of Education and Science to identify whether Ukrainian universities would prefer to cooperate with PJAIT and Japanese universities on a face-to-face basis and whether they would be allowed to go abroad in the case of face-to-face cooperation. In terms of educational cooperation, many of the universities requested online support, as they believe educational cooperation is implementable online. On the other hand, in terms of research cooperation, many universities preferred face-to-face or hybrid arrangements because of the importance of face-to-face interactions in research cooperation. In Ukraine, in principle, male between the ages of 18 and 60 are prohibited from leaving the country, but according to the Ministry of Education and Science of Ukraine, if a university in Ukraine applies for permission to leave the country, after examination by the Ministry of Education and Science and other relevant ministries, even male teachers and researchers are allowed to leave if they are participating in overseas projects.⁷⁰ On the other hand, (male) students, unlike faculty members and researchers, have no affiliation, and there is a risk that they may not return to the country after leaving, making it difficult to permit them to leave the country even to participate in overseas projects. Interviews with Ukrainian universities also confirmed cases where male faculty members and researchers, who in principle are prohibited from leaving the country, have obtained permission from the Ukrainian government to participate in overseas projects. The interviewees also informed us that if the project in question is registered or recognized by the Ministry of Education and Science, permission can be obtained smoothly.

- (2) Consideration of a draft medium- to long-term cooperation plan in terms of education and research
- 1) Draft medium- to long-term cooperation plan for strengthening IT education

Based on the concerns and needs of Ukrainian universities, "special lectures by PJAIT, Japanese universities, and Japanese companies," "provision of on-demand educational programs and teaching materials using educational platforms," "development of global PBL or industry-academia international online collaborative learning (COIL) programs," and "development of joint or double

⁷⁰ For the legal basis, see 2.1, (2) Ukrainian Government Policy for Assistance to Ukrainian refugees.

degree programs" are possible candidates for the mid- to long-term cooperation plan to strengthen IT education. The method of implementation is expected to be online in either case, depending on the requests from Ukrainian universities. In addition to the needs of the Ukrainian side, it is necessary to consider the experience and merits of the cooperating side. Therefore, these candidates were evaluated in terms of the advantages of PJAIT and Japanese universities, merits of PJAIT and Japanese universities, merits of Japanese companies, and time required.

	Advantages of PJAIT and JP universities	Merits of PJAIT and JP universities	Mertis for (JP) Companies	Time required
① Special lectures by IT practitioners	\triangle (depending on theme)	△ (assuming participation of (JP)companies)	\triangle (depending on theme)	Δ
	Cutting-edge topics can be offered with (JP) companies.	Positive effect on student recruitment through usage of the lectures in their own university lectures	Publicity effect	It can be integrated into existing classes, although some adjustments will be necessary.
 ② Utilization of educational platforms (provision of on- 	\triangle (depending on theme)	x	x	ہ (If utilizing an existing educational program)
demand educational materials)	Existing educational programs can be utilized, but may be difficult to differentiate from on-demand materials already in widespread use	Limited publicity effect	Limited publicity effect	Can be utilized in accordance with the circumstances of each university in Ukraine. Provide content for existing and planned educational platforms. ¹
3 Development of an	0	0	0	\bigtriangleup
international PBL/ COIL program	Has expertise in PJAIT ² and Japanese universities ³	Practical IT human resource development	Publicity effect, securing human resources	It can be integrated into existing classes, although some adjustments will be necessary.
Development of Joint Degree and Double	\triangle (depending on theme)	0	Х	Х
Degree Programs	PJAIT is currently discussing partnerships with European universities	Accepting international students and providing value-added learning opportunities	The participation of companies is assumed to be ancillary.	Many adjustments will be necessary, such as ensuring consistency with Ukrainian educational standards.

For example, the Digital University-Open Ukrainian Initiative project adopted by Erasmus+
 For example, modern PBL has been introduced at the PJAIT Bytom campus

https://pja.edu.pl/en/informatyka-bytom/informatyka-bytom-studia-i-stopnia-stacjonarne-polskojezyczne/o-programie/

3: In Japan, the COIL Council was established in 2018; as of October 10, 2023, 57 universities are members. https://www.kansai-u.ac.jp/Kokusai/IIGE/jp/JPN-COIL/#purpose Source: JICA Survey Team

Based on the above table, JICA Survey Team discussed with PJAIT and PJIAT confirmed that PJAIT can handle ①, ②, and ③. While PJAIT is currently discussing the development of joint programs with European universities, but it involves a considerable amount of work. Thus, it is difficult to develop a joint degree/double degree program immediately with Ukrainian universities, which has a different educational system. It would be realistic to discuss ④ if ① and ③ are successfully completed. PJAIT also commented that in the event that ①, ②, and ③ are implemented, they will be coordinated with the schedules of PJAIT faculty and will be implemented throughout the school year.

Based on the results of these discussions, the JICA Survey Team proposes the development of special lectures by IT practitioners and international PBL programs or industry-academia international online cooperative learning programs (COIL) as distance education. As for the provision of on-demand educational materials, JICA Survey Team proposes that the content of the special lectures by IT practitioners be made available on-demand.

2) Draft medium- to long-term cooperation plan for supporting IT researchers

Based on the concerns and needs of Ukrainian universities, The JICA Survey Team propose to support Ukrainian IT researchers through "research training" and "joint research" between PJAIT, Japanese universities, and possibly (Japanese) companies and Ukrainian IT universities. It is desirable to share research results and knowledge through international conferences, seminars, etc., not only to improve the skills of individual researchers, but also to benefit universities as a whole. The concept of cooperation and the details of the cooperation are shown in the figure and the table below.



- 1: Providing training and joint research for Ukrainian researchers at Ukrainian IT universities
- 2: Considering the security situation in Ukraine, for the time being, it is assumed that the project will be implemented at PJAIT or at a partner university on the Japanese side (including the use of remote technology).

Source: JICA Survey Team



Items	Contents
Research Training	Short-term (about 2 weeks):
	Study tours (visits to laboratories, research institutions, etc.), exchange of opinions on
	research themes, training on writing proposals to obtain competitive funding
	Long-term (3-6 months):
	Preparation of proposals for competitive funding, participation in research projects,
	technical training
International Research	Writing proposals for competitive funding, conducting international joint research
Cooperation	projects, co-authoring papers, and conducting international conference seminars

Table-65 Contents of Support for Ukrainian IT Researchers

Source: JICA Survey Team

The needs assessment survey also included interviews on research themes, but as mentioned in section 3)) "Cooperation needs in terms of research" in 4.3 (1), detailed research themes are extremely important assets for universities and researchers, and therefore, most of the respondents indicated that they could not provide information on detailed research themes at the time the project participation or partner universities or researchers had not yet been decided. PJAIT, on the other hand, presented four specific research topics on the condition that they be kept private. The research topics are related to data science, image/video/signal processing, artificial intelligence (AI), big data, image/video/signal processing, robotics, VR/AR/MR, VR/AR/MR, data science, artificial intelligence (AI), big data, and embedded control systems (especially in the IoT field), respectively. In addition, the Faculty of New Media at PJAIT indicated the possibility of participating in research projects in the area of graphic design and new media, although no specific research topics were presented.

(3) Implementation procedure

In order to promote cooperation in education and research in the absence of extensive networking between PJAIT and Ukrainian and Japanese universities, it is first necessary to hold conferences with the participation of PJAIT, Japanese universities, Ukrainian universities, and (Japanese) companies to present topics of their interests, deepen mutual understanding, and match educational and research themes. In this case, it would be appropriate to invite the participation of about two to three Japanese universities and Ukrainian universities.

4.4 Considerations in the Implementation of the Draft Long-Term Cooperation Plan

The future situation in Ukraine is considered extremely uncertain. While taking into account the changes in the higher education situation in Ukraine, and the resulting changes in the mobility of Ukrainian refugees in Poland due to the future invasion by Russia, and changes in the necessary IT skill currents in Poland, it is desirable to implement the long-term cooperation plan in response to changing conditions, with a review of needs early after the plan is launched and a review of the plans for the following year at the end of the year.

Annex

Annex 1:	IT literacy questionnaire in English, Ukrainian and RussianA-1
Annex 2:	Results of IT literary questionnaire survey
Annex 3:	Results of job information sites surveyA-3
Annex 5:	Results of follow up questionnaire survey
Annex 6:	Basic data of Ukrainian universitiesA-6
Annex 7:	Research Topics proposed by Ukrainian universities during the interviews (examples

Annex 1 : IT Literacy Questionnaire (Ukrainian version)

Анкета з цифрової грамотності і ІТ навичок

Дякуємо, що знайшли час на відповіді на наші запитання.

Частина І. Розкажіть, будь ласка, про себе.

- 1. Стать:
- а) 🛛 Жіноча
- b) 🗆 Чоловіча
- с) 🛛 Бажаю не відповідати
- 2. Вік
- а) 🛛 Молодше 18
- b) 🗆 19 29
- c) 🗆 30 39
- d) 🗆 40 49
- e) 🗆 50 59
- f) 🛛 Старше 60
- 3. Де Ви проживаєте у Польші?
- а) 🗆 Варшава
- b) 🗆 Краків
- с) 🗆 Лодзь
- d) 🗆 Вроцлав
- е) 🗆 Познань
- f) 🛛 Гданьск
- g) □Щецин
- h) 🗆 Бидгощ
- і) 🛛 Люблін
- ј) 🛛 Білосток
- k) □Жешув
- I) 🗆 Інше місто
- 4. З ким із членів родини Ви приїхали до Польщі? (Обов'язково, оберіть всі варіанти, що підходять)
- а) 🛛 з батьком

- b) 🗆 зматір'ю
- с) 🛛 з бабусею/дідусем
- d) 🛛 з малими дітьми (0-4 років)
- е) 🛛 з дітьми (5-12 років)
- f) 🛛 з дітьми (13-18 років)
- g) 🛛 з чоловіком/дружиною
- h) 🛛 з іншими членами родини
- і) 🛛 приїхав сам/сама
- 5. Яким є Ваш рівень освіти?
- а) 🛛 базова шкільна освіта (9 класів)
- b) 🛛 загальна середня освіта (11 класів)
- с) 🛛 ступінь бакалавра
- d) 🛛 ступінь магістра
- е) 🛛 ступінь доктора наук

6. Чи шукаєте Ви роботу у Польщі?

Якщо так, то який вид роботи Ви шукаєте? (Оберіть всі варіанти, які підходять)

Сфера діяльності		Статус зайнятості
a)	IT	🗆 повна, 🗆 часткова, 🗆 самозайнятість
b)	Будівництво	🗆 повна, 🗆 часткова, 🗆 самозайнятість
c)	Готельно-ресторанний	🗆 повна, 🗆 часткова, 🗆 самозайнятість
	бізнес	
d)	Логістика	🗆 повна, 🗆 часткова, 🗆 самозайнятість
e)	Освіта	🗆 повна, 🗆 часткова, 🗆 самозайнятість
f)	Виробництво	🗆 повна, 🗆 часткова, 🗆 самозайнятість
g)	Охорона здоров'я	🗆 повна, 🗆 часткова, 🗆 самозайнятість
h)	Торгівля	🗆 повна, 🗆 часткова, 🗆 самозайнятість
i)	Сільське господарство	🗆 повна, 🗆 часткова, 🗆 самозайнятість
j)	Інше	🗆 повна, 🗆 часткова, 🗆 самозайнятість

7. Які труднощі Ви маєте з пошуком роботи у Польщі? (Оберіть всі варіанти, які підходять)

- а) 🛛 Нестача вільного володіння мовою
- b) 🛛 Нестача відповідних навичок для бажаної роботи
- с) 🛛 Нестача досвіду роботи у бажаній галузі
- d) 🛛 Нестача часу на піклування про родину

- е) 🛛 Мало інформації про вакансії
- f) 🗆 Інше

8. Чи працюєте Ви у Польщі зараз?

Якщо так, то який вид роботи Ви виконусте? (Оберіть всі варіанти, які підходять)

Сфера діяльності		Статус зайнятості
a)	IT	🗆 повна, 🗆 часткова, 🗆 самозайнятість
b)	Будівництво	🗆 повна, 🗆 часткова, 🗆 самозайнятість
c)	Готельно-ресторанний	🗆 повна, 🗆 часткова, 🗆 самозайнятість
	бізнес	
d)	Логістика	🗆 повна, 🗆 часткова, 🗆 самозайнятість
e)	Освіта	🗆 повна, 🗆 часткова, 🗆 самозайнятість
f)	Виробництво	🗆 повна, 🗆 часткова, 🗆 самозайнятість
g)	Охорона здоров'я	🗆 повна, 🗆 часткова, 🗆 самозайнятість
h)	Торгівля	🗆 повна, 🗆 часткова, 🗆 самозайнятість
i)	Сільське господарство	🛛 повна, 🗆 часткова, 🗆 самозайнятість
j)	Інше	🗆 повна, 🗆 часткова, 🗆 самозайнятість

9. Підчас Вашого перебування у Польщі, які з видів підтримки Ви вважаєте найдоцільнішими?

(Оберіть ТРИ найбільш важливі для Вас відповіді)

- а) 🛛 Доступ до інформації про підтримку
- b) 🛛 Організація навчальних курсів для отримання певних професій
- с) 🛛 Фінансова підтримка
- d) 🛛 Допомога у піклуванні за дітьми
- е) 🛛 Допомога у пошуку житла
- f) 🛛 Доступ до охорони здоров'я
- g) 🛛 Допомога у пошуку роботи
- h) 🛛 Організація курсів з польської мови
- 10. Як довго, на Вашу думку, триватиме Ваше перебування у Польщі?
- а) 🛛 Я планую проживати у Польщі постійно.
- b) 🛛 Довше, ніж рік, але не постійно.
- с) 🛛 Менше, ніж рік, і я повернусь в Україну.
- d) 🛛 Менше, ніж рік, і я переїду до західних країн Європи.
- е) 🛛 Не можу сказати, все залежить від ситуації.

11. Опишіть Ваш рівень володіння іноземними мовами:

Мова		Рівень володіння
a)	Українська	🗆 початковий, 🗆 середній, 🗆 просунутий, 🗆 вільний
b)	Російська	🗆 початковий, 🗆 середній, 🗆 просунутий, 🗆 вільний
c)	Англійська	🗆 початковий, 🗆 середній, 🗆 просунутий, 🗆 вільний
d)	Польська	🗆 початковий, 🗆 середній, 🗆 просунутий, 🗆 вільний
e)	Інша	🗆 початковий, 🗆 середній, 🗆 просунутий, 🗆 вільний

- 12. Визначте Ваш рівень володіння польською мовою?
- а) 🛛 А1 (початковий)
- b) 🗆 A2 (початковий-середній)
- с) 🗆 В1 (середній)
- d) 🛛 B2 (середній-просунутий)
- е) 🗆 С1 (вільний)
- f) 🗆 C2 (професійний)
- g) 🛛 не знаю польської
- h) П не можу визначити свій рівень

Частина II. Розкажіть, будь ласка, про Ваші навички у сфері IT.

13. Які гаджети та скільки часу Ви використовуєте (щодня)?

IT гаджет		Скільки годин в день Ви використовуєте?
a)	PC	🗆 Не використовую 🗆 Менше ніж 1 год 🗆 1 - 3 год 🗆 Більше ніж 3
		години
b)	Планшет	□ Не використовую □ Менше ніж 1 год □ 1 - 3 год □ Більше ніж 3
		години
c)	Смартфон	□ Не використовую □ Менше ніж 1 год □ 1 - 3 год □ Більше ніж 3
		години
d)	Інше	□ Не використовую □ Менше ніж 1 год □ 1 - 3 год □ Більше ніж 3
		години

14. З якою метою та скільки часу Ви користуєтесь мережею Інтернет (щодня)?

Сфера		Скільки годин в день Ви використовуєте Інтернет?
використання		
a)	Робота	🗆 Не використовую 🗆 Менше ніж 1 год 🗆 1 - 3 год 🗆 Більше ніж 3 години
b)	Навчання	🗆 Не використовую 🗆 Менше ніж 1 год 🗆 1 - 3 год 🗆 Більше ніж 3 години
c)	Спілкування	🗆 Не використовую 🗆 Менше ніж 1 год 🗆 1 - 3 год 🗆 Більше ніж 3 години

d)	Соцмережі (Ж	🗆 Не використовую 🗆 Менше ніж 1 год 🗆 1 - 3 год 🗆 Більше ніж 3 години
	Соцмережі, напр.	
	Facebook, Twitter)	
e)	Онлайн шопінг	
f)	Інше	🗆 Не використовую 🗆 Менше ніж 1 год 🗆 1 - 3 год 🗆 Більше ніж 3 години
		🗆 Не використовую 🗆 Менше ніж 1 год 🗆 1 - 3 год 🗆 Більше ніж 3 години

15. Які мобільні застосунки Ви найчастіше використовуєте?

Тип застосунку		Як часто використовуєте?
a)	Microsoft Word	🗆 завжди, 🗆 часто, 🗆 іноді, 🗆 рідко, 🗆 ніколи
b)	Microsoft Excel	🗆 завжди, 🗆 часто, 🗆 іноді, 🗆 рідко, 🗆 ніколи
c)	Microsoft PowerPoint	🗆 завжди, 🗆 часто, 🗆 іноді, 🗆 рідко, 🗆 ніколи
d)	браузери Chrome, Edge, etc.	🗆 завжди, 🗆 часто, 🗆 іноді, 🗆 рідко, 🗆 ніколи
e)	пошта Gmail, Outlook, etc.	🗆 завжди, 🗆 часто, 🗆 іноді, 🗆 рідко, 🗆 ніколи
f)	відеоконференції Zoom,	🗆 завжди, 🗆 часто, 🗆 іноді, 🗆 рідко, 🗆 ніколи
	Teams, etc.	

- 16. Який месенджер Ви використовуєте для спілкування у Польщі? (Оберіть всі варіанти, які підходять)
- a) 🗆 Viber
- b) 🗆 WhatsApp
- c) 🗆 Telegram
- d) 🗆 Messenger
- e) 🗆 Discord
- f) 🗆 Signal
- g) 🗆 LINE
- h) 🗆 інший

Частина III. Поділіться Вашими очікуваннями щодо навчання у сфері IT.

У цьому розділі, будь ласка, розкажіть, якою би Ви бачили можливість навчання у сфері ІТ у Польщі.

 Чи відвідували Ви курси у сфері ІТ з моменту Вашого приїзду до Польщі?
 Якщо так, зазначте, будь ласка, які курси Ві відвідували? (Оберіть всі варіанти, що підходять)

- a) 🛛 Microsoft Word

- d) 🗆 Програмування
- e) П Конструювання веб-сайтів (напр., з використанням WordPress)
- f) 🛛 Комп'ютерна графіка і дизайн
- g) 🛛 Цифровий маркетинг
- h) 🗆 Кібербезпека
- і) 🗆 Інше
- 18. Чи хотіли би Ви взяти участь у курсах з ІТ у Польщі?
- а) 🗆 так
- b) 🛛 напевно так
- с) 🛛 не впевнений/на
- d) 🛛 напевно ні
- е) 🛛 точно ні
- 19. Якщо так, зазначте, будь ласка, найкращий час для відвідування навчання?
- а) 🛛 робочі дні протягом дня
- b) 🗆 робочі дні ввечері
- с) 🗆 вихідні
- d) 🛛 будь-який час
- е) 🛛 Я бажаю відвідувати тільки онлайн-курси.

20. Скільки часу Ви готові приділяти навчанню (на тиждень)?

Час		Як часто Ви готові навчатись?
a)	3 понеділка по п'ятницю	🗆 весь день, 🗆 половина дня, 🗆 1 -2 години
b)	2-3 дні на тиждень	🗆 весь день, 🗆 половина дня, 🗆 1 -2 години
c)	1 день на тиждень	🗆 весь день, 🗆 половина дня, 🗆 1 -2 години

21. Які навички Ви бажали б отримати підчас навчання?

Категорія IT навичок		Розкажіть, будь ласка, чи хотіли би Ви навчитись
a)	Microsoft Word	🗆 так 🗆 можливо 🗆 не знаю 🗆 напевно ні 🗆 точно ні
b)	Microsoft Excel	🗆 так 🗆 можливо 🗆 не знаю 🗆 напевно ні 🗆 точно ні
c)	Microsoft PowerPoint	🗆 так 🗆 можливо 🗆 не знаю 🗆 напевно ні 🗆 точно ні
d)	Програмування	🗆 так 🗆 можливо 🗆 не знаю 🗆 напевно ні 🗆 точно ні
e)	Конструювання веб-сайтів	🗆 так 🗆 можливо 🗆 не знаю 🗆 напевно ні 🗆 точно ні
f)	Комп'ютерна графіка та дизайн	🗆 так 🗆 можливо 🗆 не знаю 🗆 напевно ні 🗆 точно ні
g)	Цифровий маркетинг	🗆 так 🗆 можливо 🗆 не знаю 🗆 напевно ні 🗆 точно ні
h)	Кібербезпека	🗆 так 🗆 можливо 🗆 не знаю 🗆 напевно ні 🗆 точно ні

[Додаткові питання щодо використання застосунків Microsoft]

- 22. Чого би Ви хотіли навчитись у програмі Word? (Оберіть всі варіанти, які підходять)
- а) 🛛 Створювати і редагувати прості документи
- b) 🛛 Форматувати текст, фон сторінки
- с) 🛛 Додавати таблиці, малюнки, графіки
- d) 🛛 Створювати і редагувати таблиці
- е) 🛛 Не цікавить
- 23. Чого би Ви хотіли навчитись у програмі Excel? (Оберіть всі варіанти, які підходять)
- а) 🛛 Створювати і редагувати прості таблиці та клітинки
- b) 🛛 Функції електронних таблиць
- с) 🛛 Малювання графіків
- d) 🛛 Створення зведених таблиць
- е) 🛛 Програмування на VBA
- f) 🛛 Не цікавить
- 24. Чого би Ви хотіли навчитись у програмі **PowerPoint**? (Оберіть всі варіанти, які підходять)
- а) 🛛 Створювати та редагувати прості презентації
- b) 🛛 Редагувати дизайн презентацій
- с) 🛛 Додавати анімацію, відео і аудіо до презентацій
- d) 🛛 Створювати і додавати 3D моделі
- е) 🛛 Не цікавить

[Додаткові питання щодо програмування]

- 25. Яку мову програмування Ви хотіли би вивчити? (Оберіть всі варіанти, які підходять)
- a) 🗆 HTML, CSS
- b) 🗆 JavaScript
- c) D Python
- d) 🗆 Java
- e) □ C#
- f) □ C/C++
- g) 🗆 SQL
- h) 🗆 Інша
- 26. Якщо Ви маєте досвід у програмуванні, то якою мовою Ви володієте? (Оберіть всі

варіанти, які підходять)

- a) 🗆 HTML, CSS
- b) 🗆 JavaScript
- c) 🗆 Python
- d) 🗆 Java
- e) □ C#
- f) □ C/C++
- g) 🗆 SQL
- h) 🗆 Інша

[Додаткові питання щодо створення веб-сайтів]

- 27. Чого би Ви хотіли навчитись у **створенні веб-сайтів**? (Оберіть всі варіанти, які підходять)
- a) 🛛 Інструменти створення веб-сторінок, напр. WordPress
- b) П Створення статичних веб-сторінок з використанням HTML and CSS
- с) П Створення мультимедійного контенту (графіка та відео)
- d) 🛛 Не цікавить

[Додаткові питання щодо комп'ютерної графіки/дизайну]

- 28. Чого би Ви хотіли навчитись у комп'ютерній графіці/дизайні? (Оберіть всі варіанти, які підходять)
- a) 🛛 Графічні редактори, напр. Adobe Photoshop або безкоштовні еквіваленти
- b) 🛛 Відео-редактори, напр. Adobe Premiere або безкоштовні еквіваленти
- с) 🛛 Це цікавить

[Додаткові питання із цифрового маркетингу]

- 29. Чого би Ви хотіли навчитись у **сфері цифрового маркетингу**? (Оберіть всі варіанти, які підходять)
- а) 🛛 Основи цифрового маркетингу
- b) 🛛 Основи оптимізації ринку
- c) Пнструменти цифрового маркетингу, напр. Google Ads, Facebook Ads i Google Analytics
- d) 🛛 Не цікавить

[Додаткові питання щодо кібербезпеки]

30. Чого би Ви хотіли навчитись у сфері кібербезпеки? (Оберіть всі варіанти, які

підходять)

- е) 🛛 Основи кібербезпеки
- f) 🛛 Кібератаки та стратегії захисту
- g) 🛛 Система управління цифровою безпекою
- h) 🗆 Не цікавить
- 31. Чим би Ви хотіли займатись після проходження навчання? (Оберіть всі варіанти, які підходять)
- а) П Розпочати свій власний бізнес (напр. створення веб-сайтів і дизайн)
- b) П Шукати роботу за контрактом B2B (напр. створення веб-сайтів і дизайн)
- с) 🛛 Шукати роботу у офісі (напр. оператор керування даними)
- d) 🗆 Шукати роботу, пов'язану з IT (напр. графічний дизайнер)
- e) 🛛 Продовжувати опановувати IT навички на курсах або в університеті
- f) 🛛 Не маю чіткого визначення
- g) 🗆 Інше

Дякуємо за співпрацю і відповіді на питання!

Annex 1 : IT Literacy Questionnaire (Russian version)

Анкета оценки уровня цифровой грамотности и ІТ навыков

Благодарны, что Вы нашли время ответить на наши вопросы.

Часть І. Расскажите, пожалуйста, о себе.

- 1. Пол:
- а) 🛛 Женский
- b) 🗆 Мужской
- с) Предпочитаю не отвечать
- 2. Возраст:
- а) 🛛 Младше 18
- b) 🗆 19 29
- c) 🗆 30 39
- d) 🗆 40 49
- e) 🗆 50 59
- f) 🛛 Старше 60
- 3. Где Вы проживаете в Польше?
- а) 🗆 Варшава
- b) 🗆 Краков
- с) 🗆 Лодзь
- d) 🗆 Вроцлав
- е) 🗆 Познань
- f) 🗆 Гданск
- g) □Щецин
- h) 🗆 Быдгощ
- і) 🛛 Люблин
- ј) 🗆 Белосток
- k) □Жешув
- I) П Другой город
- 4. Кто из членов семьи приехал с Вами в Польшу? (Укажите все подходящие варианты)
- а) 🗆 сотцом

- b) 🗆 сматерью
- с) 🗆 с бабушкой/дедушкой
- d) 🛛 с маленькими детьми (0-4 года)
- е) 🗆 с детьми (5-12 лет)
- f) 🛛 с детьми (13-18 лет)
- g) 🗆 с мужем/женой
- h) 🛛 с другими членами семьи
- і) 🛛 сам/сама
- 5. Укажите Ваш уровень образования?
- а) 🛛 базовое школьное образование (9 классов)
- b) 🗆 полное школьное (11 классов)
- с) 🛛 степень бакалавра
- d) 🛛 степень магистра
- е) 🛛 степень доктора наук

6. Ищете ли Вы работу в Польше?

Если да, то какой вид работы Вы ищете? (Укажите все подходящие варианты)

Сфера деятельности		Статус занятости
a)	IT	🗆 полная, 🗆 частичная, 🗆 самозанятость
b)	Строительство	🗆 полная, 🗆 частичная, 🗆 самозанятость
c)	Гостинично-	🗆 полная, 🗆 частичная, 🗆 самозанятость
	ресторанный бизнес	
d)	Логистика	🗆 полная, 🗆 частичная, 🗆 самозанятость
e)	Образование	🗆 полная, 🗆 частичная, 🗆 самозанятость
f)	Производство	🗆 полная, 🗆 частичная, 🗆 самозанятость
g)	Медицина	🗆 полная, 🗆 частичная, 🗆 самозанятость
h)	Торговля	🗆 полная, 🗆 частичная, 🗆 самозанятость
i)	Сельское хозяйство	🗆 полная, 🗆 частичная, 🗆 самозанятость
j)	Другое	🗆 полная, 🗆 частичная, 🗆 самозанятость

- 7. Какие трудности Вы испытываете в поиске работы в Польше? (Укажите все подходящие варианты)
- а) 🛛 Нехватка свободного владения языком
- b) 🛛 Нехватка навыков для получения желаемой работы
- с) 🛛 Нехватка опыта работы в желаемой сфере
- d) 🛛 Нехватка времени для заботы о семье

- е) 🛛 Мало информации о вакансиях
- f) 🗆 Другое

8. Работаете ли Вы в Польше на данный момент?

Если да, то какой вид работы Вы выполняете? (Укажите все подходящие варианты)

Сфера деятельности		Статус занятости
a)	IT	🗆 полная, 🗆 частичная, 🗆 самозанятость
b)	Строительство	🗆 полная, 🗆 частичная, 🗆 самозанятость
c)	Гостинично-	🗆 полная, 🗆 частичная, 🗆 самозанятость
	ресторанный бизнес	
d)	Логистика	🗆 полная, 🗆 частичная, 🗆 самозанятость
e)	Образование	🗆 полная, 🗆 частичная, 🗆 самозанятость
f)	Производство	🗆 полная, 🗆 частичная, 🗆 самозанятость
g)	Медицина	🗆 полная, 🗆 частичная, 🗆 самозанятость
h)	Торговля	🗆 полная, 🗆 частичная, 🗆 самозанятость
i)	Сельское хозяйство	🗆 полная, 🗆 частичная, 🗆 самозанятость
j)	Другое	🗆 полная, 🗆 частичная, 🗆 самозанятость

9. На время Вашего находжения в Польше, какие из видов поддержки были бы для Вас самыми актуальными?

(Выберите не более ТРЕХ вариантов)

- а) 🛛 Доступ к информации о поддержке
- b) 🛛 Организация курсов для получения профессии
- с) 🛛 Финансовая поддержка
- d) 🛛 Помощь в заботе о детях
- е) 🛛 Помощь в поиске жилья
- f) 🛛 Доступ к медицине
- g) 🛛 Помощь в поиске работы
- h) 🛛 Организация курсов польского языка
- 10. Как долго Вы планируете пребывать в Польше?
- а) 🛛 Планирую оставаться в Польше.
- b) 🛛 Дольше, чем год, но не постоянно.
- с) 🛛 Меньше года, и планирую вернуться в Украину.
- d) 🛛 Меньше года, планирую переезд в западные страны Европы.
- е) 🛛 Не могу сказать, все зависит от ситуации.

11. Опишите Ваш уровень владения иностранными языками:

Язык		Уровень
a)	Украинский	🗆 начальный, 🗆 средний, 🗆 продвинутый, 🗆 свободный
b)	Русский	🗆 начальный, 🗆 средний, 🗆 продвинутый, 🗆 свободный
c)	Английский	🗆 начальный, 🗆 средний, 🗆 продвинутый, 🗆 свободный
d)	Польский	🗆 начальный, 🗆 средний, 🗆 продвинутый, 🗆 свободный
e)	Другой	🗆 начальный, 🗆 средний, 🗆 продвинутый, 🗆 свободный

- 12. Укажите Ваш уровень владения польским языком?
- а) 🗆 А1 (начальный)
- b) 🗆 А2 (начальный-средний)
- с) 🗆 В1 (средний)
- d) 🛛 В2 (средний-продвинутый)
- е) 🗆 С1 (продвинутый)
- f) 🛛 C2 (свободный)
- g) 🛛 не знаю польского языка
- h) П не могу определить свій уровень

Часть II. Расскажите, пожалуйста, о Ваших навыках в сфере IT.

IT устройство		Сколько часов в день используете?
a)	Компьютер/ноутбук	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3
		часов
b)	Планшет	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3
		часов
c)	Смартфон	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3
		часов
d)	Другое	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3
		часов

13. Какие устройства Вы используете (каждый день)?

14. С какой целью Вы используете Интернет (каждый день)?

Сфера использования		Сколько часов в день Вы используете интернет?
a)	Работа	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3 часов
b)	Учеба	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3 часов
c)	Мессенджеры	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3 часов

d)	Социальные сети	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3 часов
	(※ Социальные сети,	
	напр. Facebook, Twitter)	
e)	Онлайн шоппинг	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3 часов
f)	Другое	🗆 Не использую 🗆 Меньше 1 часа 🗆 1 - 3 часа 🗆 Более 3 часов

15. Какие мобильные приложения Вы чаще всего используете?

Тип приложения			Как часто используете?
a)	Microsoft Word		🗆 всегда, 🗆 часто, 🗆 иногда, 🗆 редко, 🗆 никогда
b)	Microsoft Excel		🗆 всегда, 🗆 часто, 🗆 иногда, 🗆 редко, 🗆 никогда
c)	Microsoft PowerPoint		🗆 всегда, 🗆 часто, 🗆 иногда, 🗆 редко, 🗆 никогда
d)	браузеры	Chrome,	🗆 всегда, 🗆 часто, 🗆 иногда, 🗆 редко, 🗆 никогда
	Edge, etc.		
e)	почтовые	клиенты	🗆 всегда, 🗆 часто, 🗆 иногда, 🗆 редко, 🗆 никогда
	Gmail, Outlook	, etc.	
f)	Видеоконфере	енции	🗆 всегда, 🗆 часто, 🗆 иногда, 🗆 редко, 🗆 никогда
	Zoom, Teams, etc.		

- 16. Какой из мессенджеров Вы используете для общения в Польше? (Укажите все подходящие варианты)
- a) 🗆 Viber
- b) 🗆 WhatsApp
- c) 🗆 Telegram
- d) 🗆 Messenger
- e) 🗆 Discord
- f) 🗆 Signal
- g) 🗆 LINE
- h) 🗆 другое

Часть III. Поделитель Вашими ожиданиями от обучения в сфере IT.

В этой части расскажите, пожалуйста, каким бы Вы видели возможность обучения навыкам IT в Польше.

17. Посещали ли Вы какие-либо курсы, посвященные IT, с момента Вашего приезда в Польшу?

Если да, то укажите какие именно курсы Вы посещали? (Укажите все подходящие варианты)

- d) 🗆 Программирование
- e) П Создание вебсайтов (напр., с использованием WordPress)
- f) 🛛 Компьбтерная графика и дизайн
- g) 🛛 Цифровой маркетинг
- h) 🗆 Кибербезопасность
- і) 🗆 Другое
- 18. Хотели бы Вы принять участие в курсах ІТ в Польше?
- а) 🛛 определенно да
- b) 🛛 возможно да
- с) 🗆 не уверен/на
- d) 🗆 возможно нет
- е) 🛛 определенно нет
- 19. Если да, укажите предпочтительное время посещения занятий?
- а) 🛛 рабочие дни, на протяжении дня
- b) 🛛 рабочие дни, вечернее время
- с) 🗆 выходные дни
- d) 🗆 любое время
- е) Предпочитаю посещать только онлайн-курсы.

20. Сколько времени Вы готовы посвящать обучению (в неделю)?

Время				Как часто Вы готовы обучаться?
a)	С	понедельника	по	🗆 весь день, 🗆 половина дня, 🗆 1 -2 часа в день
	пятницу			
b)	2-3 дня в неделю			🗆 весь день, 🗆 половина дня, 🗆 1 -2 часа в день
c)	1 день в неделю			🗆 весь день, 🗆 половина дня, 🗆 1 -2 часа в день

21. Какие навыки Вы хотели бы получить во время обучения?

Категорія IT навыков		Расскажите о навыках, которые вы хотели бы изучить
a)	Microsoft Word	🗆 да 🗆 возможно 🗆 не знаю 🗆 возможно нет 🗆 точно нет
b)	Microsoft Excel	🗆 да 🗆 возможно 🗆 не знаю 🗆 возможно нет 🗆 точно нет
c)	Microsoft PowerPoint	🗆 да 🗆 возможно 🗆 не знаю 🗆 возможно нет 🗆 точно нет
d)	Программирование	🗆 да 🗆 возможно 🗆 не знаю 🗆 возможно нет 🗆 точно нет
e)	Создание сайтов	🗆 да 🗆 возможно 🗆 не знаю 🗆 возможно нет 🗆 точно нет

f)	Компьютерная графика	🗆 да 🗆 возможно 🗆 не знаю 🗆 возможно нет 🗆 точно нет
	и дизайн	
g)	Цифровой маркетинг	🗆 да 🗆 возможно 🗆 не знаю 🗆 возможно нет 🗆 точно нет
h)	Кибербезопасность	🗆 да 🗆 возможно 🗆 не знаю 🗆 возможно нет 🗆 точно нет
i)	Другое	🗆 да 🗆 возможно 🗆 не знаю 🗆 возможно нет 🗆 точно нет

[Допольнительные вопросы о приложениях Microsoft]

- 22. Что бы Вы хотели изучить в приложении **Word**? (Укажите все подходящие варианты)
- а) 🗆 Создание и редактирование простых документов
- b) 🛛 Форматирование текста, фона документов
- с) 🗆 Добавление рисунков, графиков, таблиц
- d) 🗆 Создание и редактирование таблиц
- е) 🗆 Не интересует
- 23. Что бы Вы хотели изучить в приложении **Excel**? (Укажите все подходящие варианты)
- а) 🛛 Создание и редактирование простых таблиц и ячеек
- b) 🛛 Функции элеткронных таблиц
- с) 🗆 Создание графиков
- d) 🛛 Создание сводных таблиц
- е) 🛛 Программирование в VBA
- f) 🛛 Не интересует
- 24. Что бы Вы хотели изучить в приложении **PowerPoint**? (Укажите все подходящие варианты)
- а) 🛛 Создавать и редактировать простые презентации
- b) 🛛 Редактировать дизайн презентаций
- с) 🛛 Добавлять анимацию, видео и рисунки в презентацию
- d) 🛛 Создавать и добавлять 3D модели
- е) 🛛 Не интересует

[Дополнительные вопросы о программировании]

- 25. Какой язык программирования Вы бы хотели изучить? (Укажите все подходящие варианты)
- a) 🛛 HTML, CSS
- b) 🗆 JavaScript
- c) 🗆 Python

- d) 🗆 Java
- e) □ C#
- f) □ C/C++
- g) 🗆 SQL
- h) 🗆 Другой
- 26. Если Вы имеете опыт в программировании, то каким из языков Вы владеете? (Укажите все подходящие варианты)
- a) 🗆 HTML, CSS
- b) 🗆 JavaScript
- c) D Python
- d) 🗆 Java
- e) □ C#
- f) □ C/C++
- g) □ SQL
- h) 🗆 Другой

[Дополнительные вопросы о создании сайтов]

- 27. Что бы Вы хотели изучить в **создании сайтов**? (Укажите все подходящие варианты)
- a) ПИнструменты для создания веб-страниц, напр. WordPress
- b) 🗆 Создание статичных веб-страниц с использованием HTML и CSS
- с) 🛛 Создание мультимедийного контента (графика и видео)
- d) 🛛 Не интересует

[Дополнительные вопросы о компьютерной графике/дизайне]

- 28. Чему бы Вы хотели научиться в компьютерной графике/дизайне? (Укажите все подходящие варианты)
- a) П Графические редакторы, напр. Adobe Photoshop или их бесплатные эквиваленты
- b) 🗆 Видео редакторы, напр. Adobe Premiere или их бесплатные эквиваленты
- с) 🛛 Це интересует

[Дополнительные вопросы о цифровом маркетинге]

- 29. Чему бы Вы хотели научиться в цифровом маркетинге? (Укажите все подходящие варианты)
- а) 🛛 Основы цифрового маркетинга

- b) 🛛 Основы оптимизации рынка
- c) Пиструменты цифрового маркетинга, напр. Google Ads, Facebook Ads и Google Analytics
- d) 🛛 Не интересует

[Дополнительные вопросы о кибербезопасности]

- 30. Чему бы Вы хотели научиться в сфере кибербезопасности? (Укажите все подходящие варианты)
- е) 🛛 Основы кибербезопасности
- f) 🛛 Кибератаки и стратегии защиты
- g) 🛛 Системы управления цифровой безопасностью
- h) 🗆 Не интересует
- 31. Чем бы Вы хотели заняться после прохождения обучения? (Укажите все подходящие варианты)
- а) П Начать собственный бизнес (напр. создание сайтов и дизайн)
- b) 🛛 Искать работу по контракту B2B (напр. создание сайтов и дизайн)
- с) 🛛 Искать работу в офисе (напр. оператор управления данными)
- d) Пискать работу, связанную с IT (напр. графический дизайнер)
- e) 🛛 совершенствовать свои навыки в IT на курсах или в университете
- f) 🛛 Не имею четкого определения
- g) 🗆 Другое

Благодарим за сотрудничество и ответы на наши вопросы!

Annex 1 : IT Literacy Questionnaire (English version)

Questionnaire on IT/digital literacy

Thank you for taking your time to answers to these questions.

Part I. Please tell us about you

- 1. Gender
- a) 🗆 Female
- b) 🗆 Male
- 2. Age
- a) 🗆 Under 18
- b) 🗆 19 29
- c) 🗆 30 39
- d) 🗆 40 49
- e) 🗆 50 59
- 3. Where do you stay in Poland?
- a) 🗆 Warsaw
- b) 🗆 Kraków
- c) □ Łódź
- d) 🗆 Wrocław
- e) 🗆 Poznań
- f) 🛛 Gdańsk
- g) 🗆 Szczecin
- h) 🗆 Bydgoszcz
- i) 🗆 Lublin
- j) 🛛 🗆 Białystok
- k) 🗆 Rzeszów
- 4. Did other family members accompany you to Poland? (Required. Check all that apply)
- b)

 Came with mother

- c) \Box Came with grandparents
- d) \Box Came with infants (0-4 years)
- e) \Box Came with children (5-12 years)
- g) \Box Came with spouse
- h)

 Came with others
- i) 🛛 Came alone
- 5. What is your educational background
- b) 🗆 High school diploma
- c) 🗆 Bachelor's degree
- d) 🛛 Master's degree
- e) 🗆 Doctorate degree
- 6. Are you looking for a job in Poland?

If yes, what kind of job are you looking for? (Check all that apply)

Industry		Employment status
a)	IT	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
b)	Construction	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
c)	Hotel, restaurant	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
d)	Logistics	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
e)	Education	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
f)	Manufacturing	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
g)	Healthcare	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
h)	Commerce	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
i)	Agriculture	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
j)	Others	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment

- 7. What are the difficulties in finding a job in Poland? (Check all that apply)
- a) 🗆 Lack of language fluency
- b)

 Lack of skills necessary to obtain the desired job
- c)

 Lack of work experiences necessary to obtain the desired job
- d)

 Lack of time to take care of the family
- e)

 Lack of information on jobs
- f) \Box Others
- 8. Are you working in Poland?

If yes, what kind of job are you doing?

Industry		Employment status
a)	IT	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
b)	Construction	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
c)	Hotel, restaurant	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
d)	Logistics	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
e)	Education	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
f)	Manufacturing	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
g)	Healthcare	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
h)	Commerce	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
i)	Agriculture	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment
j)	Others	🗆 Full-time, 🗆 Part-time, 🗆 Self-employment

9. What would be the most important forms of assistance, facilitating their stay in Poland? (Select three most important assistance)

- a)

 Access to support information

- e)

 Assistance in finding accommodation
- f) \Box Access to health care

- 10. How long do you think your stay in Poland will last?
- a)
 □ I will stay in Poland permanently.
- b)
 D Longer than a year but not permanently

- e) \Box I do not know currently. It depends on how things go from here.

11. What are your language fluencies?

Language		How often do you usually use it?
a)	Ukrainian	🗆 Elementary, 🗆 Intermediate, 🗆 Advanced, 🗆 Fluent
b)	Russian	🗆 Elementary, 🗆 Intermediate, 🗆 Advanced, 🗆 Fluent
c)	English	🗆 Elementary, 🗆 Intermediate, 🗆 Advanced, 🗆 Fluent
d)	Polish	🗆 Elementary, 🗆 Intermediate, 🗆 Advanced, 🗆 Fluent

e) Other	□ □ Elementary □ Intermediate □ Advanced □ Eluent
U U		

- 12. What is your level of Polish?
- a) □A1
- b) □ A2
- c) □ B1
- d) 🗆 B2
- e) □ C1
- f) □ C2
- g) 🛛 I cannot speak Polish

Part II. Please tell us about your IT skills

-		y y x
IT device		How many hours a day do you usually use it?
a)	PC	\Box Not using \Box Less than 1 hour \Box 1 - 3 hours \Box More than 3 hours
b)	Tablet	\Box Not using \Box Less than 1 hour \Box 1 - 3 hours \Box More than 3 hours
c)	Smartphone	□ Not using □ Less than 1 hour □ 1 - 3 hours, □ More than 3 hours
d)	Others	\Box Not using \Box Less than 1 hour \Box 1 - 3 hours \Box More than 3 hours

13. What IT devices do you usually use (per day)?

14. For what purpose do you usually use the Internet (per day)?

Usage of the Internet		How many hours a day do you usually use it?
a)	For work	\Box Not using \Box Less than 1 hour \Box 1 - 3 hours \Box More than 3 hours
b)	For study	\Box Not using \Box Less than 1 hour \Box 1 - 3 hours \Box More than 3 hours
c)	For communication	\Box Not using \Box Less than 1 hour \Box 1 - 3 hours \Box More than 3 hours
d)	For SNS	\Box Not using \Box Less than 1 hour \Box 1 - 3 hours \Box More than 3 hours
	(💥 Social Networking	
	Service such as	
	Facebook, Twitter)	
e)	For online shopping	□ Not using □ Less than 1 hour □ 1 - 3 hours □ More than 3 hours
f)	Others	\Box Not using \Box Less than 1 hour \Box 1 - 3 hours \Box More than 3 hours

15. What application software do you usually use?

Type of application software		How often do you usually use it?
a)	Microsoft Word	🗆 Always, 🗆 Often, 🗆 Sometimes, 🗆 Rarely, 🗆 Never
b)	Microsoft Excel	🗆 Always, 🗆 Often, 🗆 Sometimes, 🗆 Rarely, 🗆 Never
c)	Microsoft PowerPoint	🗆 Always, 🗆 Often, 🗆 Sometimes, 🗆 Rarely, 🗆 Never

d)	Like Chrome, Edge, etc.	🗆 Always, 🗆 Often, 🗆 Sometimes, 🗆 Rarely, 🗆 Never
e)	Like Gmail, Outlook, etc.	🗆 Always, 🗆 Often, 🗆 Sometimes, 🗆 Rarely, 🗆 Never
f)	Like Zoom, Teams, etc.	🗆 Always, 🗆 Often, 🗆 Sometimes, 🗆 Rarely, 🗆 Never

16. What messaging application do you usually use in Poland? (Check all that apply)

- a) 🗆 Viber
- b) 🗆 WhatsApp
- c) 🗆 Telegram
- d) 🗆 Messenger
- e) 🗆 Discord
- f) 🗆 Signal
- g) 🗆 LINE
- h)

 Others

Part III. Please tell us about your preference for IT training

In this section, please tell us what kind of content you would prefer if you could have an opportunity to attend IT training courses in Poland.

17. Have you attended any IT training since you evacuated to Poland?

If yes, what kind of IT training did you attend? (Check all that apply)

- d) 🗆 Programming
- e) D Web authoring (Like creating websites using WordPress)
- g) 🗆 Digital marketing
- i) 🗆 Others
- 18. Would you like to participate in IT training in Poland?
- a) Definitely yes
- b) D Probably yes

- e) Definitely Not
- 19. If yes, when would be the most convenient time to attend the classroom training?
- a) 🛛 Weekday daytime
- b) 🗆 Weekday evening
- c) 🗆 Weekend
- d) 🗆 Anytime
- 20. How often do you spend your time for the classroom training (per week)?

Availability		How often do you spend your time?
a)	Monday to Friday	□ Full day, □ Half day, □ 1 -2 hours
b)	2 or 3 days a week	🗆 Full day, 🗆 Half day, 🗆 1 -2 hours
c)	1 day a week	□ Full day, □ Half day, □ 1 -2 hours

21. What do you prefer to learn from the training?

Category of IT skill		Tell us about what you would like to learn	
a)	Microsoft Word	□ Definitely □ Probably □ Neutral □ Probably Not □ Definitely Not	
b)	Microsoft Excel	□ Definitely □ Probably □ Neutral □ Probably Not □ Definitely Not	
c)	Microsoft PowerPoint	□ Definitely □ Probably □ Neutral □ Probably Not □ Definitely Not	
d)	Programming	□ Definitely □ Probably □ Neutral □ Probably Not □ Definitely Not	
e)	Web authoring	□ Definitely □ Probably □ Neutral □ Probably Not □ Definitely Not	
f)	Computer graphics/design	□ Definitely □ Probably □ Neutral □ Probably Not □ Definitely Not	
g)	Digital marketing	□ Definitely □ Probably □ Neutral □ Probably Not □ Definitely Not	
h)	Cyber security	□ Definitely □ Probably □ Neutral □ Probably Not □ Definitely Not	
i)	Others	□ Definitely □ Probably □ Neutral □ Probably Not □ Definitely Not	

[Additional questions about Microsoft applications]

- 22. What would you like to learn in Word in particular? (Check all that apply)

- d) \Box Create and edit the table of contents
- e) D Not much interest
- 23. What would you like to learn in **Excel** in particular? (Check all that apply)
- a) \Box Create and edit simple tables and formatting cells
- c) \Box Drawing graphs
- e) \Box VBA programming

- f) D Not much interest
- 24. What would you like to learn in **PowerPoint** in particular? (Check all that apply)
- b) Design slide layouts
- c) \Box Add animation, video, and audio in the presentations
- d) \Box Create and add 3D models
- e) D Not much interest

[Additional questions about programming]

- 25. What programming languages would you like to learn? (Check all that apply)
- a) 🗆 HTML, CSS
- b) 🛛 JavaScript
- c) 🗆 Python
- d) 🗆 Java
- e) □ C#
- f) □ C/C++
- g) □ SQL
- h) \Box Others
- 26. If you have programming experience, what languages can you write? (Check all that apply)
- a) 🗆 HTML, CSS
- b) 🗆 JavaScript
- c) 🗆 Python
- d) 🗆 Java
- e) □ C#
- f) □ C/C++
- g) 🗆 SQL
- h) □ Others

[Additional questions about Web authoring]

- 27. What would you like to learn in **Web authoring** in particular? (Check all that apply)

- d) D Not much interest

[Additional questions about Computer graphics/design]

- 28. What would you like to learn in **Computer graphics/design** in particular? (Check all that apply)

- c) \Box Not much interest

[Additional questions about Digital marketing]

- 29. What would you like to learn in Digital marketing in particular? (Check all that apply)

- c) Digital marketing tools such as Google Ads, Facebook Ads and Google Analytics

[Additional questions about Cyber security]

- 30. What would you like to learn in Cyber security in particular? (Check all that apply)
- e) \Box Basics of cyber security
- g)
 □ Information Security Management System
- h) D Not much interest
- 31. What would you like to do after attending the training? (Check all that apply)

- c) \Box Look for office jobs such as data management operators
- d)
 □ Look for IT-related jobs such as web-designers
- f) \Box I have no clear idea at this point

Thank you for being so cooperative in answering the questionnaire.

Annex : Results of IT literary questionnaire survey

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Results of IT literary questionnaire survey (NGO)

Figure-1 Question1. Gender



Figure-2 Question2. Age



Figure-3 Question3. Where do you stay in Poland?



Figure-4 Question4. Did other family members accompany you to Poland? (Check all that apply)



Figure-5 Question 5. What is your educational background?



Figure-6 Question6. Are you looking for a job in Poland?



Figure-7 Question7. What are the difficulties in finding a job in Poland? (Check all that apply)



Figure-8 Question8. Are you working in Poland? If yes, what kind of job are you doing?



Figure-9 Question9. What would be the most important forms of assistance, facilitating their stay in Poland? (Select three most important assistance)



Figure-10 Question 10. How long do you think your stay in Poland will last?



Figure-11 Question11. What are your language fluencies?



Figure-12 Question12. What is your level of Polish?



Figure-13 Question13. What IT devices do you usually use (per day)?



Figure-14 Question14. For what purpose do you usually use the Internet (per day)?



Figure-15 Question 15. What application software do you usually use?



Figure-16 Question16. What messaging application do you usually use in Poland? (Check all that apply)



Figure-17 Question17. Have you attended any IT training since you evacuated to Poland?



Figure-18 Question 18. Would you like to participate in IT training in Poland?



Figure-19 Question19. If yes, when would be the most convenient time to attend the classroom training?



Figure-20 Question 20. How often do you spend your time for the classroom training (per week)?



Figure-21 Question21. What do you prefer to learn from the training?



Figure-22 Question 22. What would you like to learn in Word in particular? (Check all that apply)



Figure-23 Question23. What would you like to learn in Excel in particular? (Check all that apply)



Figure-24 Question24. What would you like to learn in PowerPoint in particular? (Check all that apply)



Figure-25 Question 25. What programming languages would you like to learn? (Check all that apply)



Figure-26 Question 26. If you have programming experience, what languages can you write? (Check all that apply)



Figure-27 Question 27. What would you like to learn in Web authoring in particular? (Check all that apply)



Figure-28 Question 28. What would you like to learn in Computer graphics/design in particular? (Check all that apply)



Figure-29 Question29. What would you like to learn in Digital marketing in particular? (Check all that apply)



Figure-30 Question 30. What would you like to learn in Cyber security in particular? (Check all that apply)



Figure-31 Question 31. What would you like to do after attending the training? (Check all that apply)

Results of IT literary questionnaire survey (SNS)

[English] Questionnaire on IT/digital literacy

Annex : Results of IT literary questionnaire survey (SNS)

[English] Questionnaire on IT/digital literacy





[English] Questionnaire on IT/digital literacy

Could you help us with the survey?

Single choice

Answer Choices	Responses	Ratio
lagree with answering the questionnaire	313	96.01%
I am afraid I have to disagree with answering the questionnaire	13	3.99%

Number of valid respondents: 313 (Q1 - Q10)

1. Gender

Single choice				
Answer Choices	Responses	Ratio		
Female	234	74.76%		
Male	77	24.6%		
Prefer not to say	2	0.64%		



Female Male Prefer not to say

[English] Questionnaire on IT/digital literacy

2. Age

Single choice			
Responses	Ratio		
13	4.15%		
35	11.18%		
117	37.38%		
105	33.55%		
28	8.95%		
15	4.79%		
	Responses 13 35 117 105 28 15		



3. Did other family members accompany you to Poland?

Multiple choice		
Answer Choices	Responses	Ratio
Came with father	8	2.56%
Came with mother	48	15.34%
Came with grandparents	1	0.32%
Came with infants (0-4 years)	44	14.06%
Came with children (5-12 years)	129	41.21%
Came with children (13-18 years)	87	27.8%
Came with spouse	61	19.49%
Came with others	32	10.22%
Came alone	45	14.38%

[English] Questionnaire on IT/digital literacy



3. Did other family members accompany you to Poland?

4. What is your educational background?

Single choice			
Answer Choices	Responses	Ratio	
Primarily education	21	6.71%	
High school diploma	95	30.35%	
Bachelor's degree	75	23.96%	
Master's degree	119	38.02%	
Doctorate degree	3	0.96%	

[English] Questionnaire on IT/digital literacy



4. What is your educational background?

5. Are you looking for a job in Poland?

Single choice

-			
Answer Choices	Responses	Ratio	
Yes	246	78.59%	
No	67	21.41%	



6. What kind of job are you looking for?

Matrix of single choices

	Full-time	Part-time	Self-employment
п	104	82	20
Education	33	42	7
Finance	35	29	13
Manufacturing	29	35	10
Commerce	20	35	10
Healthcare	21	23	7
Hotel, restaurant	20	33	5
Construction	6	19	15
Logistics	23	26	9
Agriculture	4	21	12
Others	30	24	16

[English] Questionnaire on IT/digital literacy



6. What kind of job are you looking for?



[English] Questionnaire on IT/digital literacy

Single choice Responses Ratio Answer Choices Responses Ratio Office manager 45 18.29% Office worker 109 44.31% Physical worker 44 17.89%



7. What kind of position are you looking for?

7. What kind of position are you looking for? (Other...)

Category	Responses
Remotework	
IT specialist	
Psychologist	
Medicalworker	
Designer	
Kindergarten teacher	
Accountant or midwife	
Cook	-
Creativework	
Massagetherapist	
Speech and language therapist	1
Quality Assurance Automation Engineer	3
Freelance	
Doctor	
Hairdresser	
Start your own business	
Bricklayer	
Port infrastructure engineer	
Deputy director	
SiebelCRM Developer, NodeJs developer	e 3
Translator	
QA engineer	
Seamstress	
Driver	1
Salesmanager	
Laborer	
I want to study Phyton	1
To be highly paid	1

[English] Questionnaire on IT/digital literacy



8. What IT devices do you usually use (per day)?

9. For what purpose do you usually use the Internet (per day)?





[English] Questionnaire on IT/digital literacy

10. What application software do you usually use?

Matrix of single choices

	Always	Often	Sometimes	Rarely	Never
Microsoft Word	88	81	71	41	32
Microsoft Excel	32	78	86	63	54
Microsoft PowerPoint	12	35	74	96	96
Like Chrome, Edge, etc.	192	77	16	11	17
Like Gmail, Outlook, etc.	178	71	37	14	13
Like Zoom, Teams, etc.	49	70	82	46	66
Others	28	57	105	50	73
C	50	100 150	200 250	300 3	350

Microsoft Word				
Microsoft Excel				
Microsoft PowerPoint				
Like Chrome, Edge, etc.		1		
Like Gmail, Outlook, etc.				
Like Zoom, Teams, etc.				
Others				

Always Often Sometimes Rarely Never

11. Do you want to become an IT specialist?





Number of valid respondents: 286 (Q12 – Q15)

[English] Questionnaire on IT/digital literacy

12 What kind of support do you think is essential?

Answer Choices	Responses	Ratio
Provide scholarship to learn IT at universities	85	29.72%
Provide IT professional courses, collaborating with companies and universities (non-degree courses)	149	52.1%
Provide internship opportunities at IT companies	168	58.74%
Provide jobs matching services	89	31.12%
Provide programming workshops for high school students	47	16.43%
Provide business-level language training (English, Polish)	160	55.94%
Other	9	3.15%

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12. What kind of support do you think is essential? (Other...)

Give everyone a laptop who wants to work in IT Training in the field of IT All of the above. Holding programming workshops for children. Extracurricular IT education for children who have left Ukraine. of the same plan as the Ukrainian School of Invention For low-income families Online training IT training for further work in this field Courses for beginners (from 0 to specialist)

[English] Questionnaire on IT/digital literacy

13. What kind of IT training would you like to join?

Matrix of single choices

Microsoft Office 94 88 34 34 Web authoring/design 145 92 23 11 11 Computer graphics/design 133 84 32 22 11 Programming (Python) 96 86 55 26 14 Programming (Java) 88 87 52 36 14	Definitely Not
Web authoring/design 145 92 23 11 I Computer graphics/design 133 84 32 22 22 Programming(Python) 96 86 55 26 26 Programming(Java) 88 87 52 36 31	36
Computer graphics/design 133 84 32 22 22 Programming (Python) 96 86 55 26 26 Programming (Java) 88 87 52 36 31 Programming (JavaScript) 89 85 59 31	15
Programming (Python) 96 86 55 26 Programming (Java) 88 87 52 36 Programming (JavaScript) 89 85 59 31	15
Programming (Java) 88 87 52 36 Programming (JavaScript) 89 85 59 31	23
Programming/JavaScrint) 80 85 50 31	23
riogramming (avascript) 55 55 55	22
Cloud (such as AWS) 66 90 64 42	24
Data science and Ai 94 111 47 19	15
Cyber security 95 98 42 30	21
Digital marketing 100 96 46 20	24
Others 57 115 57 24	33

50 100 0 150 200 250 300 350 Microsoft Office Web authoring/design Computer graphics/design Programming (Python) Programming (Java) Programming (JavaScript) Cloud (such as AWS) Data science and Al Cyber security Digital marketing Others Definitely Probably Neutral Probably Not Definitely Not

13. What kind of IT training would you like to join?

[English] Questionnaire on IT/digital literacy

14. What kind of IT training delivery method is preferable?

single choice				
Answer Choices	Responses	Ratio		
Online	134	46.85%		
Offline (at class)	37	12.94%		
Blended (Online and offline)	115	40.21%		



15. What would you like to do after attending the training?

Multiple choice

Answer Choices	Responses	Ratio
To start or expand my own business with such as publishing own website	73	25.52%
Look for office jobs such as administrator and data management operators	80	27.97%
Look for B2B jobs such as website designing and contract IT development	99	34.62%
Look for IT-related jobs such as web designers and IT developers	154	53.85%
Continue to brush up my IT skillsthrough other training and advance to universities	52	18.18%
I have no clear idea at this point	60	20.98%
Other	2	0.7%
To start or expand my own business with such as pr Look for office jobs such as administrator and data m Look for B2B jobs such as website designing and cor Look for IT-related jobs such as web design Continue to brush up my IT skills through other training and a I have no d	0 20 40 60 ublishing own website anagement operators trract IT development ters and IT development clear idea at this point Other	80 100 120 140 160 180 73 80 99 154 154

[English] Questionnaire on IT/digital literacy

15. What would you like to do after attending the training? (Other...)

I want my daughter to study To look for an additional source of income in the IT field with the opportunity to work a few hours on

Annex 3 : Results of job information sites survey

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Results of job information sites survey (Python programming)

The chart below shows the main programming languages with the most job openings in Pracuj.pl (Ukrainie) ¹." The list is by job title (position) searched for "Python" and "Java".

- Total number of jobs: 535 in Python and 575 in Java.
- Similar distribution for both languages, with fewer jobs for interns and juniors (6% of total)
- Similar distribution for both languages, with more jobs available for seniors and specialists (87% of the total)



Figure-1 Search results in Python and Java (Report)

Position	Python	Java	Total	Percentage
Intern	29	3	32	3%
Junior	13	16	29	3%
Specialist	297	293	590	53%
Senior	153	224	377	34%
Expert	29	19	48	4%
Manager	14	17	31	3%
Total	535	572	1107	100%

Figure-2 Search results in Python and Java (Table)

¹ https://www.pracuj.pl/praca?ua=true

Results of job information sites survey (Microsoft Office)

The following chart shows the results of a free word search for "excel" on Pracuj.pl (Ukrainie) ². 33 jobs were tagged by job title, job function, and keyword.

- 70% of positions are professional, 30% are general
- Data analysis tends to be more common among professional positions, while data tabulation work is more common among general positions
- There are 39% report writing (data tabulation, graph creation, etc.) jobs.
- In the indirect sector, there are many jobs in human resources, finance, accounting departments, etc. (many back-end data management tasks)
- In industry, many jobs are in transportation, manufacturing, retail, etc. (many sales and inventory data management operations)



Figure-3 Search results in Excel (Report)

² https://www.pracuj.pl/praca?ua=true

Position#	Excerpts of responsibilities and requirements for Excel=	Job classification	Task classification	Keywords.⊄
Junior Data Analyste	Knowledge of MS PowerPoint and MS Excel with PowerQuery (M	profession	Data Analysis	e.
Process Data Engineer - 4 Subsurface ¹⁷	Digital/Software Skills: ArcGIS, advanced Excel, Linux, Exploration Archives, OpenWorks are not required but would be an advantage. ²⁴	profession÷	Data Aggregation Services	el.
Senior Analyst, Process Improvement 4 (Accounting and Administration)+*	Advanced proficiency in Microsoft Office; advanced skills in PowerPoint, Visio, Word, and Excel - must be comfortable with Vlaokup, Pivot. ⁴²	profession+-	Data analysis services ⁶³	e ¹
Assist inventory and distribution management teams in France and/or Italyer	Programs used: SAP, WMOS, MS Excelo	clerical position (e.g. in the civil service)	Data Aggregation Servicese	¢3
Paid internship in the mobility sector+2	Data analysis and report preparation (Excel, Planisware, Power BI)++	clerical position (<u>e.g.</u> in the civil service)⇔	Data Aggregation Services+	Report
Senior Financial Analyst ²	Building financial models, reporting tools, and other administrative tools in MS Excel.4 Strong knowledge of MS Excel and experience building financial models, reporting tools, and other administrative tools using the application.40	profession**	Data analysis services:2	Reporte
Social Rental Program - Manager ^{es}	Ability to manage databases (Excel)+	profession+2	Data Aggregation Services#	ę
Junior Human Resources Management and Payroli Specialists ²	Work in Excel, e.g., extracting reports from the system, \vec{e}	profession#	Data Aggregation Services#	Report-
Specialist, Financial 4 Operationse	Good knowledge of MS Windows environment with Office packages (especially MS Excel), knowledge of SQL is a big plus. ⁴⁹	profession+	Data Aggregation Services+	ę
Global Compensation Manager ³	Use your leadership skills, extensive knowledge of Excel, and compensation principles to Lead the development, implementation and management of global compensation programs, golicies and processes. Manage and mentor compensation analysts in the day- to-day execution of their work. ¹ Oversee the annual compensation planning process and quarterly and annual bonus payment cycles using Workday. Apptio's HRIS system of record; use research sources such as Payfactors, ERI, and Radford to ensure global compensation programs remain market competitive and internally fair Ensure global compensation programs remain market competitive, internally equitable, and aligned with business needs using research sources such as Payfactors, ERI, and Radford. Develop, maintain, and document compensation structures, processes, and programs to ensure compliance with regulatory requirements and company-wide compensation initiatives. Develop cost models, analyses, and plan design recommendations for various global compensation programs, maintain Applio's equity (chare) database and manage the equity program. Work with key stakeholders in Recruiting, HR. Legal, Finance, and Accounting on compensation and equity programs and processes. Lead special projects and develop senior level presentations and communications. Prioritize competing demands to support multiple initiatives and stakeholders. ⁴	profession	Data Aggregation Services	e
Data Analysis Specialist ^{e3}	Analysis of financial data using MS Excel and source documents, e3	profession#	Data analysis services ²	43
Contract Analyste	Prepare a variety of reports and analyses to improve supply chain efficiency using company sponsored software (SAP, Ariba, Excel, etc.)et	profession®	Data Aggregation Services ^{es}	Reporter
Paid Intenship Program - MS Excel ²¹	Financial data analysis, \downarrow to verify the accuracy and completeness of invoices and transactions, \downarrow ensuring the consistency and integrity of the data analyzed, \downarrow	clerical position (<u>e.g.</u> in the civil service)+>	Data Aggregation Services*	ø
Junior bank statement processing analyste ²	Experience with Excel, working knowledge of $Outlook^{\mathrm{s}^2}$	profession+2	Data Aggregation Services#	e
Analyst and client onboarding support - account and market activation ²²	(Optional requirement) Excellent digital and IT skills including MS Exceld	professione ³	Data analysis services ⁶³	et.
Power BI Developer*1	Design and develop reports within Microsoft Excel, VBA, and BI solutions (AFO, Power BI, SAC) as needed based on established reporting standards. ²⁰	profession+-	Data analysis services ²⁵	Report

Internships in Human Resources Management ^{e2}	Update HR management data in the system and Excel files43	clerical position (e.g. in the	Data Aggregation Services	¢
		civil service)⇔	Services	
Junior Database Analyst©	Maintain reports in Qlik Sense and MS Excel - automate repetitive processes using VBA for Excel, SQL, or Qlik Engine, e^{i}	profession∉	Data analysis services∉	Report
German administrator42	Manage invoices and data in Microsoft Excel [®]	clerical position (<u>e.g.</u> in the civil service)↔	Data Aggregation Services∉	¢
Analyst / Analyst⊌	Creation of analytical reports (daily, weekly, monthly) - complex Excel and accounting software.↓ Confident use of accounting programs. Accounting: MS Office, Excel (tabulations, formulas).4 ^a	profession∉	Data Analysis Services∉	Report
Independent Accountants / Independent Accountantse	Prepare statements and reports in an Excel spreadsheet $\!\!\!^{\scriptscriptstyle 2}$	profession⇔	Data analysis services⇔	Report⇔
office assistant [©]	Prepare reports, statements, and summaries in MS Excel \downarrow Spreadsheet accuracy, computational skills, and knowledge+2	clerical position (<u>e.g.</u> in the civil service)↔	Data Aggregation Services⇔	Report∈
Italian procurement specialist리	(Optional Requirement) Advanced Excel skills ^{ed}	profession∈	Data Aggregation Services⇔	4 ²
Accounting Department Assistant ²	Prepare statements for internal purposes, support calculations in MS $Excel^{\wp}$	clerical position (<u>e.g.</u> in the civil service)∉	Data Aggregation Services∉	€ ³
junior accountant€	Proficiency in MS Office packages, especially a good understanding of Excel functionality ^{e3}	profession⇔	Data analysis services⇔	¢
Vodka production operatore3	Computer literacy and simple report writing in MS Excel+2	clerical position (e.g. in the civil service)€	Data Aggregation Services∉	Report⇔
Paid Internships in the Internal Flow Optimization Section ^{e2}	\downarrow Good knowledge of the MS Office suite, especially MS Excel, working with SAP, <u>VISIO</u> and Excel ²	clerical position (<u>e.g.</u> in the civil service)↔	Data analysis services∉	چ
Paid internship in HR, HR processes and projects section/training area ^{c2}	Creating data/reports in Excel	profession4 ²	Data Aggregation Services∉	Report
business analyst⊄	↓ Familiarity with MC Excel spreadsheets ↓ Knowledge of Excel, Power Point - Love to create beautiful reports.42	profession⇔	Data Analysis Services∉	Report
Financial Manager ^{e3}	Daily execution of spreadsheets in Microsoft Excel (company revenue, expenses), CRM system, Google Docs.↓ Must be proficient in the use of Microsoft programs (Excel, Word).43	profession∉ ²	Data analysis services⇔	ę
Assistant / Assistant to the Board ²	Database management in Excel and Qgis \downarrow Fast and efficient work on computer (Word, Excel), good knowledge of Qgis $\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	clerical position (<u>e.g.</u> in the civil service)↔	Data Aggregation Services∉	¢
Operations and Accounting Specialistei	Use Excel to create and maintain a variety of financial or accounting reports, including income statements, revenue streams, and other financial analysis documents. \downarrow	profession< ²	Data Aggregation Services∉	Report⇔

Figure-4 Search results in Excel (List)

Results of job information sites survey (Website authoring)

The following figure shows the results of an aggregate analysis of the 31 jobs resulting from a free word search for "WordPress" and "Web Design" from Pracuj.pl (Ukrainie) ³, based on the main categories (web production, marketing, graphic design) according to job description.

³ https://www.pracuj.pl/praca?ua=true

• Website authoring is just under 40% and marketing is just over 40%, with a large number of jobs in web marketing



• Graphic design is a constant job with just under 20%.

Figure-5 Search results in WordPress and Web Design (Report)

Position	Role₽	
Senior WordPress Developer⊲	Web development⇔	
Web Developer	Web development⇔	
Communication Specialist@	Web development⇔	
Shopping Shopify	Web development⇔	
Web Developer↩コ	Web development⇔	
Customer Support (WordPress)∉	Graphic design⊄	
PR and marketing specialist in French⇔	Marketing₽	
SEO Specialist⇔	Marketing∉	
Assistant / Assistant	Marketing⇔	
Customer Service	Marketing₽	
Specialist/Specialist↔	Web development⇔	
Marketing Communications Specialist	Web development⇔	
Media Specialist&	Marketing⇔	
Marketing and sales support coordinator		
Chief Specialist∉	Marketing∉	
Internet Marketing Specialist⇔	Marketing₽	
Marketing Specialist ⁴²	Marketing↩	
Chief Marketing Officer⇔	Graphic design¢ ²	
Specialist/Marketer⇔	Marketing⇔	
Social Network Specialist∉	Marketing∉	
Marketing Specialist/& Graphic design		
Specialist Marketing Specialist↔	Web development⇔	
Marketing Specialist ⁽²⁾ Marketing ⁽²⁾		
Documentary Director↔	Web development⇔	
Marketing Specialist©	Marketing∉	
Internet Marketing Specialist↔	Marketing⇔	
Marketing Specialist@	Web development⇔	
Marketing and Insurance Digital Marketing Manager⇔	Web development⇔	
Marketing Specialist@	Graphic design⇔	
Graphic design designer	Graphic design⇔	
E-commerce specialists∉J	Web development⇔	

Figure-6 Search results in WordPress and Web Design (List)

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Annex 4: Results of pilot traiing questionnaire survey

Results of pilot traiing questionnaire survey

Question 2 and subsequent questions were tabulated because question 1 only asked which course the participant attended.



Figure-1 Question2. Age and gender by age group



Figure-2 Question3. Gendert



Figure-3 Question4. Educational background



Figure-4 Question5. How did you feel about the training in general?



Figure-5 Question6. Was the training period appropriate?



Figure-6 Question7. Will the content of the training be valuable in your future work?





Figure-7 Question8. Was the content of the lecture easy to understand? (All courses)



Figure-8 Question9. Were the materials provided by the lecturer easy to understand?



Figure-9 Question10. Was the lecturer's explanation easy to understand?



Figure-10 Question11. Was the Polish lecture easy to understand?



Figure-11 Question 12. To what extent have you improved your skills in the training content compared to before the training began?



Figure-12 Question13. Would you like to participate in this kind of training again?







Figure-14 Question 15. Please tell us how you want to apply what you have learned in this training to your future work





Annex 5 : Results of follow up questionnaire survey

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Results of follow up questionnaire survey



Figure-1 Question 1. What is your gender?



Figure-2 Question 2. What is your age?



Figure-3 Question 3. What is your educational background?



Figure-4 Question 4. How long do you think your stay in Poland?



Figure-5 Question 5. Which IT training course(s) did you participate in?



Figure-6 Question 6. After you completed the IT training course(s), have you done any activities to find a job?



Figure-7 Question 7. If Yes, what activities have you undertaken to find a job?



Figure-8 Question 8. As a result of your job search activities, have you found a job?



Figure-9 Question 9. If Yes, did anything from your PJAIT training help you in finding a job?



Figure-10 Question 10. If Yes, what type of job have you found?



Figure-11 Question 11. If No, what are the reasons not to find a job?



Figure-12 Question 12. What kinds of future support are needed to find a job?



Figure-13 Question 13. Do you agree that we contact you for further information?

Annex 6 : Basic Data of Ukrainian Universities

List of Ukrainian Universities and Basic Data

Name of University/Location (State)	Questionnaire survey	Interview survey	Interview sheets	Leading universities*
Kviv	. ,			Ũ
Borys Grinchenko Kyi University	~			
Dragomanov Ukrainian State University	~			
Kyiv National Economic University Named after Vadym Hetman				~
National Technical University of Ukraine "Igor Sikorsky Kyiv				
Polytechnic Institute"			\checkmark	\checkmark
National University of Kyiv-Mohyla Academy				\checkmark
National University of Life and Environmental Sciences of Ukraine	\checkmark			
State University of Information and Communication Technology				\checkmark
Taras Shevchenko National University of Kyiv	\checkmark			\checkmark
Odesa	\checkmark			
Odesa I.I.Mechnikov National University	\checkmark	\checkmark	\checkmark	~
Odessa Polytechnic National University			\checkmark	~
Kharkiv				
Kharkiv National University of Radio Electronics	\checkmark	\checkmark	\checkmark	~
National Aerospace University "Kharkiv aviation institute"	~			~
National Technical University "Kharkiv Polytechnic Institute"				~
O.M. Beketov National University of Urban Economy in Kharkiv			~	
Simon Kuznets Kharkiv National University of Economics				~
V. N. Karazin Kharkiv National University	\checkmark			\checkmark
Mykokaiv				
Mykolaiv National Agrarian University	√			
Petro Mohyla Black Sea National University	√			
Lviv				
Ivan Franko National University of Lviv		~	~	~
Lviv Polytechnic National University		\checkmark	~	~
Ukrainian Catholic University				~
Ivano-Frankivsk				
Ivano-Frankivsk National Medical University	\checkmark			
Vasyl Stefanyk Precarpathian National University	√			
Donipropetrovsk				
Dninro University of Technology		~	~	~
Oles Honchar Dninro National University				, ,
SHEL «Prvazovskyi State Technical University»			~	
Rivne				
National University of Water and Environmental Engineering		√	V	
Ternonil		· · · · · · · · · · · · · · · · · · ·		
Donbas State Engineering Academy			~	
Chemibiy				
Yuriy Fedkovych Chemiytsi National University				J
Charlesy				
Cherkasy Charkasy Stata Taabaalagigal University			1	
Khorson			•	
Kherson Kharon Stata University				
			v	
Sumy	.1			1
Baltava	v			v
Follava		./		
National University «Yuri Kondratyuk Poltava Polytechnic»		v	v	
	~			
Vinnytsia Vienytsia National Technical University				
Vinnytsia National Technical University			V	
K nmeinytskyi				,
Khmeinytskyi National University				×
Podilia State University	~		L	
Volyn				
Lutsk National Technical University	✓ 			
* Ministry of Education and Science in Ukraine's suggestion as poter	ntial Ukrainian partner univ	versities of JICA projects		
Source: JICA Survey Team				

Name of University/Location (State)	Public/Private	Number of studens (persons)	Number of Lecturers (persons)	Number of departments or facultijes	Number of IT-related faculties and graduate schools
Kyiv				incuince	5010015
Borys Grinchenko Kyi University	Public	8, 783	743	13	1
Dragomanov Ukrainian State University	Public	17,000	1,900	18	1
Kyiv National Economic University Named after Vadym Hetman	Public	10,000	750	8	1
National Technical University of Ukraine "Igor Sikorsky Kyiv	Public	21 500	2 800	24	16
Polytechnic Institute"	Tublic	21,500	2,000	24	10
National University of Kyiv-Mohyla Academy	Public	3,936	608	6	1
Ukraine	Public	31,000	3,000	13	3
State University of Information and Communication Technology	Public	8,000	310	25	10
Taras Shevchenko National University of Kyiv	Public	28,000	2,944	22	4
Odesa			·		
Odesa I.I.Mechnikov National University	Public	10,680	996	11	1
Odessa Polytechnic National University	Public	6,618	100	15	2
Kharkiv					
Kharkiv National University of Radio Electronics	Public	8,500	650	7	6
National Aerospace University "Kharkiv aviation institute"	Public	7,000	947	8	3
National Technical University "Kharkiv Polytechnic Institute"	Public	14,000	1,500	10	5
O.M. Beketov National University of Urban Economy in Kharkiv	Public	7,552	689	6	1
Simon Kuznets Kharkiv National University of Economics	Public	6,324	650	7	1
V. N. Karazin Kharkiv National University	Public	15,000	2,000	20	5
Mykokaiv					
Mykolaiv National Agrarian University	Public	6,000	334	8	2
Petro Mohyla Black Sea National University	Public	4,200	314	9	1
Lviv					
Ivan Franko National University of Lviv	Public	24,333	2,029	19	1
Lviv Polytechnic National University	Public	28,800	2,300	16	4
Ukrainian Catholic University	Private	2,160	297	5	1
Ivano-Frankivsk					
Ivano-Frankivsk National Medical University	Public	6,114	938	3	0
Vasyl Stefanyk Precarpathian National University	Public	15,479	903	11	3
Donipropetrovsk					
Dnipro University of Technology	Public	10,000	649	10	2
Oles Honchar Dnipro National University	Public	10,000	879	14	1
SHEI «Pryazovskyi State Technical University»	Public	11,000	517	5	1
Rivne					
National University of Water and Environmental Engineering	Public	7,131	522	10	3
Ternopil					
Donbas State Engineering Academy	Public	6,125	411	4	1
Chernihiv					
Yuriy Fedkovych Chernivtsi National University	Public	12,346	993	6	1
Cherkasy					
Cherkasy State Technological University	Public	4,462	292	6	1
Kherson					
Kherson State University	Public	2,964	272	9	1
Sumy					
Sumy State University	Public	12,000	3,000	7	4
Poltava			I		
National University «Yuri Kondratyuk Poltava Polytechnic»	Public	7,000	345	6	2
Poltava State Agrarian University	Public	9,000	316	4	2/
Vinnytsa					
Vinnytsia National Technical University	Public	4,900	425	7	4
Khmelnytskyi					
Khmelnytskyi National University	Public	6,500	508	8	1
Podillia State University	Public	6,133	211	7	2
Volyn			1		
Lutsk National Technical University	Public	5,266	459	7	4
Souce : Each university's website, Ukrainian university potal site (https://www.education.ua/)					

Annex 7 : Research topics proposed by Ukrainian universities during the interviews (examples)

Existing Research Themes	Research Areas with Prospects	
Algorithms, models, and physically-informed		
AI for multiscale complex (composite, bio and	Intelligent monitoring of relevant data in	
mesoporous) materials modelling.	open sources, Agent-oriented software	
Processing of microscopic images/video of	development, Processing of weak-	
biological objects.	structured textual data, Software	
Modeling and processing of	engineering process improvement;,	
microinterferometric images (AI/CV) in the	Analysis and synthesis of complex,	
field of Material Science and Surface Science	decentralized systems, Dynamic systems	
Detection of explosive objects and	management under uncertain conditions,	
humanitarian demining of territories.	Development of the systems of navigation	
Creation of bionic limb prostheses for people	and automatic control of intellectual	
victims of mine danger.	robotic systems, Development of the	
Development of ML algorithms and surrogate	computational intelligence methods for	
models (based on computer simulation	reliability predictions and diagnostics of a	
synthetic data) for diagnosing the extent and	remaining lifetime of structural elements	
volume of direct and in-direct soft tissue	(engineering and biomedical)	
damage in gunshot wounds		

University B

University A

Research TopicsAdaptive control systems in conditions of uncertaintyProgramming of logic controllers Siemens, Owen, energy-saving devices and technologiesModern measuring devices and information-measuring systemsElectrical equipment and power supply; development of automated control systems for
technological processes; - modeling the operation of grain drying equipmentModeling the operation of mechanical and electromechanical systemsEnergy-saving technologies, control systems in power engineering, lighting technology, and
light sourcesImprovement of the quality of information signals in telecommunication systems and
networks

Mathematical modeling of lifting and transport, construction, and road machinery

Modernization of motor vehicles

Development of e-learning systems

Artificial intelligence, genetic algorithms, neural networks

Information security, computer networks

Mathematical models of multicriteria optimization

Source : Interview Survey